Control Technology, I/O Systems and Automation Infrastructure

8

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PHOENIX CONTACT
INSPIRING INNOVATIONS

PCB connection technology and electronics housing
- PCB terminal blocks and plug-in connectors
- Electronics housing

Connection technology for field devices
- Plug-in connectors
- Cables and connectors

Modular terminal blocks
- Modular terminal blocks

Sensor/actuator cabling and industrial plug-in connectors
- Sensor/actuator cabling
- Cables and connectors
- Plug-in connectors

Marking systems, tools, and mounting material
- Marking and labeling
- Tools
- Installation and mounting material

Surge protection and power supply units
- Lightning monitoring system
- Surge protection and interference filters
- Power supply units and UPS
- Protective devices

Interface technology and switching devices
- Electronic switching devices and motor control
- Measurement and control technology • Monitoring
- Relay modules • System cabling for controllers

Control technology, I/O systems and automation infrastructure

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FL WLAN EPA
Power
LAN
FL IOT EPA MD
Power
LAN

Ethernet networks

Make the most of all the options offered by your Ethernet network.

Phoenix Contact offers you more real-time, more wireless, more safety, and more reliability.

Industrial Ethernet from Phoenix Contact can be easily integrated in your automation infrastructure - because we make Ethernet easy.

Benefit from our experience in automation which spans decades and the experience we have gained in industrial Ethernet networks over the past ten plus years.

We know and understand the expectations and demands placed on automation. This is evident and embodied in our products and solutions.

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Switches

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Factoryline Wired – switches

Type	**FL SWITCH SFNB ...**	**FL SWITCH SFN ... FL SWITCH SFN ... GT ...**	**FL SWITCH SFNT ...**	**FL SWITCH SF ...**	**FL SWITCH 1000 ...**
Description	Standard switches with basic functions, up to 8 ports (RJ45/FO)	Standard switches with up to 16 ports and standard Gigabit switches with 8 ports (RJ45/FO)	Standard switches with wide temperature range, up to 16 ports (RJ45/FO)	Standard switches with flat design with up to 16 ports (RJ45/FO)	Industrial unmanaged switches with up to 24 ports (RJ45/FO)
Page	**6**	**10**	**14**	**16**	**18**

Type	**FL SWITCH 3000 ...**	**FL SWITCH 4000 ...**	**FL SWITCH LM ...**	**FL SWITCH SMCS ...**	**FL SWITCH IRT ...**
Description	Industrial managed switches with up to 16 ports (RJ45/FO)	Industrial managed Gigabit switches with up to 16 ports (RJ45/FO)	Lean Managed Switches with up to 8 ports (RJ45/FO)	Smart Managed Compact Switches with up to 16 ports (RJ45/FO)	PROFINET realtime switch with 4 ports (RJ45/SCRJ)
Page	**16**	**22**	**24**	**28**	**32**

Type	**FL NAT SMN 8TX**	**FL SWITCH SMN 6TX/2POF-PN**	**FL MC ETH/FO 660 T**	**FL SWITCH GHS...**	**FL SWITCH 1605 M12**
Description	NAT switch with 1:1 NAT router function with 8 ports (RJ45)	Smart Narrow Switch with 8 ports (RJ45/SCRJ)	Media converter with 2 SCRJ and 2 RJ45 ports	Gigabit Modular Switches with up to 28 ports (RJ45/FO)	Standard switch with IP67 protection with 5 ports (M12)
Page	**32**	**33**	**33**	**34**	**38**

Interface modules

Hubs

Power over Ethernet

Type	**FL IF ...**	**FL SFP ...**	**FL MEM PLUG ...**	**FL HUB ... TX-ZF**	**FL PSE 2TX**
Description	Media modules for Modular Managed Switch system	Plug-in I/O modules for transmission ranges up to 80 km	Replaceable configuration memory for easy device replacement and startup	Ethernet hubs with 8/16 RJ45 ports	Power over Ethernet module (PSE) with 2 PoE ports
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Factoryline Security – secure networks

Type	**FL MGUARD RS ...**	**FL MGUARD GT/GT ...**	**FL MGUARD SMART2 ...**	**PCI 4000**	**TC MGUARD RS 4000 3G**
Description	Firewall/router in metal housing	Gigabit router with firewall, replaceable memory	Router with firewall for mobile use	Router with firewall for PCI	Mobile phone VPN router **See Section: industrial communication technology**
Page	**40**	**41**	**41**	**45**	**425**

Software

Services

Type	**FL SNMP OPC SERVER**	**FL VIEW**	**FL MGUARD DM ...**	**Services**
Description	Monitoring/configuration of SNMP-compatible devices in HMI and SCADA systems	Diagnostic software for graphical representation of Ethernet networks	Central management software for FL MGUARD devices	Service packages for Industrial Ethernet
Page	**507**	**44**	**45**	**46**

Wireless Ethernet

Type	**FL WLAN 5100**	**FL WLAN ...**	**FL WLAN EPA ...**	**FL BT EPA ...**	**Accessories**
Description	WLAN access point for control cabinet mounting	WLAN access point for wall mounting	WLAN Ethernet adapter	Bluetooth access point and Ethernet adapter	Antennae, adapter cables, and surge protection
Page	**48**	**50**	**51**	**52**	**54**

Gateways/proxies | Media converters | COM server | Isolator | Accessories

Type	**FL NP PND...**	**FL MC ...**	**FL COMSERVER ...**	**FL ISOLATOR ...**	**Patch fields and cables**
Description	PROFINET proxies function as a link between PROFINET networks and other fieldbus systems	Conversion of 10/100Base-T(X) Ethernet to fiber optics	Device servers for converting serial interfaces	4 kV Ethernet ISOLATOR for electrical isolation	Patch fields, cables, tools, and fiber optic connector plugs
			See Section: industrial communication technology		
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Unmanaged switches

Standard switches with basic functions

FL SWITCH SFNB… unmanaged switches are optimized for basic and entry level applications where low installation costs with full industrialization are required.

– 5 to 8 ports in a narrow, metal housing
– Optional SC and ST fiber optic ports
– For longer distances, multi-mode and single-mode fiber connections are available
– RJ45 ports provide 10/100 Mbps speeds ; fiber optic ports operate at 100 Mbps
– Autonegotiation and autocross recognition provide easy installation and setup
– LED indicators provide local diagnostics
– Cable locking security options

Ethernet

5 RJ45 ports

Ex:

Technical data

Ethernet interface	
Number of ports	5 (RJ45 ports)
Transmission speed	10/100 Mbps
Connection method	RJ45
Fiber optic interface	
Number of ports	-
Transmission speed	-
Connection method	-
Transmission length	-
Function	
Basic functions	Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode
Status and diagnostic indicators	LEDs: U_S, link and activity per port
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum conductor length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC
Residual ripple	3.6 V_{PP}
Supply voltage range	12 V DC ... 48 V DC
Typical current consumption	185 mA (@24 V DC)
General data	
Weight	205 g
Width	28 mm
Height	110 mm
Depth	70 mm
Degree of protection	IP20
Ambient temperature (operation)	-10 °C ... 60 °C
Permissible humidity (operation)	5% ... 95% (no condensation)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch - 5 RJ45 ports - 8 RJ45 ports - 4 RJ45 ports, 1 SC FO port - 4 RJ45 ports, 1 ST FO port	**FL SWITCH SFNB 5TX**	**2891001**	1

Ethernet

8 RJ45 ports

Ex: c UL us

Technical data

8 (RJ45 ports)
10/100 Mbps
RJ45
-
-
-
-
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode
LEDs: U_S, link and activity per port
Network, linear, and star structure: any
100 m
24 V DC
3.6 V_{PP}
9 V DC ... 32 V DC
140 mA (@24 V DC)
320 g
50 mm
110 mm
70 mm
IP20
-10 °C ... 60 °C
5% ... 95% (no condensation)
EN 61000-6-4
EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFNB 8TX	**2891002**	1

Ethernet

4 RJ45 ports and 1 fiber optic port (multi mode)

Ex: c UL us

Technical data

	FL SWITCH SFNB 4TX/FX FL SWITCH SFNB 4TX/FX ST
4 (RJ45 ports)	
10/100 Mbps	
RJ45	
1 (FO port)	
100 Mbps (SC-D, full duplex)	100 Mbps (ST multi mode)
SC	ST
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
LEDs: U_S, link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC	
3.6 V_{PP}	
12 V DC ... 48 V DC	
185 mA (@24 V DC)	175 mA (@24 V DC)
205 g	
28 mm	
110 mm	
70 mm	
IP20	
0 °C ... 60 °C	-10 °C ... 60 °C
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFNB 4TX/FX	**2891027**	1
FL SWITCH SFNB 4TX/FX ST	**2891028**	1

Ethernet

4 RJ45 ports and 1 fiber optic port (single mode)

Ex: c UL us

Technical data

4 (RJ45 ports)
10/100 Mbps
RJ45
1 (FO port)
100 Mbps (SC single mode)
SC
25 km (fiberglass with F-G 9/125 0.5 dB/km)
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode
LEDs: U_S, link and activity per port
Network, linear, and star structure: any
100 m
24 V DC
3.6 V_{PP}
12 V DC ... 48 V DC
175 mA (@24 V DC)
205 g
28 mm
110 mm
70 mm
IP20
-10 °C ... 60 °C
5% ... 95% (no condensation)
EN 61000-6-4
EN 61000-6-2

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFNB 4TX/FX SM20	**2891029**	1

Unmanaged switches

Notes:

1) EMC: Class A product, see page 553

Standard switches with up to 8 ports

FL SWITCH SFN… unmanaged switches have a wide range of configurations and features for general purpose applications.

– 5 to 8 ports in a narrow, metal housing
– Optional SC and ST fiber optic ports
– DC and AC power supply options
– Quality of Service (QoS) prioritized messages
– RJ45 ports provide 10/100 Mbps speeds ; fiber optic ports operate at 100 Mbps
– Autonegotiation and autocross recognition provide easy installation and setup
– LED indicators provide local diagnostics
– Switch-mounted cable locking and port blocking options

Ethernet

5/8 RJ45 ports

Ex:

Technical data

	FL SWITCH SFN 5TX	FL SWITCH SFN 8TX
Ethernet interface		
Number of ports	5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed	10/100 Mbps	
Connection method	RJ45	
Fiber optic interface		
Number of ports	-	
Transmission speed	-	
Wavelength	-	
Transmission length	-	
	-	
Function		
Basic functions	Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
Status and diagnostic indicators	LEDs: U_S, link and activity per port	LEDs: U_{S1}, link and activity per port
Network expansion parameters		
Cascading depth	Network, linear, and star structure: any	
Maximum conductor length (twisted pair)	100 m	
Power supply		
Supply voltage	24 V DC	
Residual ripple	3.6 V_{PP}	
Supply voltage range	9 V DC ... 30.2 V DC	
Typical current consumption	90 mA (at 24 V DC)	Typ. 140 mA
General data		
Weight	265 g	365 g
Width	30 mm	50 mm
Height	120 mm	
Depth	70 mm	
Degree of protection	IP20	
Ambient temperature (operation)	0 °C ... 60 °C	
Permissible humidity (operation)	5% ... 95% (no condensation)	
Noise emission	EN 61000-6-4	
Noise immunity	EN 61000-6-2:2005	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch			
- 5 RJ45 ports	**FL SWITCH SFN 5TX**	**2891152**	1
- 8 RJ45 ports	**FL SWITCH SFN 8TX**	**2891929**	1
- 8 RJ45 ports, flow control disabled	**FL SWITCH SFN 8TX-NF[1])**	**2891022**	1
- 4 RJ45 ports, 1 SC FO port			
- 4 RJ45 ports, 1 ST FO port			
- 7 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 ST FO port			
- 7 RJ45 ports, 1 SC FO port, flow control disabled			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			
- 6 RJ45 ports, 2 SC FO ports, flow control disabled			

Accessories

Layer-1 security elements	FL PLUG GUARD...

Ethernet

5/8 RJ45 ports with AC supply

Ex: c UL us

Technical data

FL SWITCH SFN 5TX-24VAC	FL SWITCH SFN 8TX-24VAC
5 (RJ45 ports)	8 (RJ45 ports)
10/100 Mbps	
RJ45	
-	
-	
-	
-	
-	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
LEDs: U_S, link and activity per port	LEDs: U_{S1}, link and activity per port
Network, linear, and star structure: any	
100 m	
24 V AC	
3.6 V_{PP}	
20 V AC ... 28 V AC	
Typ. 114 mA	Typ. 189 mA
277 g	340 g
30 mm	50 mm
120 mm	
70 mm	
IP20	
0 °C ... 60 °C	
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFN 5TX-24VAC	**2891021**	1
FL SWITCH SFN 8TX-24VAC	**2891020**	1

Accessories

FL PLUG GUARD...

Ethernet

4/7 RJ45 ports and 1 FO port

Ex: c UL us

Technical data

FL SWITCH SFN 4TX/FX	FL SWITCH SFN 7TX/FX
4 (RJ45 ports)	7 (RJ45 ports)
10/100 Mbps	
RJ45	
1 (FO port)	
100 Mbps (SC-D, full duplex)	
1300 nm/1310 nm	
2000 m (fiberglass 50/125)	
2000 m (fiberglass 62.5/125)	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
LEDs: U_S, link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC	
3.6 V_{PP}	
9 V DC ... 30.2 V DC	
Typ. 140 mA	Typ. 190 mA
265 g	365 g
30 mm	50 mm
120 mm	
70 mm	
IP20	
0 °C ... 60 °C	
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFN 4TX/FX	**2891851**	1
FL SWITCH SFN 4TX/FX ST	**2891453**	1
FL SWITCH SFN 7TX/FX	**2891097**	1
FL SWITCH SFN 7TX/FX ST	**2891110**	1
FL SWITCH SFN 7TX/FX-NF[1])	**2891023**	1

Accessories

FL PLUG GUARD...

Ethernet

6 RJ45 ports and 2 FO ports

Ex: c UL us

Technical data

FL SWITCH SFN 6TX/2FX	FL SWITCH SFN 6TX/2FX ST
6 (RJ45 ports)	
10/100 Mbps	10/100 Mbps (RJ45)
RJ45	
2 (FO ports)	
100 Mbps (SC-D, full duplex)	100 Mbps (ST, full duplex)
1300 nm	
2000 m (fiberglass 50/125)	
2000 m (fiberglass 62.5/125)	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
LEDs: U_S, link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC	
3.6 V_{PP}	
9 V DC ... 30.2 V DC	
Typ. 230 mA	
365 g	
50 mm	
120 mm	
70 mm	
IP20	
0 °C ... 60 °C	
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFN 6TX/2FX	**2891314**	1
FL SWITCH SFN 6TX/2FX ST	**2891411**	1
FL SWITCH SFN 6TX/2FX-NF[1])	**2891024**	1

Accessories

FL PLUG GUARD...

Unmanaged switches

Ethernet

16 RJ45 ports

Ex:

Standard switches with up to 16 ports

FL SWITCH SFN(T)… 16-port unmanaged switches provide high-density Ethernet connections for large or higher-level applications.

– 16 ports in a narrow, metal housing with redundant power supply
– Optional SC fiber optic ports
– Standard temperature (0°C… 60°C) and wide temperature (-40°C… 75°C) devices available
– RJ45 ports provide 10/100 Mbps speeds ; fiber optic ports operate at 100 Mbps
– Autonegotiation and autocross recognition provide easy installation and setup
– LED indicators provide local diagnostics
– Cable locking security options

Technical data

	FL SWITCH SFN 16TX	FL SWITCH SFNT 16TX
Ethernet interface		
Number of ports	16 (RJ45 ports)	
Transmission speed	10/100 Mbps	
Connection method	RJ45	
Fiber optic interface		
Number of ports	-	
Wavelength	-	
Transmission length	-	
Function		
Basic functions	Unmanaged switch / auto negotiation, complies with IEEE 802.3, store-and-forward switching mode, includes alarm contacts	
Status and diagnostic indicators	LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, voltage alarm	
Network expansion parameters		
Cascading depth	Network, linear, and star structure: any	
Maximum conductor length (twisted pair)	100 m	
Power supply		
Supply voltage	24 V DC (redundant)	
Residual ripple	3.6 V_{PP}	
Supply voltage range	12 V DC ... 48 V DC	
Typical current consumption	350 mA (at 24 V DC)	
General data		
Weight	870 g	
Width	70 mm	
Height	135 mm	
Depth	110 mm	
Degree of protection	IP20	
Ambient temperature (operation)	0 °C ... 60 °C	-40 °C ... 75 °C
Permissible humidity (operation)	5% ... 95% (no condensation)	
Noise emission	EN 61000-6-4	
Noise immunity	EN 61000-6-2	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch 16 RJ45 ports 15 RJ45 ports, 1 FO port 14 RJ45 ports, 2 FO ports	**FL SWITCH SFN 16TX**	**2891933**	1
Ethernet switch, wide temperature 16 RJ45 ports 15 RJ45 ports, 1 FO port 14 RJ45 ports, 2 FO ports	**FL SWITCH SFNT 16TX**	**2891952**	1

Ethernet

15 RJ45 ports and 1 FO port

Ethernet

14 RJ45 ports and 2 FO ports

Ex:

Technical data

FL SWITCH SFN 15TX/FX	FL SWITCH SFNT 15TX/FX
15 (RJ45 ports) 10/100 Mbps RJ45	
1 (FO port) 1300 nm 12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Unmanaged switch / auto negotiation, complies with IEEE 802.3, store-and-forward switching mode, includes alarm contacts LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, voltage alarm	
Network, linear, and star structure: any 100 m	
24 V DC (redundant) 3.6 V_{PP} 12 V DC ... 48 V DC 350 mA (at 24 V DC)	
870 g 70 mm 135 mm 110 mm IP20	
0 °C ... 60 °C	-40 °C ... 75 °C
5% ... 95% (no condensation)	
EN 61000-6-4 EN 61000-6-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFN 15TX/FX	**2891934**	1
FL SWITCH SFNT 15TX/FX	**2891953**	1

Ex:

Technical data

FL SWITCH SFN 14TX/2FX	FL SWITCH SFNT 14TX/2FX
14 (RJ45 ports) 10/100 Mbps RJ45	
2 (FO port) 1300 nm 12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Unmanaged switch / auto negotiation, complies with IEEE 802.3, store-and-forward switching mode, includes alarm contacts LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, voltage alarm	
Network, linear, and star structure: any 100 m	
24 V DC (redundant) 3.6 V_{PP} 12 V DC ... 48 V DC 350 mA (at 24 V DC)	
870 g 70 mm 135 mm 110 mm IP20	
0 °C ... 60 °C	-40 °C ... 75 °C
5% ... 95% (no condensation)	
EN 61000-6-4 EN 61000-6-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFN 14TX/2FX	**2891935**	1
FL SWITCH SFNT 14TX/2FX	**2891954**	1

Standard Gigabit switches

FL SWITCH SFN… Gigabit unmanaged switches have a wide range of fiber and copper port configurations for high performance applications.

– 8 ports in a narrow, metal housing with redundant power supply
– All ports provide 1000 Mbps speeds
– Autonegotiation and autocross recognition provide easy installation and setup
– **FL SWITCH SFN 6GT/2LX** provides a transmission length of up to 10 km with 2 single-mode fiber ports
– **FL SWITCH SFN 6GT/2LX-20** provides a transmission length of up to 20 km with 2 single-mode fiber ports
– LED indicators provide local diagnostics
– Relay contact

Ethernet

8 RJ45 ports

Ex:

Technical data

Ethernet interface	
Number of ports	8 (RJ45 ports)
Transmission speed	10/100/1000 Mbps (RJ45)
Connection method	RJ45
Fiber optic interface	
Number of ports	-
Connection method	-
Wavelength	-
Transmission length	-
Other connections	
Potential-free signaling contact	Plug-in/screw connection via COMBICON
Function	
Basic functions	Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode
Status and diagnostic indicators	LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum conductor length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V_{PP}
Supply voltage range	9 V DC ... 30.2 V DC
Typical current consumption	Typ. 430 mA
General data	
Weight	395 g
Width	50 mm
Height	120 mm
Depth	70 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 75 °C
Permissible humidity (operation)	5% ... 95% (no condensation)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch			
- 8 RJ45 ports - 7 RJ45 ports, 1 SC FO port (multi mode)	**FL SWITCH SFN 8GT**	**2891673**	1
- 6 RJ45 ports, 2 SC FO ports (multi mode)			
- 6 RJ45 ports, 2 SC FO ports (single mode) with 10 km range			
- 6 RJ45 ports, 2 SC FO ports (single mode) with 20 km range			

Accessories

Layer-1 security elements	FL PLUG GUARD...

Ethernet

7 RJ45 ports and
1 fiber optic port (multi mode)

Ex:

Technical data

7 (RJ45 ports)	
10/100/1000 Mbps	
RJ45	
1 (FO port)	
SC	
850 nm	
220 m (fiberglass 62.5/125)	
Plug-in/screw connection via COMBICON	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC (redundant)	
3.6 V_{PP}	
9 V DC ... 30.2 V DC	
Typ. 320 mA	
415 g	
50 mm	
120 mm	
70 mm	
IP20	
-25 °C ... 75 °C	
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFN 7GT/SX	**2891518**	1

Accessories

FL PLUG GUARD...

Ethernet

6 RJ45 ports and
2 fiber optic ports (multi mode)

Ex:

Technical data

6 (RJ45 ports)	
10/100/1000 Mbps	
RJ45	
2 (FO ports)	
SC	
850 nm	
220 m (fiberglass 62.5/125)	
Plug-in/screw connection via COMBICON	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC (redundant)	
3.6 V_{PP}	
9 V DC ... 30.2 V DC	
Typ. 350 mA	
425 g	
50 mm	
120 mm	
70 mm	
IP20	
-25 °C ... 60 °C (75 °C in preparation)	
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFN 6GT/2SX	**2891398**	1

Accessories

FL PLUG GUARD...

Ethernet

6 RJ45 ports and
2 fiber optic ports (single mode)

Ex:

Technical data

	FL SWITCH SFN 6GT/2LX	FL SWITCH SFN 6GT/2LX-20
6 (RJ45 ports)		
10/100/1000 Mbps		
RJ45		
2 (FO ports)		
SC		
1310 nm		
10000 m (fiberglass 9/125)		20000 m (fiberglass 9/125)
Plug-in/screw connection via COMBICON		
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode		
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port		
Network, linear, and star structure: any		
100 m		
24 V DC (redundant)		
3.6 V_{PP}		
9 V DC ... 30.2 V DC		
Typ. 360 mA		
435 g		
50 mm		
120 mm		
70 mm		
IP20		
-25 °C ... 60 °C (75 °C in preparation)		0 °C ... 60 °C
5% ... 95% (no condensation)		
EN 61000-6-4		
EN 61000-6-2:2005		

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFN 6GT/2LX	**2891987**	1
FL SWITCH SFN 6GT/2LX-20	**2891563**	1

Accessories

FL PLUG GUARD...

Unmanaged switches

Notes:

1) EMC: Class A product, see page 553

Standard switches with wide temperature range

FL SWITCH SFNT… unmanaged switches are optimized for use in extreme environments and marine applications.

– 5 to 8 ports in a narrow, metal housing with redundant power supply
– Optional SC and ST fiber optic ports
– RJ45 ports provide 10/100 Mbps speeds ; fiber optic ports operate at 100 Mbps
– Wide operating temperature range (-40°C… 75°C)
– Autonegotiation and autocross recognition provide easy installation and setup
– Quality of Service (QoS) prioritized messages
– LED indicators provide local diagnostics
– Alarm contact provides power and link status diagnostics
– Switch-mounted cable locking and port blocking options

Ethernet

5/8 RJ45 ports

Ex:

Technical data

	FL SWITCH SFNT 5TX	FL SWITCH SFNT 8TX
Ethernet interface		
Number of ports	5 (RJ45 ports)	8 (RJ45 ports)
Transmission speed	10/100 Mbps	
Connection method	RJ45	
Fiber optic interface		
Number of ports	-	
Transmission speed	-	
Connection method	-	
Transmission length	-	
Function		
Basic functions	Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode, includes QoS and alarm contact	
Status and diagnostic indicators	LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, alarm (power and link down)	
Network expansion parameters		
Cascading depth	Network, linear, and star structure: any	
Maximum conductor length (twisted pair)	100 m	
Power supply		
Supply voltage	24 V DC (redundant)	
Residual ripple	3.6 V_{PP}	
Supply voltage range	9 V DC ... 32 V DC	
Typical current consumption	125 mA (@24 V DC)	155 mA (@24 V DC)
General data		
Weight	275 g	460 g
Width	30 mm	50 mm
Height	130 mm	
Depth	100 mm	
Degree of protection	IP20	
Ambient temperature (operation)	-40 °C ... 75 °C	
Permissible humidity (operation)	5% ... 95% (no condensation)	
Noise emission	EN 61000-6-4	
Noise immunity	EN 61000-6-2	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch, wide temperature			
- 5 RJ45 ports	**FL SWITCH SFNT 5TX**	**2891003**	1
- 8 RJ45 ports	**FL SWITCH SFNT 8TX**	**2891005**	1
- 4 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 ST FO port			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			
Ethernet switch, wide temperature, conformal coating for harsh environments			
- 5 RJ45 ports	**FL SWITCH SFNT 5TX-C**	**2891043**	1
- 8 RJ45 ports	**FL SWITCH SFNT 8TX-C**	**2891045**	1
- 4 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 ST FO port			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			

Accessories

Mounting plate, for 5- and 8-port SFNT switches	**FL PA SFNT 5-8**	**2891012**	1

Ethernet

4 RJ45 ports and 1 FO port

Ex: c UL us

Technical data

4 (RJ45 ports)	
10/100 Mbps	
RJ45	
1 (FO port)	
100 Mbps (SC-D, full duplex)	
SC	
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode, includes QoS and alarm contact	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, alarm (power and link down)	
Network, linear, and star structure: any	
100 m	
24 V DC (redundant)	
3.6 V_{PP}	
9 V DC ... 32 V DC	
180 mA (@24 V DC)	
280 g	
30 mm	
130 mm	
100 mm	
IP20	
-40 °C ... 75 °C	
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFNT 4TX/FX	**2891004**	1
FL SWITCH SFNT 4TX/FX-C	**2891044**	1

Accessories

FL PA SFNT 5-8	**2891012**	1

Ethernet

7 RJ45 ports and 1 FO port

Ex: c UL us

Technical data

	FL SWITCH SFNT 7TX/FX	FL SWITCH SFNT 7TX/FX ST
7 (RJ45 ports)		
10/100 Mbps	10/100 Mbps	
RJ45		
1 (FO port)		
100 Mbps (SC-D, full duplex)	100 Mbps (ST, full duplex)	
SC	ST	
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)		
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode, includes QoS and alarm contact		
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, alarm (power and link down)		
Network, linear, and star structure: any		
100 m		
24 V DC (redundant)		
3.6 V_{PP}		
9 V DC ... 32 V DC		
180 mA (@24 V DC)		
470 g		
50 mm		
130 mm		
100 mm		
IP20		
-40 °C ... 75 °C		
5% ... 95% (no condensation)		
EN 61000-6-4		
EN 61000-6-2		

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFNT 7TX/FX	**2891006**	1
FL SWITCH SFNT 7TX/FX ST	**2891007**	1
FL SWITCH SFNT 7TX/FX-C	**2891046**	1
FL SWITCH SFNT 7TX/FX ST-C	**2891047**	1

Accessories

FL PA SFNT 5-8	**2891012**	1

Ethernet

6 RJ45 ports and 2 FO ports

Ex: c UL us

Technical data

	FL SWITCH SFNT 6TX/2FX[1])	FL SWITCH SFNT 6TX/2FX ST[1])
6 (RJ45 ports)		
10/100 Mbps		
RJ45		
2 (FO port)		
100 Mbps (SC-D, full duplex)	100 Mbps (ST, full duplex)	
SC	ST	
12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)		
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode, includes QoS and alarm contact		
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port, alarm (power and link down)		
Network, linear, and star structure: any		
100 m		
24 V DC (redundant)		
3.6 V_{PP}		
9 V DC ... 32 V DC		
250 mA (@24 V DC)		
484 g		
50 mm		
130 mm		
100 mm		
IP20		
-40 °C ... 75 °C		
5% ... 95% (no condensation)		
EN 61000-6-4		
EN 61000-6-2		

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SFNT 6TX/2FX[1])	**2891025**	1
FL SWITCH SFNT 6TX/2FX ST[1])	**2891026**	1
FL SWITCH SFNT 6TX/2FX-C	**2891048**	1
FL SWITCH SFNT 6TX/2FX ST-C	**2891049**	1

Accessories

FL PA SFNT 5-8	**2891012**	1

Unmanaged switches

Standard SF switches

FL SWITCH SF… unmanaged switches have a wide variety of port configurations in a low-profile, metal housing for general-purpose applications.

– Up to 16 ports in a low-profile, metal housing with redundant power supply
– Optional SC and ST fiber optic ports
– RJ45 ports provide 10/100 Mbps speeds ; fiber optic ports operate at 100 Mbps
– Autonegotiation and autocross recognition provide easy installation and setup
– LED indicators provide local diagnostics
– Relay contact provides power status alarming
– Cable locking security options

Notes:

1) EMC: Class A product, see page 553

Ethernet

8/16 RJ45 ports

Ex:

Technical data

	FL SWITCH SF 8TX[1])	FL SWITCH SF 16TX
Ethernet interface		
Number of ports	8 (RJ45 ports)	16 (RJ45 ports)
Transmission speed	10/100 Mbps	
Connection method	RJ45	
Fiber optic interface		
Number of ports	-	
Connection method	-	
Wavelength	-	
Transmission length	-	
Other connections		
Potential-free signaling contact	Plug-in/screw connection via COMBICON	
Function		
Basic functions	Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
Status and diagnostic indicators	LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network expansion parameters		
Cascading depth	Network, linear, and star structure: any	
Maximum conductor length (twisted pair)	100 m	
Power supply		
Supply voltage	24 V DC	
Residual ripple	3.6 V_{PP}	
Supply voltage range	18.5 V DC ... 30.2 V DC	
Typical current consumption	Typ. 200 mA	Typ. 300 mA
General data		
Weight	260 g	380 g
Width	135 mm	205 mm
Height	94.3 mm	
Depth	30 mm	
Degree of protection	IP20	
Ambient temperature (operation)	0 °C ... 55 °C	
Permissible humidity (operation)	5% ... 95% (no condensation)	
Noise emission	EN 61000-6-4	
Noise immunity	EN 61000-6-2:2005	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch			
- 8 RJ45 ports	**FL SWITCH SF 8TX[1])**	**2832771**	1
- 16 RJ45 ports	**FL SWITCH SF 16TX**	**2832849**	1
- 7 RJ45 ports, 1 SC FO port			
- 7 RJ45 ports, 1 ST FO port			
- 15 RJ45 ports, 1 SC FO port			
- 6 RJ45 ports, 2 SC FO ports			
- 6 RJ45 ports, 2 ST FO ports			
- 14 RJ45 ports, 2 SC FO ports			
- 4 RJ45 ports, 3 ST FO ports			

Ethernet

7/15 RJ45 ports and 1 FO port

Ex:

Technical data	
FL SWITCH SF 7TX/FX	FL SWITCH SF 15TX/FX
7 (RJ45 ports)	15 (RJ45 ports)
10/100 Mbps	
RJ45	
1 (FO port)	
SC	
1300 nm	
6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)	
Plug-in/screw connection via COMBICON	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC	
3.6 V_{PP}	
18.5 V DC ... 30.2 V DC	
Typ. 220 mA	Typ. 330 mA
260 g	380 g
135 mm	205 mm
115.3 mm	
30 mm	
IP20	
0 °C ... 55 °C	
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2:2005	

Ordering data		
Type	Order No.	Pcs. / Pkt.
FL SWITCH SF 7TX/FX	**2832726**	1
FL SWITCH SF 7TX/FX ST	**2832577**	1
FL SWITCH SF 15TX/FX	**2832661**	1

Ethernet

6/14 RJ45 ports and 2 FO ports

Ex:

Technical data	
FL SWITCH SF 6TX/2FX	FL SWITCH SF 14TX/2FX
6 (RJ45 ports)	14 (RJ45 ports)
10/100 Mbps	
RJ45	
2 (FO ports)	
SC	
1300 nm	
6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)	
Plug-in/screw connection via COMBICON	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC	
3.6 V_{PP}	
18.5 V DC ... 30.2 V DC	
Typ. 240 mA	Typ. 360 mA
260 g	380 g
135 mm	205 mm
115.3 mm	
30 mm	
IP20	
0 °C ... 55 °C	
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2:2005	

Ordering data		
Type	Order No.	Pcs. / Pkt.
FL SWITCH SF 6TX/2FX	**2832933**	1
FL SWITCH SF 6TX/2FX ST	**2832674**	1
FL SWITCH SF 14TX/2FX	**2832593**	1

Ethernet

4 RJ45 ports and 3 FO ports

Ex:

Technical data	
4 (RJ45 ports)	
10/100 Mbps	
RJ45	
3 (FO ports)	
ST	
1300 nm	
6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)	
Plug-in/screw connection via COMBICON	
Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network, linear, and star structure: any	
100 m	
24 V DC	
3.6 V_{PP}	
18.5 V DC ... 30.2 V DC	
Typ. 240 mA	
140 g	
135 mm	
115.3 mm	
30 mm	
IP20	
0 °C ... 55 °C	
5% ... 95% (no condensation)	
EN 61000-6-4	
EN 61000-6-2:2005	

Ordering data		
Type	Order No.	Pcs. / Pkt.
FL SWITCH SF 4TX/3FX ST	**2832603**	1

Unmanaged switches

N

Notes:

A media converter which meets the same requirements that are required for switchgear and transformer substations in energy technology can be found on page 409

8 RJ45 ports

FL SWITCH 1008E
industrial unmanaged switch

The FL SWITCH 1008E industrial unmanaged switch is designed for use in energy technology. With its robust design, it can be used in environments subject to high levels of EMI around switchgear that have been designed according to the new IEC 61850 standard.

Features:

- 8 RJ45 ports in metal housing with DIN rail adapter
- Wide operating temperature range (-40°C… 75°C)
- Redundant power supply with a wide range from 12 ... 57 V DC (24, 36, 48 V DC)
- Robust design for high EMC requirements, such as electrostatic discharge with 15 kV air discharge and 8 kV contact discharge ; surge withstand capability (surge) and fast transients (burst) up to 4 kV
- Floating alarm contact for power supply monitoring and diagnostics
- Link monitoring of every port for diagnostics via alarm LED and alarm contact can be configured via DIP switches

Technical data

Ethernet interface	
Number of ports	8 (RJ45 ports)
Transmission speed	10/100 Mbps
Connection method	RJ45
Function	
Basic functions	Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode, includes QoS and alarm contact. Meets IEC 61850-3 and IEEE 1613 standards
Status and diagnostic indicators	LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum conductor length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V_{PP}
Supply voltage range	12 V DC ... 57 V DC
Typical current consumption	440 mA (@24 V DC)
General data	
Weight	660 g
Width	54.4 mm
Height	146.4 mm
Depth	125 mm
Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 75 °C
Permissible humidity (operation)	5% ... 95% (no condensation)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch - 8 RJ45 ports	**FL SWITCH 1008E**	**2891065**	1

Unmanaged switches

N

N

FL SWITCH 1824 and 1924 rack mount switches provide 24 twisted pair ports (RJ45) of 10/100 or 10/100/1000 mbps and are optimized for large scale or 19" rack mount preferred applications.

Features:

– Fully industrial switches with high IEC 61000-4 noise immunity and 0-60c operation
– Wide input AC voltage range for flexible use - AC powered 100 - 240 V AC

Ethernet

24 RJ45 Ports

Ethernet

24 RJ45 Ports

	Technical data	Technical data
Ethernet interface		
Number of ports	24 (RJ45 ports)	24 (RJ45 ports)
Transmission speed	10/100 Mbps	10/100/1000 Mbps
Connection method	RJ45	RJ45
Function		
Basic functions	Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode	Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode
Status and diagnostic indicators	LEDs: U_S, link and activity per port	LEDs: U_S, link and activity per port
Network expansion parameters		
Cascading depth	Network, linear, and star structure: any	Network, linear, and star structure: any
Maximum conductor length (twisted pair)	100 m	100 m
Power supply		
Supply voltage	120 V AC	120 V AC
Supply voltage range	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Typical current consumption	270 mA (100 V AC)	312 mA (100 V AC)
General data		
Weight	2110 g	2730 g
Width	440 mm	440 mm
Height	44 mm	44 mm
Depth	173 mm	210 mm
Degree of protection	IP20	IP20
Ambient temperature (operation)	0 °C ... 60 °C	0 °C ... 60 °C
Permissible humidity (operation)	5% ... 95% (no condensation)	5% ... 95% (no condensation)
Noise emission	EN 61000-6-4	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005	EN 61000-6-2:2005

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Ethernet switch						
	FL SWITCH 1824	**2891041**	1			
				FL SWITCH 1924	**2891057**	1

Managed switches

N

The FL SWITCH 3000 industrial managed switches provide scalable power for application flexibility and ease of use.

Features:

– Standard (-10°C… 60°C) and wide temperature (-40°C… 75°C) devices available
– Extended Ring Redundancy provides a 15 ms recovery time
– Extensive IEEE and security functions

Ethernet

5/8 RJ45 ports

Ethernet

16 RJ45 ports

	Technical data		Technical data	
	FL SWITCH 3005	FL SWITCH 3008T	FL SWITCH 3016	FL SWITCH 3016T
Ethernet interface				
Number of ports	5 (RJ45 ports)	8 (RJ45 ports)	16 (RJ45 ports)	
Transmission speed	10/100 Mbps (with autonegotiation)		10/100 Mbps (with autonegotiation)	
Connection method	RJ45		RJ45	
Fiber optic interface				
Number of ports	-		-	
Transmission speed	-		-	
Connection method	-		-	
Transmission length	-		-	
Function				
Basic functions	Managed switch		Managed switch	
Status and diagnostic indicators	LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port		LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
Network expansion parameters				
Cascading depth	Network, linear, and star structure: any		Network, linear, and star structure: any	
Maximum conductor length (twisted pair)	100 m		100 m	
Power supply				
Supply voltage	24 V DC		24 V DC	24 V DC (redundant)
Residual ripple	3.6 V_{PP}		3.6 V_{PP}	
Supply voltage range	12 V DC ... 48 V DC		12 V DC ... 48 V DC	
Typical current consumption	200 mA (24 V DC)	210 mA (24 V DC)	312 mA (24 V DC)	
General data				
Weight	920 g	940 g	1245 g	
Width	54.4 mm		66 mm	
Height	146.4 mm		173 mm	
Depth	125 mm		140 mm	
Degree of protection	IP20		IP20	
Ambient temperature (operation)	-10 °C ... 60 °C	-40 °C ... 75 °C	-10 °C ... 60 °C	-40 °C ... 75 °C
Permissible humidity (operation)	5% ... 95% (no condensation)		5% ... 95% (no condensation)	
Noise emission	EN 61000-6-4		EN 61000-6-4	
Noise immunity	EN 61000-6-2:2005		EN 61000-6-2:2005	

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Ethernet switch						
- 5 RJ45 ports	**FL SWITCH 3005**	**2891030**	1			
- 8 RJ45 ports	**FL SWITCH 3008**	**2891031**	1			
- 16 RJ45 ports				**FL SWITCH 3016**	**2891058**	1
Ethernet switch, wide temperature						
- 5 RJ45 ports	**FL SWITCH 3005T**	**2891032**	1			
- 8 RJ45 ports	**FL SWITCH 3008T**	**2891035**	1			
- 16 RJ45 ports				**FL SWITCH 3016T**	**2891059**	1
- 4 RJ45 ports, 1 SC FO port						
- 4 RJ45 ports, 1 ST FO port						
- 6 RJ45 ports, 2 SC FO ports						
- 6 RJ45 ports, 2 ST FO ports						

	Accessories	Accessories
Patch cable, CAT5, pre-assembled (see page 418)	FL CAT5 PATCH ...	FL CAT5 PATCH ...

Ethernet

4 RJ45 ports and
1 fiber optic port (multi mode)

Ethernet

6 RJ45 ports and
2 fiber optic ports (multi mode)

6 RJ45 ports and
2 fiber optic ports (single mode)

Technical data

	FL SWITCH 3004T-FX	FL SWITCH 3004T-FX ST
	4 (RJ45 ports) 10/100 Mbps (with autonegotiation) RJ45	
	1 (FO port) 100 Mbps (SC-D, full duplex) SC 12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	100 Mbps (ST, full duplex) ST
	Managed switch LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
	Network, linear, and star structure: any 100 m	
	24 V DC 3.6 V_{PP} 12 V DC ... 48 V DC 230 mA (24 V DC)	
	920 g	930 g
	54.4 mm 146.4 mm 125 mm IP20 -40 °C ... 75 °C 5% ... 95% (no condensation) EN 61000-6-4 EN 61000-6-2:2005	

Technical data

	FL SWITCH 3006T-2FX	FL SWITCH 3006T-2FX ST
	6 (RJ45 ports) 10/100 Mbps (with autonegotiation) RJ45	
	2 (FO ports) 100 Mbps (SC-D, full duplex) SC 12.1 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	100 Mbps (ST, full duplex) ST
	Managed switch LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port	
	Network, linear, and star structure: any 100 m	
	24 V DC 3.6 V_{PP} 12 V DC ... 48 V DC 330 mA (24 V DC)	
	960 g	955 g
	54.4 mm 146.4 mm 125 mm IP20 -40 °C ... 75 °C 5% ... 95% (no condensation) EN 61000-6-4 EN 61000-6-2:2005	

Technical data

6 (RJ45 ports) 10/100 Mbps (with autonegotiation) RJ45
2 (FO ports) 100 Mbps (SC-D, full duplex) SC 40 km
Managed switch LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Network, linear, and star structure: any 100 m
24 V DC 3.6 V_{PP} 12 V DC ... 48 V DC 330 mA (24 V DC)
970 g 54.4 mm 146.4 mm 125 mm IP20 -40 °C ... 75 °C 5% ... 95% (no condensation) EN 61000-6-4 EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH 3004T-FX	**2891033**	1
FL SWITCH 3004T-FX ST	**2891034**	1

Accessories

FL CAT5 PATCH ...

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH 3006T-2FX	**2891036**	1
FL SWITCH 3006T-2FX ST	**2891037**	1

Accessories

FL CAT5 PATCH ...

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH 3006T-2FX SM	**2891060**	1

Accessories

FL CAT5 PATCH ...

Managed switches

N

Ethernet

8 RJ45 ports and 2 SFP ports

The **FL SWITCH 4000** infrastructure managed switches provide gigabit trunk ports and can be flexibly scaled in their performance while maintaining ease of operation.

Features:

– 2 Gigabit ports for high performance data trunk lines
– Wide temperature range for harsh environments (-40 °C ... 75 °C)
– 15 ms recovery time with extended ring redundancy
– Extensive IEEE and security functions
– Flexible fiber interface options

Technical data

Ethernet interface	
Number of ports	8 (RJ45 ports)
Transmission speed	10/100 Mbps
Connection method	RJ45
Gigabit Ethernet interface	
Number of ports	-
Transmission speed	-
Connection method	-
Fiber optic interface	
Number of ports	2 (SFP ports)
Transmission speed	1000 Mbps (full duplex)
Connection method	SFP ports
Transmission length	Up to 80 km (depending on the fiber/SFP module used)
Function	
Basic functions	Managed switch
Status and diagnostic indicators	LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum conductor length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC (redundant)
Residual ripple	3.6 V_{PP}
Supply voltage range	12 V DC ... 48 V DC
Typical current consumption	278 mA (24 V DC)
General data	
Weight	965 g
Width	66 mm
Height	173 mm
Depth	140 mm
Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 75 °C
Permissible humidity (operation)	5% ... 95% (no condensation)
Noise emission	EN 61000-6-4
Noise immunity	EN 61000-6-2:2005

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch, wide temperature	**FL SWITCH 4008T-2SFP**	**2891062**	1

Accessories

Patch cable, CAT5, pre-assembled (see page 418)	FL CAT5 PATCH ...

N

Ethernet

**10 RJ45 ports and
4 fiber optic ports (single mode)**

Technical data

8 (RJ45 ports)
10/100 Mbps
RJ45
2 (RJ45 ports)
10/100/1000 Mbps
RJ45
4 (SC single mode)
100 Mbps (SC-D, full duplex)
SC
-
Managed switch
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Network, linear, and star structure: any
100 m
24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 48 V DC
488 mA (24 V DC)
1300 g
66 mm
173 mm
140 mm
IP20
-40 °C ... 75 °C
5% ... 95% (no condensation)
EN 61000-6-4
EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH 4008T-2GT-4FX SM	**2891061**	1

Accessories

FL CAT5 PATCH ...

N

Ethernet

**14 RJ45 ports and
2 fiber optic ports (multi mode)**

Technical data

12 (RJ45 ports)
10/100 Mbps
RJ45
2 (RJ45 ports)
10/100/1000 Mbps
RJ45
2 (SC multi mode)
100 Mbps (SC-D, full duplex)
SC
-
Managed switch
LEDs: U_{S1}, U_{S2} (redundant voltage supply), link and activity per port
Network, linear, and star structure: any
100 m
24 V DC (redundant)
3.6 V_{PP}
12 V DC ... 48 V DC
474 mA (24 V DC)
1285 g
66 mm
173 mm
140 mm
IP20
-40 °C ... 75 °C
5% ... 95% (no condensation)
EN 61000-6-4
EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH 4012T-2GT-2FX	**2891063**	1

Accessories

FL CAT5 PATCH ...

Managed switches

Lean Managed Switches

Maximum possible diagnostics in a minimum amount of space. The compact FO-compatible and managed Ethernet switches can be optimally incorporated in a wide range of applications thanks to their connection properties.

They have all the necessary standard functions for operating an Ethernet network that is both flexible and rugged.

Features:

– -40°C ... 70°C operating temperature
– Comprehensive fiber optic versions
– Compact housing
– Configurable alarm contact

Notes:

1) EMC: Class A product, see page 553

Ethernet

EtherNet/IP

5 RJ45 ports

Technical data

Ethernet interface	
Number of ports	5 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	-
Wavelength	-
Transmission length	-
	-
	-
	-
Other connections	
Serial (V.24 (RS-232))	V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)
Function	
Basic functions	Store-and-forward switch complies with IEEE 802.3 2, priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), DHCP server
Supported browsers	Internet Explorer 5.5 or higher
SNMP – Simple Network Management Protocol	Supported SNMP-MIBs: Enterprise, MIB II, Bridge
Redundancy	Rapid Spanning Tree 802.1w, Fast Ring Detection
Status and diagnostic indicators	Per Ethernet 2 status LEDs: LINK and status activity, 100, full duplex, supply voltage U_{S1} and U_{S2} (redundant supply voltage)
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum conductor length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC
Residual ripple	3.6 V_{PP}
Supply voltage range	18.5 V DC ... 30.5 V DC
Typical current consumption	250 mA (at U_S = 24 V DC)
General data	
Weight	230 g
Width	45 mm
Height	99 mm
Depth	112 mm
Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C
Permissible humidity (operation)	30% ... 95% (no condensation)
Noise emission	EN 61000-6-3/-4
Noise immunity	EN 61000-6-2:2005

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Lean Managed Switch - 5 RJ45 ports - 8 RJ45 ports - 4 RJ45 ports, 1 SC FO port - 4 RJ45 ports, 1 ST FO port	**FL SWITCH LM 5TX[1])**	**2989527**	1
Lean Managed Switch, preconfigured for EtherNet/IP™ - 5 RJ45 ports - 8 RJ45 ports - 4 RJ45 ports, 1 SC FO port - 4 RJ45 ports, 1 ST FO port	**FL SWITCH LM 5TX-E[1])**	**2989336**	1

Ethernet

EtherNet/IP

8 RJ45 ports

Ethernet

EtherNet/IP

4 RJ45 ports and 1 fiber optic port (multi mode)

Ethernet

EtherNet/IP

4 RJ45 ports and 1 fiber optic port (single mode)

Technical data	Technical data	Technical data
8 (RJ45 ports) 10/100 Mbps	4 (RJ45 ports) 10/100 Mbps	4 (RJ45 ports) 10/100 Mbps
- - - - - -	1 (SC multi mode) 1300 nm 11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000) 6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200) 3000 m (fiberglass with F-G 62.5/125 2.6 dB/km F600) 2800 m (fiberglass with F-G 50/125 1.6 dB/km F800)	1 (SC single mode) 1300 nm 36000 m (fiberglass with F-G 9/125 0.36 dB/km) 32000 m (fiberglass with F-G 9/125 0.4 dB/km) 26000 m (fiberglass with F-G 9/125 0.5 dB/km) -
V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)	V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)	V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)
Store-and-forward switch complies with IEEE 802.3 2, priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), DHCP server	Store-and-forward switch complies with IEEE 802.3 2, priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), DHCP server	Store-and-forward switch complies with IEEE 802.3 2, priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), DHCP server
Internet Explorer 5.5 or higher Supported SNMP MIBs: Enterprise, MIB II, Bridge	Internet Explorer 5.5 or higher Supported SNMP-MIBs: Enterprise, MIB II, Bridge	Internet Explorer 5.5 or higher Supported SNMP-MIBs: Enterprise, MIB II, Bridge
Rapid Spanning Tree 802.1w, Fast Ring Detection	Rapid Spanning Tree 802.1w, Fast Ring Detection	Rapid Spanning Tree 802.1w, Fast Ring Detection
Per Ethernet 2 status LEDs: LINK and status activity, 100, full duplex, supply voltage U_{S1} and U_{S2} (redundant supply voltage)	Per Ethernet 2 status LEDs: LINK and status activity, 100, full duplex, supply voltage U_{S1} and U_{S2} (redundant supply voltage)	Per Ethernet 2 status LEDs: LINK and status activity, 100, full duplex, supply voltage U_{S1} and U_{S2} (redundant supply voltage)
Network, linear, and star structure: any 100 m	Network, linear, and star structure: any 100 m	Network, linear, and star structure: any 100 m
24 V DC 3.6 V_{PP} 18.5 V DC ... 30.5 V DC 250 mA (at U_S = 24 V DC)	24 V DC 3.6 V_{PP} 18.5 V DC ... 30.5 V DC 400 mA (at U_S = 24 V DC)	24 V DC 3.6 V_{PP} 18.5 V DC ... 30.5 V DC 400 mA (at U_S = 24 V DC)
230 g 45 mm 99 mm 112 mm IP20 -40 °C ... 70 °C 30% ... 95% (no condensation) EN 61000-6-3/-4 EN 61000-6-2:2005	230 g 45 mm 99 mm 112 mm IP20 -40 °C ... 70 °C 30% ... 95% (no condensation) EN 61000-6-3/-4 EN 61000-6-2:2005	230 g 45 mm 99 mm 112 mm IP20 -40 °C ... 70 °C 30% ... 95% (no condensation) EN 61000-6-3/-4 EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH LM 8TX[1])	**2832632**	1
FL SWITCH LM 8TX-E[1])	**2891466**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH LM 4TX/1FX[1])	**2989624**	1
FL SWITCH LM 4TX/1FX ST[1])	**2989721**	1
FL SWITCH LM 4TX/1FX-E[1])	**2989433**	1
FL SWITCH LM 4TX/1FX ST-E[1])	**2989530**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH LM 4TX/1FX SM[1])	**2989828**	1
FL SWITCH LM 4TX/1FX SM ST[1])	**2989925**	1
FL SWITCH LM 4TX/1FX SM-E[1])	**2989637**	1
FL SWITCH LM 4TX/1FX SM ST-E[1])	**2989734**	1

Managed switches

Lean Managed Switches

Maximum possible diagnostics in a minimum amount of space. The compact FO-compatible and managed Ethernet switches can be optimally incorporated in a wide range of applications thanks to their comprehensive software.

They have all the necessary standard functions for operating an Ethernet network that is both flexible and rugged.

Features:

– RSTP with fast switch-over
– Port mirroring
– Configuration can be stored externally
– Web-based management, SNMP

Notes:

1) EMC: Class A product, see page 553

Ethernet

EtherNet/IP

4 RJ45 ports and
2 fiber optic ports (multi mode)

BSH

Technical data

Ethernet interface	
Number of ports	4 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	2 (SC multi mode)
Wavelength	1300 nm
Transmission length	11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000) 6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200) 3000 m (fiberglass with F-G 62.5/125 2.6 dB/km F600) 2800 m (fiberglass with F-G 50/125 1.6 dB/km F800)
Other connections	
Serial (V.24 (RS-232))	V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)
Function	
Basic functions	store-and-forward switch complies with IEEE 802.3 2 priority classes in acc. with IEEE802.1 P TCP/IP protocol, BootP-capable, port mirroring, integrated web server function, multicast filtering, IGMP snooping, Rapid Spanning Tree (RSTP)
Supported browsers	Internet Explorer 5.5 or higher
SNMP – Simple Network Management Protocol	Supported SNMP-MIBs: Enterprise, MIB II, Bridge
Redundancy	Rapid Spanning Tree 802.1w, Fast Ring Detection
Status and diagnostic indicators	Per Ethernet 2 status LEDs: LINK and status activity, 100, full duplex, supply voltage U_{S1} and U_{S2} (redundant supply voltage)
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum conductor length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC
Residual ripple	3.6 V_{PP}
Supply voltage range	18.5 V DC ... 30.5 V DC
Typical current consumption	400 mA (at U_S = 24 V DC)
General data	
Weight	230 g
Width	45 mm
Height	99 mm
Depth	112 mm
Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C
Permissible humidity (operation)	30% ... 95% (no condensation)
Noise emission	EN 61000-6-3/-4
Noise immunity	EN 61000-6-2:2005

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Lean Managed Switch - 4 RJ45 ports, 2 SC FO ports - 4 RJ45 ports, 2 ST FO ports	**FL SWITCH LM 4TX/2FX[1])**	**2832658**	1
Lean Managed Switch, preconfigured for EtherNet/IP™ - 4 RJ45 ports, 2 SC FO ports - 4 RJ45 ports, 2 ST FO ports	**FL SWITCH LM 4TX/2FX-E[1])**	**2891660**	1

Ethernet

EtherNet/IP

4 RJ45 ports and
2 fiber optic ports (single mode)

Ethernet

EtherNet/IP

4 RJ45 ports and
2 fiber optic ports in ST format (multi mode)

Ethernet

EtherNet/IP

4 RJ45 ports and
2 fiber optic ports in ST format (single mode)

Technical data

4 (RJ45 ports)	
10/100 Mbps	
2 (SC single mode)	
1300 nm	
36000 m (fiberglass with F-G 9/125 0.36 dB/km)	
32000 m (fiberglass with F-G 9/125 0.4 dB/km)	
26000 m (fiberglass with F-G 9/125 0.5 dB/km)	
-	
V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)	
store-and-forward switch complies with IEEE 802.3 2 priority classes in acc. with IEEE802.1 P TCP/IP protocol, BootP-capable, port mirroring, integrated web server function, multicast filtering, IGMP snooping, Rapid Spanning Tree (RSTP)	
Internet Explorer 5.5 or higher	
Supported SNMP MIBs: Enterprise, MIB II, Bridge	
Rapid Spanning Tree 802.1w, Fast Ring Detection	
Per Ethernet 2 status LEDs: LINK and status activity, 100, full duplex, supply voltage U_{S1} and U_{S2} (redundant supply voltage)	
Network, linear, and star structure: any	
100 m	
24 V DC	
3.6 V_{PP}	
18.5 V DC ... 30.5 V DC	
400 mA (at U_S = 24 V DC)	
230 g	
45 mm	
99 mm	
112 mm	
IP20	
-40 °C ... 70 °C	
30% ... 95% (no condensation)	
EN 61000-6-3/-4	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH LM 4TX/2FX SM[1])	**2891916**	1
FL SWITCH LM 4TX/2FX SM-E[1])	**2891864**	1

Technical data

4 (RJ45 ports)	
10/100 Mbps	
2 (ST multi mode)	
1300 nm	
11000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)	
6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)	
3000 m (fiberglass with F-G 62.5/125 2.6 dB/km F600)	
2800 m (fiberglass with F-G 50/125 1.6 dB/km F800)	
V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)	
Store-and-forward switch complies with IEEE 802.3 2 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP)	
Internet Explorer 5.5 or higher	
Supported SNMP-MIBs: Enterprise, MIB II, Bridge	
Rapid Spanning Tree 802.1w, Fast Ring Detection	
Per Ethernet 2 status LEDs: LINK and status activity, 100, full duplex, supply voltage U_{S1} and U_{S2} (redundant supply voltage)	
Network, linear, and star structure: any	
100 m	
24 V DC	
3.6 V_{PP}	
18.5 V DC ... 30.5 V DC	
400 mA (at U_S = 24 V DC)	
230 g	
45 mm	
99 mm	
112 mm	
IP20	
-40 °C ... 70 °C	
30% ... 95% (no condensation)	
EN 61000-6-3/-4	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH LM 4TX/2FX ST[1])	**2989132**	1
FL SWITCH LM 4TX/2FX ST-E[1])	**2989831**	1

Technical data

4 (RJ45 ports)	
10/100 Mbps	
2 (ST single mode)	
1300 nm	
36000 m (fiberglass with F-G 9/125 0.36 dB/km)	
32000 m (fiberglass with F-G 9/125 0.4 dB/km)	
26000 m (fiberglass with F-G 9/125 0.5 dB/km)	
-	
V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)	
Store-and-forward switch complies with IEEE 802.3 2 priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, port mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP)	
Internet Explorer 5.5 or higher	
Supported SNMP-MIBs: Enterprise, MIB II, Bridge	
Rapid Spanning Tree 802.1w, Fast Ring Detection	
Per Ethernet 2 status LEDs: LINK and status activity, 100, full duplex, supply voltage U_{S1} and U_{S2} (redundant supply voltage)	
Network, linear, and star structure: any	
100 m	
24 V DC	
3.6 V_{PP}	
18.5 V DC ... 30.5 V DC	
400 mA (at U_S = 24 V DC)	
230 g	
45 mm	
99 mm	
112 mm	
IP20	
-40 °C ... 70 °C	
30% ... 95% (no condensation)	
EN 61000-6-3/-4	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH LM 4TX/2FX SM ST[1])	**2989239**	1
FL SWITCH LM 4TX/2FX SM ST-E[1])	**2989938**	1

Smart Managed Switches

Smart Managed Switches offer both excellent realtime properties and high data throughput.

The industrial DIN rail switches support Fast Ethernet or Gigabit on all ports and are ideal for use in the PROFINET RT or EtherNet/IP™ environment.

The **FL SWITCH SMCS 8GT** and **6GT/2SFP** Gigabit versions also have maritime approvals GL, BV, ABS, LR, and DNV.

All eight-port versions of the SMCS switches can be used in Ex Zone II.

All devices support:

– RSTP
– MRP (client and master)
– VLANs
– SNMP

Ethernet

PROFINET

8 RJ45 ports

Technical data

	FL SWITCH SMCS 8GT	FL SWITCH SMCS 8TX
Ethernet interface		
Number of ports	8 (RJ45 ports)	
Transmission speed	10/100/1000 Mbps	10/100 Mbps
Fiber optic interface		
Number of ports	-	
Wavelength	-	
Transmission length	-	
	-	
Other connections		
Serial (V.24 (RS-232))	V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)	
Function		
Basic functions	Store-and-forward switch complies with IEEE 802.3 2 priority classes as per IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET IO Device, media redundancy protocol (MRP).	
Status and diagnostic indicators	Per Ethernet 2 status LEDs: LINK and status activity with switchover, 100, full duplex, supply voltage U_{s1} and U_{s2} (redundant supply voltage), and FAIL	
Network expansion parameters		
Cascading depth	Network, linear, and star structure: any	
Maximum conductor length (twisted pair)	100 m	
Power supply		
Supply voltage	24 V DC	
Residual ripple	3.6 V_{PP}	
Supply voltage range	18 V DC ... 32 V DC	
Typical current consumption	600 mA (at U_S = 24 V DC)	
General data		
Weight	650 g	
Width	128 mm	
Height	110 mm	
Depth	69 mm	
Degree of protection	IP20	
Ambient temperature (operation)	0 °C ... 55 °C (no condensation)	
Permissible humidity (operation)	5% ... 95% (no condensation)	
Noise emission	EN 61000-6-3 +A11	
Noise immunity	EN 61000-6-2:2005	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Smart Managed Compact Switch			
- 8 RJ45 ports	**FL SWITCH SMCS 8TX**	**2989226**	1
- 8 RJ45 ports, 1000 Mbps	**FL SWITCH SMCS 8GT**	**2891123**	1
- 6 RJ45 ports, 2 SFP fiber optics ports			
- 6 RJ45 ports, 2 SFP fiber optics ports, 1000 Mbps			
- 16 RJ45 ports			
- 14 RJ45 ports, 2 SC fiber optics ports (multi mode)			
- 14 RJ45 ports, 2 SC FO ports (single mode)			

N

N

Ethernet

6 RJ45 ports and 2 SFP slots

Ethernet

16 RJ45 ports

Ethernet

14 RJ45 ports and 2 FO ports

Technical data

	FL SWITCH SMCS 6GT/2SFP	FL SWITCH SMCS 6TX/2SFP
	6 (RJ45 ports)	
	10/100/1000 Mbps	10/100 Mbps
	2 (SFP ports)	
	-	
	Up to 80 km (depending on the fiber/SFP module used)	
	-	
	V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)	
	Store-and-forward switch complies with IEEE 802.3 2 priority classes as per IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET IO Device, media redundancy protocol (MRP).	
	Per Ethernet 2 status LEDs: LINK and status activity with switchover, 100, full duplex, supply voltage U_{s1} and U_{s2} (redundant supply voltage), and FAIL	
	Network, linear, and star structure: any	
	100 m	
	24 V DC	
	3.6 V_{PP}	
	18 V DC ... 32 V DC	
	650 mA (at U_S = 24 V DC)	
	650 g	
	128 mm	
	110 mm	
	69 mm	
	IP20	
	0 °C ... 55 °C	
	5% ... 95% (no condensation)	
	EN 61000-6-3 +A11	
	EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SMCS 6TX/2SFP	**2989323**	1
FL SWITCH SMCS 6GT/2SFP	**2891479**	1

Technical data

	16 (RJ45 ports)
	10/100 Mbps
	-
	-
	-
	-
	V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)
	Store-and-forward switch complies with IEEE 802.3 2 priority classes as per IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET IO Device, media redundancy protocol (MRP).
	Per Ethernet 2 status LEDs: LINK and status activity with switchover, 100, full duplex, supply voltage U_{s1} and U_{s2} (redundant supply voltage), and FAIL
	Network, linear, and star structure: any
	100 m
	24 V DC
	3.6 V_{PP}
	18 V DC ... 32 V DC
	190 mA (at U_S = 24 V DC)
	1035 g
	214 mm
	110 mm
	69 mm
	IP20
	-40 °C ... 70 °C (no condensation)
	5% ... 95% (no condensation)
	EN 61000-6-3
	EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SMCS 16TX	**2700996**	1

Technical data

	FL SWITCH SMCS 14TX/2FX	FL SWITCH SMCS 14TX/2FX-SM
	14 (RJ45 ports)	
	10/100 Mbps	
	2 (SC multi mode)	2 (SC single mode)
	1310 nm	
	10000 m (depending on the fiber used)	36000 m (fiberglass with F-G 9/125 0.36 dB/km)
	6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)	32000 m (fiberglass with F-G 9/125 0.4 dB/km)
	V.24 (RS-232-C), 6-pos. MINI-DIN socket (PS/2)	
	Store-and-forward switch complies with IEEE 802.3 2 priority classes as per IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET IO Device, media redundancy protocol (MRP).	
	Per Ethernet 2 status LEDs: LINK and status activity with switchover, 100, full duplex, supply voltage U_{s1} and U_{s2} (redundant supply voltage), and FAIL	
	Network, linear, and star structure: any	
	100 m	
	24 V DC	
	3.6 V_{PP}	
	18 V DC ... 32 V DC	
	260 mA (at U_S = 24 V DC)	
	1035 g	
	214 mm	
	110 mm	
	69 mm	
	IP20	
	-40 °C ... 70 °C (no condensation)	
	5% ... 95% (no condensation)	
	EN 61000-6-3	
	EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SMCS 14TX/2FX	**2700997**	1
FL SWITCH SMCS 14TX/2FX-SM	**2701466**	1

Managed switches

Notes:
1) EMC: Class A product, see page 553

N

PROFINET realtime switches

The new IRT switches are particularly suitable for high-performance PROFINET networks.

The FL SWITCH IRT switches use built-in ERTEC (Enhanced Real Time Ethernet Controller) technology to forward PROFINET data packets at the fastest possible speeds via the cut through process.

In addition, PROFINET data packets are always delivered with the highest priority to the receiver independently of other data traffic.

The FL SWITCH IRT switches can be fully configured and monitored via STEP 7 and PC Worx.

Features:

– Easy integration into a PROFINET network
– Extended temperature range (-25°C…60°C)
– POF interfaces for use in areas heavily affected by EMC
– Path length measurement
– Fiber optic diagnostics
– MRP client

Ethernet

PROFINET

4 RJ45 Ports

Technical data

Ethernet interface	
Number of ports	4 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	-
Transmission speed	-
Wavelength	-
Transmission length	-
Function	
Basic functions	Cut-through/store-and-forward switch complies with IEEE 802.3 2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol, DCP capable, integrated web server function, PROFINET IO device.
Status and diagnostic indicators	2 status LEDs per Ethernet port: LINK and activity, supply voltage U_{s1} and U_{s2} (redundant supply voltage) as well as BF
Network expansion parameters	
Cascading depth	Line and star structure: as desired
Maximum conductor length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC
Residual ripple	3.6 V_{PP}
Supply voltage range	18.5 V DC ... 30.2 V DC
Typical current consumption	165 mA (at U_S = 24 V DC)
General data	
Weight	450 g
Width	127 mm
Height	95 mm
Depth	69 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 60 °C
Permissible humidity (operation)	5% ... 95% (no condensation)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch for PROFINET applications - 4 RJ45 ports - 2 RJ45 ports, 2 POF SCRJ ports - 1 RJ45 port, 3 POF SCRJ ports	**FL SWITCH IRT 4TX**	**2700689**	1
Ethernet switch for PROFINET applications - 1 RJ45 port, 3 POF SCRJ ports			

Accessories

Configuration memory, replaceable	**FL MEM PLUG**[1)]	**2891259**	1
Patch cable, CAT6, pre-assembled (see page 418)	FL CAT6 PATCH ...		

Ethernet

2 RJ45 ports and 2 POF SCRJ ports

Ethernet

1 RJ45 port and 3 POF SCRJ ports

Ethernet

1 RJ45 port and 3 POF SCRJ ports, for wall mounting

Technical data

2 (RJ45 ports)	
10/100 Mbps	
2 (SCRJ)	
100 Mbps (full duplex)	
650 nm	
Up to 250 m (depending on the fiber used)	
Cut-through/store-and-forward switch complies with IEEE 802.3 2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol, DCP capable, integrated web server function, PROFINET IO device.	
2 status LEDs per Ethernet port: LINK and activity, supply voltage U_{s1} and U_{s2} (redundant supply voltage) as well as BF	
Line and star structure: as desired	
100 m	
24 V DC	
3.6 V_{PP}	
18.5 V DC ... 30.2 V DC	
235 mA (at U_S = 24 V DC)	
450 g	
127 mm	
95 mm	
69 mm	
IP20	
-25 °C ... 60 °C	
5% ... 95% (no condensation)	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH IRT 2TX 2POF[1])	**2700691**	1

Accessories

FL MEM PLUG[1])	**2891259**	1
FL CAT6 PATCH ...		

Technical data

1 (RJ45 ports)	
10/100 Mbps	
3 (SCRJ)	
100 Mbps (full duplex)	
650 nm	
Up to 250 m (depending on the fiber used)	
Cut-through/store-and-forward switch complies with IEEE 802.3 2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol, DCP capable, integrated web server function, PROFINET IO device.	
2 status LEDs per Ethernet port: LINK and activity, supply voltage U_{s1} and U_{s2} (redundant supply voltage) as well as BF	
Line and star structure: as desired	
100 m	
24 V DC	
3.6 V_{PP}	
18.5 V DC ... 30.2 V DC	
270 mA (at U_S = 24 V DC)	
450 g	
127 mm	
95 mm	
69 mm	
IP20	
-25 °C ... 60 °C	
5% ... 95% (no condensation)	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH IRT TX 3POF[1])	**2700692**	1

Accessories

FL MEM PLUG[1])	**2891259**	1
FL CAT6 PATCH ...		

Technical data

1 (RJ45 ports)	
10/100 Mbps	
3 (SCRJ)	
100 Mbps (full duplex)	
650 nm	
Up to 250 m (depending on the fiber used)	
Cut-through/store-and-forward switch complies with IEEE 802.3 2 priority classes in accordance with IEEE802.1 P, TCP/IP protocol, DCP capable, integrated web server function, PROFINET IO device.	
2 status LEDs per Ethernet port: LINK and activity, supply voltage U_{S1} and U_{S2} as well as BF	
Line and star structure: as desired	
100 m	
24 V DC	
3.6 V_{PP}	
18.5 V DC ... 30.2 V DC	
260 mA (at U_S = 24 V DC)	
1850 g	
176 mm	
112 mm	
99 mm	
IP67	
-25 °C ... 60 °C	
5% ... 95% (no condensation)	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH IRT IP TX/3POF	**2700697**	1

Accessories

FL MEM PLUG[1])	**2891259**	1
FL CAT6 PATCH ...		

Smart Managed Switches

The NAT switch combines the functions of a NAT router and a switch in a single device. Thanks to 1:1 NAT or virtual NAT, the **FL NAT SMN 8TX** enables individual machines or systems to always be assigned the same IP addresses and for these IP addresses to then be implemented in the IP address area of the higher-level company network.

The **FL SWITCH SMN 6TX/2POF-PN** Smart Managed Narrow switch is an Ethernet switch suitable for industrial applications with six Fast Ethernet ports in RJ45 format and two fiber optic ports in POF-SCRJ format. The switch has PROFINET mode activated by default.

The Ethernet T-coupler allows easy system conversion from fieldbus to industrial Ethernet. Thanks to the number of ports, it is particularly suitable for the distributed integration of field devices in a POF line or ring structure.

Notes:

1) EMC: Class A product, see page 553

Ethernet

NAT switch with 8 RJ45 ports

Technical data

Ethernet interface	
Number of ports	8 (RJ45 ports)
Transmission speed	10/100 Mbps
Fiber optic interface	
Number of ports	-
Transmission length	-
Function	
Basic functions	store-and-forward switch, complies with IEEE 802.3 2, priority classes in acc. with IEEE 802.1 P TCP/IP protocol, BootP-capable, integrated web server function, Rapid Spanning Tree (RSTP), router, 1:1 NAT router
Status and diagnostic indicators	Per Ethernet 2 status LEDs: LINK and status activity with switchover, 100, full duplex, supply voltage U_{s1} and U_{s2} (redundant supply voltage), and FAIL
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum conductor length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC
Residual ripple	3.6 V_{PP}
Supply voltage range	18 V DC ... 32 V DC
Typical current consumption	600 mA (at U_S = 24 V DC)
General data	
Weight	650 g
Width	58 mm
Height	133 mm
Depth	130 mm
Degree of protection	IP20
Ambient temperature (operation)	0 °C ... 55 °C
Permissible humidity (operation)	5% ... 95% (no condensation)
Noise emission	EN 61000-6-3 +A11
Noise immunity	EN 61000-6-2:2005

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Smart Managed Narrow NAT switch with 1:1 NAT router function - 8 RJ45 ports	**FL NAT SMN 8TX**	**2989365**	1
Smart Managed Narrow Switch - 6 RJ45 ports, 2 POF FO ports			
FO T coupler, for converting 10/100BASE-T to polymer or HCS fiber, (660 nm), SCRJ connection			

Accessories

Configuration memory, replaceable	**FL MEM PLUG**[1])	**2891259**	1

Ethernet

PROFINET

6 RJ45 ports and 2 POF SCRJ ports

Ethernet

Ethernet fiber optics T-coupler for polymer and HCS fibers

Technical data

6 (RJ45 ports)	2 (RJ45 ports)
10/100 Mbps	10/100 Mbps
2 (SCRJ)	2 (SCRJ)
Up to 250 m (depending on the fiber used)	Up to 250 m (depending on the fiber used)
Store-and-forward switch complies with IEEE 802.3 2 priority classes as per IEEE 802.1 P TCP/IP protocol, BootP-capable, port-mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP), PROFINET IO Device, media redundancy protocol (MRP).	Store-and-forward media converter standard-compliant IEEE 802.3 2, priority classes according to IEEE 802.1 P, TCP/IP protocol, BootP-capable, port mirroring, integrated web server function, multicast filtering, IGMP snooping, VLAN, Rapid Spanning Tree (RSTP)
2 status LEDs per Ethernet port: LINK and selection of Status Activity, 100, full duplex, supply voltage U_{S1} and U_{S2} (redundant supply voltage), and FAIL. FD/FO LED indicates duplex mode for twisted pair ports and the system reserve for optical interfaces.	2 status LEDs per Ethernet: activity and duplex mode, supply voltage U_{S1} and U_{S2} (redundant supply voltage) as well as LED BAR GRAPH for FO ports for displaying the system reserve for each optical interface.
Network, linear, and star structure: any	Line, star, tree, and redundant ring ; any cascading depth
100 m	100 m
24 V DC	24 V DC
3.6 V_{PP}	3.6 V_{PP}
18 V DC ... 32 V DC	18.5 V DC ... 30.5 V DC
320 mA (at U_S = 24 V DC)	400 mA (at U_S = 24 V DC)
720 g	230 g
56 mm	45 mm
133 mm	99 mm
125 mm	123 mm
IP20	IP20
0 °C ... 55 °C	-20 °C ... 55 °C
5% ... 95% (no condensation)	10% ... 95% (no condensation)
EN 61000-6-3 +A11	EN 61000-6-3/-4
EN 61000-6-2:2005	EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH SMN 6TX/2POF-PN[1])	**2700290**	1

Accessories

FL MEM PLUG[1])	**2891259**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MC ETH/FO 660 T[1])	**2313164**	1

Accessories

Gigabit Modular Switches

The high-performance Gigabit Modular Switch can be extended to up to 28 ports with any transmission medium.

Features:

– Up to 12 integrated ports with 1000 Mbps data transmission
– Connection of connection media that can be assembled in the field, such as POF, HCS, and GI HCS
– Connection of Gigabit fiberglass via FL SFP plug-in modules
– Quick and easy local configuration options with the new operator/display interface
– Security in the automation network according to IEEE 802.1X
– Optional Layer 3 functions can be activated

Notes:

1) EMC: Class A product, see page 553

Head station, 8 - 16 ports

PROFIenergy PROFINET

Technical data

SFP interface	
Description	Ethernet (combo)
Number of ports	4 (SFP ports or RJ45 ports)
Transmission speed	1000 Mbps (full duplex)
Transmission physics	FO Copper
Copper interface	
Description	Ethernet (RJ45)
Number of ports	4
Transmission speed	10/100 Mbps
Transmission physics	Copper
Interface extension	
Description	Ethernet
Number of ports	2 (per interface module)
Note on connection method	Max. 4 interface modules (without extension)
Transmission speed	10/100 Mbps (full duplex)
Transmission physics	Multi-mode fiberglass Single-mode fiberglass POF-SCRJ GI-HCS fibers Copper PoE
Function	
Basic functions	Store-and-forward switch, smart mode, port mirroring, multicast filtering, IGMP snooping, VLAN, Media Redundancy Protocol (MRP according to IEC 62439), Rapid Spanning Tree (RSTP), Fast Ring Detection (FRD), Large Tree Support, IEEE 802.1X security, port security, PROFINET IO device, GMRP, GVRP, SNTP, 2 digital inputs
Power supply	
Supply voltage	24 V DC
Supply voltage range	18.5 V DC ... 30.2 V DC
Typical current consumption	800 mA (up to 2.5 A, depends on the configuration)
General data	
Weight	2700 g
Width	287 mm
Height	125 mm
Depth	115 mm
Degree of protection	IP20
Ambient temperature (operation)	-20 °C ... 55 °C (no condensation)
Noise emission	EN 61000-6-3/-4
Noise immunity	EN 61000-6-2:2005

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Gigabit Modular Switch			
- 4 Gigabit ports and 12 Fast Ethernet ports	**FL SWITCH GHS 4G/12[1])**	**2700271**	1
- 12 Gigabit ports and 8 Fast Ethernet ports	**FL SWITCH GHS 4G/12-L3[1])**	**2700786**	1
Extension			
- 8 Ethernet ports			

Accessories

Parameterization memory, replaceable	**SD FLASH 512MB**	**2988146**	1
Parameterization memory, can be replaced, with MRM function	**FL SD FLASH/MRM**	**2700270**	1
Parameterization memory, can be replaced, with MRM and Layer 3 function	**FL SD FLASH/L3/MRM**	**2700607**	1

Ethernet

Head station, 12 - 20 ports

Extension, 8 ports

PROFIenergy PROFINET

Technical data	
Ethernet (SFP)	-
4 (SFP ports)	-
1000 Mbps (full duplex)	-
FO	-
Ethernet (RJ45)	-
8	-
10/100/1000 Mbps	-
Copper	-
Ethernet	Ethernet
2 (per interface module)	2 (per interface module)
Max. 4 interface modules (without extension)	Max. 4 interface modules
10/100 Mbps (full duplex)	10/100 Mbps (full duplex)
Multi-mode fiberglass	Multi-mode fiberglass
Single-mode fiberglass	Single-mode fiberglass
POF-SCRJ	POF-SCRJ
GI-HCS fibers	GI-HCS fibers
Copper	Copper
PoE	PoE
Store-and-forward switch, smart mode, port mirroring, multicast filtering, IGMP snooping, VLAN, Media Redundancy Protocol (MRP according to IEC 62439), Rapid Spanning Tree (RSTP), Fast Ring Detection (FRD), Large Tree Support, IEEE 802.1X security, port security, PROFINET IO device, GMRP, GVRP, SNTP, 2 digital inputs	Extension module for Modular Managed Switch
24 V DC	-
18.5 V DC ... 30.2 V DC	-
800 mA (up to 2.7 A, depends on the configuration)	(via head station)
2700 g	650 g
287 mm	127 mm
125 mm	125 mm
115 mm	115 mm
IP20	IP20
-20 °C ... 55 °C (no condensation)	-20 °C ... 55 °C (no condensation)
EN 61000-6-3/-4	EN 61000-6-3/-4
EN 61000-6-2:2005	EN 61000-6-2:2005

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH GHS 12G/8[1])	**2989200**	1
FL SWITCH GHS 12G/8-L3[1])	**2700787**	1

Accessories

SD FLASH 512MB	**2988146**	1
FL SD FLASH/MRM	**2700270**	1
FL SD FLASH/L3/MRM	**2700607**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL FXT[1])	**2989307**	1

Accessories

Interface modules

Highly modular 2-port interface modules allow a flexible cable exit: either downward or to the front, depending on the requirements of the installation and location. There are interface modules for twisted pairs, fiberglass or the cost effective Ethernet installation with polymer and HCS fibers, all designed to carry out the particular job at hand.

Notes:

1) EMC: Class A product, see page 553

Ethernet

TX ports

Ethernet

FO ports

Ex:

Ex:

	Technical data		Technical data	
	FL IF 2TX VS-RJ-F[1])	FL IF 2PSE-F[1])	FL IF 2FX SC-F[1])	FL IF 2FX ST-D[1])
Ethernet interface				
Number of ports	2 (RJ45 ports)	2 (PoE ports)	-	
Transmission speed	10/100 Mbps (connection direction forwards)		-	
Fiber optic interface				
Number of ports	-		2 (SC multi mode)	2 (ST multi mode)
Wavelength	-		1300 nm	
Transmission length	-		2800 m (fiberglass with F-G 50/125 1.6 dB/km F800)	10000 m (fiberglass with F-G 62.5/125 0.7 dB/km F1000)
	-		6400 m (fiberglass with F-G 50/125 0.7 dB/km F1200)	
	-		3000 m (fiberglass with F-G 62.5/125 2.6 dB/km F600)	
	-		2800 m (fiberglass with F-G 50/125 1.6 dB/km F800)	
Function				
Basic functions	Media module for Modular Managed Switch	Media module for Modular Managed Switch with Power over Ethernet IEEE802.3af, Power Source Equipment (PSE)	Media module for Modular Managed Switch	
Power supply				
Power supply connection	From FL SWITCH GHS or FXT		From FL SWITCH GHS or FXT	
Supply voltage	(via head station)	(internal / 48 V DC for PoE)	(via head station)	
Typical current consumption	10 mA	10 mA (max. 900 mA)	200 mA	
General data				
Weight	70 g		80 g	
Width	31 mm		31 mm	
Height	75.7 mm	84.7 mm	75.7 mm	83 mm
Depth	75.5 mm		72.5 m	72.5 mm
Degree of protection	IP20		IP20	
Ambient temperature (operation)	-20 °C ... 55 °C (no condensation)		0 °C ... 55 °C (no condensation)	
Permissible humidity (operation)	10% ... 95% (no condensation)		10% ... 95% (no condensation)	
Noise emission	EN 61000-6-3/-4		EN 61000-6-3/-4	
Noise immunity	EN 61000-6-2:2005		EN 61000-6-2:2005	

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Interface module for Modular Managed Switch system						
- Exit to the front	**FL IF 2TX VS-RJ-F[1])**	**2832344**	1			
- Exit downward	**FL IF 2TX VS-RJ-D[1])**	**2832357**	1			
- Power-over-Ethernet, exit to the front	**FL IF 2PSE-F[1])**	**2832904**	1			
Fiber optics media module for connecting 100Base FX multi mode fiberglass (1300 nm)						
- Exit to the front				**FL IF 2FX SC-F[1])**	**2832412**	1
- Exit downward				**FL IF 2FX SC-D[1])**	**2832425**	1
- Exit downward				**FL IF 2FX ST-D[1])**	**2884033**	1
				FL IF 2FX SM SC-D[1])	**2832205**	1
Interface modules, 2 ports, SCRJ for POF/HCS, diagnosis-capable						
Slot module for synchronization port						
- Wavelength 850 nm (short)						
- Wavelength 1300 nm (long)						
- Wavelength 1550 nm (longhaul)						
Configuration memory, replaceable						
- MRM function						

Ethernet

POF-SCRJ ports

SFP modules for transmission ranges up to 80 km

Configuration memory and MRP manager function

Technical data

-	
-	
2 (SCRJ)	
650 nm	
50 m (including 3 dB system reserve, polymer fiber with F-K 980/1000 230 dB/km)	
100 m (HCS fiber with F-S 200/230 10 dB/km)	
300 m (GI HCS fiber with F-S 200/300, with 15 dB/km)	
-	
Media module for Modular Managed Switch with FO diagnosis	
From FL SWITCH GHS or FXT	
(via head station)	
200 mA	
80 g	
31 mm	
73.5 mm	
72.5 mm	
IP20	
0 °C ... 55 °C (no condensation)	
10% ... 95% (no condensation)	
EN 61000-6-3/-4	
EN 61000-6-2:2005	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL IF 2POF SCRJ-D[1])	**2891084**	1

Technical data

	FL SFP SX	FL SFP LX
-	-	
-	-	
1 (LC multi mode)		1 (LC single mode)
850 nm		1310 nm
550 m (fiberglass 50/125)		30 km (fiberglass 9/125)
300 m (fiberglass 62.5/125)		250 m (fiberglass 62.5/125)
-		
-		
SFP module as FO port		
Via SFP slot		
-		
-		
-40 °C ... 85 °C (no condensation)		
30% ... 95% (no condensation)		
-		
-		

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SFP SX	**2891754**	1
FL SFP LX	**2891767**	1
FL SFP LH	**2989912**	1

Technical data

	FL MEM PLUG[1])	FL MEM PLUG/MRM[1])
-	-	
-	-	
-		
-		
-		
-		
-		
-		
Configuration memory (plug-in)		Configuration memory and manager for the media redundancy protocol (MRP)
From FL SWITCH MCS/SMCS		
-		
-		
25 g		
16 mm		
57 mm		
IP20		
0 °C ... 55 °C (no condensation)		
10% ... 95% (no condensation)		
EN 61000-6-3/-4		
EN 61000-6-2:2005		

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MEM PLUG[1])	**2891259**	1
FL MEM PLUG/MRM[1])	**2891275**	1

IP67 switch, hub, and Power over Ethernet

The **FL SWITCH 1605** was developed for use in harsh environments. Thanks to its degree of protection and compact design, it is ideal for use directly in the machine.

The **FL HUB 8/16TX ZF** is particularly flexible for use in applications where hubs are required. It is ideal for special automation protocols, such as Powerlink or FL Net.

Power over Ethernet solutions

Power over Ethernet enables the combined transmission of power and data.

FL PSE 2TX power source equipment

Thanks to the use of the Power over Ethernet standard IEEE 802.3af, the following termination devices can be operated, for example:
– WLAN access points
– IP phones
– IP cameras

FL SWITCH 1001T-4POE

The **FL SWITCH 1001T-4POE** 5-port unmanaged switch provides four Power over Ethernet connections with 10/100 Mbps. Save time and money when installing industrial devices such as WLAN access points or security cameras.

Features:

– Flexible use of POE devices thanks to powerful 30 W POE ports (IEEE 801.1at)
– Extended temperature range (−40°C … +75°C) for harsh environments
– Redundant supply with alarm contact for maximum network availability

Notes:

1) EMC: Class A product, see page 553

Ethernet

Standard switch, IP67 protection

Technical data

Ethernet interface	
Number of ports	5 (M12 socket)
Transmission speed	10/100 Mbps
Connection method	M12
Function	
Basic functions	Unmanaged switch / autonegotiation, complies with IEEE 802.3, store-and-forward switching mode
Status and diagnostic indicators	LEDs: U_S (voltage supply), link and activity per port
Network expansion parameters	
Cascading depth	Network, linear, and star structure: any
Maximum conductor length (twisted pair)	100 m
Power supply	
Supply voltage	24 V DC (M12 plug-in connector)
Residual ripple	3.6 V_{PP}
Supply voltage range	18 V DC ... 32 V DC
Typical current consumption	40 mA (24 V DC)
General data	
Weight	220 g
Width	30 mm
Height	200 mm
Depth	41 mm
Degree of protection	IP65/IP66/IP67
Ambient temperature (operation)	-40 °C ... 70 °C
Permissible humidity (operation)	10% ... 95%

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet switch			
- 5 Ethernet ports in M12 format	**FL SWITCH 1605 M12**	**2700200**	1
Ethernet hub			
- 8 RJ45 ports			
- 16 RJ45 ports			
Power over Ethernet module (PSE)			
Power over Ethernet switch			

Ethernet

Hub with RJ45 ports

Ethernet

Power Source Equipment

Power over Ethernet switch

Ex:

Ex:

Technical data		Technical data	Technical data
FL HUB 8TX-ZF[1])	FL HUB 16TX-ZF[1])		
8 (RJ45)	16 (RJ45)	2 (PoE ports)	5 (4x POE ports, 1x 10/100 port)
10/100 Mbps		10/100 Mbps	10/100 Mbps
RJ45 socket		8-pos. RJ45 socket	RJ45 socket
Hub/repeater, compliance with IEEE 802.3		PSE/midspan, complies with IEEE 802.3af	PSE, complies with IEEE 802.3at
LEDs: UL (communications voltage), COL (collision) link and receive LED per port		LEDs: US, PoE detection per port	LEDs: U_{S1}, U_{S2} (redundant voltage supply) ; alarm ; LNK/ACT, POE, 100 Mbps per port
4 hubs 10 Mbps / 2 hubs 100 Mbps		-	-
100 m		100 m	100 m
24 V DC (via COMBICON ; max. conductor cross section 2.5 mm²)		24 V DC (via COMBICON ; max. conductor cross section 2.5 mm²)	24 V DC
3.6 V_{PP}		3.6 V_{PP}	3.6 V_{PP}
18.5 V DC ... 30.5 V DC		18.5 V DC ... 30.5 V DC	18 V DC ... 57 V DC
Typ. 144 mA (to U_S)		Typ. 100 mA (during no load ; approx. 1800 mA at 24 V at the input with maximum load and 25°C ambient temperature)	-
140 g	280 g	320 g	685 g
45 mm	90 mm	45 mm	55 mm
99 mm		99 mm	117 mm
112 mm		112 mm	78 mm
IP20		IP20	IP20
0 °C ... 60 °C	0 °C ... 55 °C	0 °C ... 55 °C	-40 °C ... 75 °C
30% ... 95% (no condensation)		30% ... 95% (no condensation)	5% ... 95% (no condensation)

Ordering data

Type	Order No.	Pcs. / Pkt.
FL HUB 8TX-ZF[1])	**2832551**	1
FL HUB 16TX-ZF[1])	**2832564**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL PSE 2TX[1])	**2891013**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SWITCH 1001T-4POE	**2891064**	1

Security routers for DIN rails

The compact and fanless DIN rail devices in metal housing suitable for industrial applications have an SD card slot at the front for configuration memory. The SD cards can be used for starting up or replacing the devices quickly and easily.

The devices feature an extended temperature range and contain a buffered realtime clock and trusted platform module (TPM) for secure and reliable key generation and management.

The FL MGUARD RS4000 ... devices provide high-availability high-end security for industry and a remote maintenance infrastructure for the secure and reliable connection of machines and systems.

The FL MGUARD RS2000 ... devices are designed for price-sensitive applications with fewer complex requirements and allow secure and reliable remote maintenance of machines and systems in the field via the Internet. In this context, they are used as industrial remote service routers with a simplified configuration.

Secure networks also with Gigabit

The new router generation for top-class security:

– Replaceable configuration memory
– Comprehensive connection options
– Flexible routing
– Intelligent stateful inspection firewall
– Secure remote services (VPN) according to IPsec standard
– Central management tool available

Notes:

1) EMC: Class A product, see page 553

Router with intelligent firewall

Technical data

Ethernet interface	
Number of ports	2 (RJ45)
Transmission speed	10/100 Mbps
Function	
Basic functions	Router with intelligent firewall (VPN, 10 tunnels as an option, up to 250 with additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN (as an option): up to 124 Mbps/40 Mbps (as an option)
SNMP – Simple Network Management Protocol	SNMPv1, v2, v3
Security functions	
VPN throughput	max. 40 Mbps (router mode, VPN bidirectional throughput)
Number of VPN tunnels	0 (as an option, 10 tunnels up to 250 tunnels, with additional license FL MGUARD LIC VPN-10/ Order No. 2700194 or FL MGUARD LIC VPN-250/ Order No. 2700193 or 2700192)
Encryption methods	DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode	-
Authentication	-
Data integrity	-
1:1 Network Address Translation (NAT) in the VPN	-
Firewall data throughput	max. 124 Mbps (router mode, default firewall rules, bidirectional throughput)
Firewall rules	Configurable stateful inspection firewall with full scope of functions
Filtering	MAC and IP addresses, ports, protocols
Protection against	IP spoofing, DoS and Syn Flood Protection
Routing	Standard routing, NAT, 1:1-NAT, port forwarding
Power supply	
Supply voltage	24 V DC
Typical current consumption	100 mA
General data	
Width	45 mm
Ambient temperature (operation)	-20 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Router/firewall, replaceable memory - 2 x WAN interface (1 x RJ45, 1 x V.24/RS-232), 1 x LAN interface (RJ45)	**FL MGUARD RS4000 TX/TX**[1]	**2700634**	1
Router/firewall with VPN, replaceable memory - 2 x WAN interface (1 x RJ45, 1 x V.24/RS-232), 1 x LAN interface (RJ45) - 1 x WAN interface (RJ45), 1 x LAN interface (RJ45)			

Accessories

Parameterization memory, replaceable	**SD FLASH 512MB**	**2988146**	1
License to configure and operate **10 VPN tunnels** on FL MGUARD	**FL MGUARD LIC VPN-10**	**2700194**	1
License to configure and operate **250 VPN tunnels** on FL MGUARD	**FL MGUARD LIC VPN-250**	**2700193**	1
License to configure **any number of tunnels** and operate **250 VPN** tunnels on FL MGUARD	**FL MGUARD LIC VPN-250 GROUP**	**2700192**	1
Central **device management software** for FL MGUARD devices	**FL MGUARD DM ... (see software)**		

Router with intelligent firewall and VPN

Router with simplified 2-click firewall and VPN

Gigabit router with firewall, replaceable memory

Technical data

2 (RJ45)	
10/100 Mbps	
Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps	
SNMPv1, v2, v3	
max. 40 Mbps (router)	
10 (as an option, up to 250, with additional license FL MGUARD LIC VPN-250/ Order No. 2700193 or 2700192)	
DES, 3DES, AES-128, -192, -256	
ESP-Tunnel / ESP-Transport	
X.509v3 certificates with RSA or PSK	
MD5, SHA-1	
Supported	
max. 124 Mbps (router mode, default firewall rules, bidirectional throughput)	
Configurable stateful inspection firewall with full scope of functions	
MAC and IP addresses, ports, protocols	
IP spoofing, DoS and Syn Flood Protection	
Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC	
100 mA	
45 mm	
-20 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MGUARD RS4000 TX/TX VPN[1])	**2200515**	1

Accessories

SD FLASH 512MB	**2988146**	1
FL MGUARD LIC VPN-250	**2700193**	1
FL MGUARD LIC VPN-250 GROUP	**2700192**	1

FL MGUARD DM ... (see software)

Technical data

2 (RJ45)	
10/100 Mbps	
Router with simplified 2-click firewall and VPN for 2 tunnels (fixed), metal housing, slot for any SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps	
SNMPv1, v2, v3	
max. 40 Mbps (router mode, VPN bidirectional throughput)	
2 (Fixed, Ipsec (IETF standard)	
DES, 3DES, AES-128, -192, -256	
ESP-Tunnel / ESP-Transport	
X.509v3 certificates with RSA or PSK	
MD5, SHA-1	
Supported	
max. 124 Mbps (router mode, default firewall rules, bidirectional throughput)	
Simplified 2-click stateful inspection firewall	
Incoming or outgoing traffic	
-	
Standard routing, NAT, 1:1-NAT, port forwarding	
24 V DC	
100 mA	
45 mm	
-20 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MGUARD RS2000 TX/TX VPN[1])	**2700642**	1

Accessories

SD FLASH 512MB	**2988146**	1

FL MGUARD DM ... (see software)

Technical data

	FL MGUARD GT/GT	FL MGUARD GT/GT VPN
2 (Combo ports)		
10/100/1000 Mbps (SFP module: 1000 Mbps)		
	Router with intelligent firewall and Gigabit connectivity	Router with intelligent firewall and Gigabit connectivity and VPN
SNMPv1, v2, v3		
	-	max. 101 Mbps (router mode, VPN bidirectional throughput)
	-	10 (up to 250 with license possible)
	-	DES, 3DES, AES-128, -192, -256
	-	ESP-Tunnel / ESP-Transport
	-	X.509v3 certificates with RSA or PSK
	-	MD5, SHA-1
	-	Supported
	max. 398 Mbps (router mode, VPN bidirectional throughput)	max. 398 Mbps (router mode, default firewall rules, bidirectional throughput)
Configurable stateful inspection firewall		
MAC and IP addresses, ports, protocols		
IP spoofing, DoS and Syn Flood Protection		
Standard routing, NAT, 1:1-NAT, port forwarding		
24 V DC		
270 mA		
128 mm		
-20 °C ... 60 °C		

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MGUARD GT/GT	**2700197**	1
FL MGUARD GT/GT VPN	**2700198**	1

Accessories

FL MGUARD LIC VPN-10	**2700194**	1
FL MGUARD LIC VPN-250	**2700193**	1
FL MGUARD LIC VPN-250 GROUP	**2700192**	1

FL MGUARD DM ... (see software)

Firewall/router for office-based/mobile use

The FL MGUARD SMART2 features maximum possible security and performance in a minimum amount of space.

With its rugged housing and uncomplicated power supply via any USB port, the FL MGUARD SMART2 is the ideal solution for the mobile protection of critical company resources.

The device is particularly suitable for the mobile and stationary protection of workstations and environments close to the production process with low requirements for industrial hardening.

It can be used as a secure firewall between office and production networks, as a remote maintenance client or as a security router for small workgroups.

Router with firewall for mobile use

Technical data

	FL MGUARD SMART2	FL MGUARD SMART2 VPN
Ethernet interface		
Number of ports	2 (RJ45)	
Transmission speed	10/100 Mbps	
Function		
Basic functions	Firewall/router for office use or mobile service technicians	
SNMP – Simple Network Management Protocol	SNMPv1, v2, v3	
VLAN – Virtual Local Area Network	As per 802.1Q	
Security functions		
Dynamic Host Configuration Protocol (DHCP) support	Server or Relay Agent	
Network Time Protocol (NTP) client	Client	
Link Layer Discovery Protocol (LLDP)	As per protocol 802.2	
Remote syslog logging	On externals server	
VPN throughput	max. 40 Mbps (router mode, VPN bidirectional throughput)	
Number of VPN tunnels	-	10 (up to 250 possible with license)
Encryption methods	DES, 3DES, AES-128, -192, -256	
Internet Protocol Security (IPsec) mode	-	ESP-Tunnel / ESP-Transport
Authentication	-	X.509v3 certificates with RSA or PSK
Data integrity	-	MD5, SHA-1
1:1 Network Address Translation (NAT) in the VPN	-	Supported
Firewall data throughput	max. 124 Mbps (Router mode, default firewall rules, bidirectional throughput)	
Firewall rules	Configurable stateful inspection firewall	
Filtering	MAC and IP addresses, ports, protocols	
Protection against	IP spoofing, DoS and Syn Flood Protection	
Routing	NAT, 1:1-NAT, Port Forwarding	
Power supply		
Supply voltage	5 V DC (from USB interface)	
General data		
Width	77 mm	
Degree of protection	IP30	
Ambient temperature (operation)	0 °C ... 40 °C	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Router with firewall for mobile use			
- With VPN	**FL MGUARD SMART2**	**2700640**	1
	FL MGUARD SMART2 VPN	**2700639**	1

Accessories

License to configure and operate **10 VPN tunnels** on FL MGUARD	**FL MGUARD LIC VPN-10**	**2700194**	1
License to configure and operate **250 VPN tunnels** on FL MGUARD	**FL MGUARD LIC VPN-250**	**2700193**	1
License to configure **any number of tunnels** and operate **250 VPN** tunnels on FL MGUARD	**FL MGUARD LIC VPN-250 GROUP**	**2700192**	1
License for **lifetime software update** of FL MGUARD field devices	**FL MGUARD LIC LIFETIME FW**	**2700184**	1
Central **device management software** for FL MGUARD devices	**FL MGUARD DM ... (see software)**		

N

Security routers without DIN rail mounting

Security is fundamental for PC-based automation. Do not leave any room for attack.

Distributed protection concepts where automation cells are protected individually provide maximum security.

In order to protect your PC reliably and easily in the network, PCI bus-based **FL MGUARD PCI** cards are the ideal choice. mGuard technology features:

– Maximum security
– Optimum performance
– Central management

Router with firewall for PCI

Technical data

	FL MGUARD PCI4000	FL MGUARD PCI4000 VPN
Ethernet interface		
Number of ports	2 (RJ45)	
Transmission speed	10/100 Mbps	
Function		
Basic functions	Router with intelligent firewall (VPN, 10 tunnels as an option, up to 250 with additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN (as an option): up to 124 Mbps/40 Mbps (as an option)	Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card, extended temperature range, high-performance firewall/VPN: up to 124 Mbps/40 Mbps
SNMP – Simple Network Management Protocol	SNMPv1, v2, v3	
Security functions		
Dynamic Host Configuration Protocol (DHCP) support	Server or Relay Agent	
Network Time Protocol (NTP) client	Client	
Link Layer Discovery Protocol (LLDP)	As per protocol 802.2	
VPN throughput	max. 40 Mbps (Router mode, VPN bidirectional throughput)	max. 40 Mbps (Router)
Number of VPN tunnels	0 (as an option, 10 tunnels up to 250 tunnels, with additional license FL MGUARD LIC VPN-10/Order No. 2700194 or FL MGUARD LIC VPN-250/Order No. 2700193 or 2700192)	10 (as an option, up to 250, with additional license FL MGUARD LIC VPN-250/Order No. 2700193 or 2700192)
Encryption methods	DES, 3DES, AES-128, -192, -256	
Internet Protocol Security (IPsec) mode	-	ESP-Tunnel / ESP-Transport
Authentication	-	X.509v3 certificates with RSA or PSK
Data integrity	-	MD5, SHA-1
1:1 Network Address Translation (NAT) in the VPN	-	Supported
Firewall data throughput	max. 124 Mbps (router mode, default firewall rules, bidirectional throughput)	
Firewall rules	Configurable stateful inspection firewall with full scope of functions	
Filtering	MAC and IP addresses, ports, protocols	
Protection against	IP spoofing, DoS and Syn Flood Protection	
Routing	Standard routing, NAT, 1:1-NAT, port forwarding	
General data		
Ambient temperature (operation)	0 °C ... 70 °C	

Ordering data

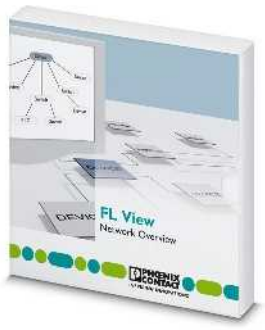
Description	Type	Order No.	Pcs. / Pkt.
Router with firewall			
- With VPN	**FL MGUARD PCI4000**	**2701274**	1
	FL MGUARD PCI4000 VPN	**2701275**	1

Accessories

License to configure and operate **10 VPN tunnels** on FL MGUARD	**FL MGUARD LIC VPN-10**	**2700194**	1
License to configure and operate **250 VPN tunnels** on FL MGUARD	**FL MGUARD LIC VPN-250**	**2700193**	1
License to configure **any number of tunnels** and operate **250 VPN** tunnels on FL MGUARD	**FL MGUARD LIC VPN-250 GROUP**	**2700192**	1
License for **lifetime software update** of FL MGUARD field devices	**FL MGUARD LIC LIFETIME FW**	**2700184**	1
Parameterization memory, replaceable	**SD FLASH 512MB**	**2988146**	1
Central **device management software** for FL MGUARD devices	**FL MGUARD DM ... (see software)**		

Network diagnostics software

N



FL VIEW scans the Ethernet TCP/IP (PROFINET) network and automatically detects all the devices in the network and their connections. Using various display methods, IP addresses, devices or locations can be shown in the topology with the corresponding image files.

Features:

– Status display of network connections and network devices using different colors - you can identify a faulty device or an overloaded connection immediately
– Detection of the imminent failure of network components, e.g., through detection of the increasing ping error rate and its display

Technical data

Hardware requirements	
CPU	> 1 GHz
Main memory (RAM)	512 MB
Hard disk memory	min. 150 Mbyte (for help and video files, an additional 650 MB is needed)
Optical drive	CD-ROM
Interfaces	Ethernet Port
Software requirements	
Operating systems	32-bit system: Windows XP SP3, 32-bit and 64-bit system: Windows 7, Windows 2003, Windows 2008 server
Basic functions	
	FL VIEW is a software product for detecting and monitoring industrial Ethernet TCP/IP networks with advanced features for PROFINET applications. FL VIEW automatically detects the topology and status of the networks and devices and transmits this in an animated realtime graphic.
Languages supported	
	English

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Network monitoring software, for nodes in different subnetworks			
- For 64 nodes	**FL VIEW 64**	**2701472**	1
- For 256 nodes	**FL VIEW 256**	**2701473**	1
- For 512 nodes	**FL VIEW 512**	**2701474**	1
Network monitoring software, for 32 nodes in one subnetwork			
	FL VIEW 32 LITE	**2701744**	1

Device Manager for FL MGUARD devices

The Device Manager simplifies the management of FL MGUARD security appliances.

The tool features a template mechanism that enables the user to configure and manage all FL MGUARD devices centrally – from a few hundred devices to several thousand.

Features:

– Central configuration of several thousand appliances
– Template-based management tool
– Suitable for remote maintenance applications

Central management software for FL MGUARD

Technical data

Hardware requirements	
CPU	> 1 GHz
Main memory (RAM)	512 MB
Hard disk memory	4 Gbyte (free memory space (server), 500 MB free memory space (client))
Optical drive	CD-ROM
Interfaces	Ethernet Port
Software requirements	
Operating systems	MS Windows 2000 SP2 or later, Windows XP, Linux
Basic functions	
	Central management software for up to 100 FL MGUARD devices
Languages supported	
	-

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Central **device management software** for FL MGUARD devices, for **100 devices** in the field, for installation on a PC. Additional service FL MGUARD PROF SERVICE2 required.	**FL MGUARD DM 100**	**2700183**	1
Central **device management software** for FL MGUARD devices, for **any number of devices** in the field, for installation on a PC. Additional service FL MGUARD PROF SERVICE 2 required.	**FL MGUARD DM UNLIMITED**	**2981974**	1

Accessories

Device Manager software update, for both FL MGUARD DM 100 and FL MGUARD DM UNLIMITED.	**FL MGUARD DM UPD**	**2700222**	1
Upgrade license from FL MGUARD DM 100 to FL MGUARD DM UNLIMITED.	**FL MGUARD DM DEVICE UPGRADE**	**2700223**	1
Startup and induction for FL MGUARD DM.	**FL MGUARD PROF SERVICE 2**	**2700185**	1

In addition to products, we also offer you support whenever you need it.

We offer on-demand professional support, from consultation, network analysis, and design to configuration support and startup. We not only support you over the phone or by e-mail, but also directly on site, if you so desire. Contact us for more information.

We support you in the design and planning of your network.

We will develop custom solutions for you that are tailored to your specific requirements. Whether you need failsafe network structures, concepts for protecting or remotely maintaining your machinery or high-performance wireless networks, we will find the right solution for you.

FL START-UP SUPPORT
Order No. 2701426

Description:

– Startup of network components from Phoenix Contact
– Support regarding analysis, consultation/planning or configuration/startup together with a responsible person employed by the initiator

Services offered in the following areas:

"Analysis"
– Assessment of existing network environment
– Analysis of network in relation to requirements
– Measurement of wireless field
– Measurement of data throughput
– Determining frequency band use
– Checking the network security concept

"Planning/consultation"
– Advice on the selection of wireless technology and antenna technology
– Planning/creation and development of a network security concept
– Planning/creation and development of a redundancy concept
– Planning/creation and development of a diagnostics concept
– Advice on the selection of technology and corresponding components
– Planning/creation and development of an Ethernet network including documentation

"Configuration/startup"
– Support with configuration/startup of Ethernet networks
– Support with configuration/startup of WLAN/Bluetooth connections
– Support with configuration/startup of VPN connections

We will turn you into an automation network specialist - if you so desire.

Do you want to gain a better insight into network technology for yourself or your staff?

We offer individual and practical training courses that are tailor-made to suit your requirements and needs.

FL TRAINING
Order No. 2701427

Description:

– Training with network components from Phoenix Contact covering network standards, Ethernet security or wireless

"Ethernet security" training
– The design and implementation of sophisticated Ethernet security and remote service solutions.
– Put your theoretical knowledge to the test on an industrial Ethernet network with components from Phoenix Contact

"Wireless" training
– Learn how important wireless technology is and how it is used in automation
– Detailed explanation of the basics of wireless technology such as wireless LAN (WLAN) and Bluetooth
– Creation of wireless networks in practical exercises

Our specialists are also on hand to offer practical support on site.

We offer support during the configuration and startup phases. We measure and assess the performance, availability, and security of your network. We also show you how it can be optimized.

What's more, if your network is not working according to your expectations, we will eliminate any faults.

FL MAINTENANCE SUPPORT
Order No. 2701424

Description:

– Troubleshooting in an Ethernet communication network with components from Phoenix Contact together with a responsible person employed by the initiator

Services offered:

– Support with troubleshooting
– Support with the hardware check
– Network analysis
– Configuration check
– Provision of high-quality measuring instruments
– Service report with complete documentation

Services for functional safety can be found on page 114.

Services for automation can be found on page 546.

Industrial WLAN

The latest generation of WLAN modules offers maximum reliability, data throughput, and range.

Faster

– The new high-speed WLAN 5100 brings WLAN 802.11n to industrial applications and with it a data rate of up to 300 Mbps

Configuration

– Central cluster management enables the entire wireless network to be set up in just minutes

More reliable

– MiMo technology with three antennas for wireless communication that is more robust, faster, and covers a wider range

WLAN

WLAN access point/2.4 GHz, 5 GHz client 802.11 a/b/g/n

Technical data

Wireless interface	
Wireless standard	IEEE 802.11
Frequency band	2.4 GHz / 5 GHz
Transmission power	max. 23 dBm (EIRP)
Antenna connection method	RSMA (female)
Number	3
Antenna	
Assembly instructions	Antennas not included in scope of supply
Ethernet interfaces	
Number	2
Connection method	RJ45 socket
Power supply for module electronics	
Supply voltage	24 V DC
Connection method	Via COMBICON
Supply voltage range	10 V DC ... 36 V DC
Supply current	200 mA
Security	
	802.11i WPA PSK (preshared key) WPA2 AES TKIP Supports 802.1X/RADIUS MAC filter
Function	
Operating modes	Access point/client adapter/repeater/WDS bridge
Basic functions	SNMP(V2/V3), CLI, WPS, DHCP, DCP, BootP, HTTP, HTTPS, syslog, fast roaming, SD card, dual FW image, 1 x DI, 1 x DO, 2 x Ethernet 10/100 Mbit, auto crossover, auto negotiation, MODE button
Configuration	Cluster management, web-based management, WPS
General data	
Wireless licenses	EU, more countries in e-shop
Weight	418 g
Width	40 mm
Height	109 mm
Depth	109 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 60 °C (extended temperature range on request)
Permissible humidity (operation)	10% ... 95% (no condensation)
Air pressure (operation)	800 hPa ... 1080 hPa (up to 2000 m above mean sea level)
Shock in acc. with IEC 60068-2-27:1997	30 g
Vibration (operation) in acc. with IEC 60068-2-6:1982	5g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Wireless LAN Access Point - WLAN 802.11 a,b,g,n, frequency 2.4 GHz, 5 GHz, IP20	**FL WLAN 5100**	**2700718**	1
- Approval for the USA and Canada	**FL WLAN 5101**	**2701093**	1

Accessories

Parameterization memory, replaceable	**SD FLASH 512MB**	**2988146**	1

Control box sets

Control box set for the FL WLAN 5100 access point for use directly in industrial environments or in protected outdoor areas.

Features:

– IP66 control box
– Mounting suitable for industrial use
– Bore holes, screw connections already included
– Various sets, suitable for the most common applications

Technical data

	FL RUGGED BOX OMNI-1	FL RUGGED BOX DIR-1
General data		
Set contents	Control box (with bore holes incl. sealing plugs, screw connections, and DIN rail), 3 omnidirectional antennas incl. antenna cable and RJ45 plug for field assembly	Control box (with bore holes incl. sealing plugs, screw connections, and DIN rail), panel antenna incl. antenna cable and 100 ... 240 V AC power supply unit incl. terminal block base
Width	174 mm	
Height	254 mm	
Depth	137 mm	
Degree of protection	IP66	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Control cabinet set, IP66, including DIN rail, plugs, and screw connections			
- With 3 omnidirectional antennas and antenna cables	**FL RUGGED BOX** **FL RUGGED BOX OMNI-1**	**2701204** **2701430**	1 1
- With 3 omnidirectional antennas, antenna cables, and 100 ... 240 V AC power supply	**FL RUGGED BOX OMNI-2**	**2701439**	1
- With one panel antenna, antenna cable, and 100 ... 240 V AC power supply	**FL RUGGED BOX DIR-1**	**2701440**	1

Accessories

Set for mast mounting of the FL RUGGED BOX housing, including screw clamps for masts up to 89 mm in diameter	**FL RUGGED BOX POLE SET**	**2701205**	1

Industrial WLAN

Factoryline WLAN devices have been developed specifically for use under harsh industrial conditions.

Features:

– Maximum security according to IEEE 802.11i with AES encryption
– 2.4 GHz and 5 GHz supported
– High resistance to vibration, shock, and EMI
– Range of several hundred meters*

Notes:

* The range may be significantly above or below that stated, and depends on the environment, antenna technology and the product used.

Please visit www.phoenixcontact.com, for more information on the prevailing country-specific approvals for the relevant product.

WLAN

WLAN access point

Technical data

	FL WLAN 24 AP 802-11	FL WLAN 24 DAP 802-11
Wireless interface		
Wireless standard	IEEE 802.11	
Frequency band	ISM 2.4 GHz / 5 GHZ ISM	
Transmission power	20 dBm (EIRP)	
Antenna connection method	RSMA (female)	
Antenna		
Connection method	RSMA (male)	
Assembly instructions	External OMNI omnidirectional antenna, the antennas can be exchanged	
Ethernet interfaces		
Connection method	RJ45 socket	
Power supply for module electronics		
Supply voltage	24 V DC (PoE)	
Connection method	Via COMBICON	
Supply voltage range	18.5 V DC ... 30.5 V DC	
Supply current	400 mA (recommended protection 2AT)	
Security		
	WEP 64 bit/128 bit WEPplus WPA TKIP 802.11i WPA2 (RSN, AES) WPA PSK (preshared key) WPA group & master rekeying	
Function		
Operating modes	Access Point	
Configuration	Multilingual web-based interface (German/English) under http or https, with password protection	
General data		
Wireless licenses	Europe, additional countries in the e-shop	
Weight	1300 g	
Width	159 mm	
Height	250 mm	
Depth	65 mm	
Degree of protection	IP65	
Ambient temperature (operation)	-20 °C ... 55 °C	
Permissible humidity (operation)	10% ... 85% (no condensation)	
Air pressure (operation)	795 hPa ... 1080 hPa (up to 2000 m above mean sea level)	
Shock in acc. with IEC 60068-2-27:1997	25g	
Vibration (operation) in acc. with IEC 60068-2-6:1982	5g	
Mounting type	Adapter plate	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Wireless LAN Access Point			
- One wireless interface, two antennas	**FL WLAN 24 AP 802-11**	**2884075**	1
- Two wireless interfaces, four antennas	**FL WLAN 24 DAP 802-11**	**2884279**	1
Wireless LAN Ethernet port adapter - Internal 2.4 GHz panel antenna - Internal 5 GHz panel antenna - External RSMA antenna connection (female)			

Accessories

Replaceable configuration memory for WLAN modules	**FL WLAN SIM**	**2692539**	1
Mounting material, for wall or mast mounting			
Mounting material, for DIN rail mounting			

N

WLAN Ethernet adapter with internal panel antenna 2.4/5 GHz

WLAN Ethernet adapter with external antenna connection

Technical data

FL WLAN EPA	FL WLAN EPA 5N
IEEE 802.11	
2.4 GHz	5 GHz
max. 20 dBm (EIRP)	max. 14 dBm (EIRP)
(Internal)	
Permanently installed	
Internal circularly polarized panel antenna	
M 12 plug-in connectors (D-coded, female)	
24 V DC	
M12 plug-in connector (A-coded, male)	
9 V DC ... 30 V DC	
76 mA (at 24 V DC)	
802.11i	
WPA PSK (preshared key)	
WPA2 PSK	
AES	
WEP 64 bit/128 bit	
TKIP	
Supports 802.1X/RADIUS	
Ethernet client adapter	
Web interface, MODE button, AT commands (TCP/IP), SSC	
Europe, USA, Canada, additional countries in the e-shop	
120 g	
66 mm	
91 mm	
34 mm	
IP65	
-40 °C ... 65 °C	
5% ... 90% (no condensation)	
795 hPa ... 1080 hPa (up to 2000 m above mean sea level)	
Wall mounting	

Technical data

IEEE 802.11
2.4 GHz/5 GHz
max. 20 dBm (EIRP)
RSMA (female)
RSMA (male)
External OMNI omnidirectional antenna supplied as standard, antennas can be exchanged
M 12 plug-in connectors (D-coded, female)
24 V DC
M12 plug-in connector (A-coded, male)
9 V DC ... 30 V DC
76 mA (at 24 V DC)
802.11i
WPA PSK (preshared key)
WPA2 PSK
AES
WEP 64 bit/128 bit
TKIP
Supports 802.1X/RADIUS
Ethernet client adapter
Web interface, MODE button, AT commands (TCP/IP), SSC
Europe, USA, Canada, additional countries in the e-shop
120 g
66 mm
91 mm
34 mm
IP65
-40 °C ... 65 °C
5% ... 90% (no condensation)
795 hPa ... 1080 hPa (up to 2000 m above mean sea level)
-
-
Wall mounting

Ordering data

Type	Order No.	Pcs. / Pkt.
FL WLAN EPA	**2692791**	1
FL WLAN EPA 5N	**2700488**	1

Accessories

FL EPA WMS	**2701134**	1
FL EPA RMS	**2701133**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL WLAN EPA RSMA	**2701169**	1

Accessories

FL EPA WMS	**2701134**	1
FL EPA RMS	**2701133**	1

Industrial Bluetooth

N

Bluetooth modules for the wireless integration of Ethernet-capable devices in the control network. Optimized for use in PROFINET/PROFIsafe networks.

Features:

- Protocol-transparent communication on Layer 2
- WLAN coexistence functions AFH, LEM, black channel listing
- Integrated special antenna (EPA)
- Range* of up to 200 m
- Reliable wireless transmission of safety-related data signals using SafetyBridge technology

Notes:

* The range may be significantly above or below that stated, and depends on the environment, antenna technology and the product used.

Please visit www.phoenixcontact.com for more information on the prevailing country-specific approvals for the relevant product.

Bluetooth access point

Technical data

Wireless interface	
Wireless standard	Bluetooth 2.1 + EDR
Frequency range	2.402 GHz ... 2.48 GHz (ISM bandwidth)
Transmission power	max. 12 dBm (EIRP)
Wireless modules that can be connected	7
Profiles supported	PAN
Antenna connection method	RSMA (female)
Antenna	
Connection method	RSMA (male)
Assembly instructions	External OMNI omnidirectional antenna supplied as standard, antennas can be exchanged
Ethernet interfaces	
Connection method	M 12 plug-in connectors (D-coded, female)
Power supply for module electronics	
Supply voltage	24 V DC
Connection method	M12 plug-in connector (A-coded, male)
Supply voltage range	9 V DC ... 30 V DC
Current consumption	46 mA (at 24 V DC)
Security	
	128-bit data encryption Authentication PIN Non-discoverable
Function	
Operating modes	BT access point
Function	P2P Client Access point
Configuration	Web interface, MODE button, AT commands (TCP/IP), SSC
General data	
Wireless licenses	Europe, additional countries in the e-shop
Weight	120 g
Width	66 mm
Height	91 mm
Depth	34 mm
Degree of protection	IP65
Protection class	III, IEC 61140, EN 61140, VDE 0140-1
Ambient temperature (operation)	-40 °C ... 65 °C
Permissible humidity (operation)	5% ... 90% (no condensation)
Air pressure (operation)	795 hPa ... 1080 hPa (up to 2000 m above mean sea level)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Bluetooth Access Point			
	FL BT EPA MP	**2701416**	1
Bluetooth Ethernet Client adapter			
Protocol-transparent **Ethernet wireless path**			

Accessories

Mounting material, for wall or mast mounting	**FL EPA WMS**	**2701134**	1
Mounting material, for DIN rail mounting	**FL EPA RMS**	**2701133**	1

Bluetooth

Bluetooth Ethernet adapter

Bluetooth

Solution set, including cable

Technical data

Bluetooth 2.1 + EDR
2.402 GHz ... 2.48 GHz (ISM bandwidth)
max. 15 dBm (EIRP)
1
PAN
(Internal)
Permanently installed
Internal circularly polarized panel antenna
M 12 plug-in connectors (D-coded, female)
24 V DC
M12 plug-in connector (A-coded, male)
9 V DC ... 30 V DC
46 mA (at 24 V DC)
128-bit data encryption
Authentication
PIN
Non-discoverable
Ethernet client adapter
P2P
Client
Web interface, MODE button, AT commands (TCP/IP), SSC
Europe, additional countries in the e-shop
120 g
66 mm
91 mm
34 mm
IP65
III, IEC 61140, EN 61140, VDE 0140-1
-40 °C ... 65 °C
5% ... 90% (no condensation)
795 hPa ... 1080 hPa (up to 2000 m above mean sea level)

Ordering data

Type	Order No.	Pcs. / Pkt.
FL BT EPA	**2692788**	1

Accessories

FL EPA WMS	**2701134**	1
FL EPA RMS	**2701133**	1

Technical data

Bluetooth 2.1 + EDR
2.402 GHz ... 2.48 GHz (ISM bandwidth)
max. 15 dBm (EIRP)
1
PAN
(Internal)
Permanently installed
Internal circularly polarized panel antenna
M 12 plug-in connectors (D-coded, female)
24 V DC
M12 plug-in connector (A-coded, male)
9 V DC ... 30 V DC
46 mA (per module at 24 V DC)
128-bit data encryption
Authentication
PIN
Non-discoverable
Ethernet client adapter
P2P
Bridge
Web interface, MODE button, AT commands (TCP/IP), SSC
Europe, additional countries in the e-shop
490 g
66 mm
91 mm
34 mm
IP65
III, IEC 61140, EN 61140, VDE 0140-1
-40 °C ... 65 °C
5% ... 90% (no condensation)
795 hPa ... 1080 hPa (up to 2000 m above mean sea level)

Ordering data

Type	Order No.	Pcs. / Pkt.
FL BT EPA AIR SET	**2693091**	1

Accessories

FL EPA WMS	**2701134**	1
FL EPA RMS	**2701133**	1

2.4 GHz/5 GHz accessories

Omnidirectional antennas

Omnidirectional antennas to increase gain.

– Standard omnidirectional antennas

Gain 2 dBi (2.4 GHz)

Gain 2.5 dBi (2.4 GHz)/5 dBi (5 GHz)

	Technical data	Technical data
Ambient temperature (operation)	-20 °C ... 65 °C	-40 °C ... 70 °C
Degree of protection	IP65	IP68
Gain	2 dBi	2.5 dBi (2.4 GHz) 5 dBi (5 GHz)
Impedance	50 Ω	50 Ω
Connection method	RSMA (male)	N (male)
Horizontal / vertical apex angle	360 ° / 75 °	360 ° (at 2.4 GHz) / 30 ° (at 2.4 GHz) 360 ° (at 5 GHz) / 16 ° (at 5 GHz)
Dimensions W / H	7.8 mm / 82.5 mm	23 mm / 180 mm
Frequency range	2.4 GHz	2.4 GHz ... 2.5 GHz / 5.15 GHz ... 5.83 GHz

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
With connection RSMA (male)	**RAD-ISM-2400-ANT-OMNI-2-1-RSMA**	**2701362**	1			
With N connection (male)				**ANT-OMNI-2459-02**	**2701408**	1

2.4 GHz/5 GHz accessories

Omnidirectional antennas

Omnidirectional antennas to increase gain.

– With vandalism protection thanks to increased impact strength

Gain 3 dBi (2.4 GHz)

Dual band,
gain up to 6 dBi (2.4 GHz)/up to 8 dBi (5 GHz)

	Technical data	Technical data
Ambient temperature (operation)	-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection	IP55	IP68
Gain	3 dBi	6 dBi (2.4 GHz, when mounted on metal surface) 3 dBi (2.4 GHz, no metal surface) 8 dBi (5.6 GHz, when mounted on metal surface) 5 dBi (5.6 GHz, no metal surface)
Impedance	50 Ω	50 Ω
Connection method	RSMA (male)	N (female)
Horizontal / vertical apex angle	360 ° / 85 °	360 ° / -
Dimensions W / H	86 mm / 43 mm	92 mm / 51 mm
Frequency range	2.4 GHz	2.4 GHz / 5.15 GHz ... 5.83 GHz

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
With connection RSMA (male)	**RAD-ISM-2400-ANT-VAN-3-0-RSMA**	**2701358**	1			
With adapter cable N (male) -> SMA (male)				**RAD-ISM-2459-ANT-FOOD-6-0**	**2692526**	1

2.4 GHz/5 GHz accessories

Omnidirectional antennas

Omnidirectional antennas to increase gain.

– High-quality omnidirectional antennas for wall and mast mounting

Gain 6 dBi (2.4 GHz)

Gain 5 dBi (5 GHz)

	Technical data	Technical data
Ambient temperature (operation)	-40 °C ... 75 °C	-45 °C ... 70 °C
Degree of protection	IP55	IP64
Gain	6 dBi	5 dBi
Impedance	50 Ω	50 Ω
Connection method	N (female)	N (female)
Horizontal / vertical apex angle	360 ° / 30 °	360 ° / 25 °
Dimensions W / H	22 mm / 250 mm	16 mm / 130 mm
Frequency range	2.4 GHz ... 2.5 GHz	5.15 GHz ... 5.875 GHz
Scope of delivery	Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna With connection N (female)	**RAD-ISM-2400-ANT-OMNI-6-0**	**2885919**	1	**ANT-OMNI-5900-01**	**2701347**	1

2.4 GHz/5 GHz accessories

N N

Directional wireless antennas

Directional wireless antennas with high gain for transmission over longer distances.

– Linear polarized

– For wall or mast mounting

Dual band, gain up to 9 dBi (2.4/5 GHz)

with 2 radiators, gain 9 dBi (5 GHz)

	Technical data	Technical data
Ambient temperature (operation)	-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection	IP67	IP67
Gain	9 dBi	9 dBi
Impedance	50 Ω	50 Ω
Connection method	N (female)	N (female)
Horizontal / vertical apex angle	75 ° (at 2.4 GHz) / 55 ° (at 2.4 GHz) 55 ° (at 5 GHz) / 55 ° (at 5 GHz)	70 ° (at 5 GHz) / 60 ° (at 5 GHz)
Dimensions W / H	80 mm / 101 mm	80 mm / 101 mm
Frequency range	2.4 GHz ... 2.5 GHz / 5.15 GHz ... 5.875 GHz	5.15 GHz ... 5.875 GHz
Scope of delivery	Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
PANEL directional wireless antenna (without cable) With connection N (female)	**ANT-DIR-2459-01**	**2701186**	1	**ANT-DIR-5900-01**	**2701348**	1

Accessories 5 GHz

Directional wireless antennas, linear polarized

Directional wireless antennas with high gain for transmission over long distances.

18 dBi gain

22 dBi gain

	Technical data	Technical data
Ambient temperature (operation)	-40 °C ... 70 °C	-40 °C ... 70 °C
Degree of protection	IP55	IP55
Gain	18 dBi	22 dBi
Impedance	50 Ω	50 Ω
Connection method	N (female)	N (female)
Horizontal / vertical apex angle	18 ° / 18 °	12 ° / 12 °
Dimensions W / H	152.4 mm / 152.4 mm	304.8 mm / 304.8 mm
Frequency range	5.25 GHz ... 5.85 GHz	5.25 GHz ... 5.85 GHz
Scope of delivery	Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Parabolic antenna						
Gain 18 dBi	**RAD-ISM-5000-ANT-PAR-18-N**	**5606613**	1			
Gain 22 dBi				**RAD-ISM-5000-ANT-PAR-22-N**	**5606174**	1

Antenna cable

Notes:

Keep the connection from the wireless module to the antenna as short as possible, as every cable leads to attenuation.

Extension cable for positioning antennas at a distance: leading out of the control cabinet, connection to an antenna mounted somewhere else.

– Extension or adaptation of wireless module for antenna
– Cable with low attenuation:
  Approximately 0.54 dB/m at 2.4 GHz
  Approximately 0.97 dB/m at 5 GHz

N (male) -> N (male)

	Technical data
Ambient temperature (operation)	-40 °C ... 105 °C
Impedance	50 Ω

	Ordering data		
Description	Type	Order No.	Pcs. / Pkt.
Antenna extension cable			
3 m	**RAD-CAB-EF393- 3M**	**2867649**	1
5 m	**RAD-CAB-EF393- 5M**	**2867652**	1
10 m	**RAD-CAB-EF393-10M**	**2867665**	1
15 m	**RAD-CAB-EF393-15M**	**2885634**	1

Antenna cable

N

Cables and pigtails for connecting the antennas to the wireless module.
– Attenuation for **RAD-PIG-RSMA/N...:**
Approximately 0.80 dB/m at 2.4 GHz
Approximately 1.10 dB/m at 5 GHz
– Attenuation for **RAD-PIG-EF316-N...:**
Approximately 1.52 dB/m at 2.4 GHz
Approximately 2.45 dB/m at 5 GHz

RSMA (male) -> N (male)

RSMA (male) -> N (female)

	Technical data	Technical data
Ambient temperature (operation)	-40 °C ... 85 °C	-40 °C ... 70 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Antenna adapter cable						
0.5 m long	**RAD-PIG-RSMA/N-0.5**	**2903263**	1			
1 m long	**RAD-PIG-RSMA/N-1**	**2903264**	1			
2 m long	**RAD-PIG-RSMA/N-2**	**2903265**	1			
3 m long	**RAD-PIG-RSMA/N-3**	**2903266**	1			
Antenna adapter cable						
0.5 m long				**RAD-PIG-EF316-N-RSMA**	**2701402**	1

Adapters and surge protection

Adapter for connecting SMA antenna cables.

Outdoor surge protection for 2.4 GHz and 5 GHz.

Adapter

Surge protection (2.4/5 GHz)

	Technical data	Technical data
Ambient temperature (operation)	-65 °C ... 165 °C	-40 °C ... 90 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Adapter						
RSMA (male) -> SMA (female)	**RAD-ADP-RSMA/F-SMA/F**	**2884538**	1			
COAXTRAB, protective adapter for antenna connections						
N (female) -> N (female)				**CN-LAMBDA/4-5.9-BB**	**2838490**	1
N (male) -> N (female)				**CN-LAMBDA/4-5.9-SB**	**2800023**	1

Leaky cable and accessories

The leaky cable is a cable that acts as an antenna, which emits continuously along its length. It ensures a continuous wireless connection when using track-guided systems, even in angled or difficult to reach spaces.

Leaky cable

	Technical data	Technical data
Ambient temperature (operation)	-40 °C ... 85 °C	-
Impedance	50 Ω	50 Ω
Cable, attenuation	19.8 dB/100 m, longitudinal attenuation (2.4 GHz)	-
Connection method	Open end	N (female)
Frequency range	2.4 GHz ... 2.6 GHz	2.4 GHz ... 6 GHz

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Leaky cables	**FL LCX CABLE METER**	**2884774**	1			
Connectors for leaky cable				**FL LCX CON-N/F**	**2884965**	1
Antenna cables for leaky cables 1 m long, N (male) -> N (male)				**FL LCX PIG-EF142-N-N**	**2700677**	1
Termination resistors for leaky cable N (male)				**FL LCX 50-OHM**	**2884978**	1

Accessories for leaky cable

Cable fastenings are required for mounting the leaky cable and an alignment tool is required for mounting the connector for connecting the wireless unit.

Planing tool

Cable tie

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Alignment tool for leaky cable	**FL LCX TOOL**	**2884981**	1			
Cable tie for leaky cable				**FL LCX CLAMP**	**2884994**	100

Weather protection

Sealing tape

– Provides additional weather protection for adapters, splitters, cable connections, etc.
– Self-vulcanizing

Technical data

General data	
Ambient temperature range	-40 °C ... 90 °C
Properties	Self-vulcanizing
Width	19 mm
Length	3 m
Thickness	0.75 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Weather protection tape	**RAD-TAPE-SV-19-3**	**2903182**	1

FL WST Basic – Wireless simulations software

Wireless planning in a few steps that provides important information about the material requirements and later installation:
– How many access points are required to provide wireless coverage for the area?
– Where is the best installation position from the wireless perspective?
– What are the benefits of using special antennas?

Wireless simulation software

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Simulation software to support the planning of wireless systems in industrial environments	**FL WST BASIC**	**2692254**	1

PROFINET proxies

Gateways and proxies from Phoenix Contact are the intelligent solution for integrating networks into other networks.

Your advantages:
- 1:1 integration of networks or segments, thanks to proxy technology
- Easy system modernization with transparent communication over multiple bus systems
- Versatile diagnostics: thanks to topology detection and manufacturer-independent diagnostic concepts
- Fast device replacement with optional CF card as parameterization memory

Proxy for INTERBUS

Do you want to integrate an INTERBUS application into a PROFINET network? Then the FL NP PND-4TX IB is the ideal solution. Simply parameterize the device using your corresponding programming tool. Use the integrated switch in the control cabinet as an uplink to the higher-level control system or in the field for series connection.

Proxy for PROFIBUS

Integrate controllers, I/O stations, and other automation devices seamlessly into a PROFIBUS network. Each PROFIBUS device can be configured and diagnosed directly using the FL NP PND-4TX PB. I/O signals of PROFIBUS devices are linked directly to program variables from the application. The PROFIBUS proxy is operated exclusively using PC Worx.

Additional features:
- Data exchange, diagnostics, and parameterization are via the PROFINET protocol
- They can be integrated and parameterized in any controller using the PROFINET functionality
- LLDP support for topology detection
- PROFINET IO update rates ≥ 1 ms

Notes:

1) EMC: Class A product, see page 553

PROFINET INTERBUS proxy

PROFIBUS

Technical data

PROFINET IO	
Specification	PROFINET IO RT, spec. 3.2
Conformance class	B
Update rate	min. 1 ms
Software	
	Diagnostics software: DIAG+, version 2.0 or higher Configuration software: using the GSDML file or PC Worx Version 5.0 or higher
Ethernet	
Connection method	RJ45 socket
Transmission speed	10/100 Mbps
INTERBUS	
Interface	INTERBUS (Master)
Connection method	9-pos. D-SUB female
Number	1
Number of I/O nodes	8192
Number of devices with parameter channel (PCP)	max. 126 (512 words)
Transmission speed	500 kbaud/2 Mbaud, can be selected
PROFIBUS	
Interface	-
Connection method	-
Number	-
Transmission speed	-
Number of supported devices	
Number of supported devices	max. 512 (depending on the control class and data direction)
Power supply	
Supply voltage	24 V DC
Supply voltage range	18.5 V DC ... 30.2 V DC
Typical current consumption	Typ. 350 mA
General data	
Width	128 mm
Height	95 mm
Depth	69 mm
Ambient temperature (operation)	-25 °C ... 60 °C
Ambient temperature (storage/transport)	-25 °C ... 70 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Proxy for PROFINET IO - INTERBUS - INTERBUS FO - PROFIBUS	**FL NP PND-4TX IB[1])**	**2985974**	1

Accessories

Parameterization memory	**CF FLASH 256MB**	**2988780**	1

PROFINET INTERBUS fiber optic proxy

PROFINET PROFIBUS proxy for PC Worx control systems

PROFIBUS

Technical data	Technical data
PROFINET IO RT, spec. 3.2	PROFINET-IO RT, spec. 2.1
B	B
min. 1 ms	min. 1 ms
Diagnostics software: DIAG+, version 2.0 or higher Configuration software: using the GSDML file or PC Worx Version 5.0 or higher	Diagnostics software: DIAG+, version 2.0 or higher Configuration software PC Worx Version 5.20, Service Pack 3 or higher
RJ45 socket	RJ45 socket
10/100 Mbps	10/100 Mbps
INTERBUS (Master)	-
F-SMA connector	-
1	-
8192	-
max. 126 (512 words)	-
500 kbaud/2 Mbaud, can be selected	-
-	PROFIBUS DP V0/V1 class 2 master
-	9-pos. D-SUB female
-	1
-	to 12 Mbps
max. 512 (depending on the control class and data direction)	max. 125
24 V DC	24 V DC
18.5 V DC ... 30.2 V DC	18.5 V DC ... 30.2 V DC
Typ. 350 mA	350 mA
128 mm	128 mm
95 mm	95 mm
69 mm	69 mm
-25 °C ... 60 °C	-25 °C ... 55 °C
-25 °C ... 70 °C	-25 °C ... 70 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FL NP PND-4TX IB-LK[1])	**2985929**	1

Accessories

CF FLASH 256MB	**2988780**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL NP PND-4TX PB	**2985071**	1

Accessories

CF FLASH 256MB	**2988780**	1

Accessories

The reliability of networks is becoming more and more important and is a decisive factor for the future of entire companies. Independent studies show that more than 70% of network errors and crashes are due to faulty cabling infrastructure and manipulation of the connecting cables.

With the new accessories for Factoryline patch cables, the various safety requirements for automation are comprehensively met.

Dust protection
for SFN switches and patch fields

Security lock
for SFN switches and patch fields

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Dust protection with color marking, for SFN switch and angled patch connector						
- Black	**FL DUST CVR BK**	**2891107**	10			
- Blue	**FL DUST CVR BU**	**2891204**	10			
- Brown	**FL DUST CVR BN**	**2891301**	10			
- Yellow	**FL DUST CVR YE**	**2891408**	10			
- Gray	**FL DUST CVR GY**	**2891505**	10			
- Green	**FL DUST CVR GN**	**2891602**	10			
- Red	**FL DUST CVR RD**	**2891709**	10			
- Violet	**FL DUST CVR VT**	**2891806**	10			
- White	**FL DUST CVR WH**	**2891903**	10			
Security frame for SFN switch and patch fields						
- Green				**FL PLUG GUARD GN**	**2891615**	20
- Red				**FL PLUG GUARD RD**	**2891712**	20
- White				**FL PLUG GUARD WH**	**2891819**	20
Locking element for FL PLUG GUARD... security frame						
- Locking element				**FL PORT GUARD**	**2891220**	20
- Key				**FL PLUG GUARD KEY**	**2891327**	1
Color marking for FL CAT ...patch...						
- Black						
- Blue						
- Brown						
- Yellow						
- Gray						
- Green						
- Red						
- Violet						
Security element for FL CAT ...patch...						
- Security element						
- Security element, lockable						
- Key						
Dust protection cap for RJ45 socket						

Color coding for RJ45 FL patch cables

Security element for RJ45 FL patch cables

Dust protection for RJ45 sockets

Ordering data

Type	Order No.	Pcs. / Pkt.
FL PATCH CCODE BK	2891194	20
FL PATCH CCODE BU	2891291	20
FL PATCH CCODE BN	2891495	20
FL PATCH CCODE YE	2891592	20
FL PATCH CCODE GY	2891699	20
FL PATCH CCODE GN	2891796	20
FL PATCH CCODE RD	2891893	20
FL PATCH CCODE VT	2891990	20

Ordering data

Type	Order No.	Pcs. / Pkt.
FL PATCH SAFE CLIP	2891246	20
FL PATCH GUARD	2891424	20
FL PATCH GUARD KEY	2891521	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FL RJ45 PROTECT CAP	2832991	10

SAFECONF
Configuracion Software

Functional safety

Safety devices
– Modules for all common applications such as emergency stop, safety doors, light grids, etc.
– Modules for monitoring various speeds during operation and downtime
– Modules for coupling digital output signals from failsafe controllers to I/O devices

Configurable safety modules
– Multifunctional evaluation module with 20 safe inputs and 4 safe outputs
– Multifunctional extendable safety module
– Monitoring of all the safety-related functions of a machine, such as emergency stop, safety doors, light grids, etc.
– Flexible extension with safe digital I/O modules
– Easy configuration using the SAFECONF software

Network safety solutions
– SafetyBridge I/O modules exchange safe signals via an automation network
– Flexible use: compatible with all common bus systems
– Easy configuration using the SAFECONF software

Safe control technology
With high-performance safety controllers, proxies, and gateways, you can also reliably integrate functional safety in your PROFIsafe networks.
– Controls even large numbers of I/Os reliably, thanks to high-performance technology
– Reduced wiring effort, thanks to the joint transmission of control and safety protocols via a single Ethernet cable
– Uniform configuration worldwide, thanks to standardized programming according to IEC 61131

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Safety devices

	Safety relays				
Type	**PSR-ESA2 PSR-ESAM2**	**PSR-ESAM4**	**PSR-ESD-30 PSR-ESD-300**	**PSR-ESL4**	**PSR-THC4**
Description	Single-channel emergency stop and safety door monitoring	Two-channel emergency stop and safety door monitoring	Single and two-channel emergency stop, safety door, and light grid monitoring with time function	Single and two-channel light grid monitoring	Two-channel monitoring of two-hand controls and safety doors
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	Safety relays	Modular safety system		Speed and downtime monitors	
Type	**PSR-URM4**	**PSR-SDC4**	**PSR-URM PSR-URD3**	**PSR-MOTIONSTOP**	**PSR-RSM4**
Description	Contact extensions	Multifunctional master module	Extension modules	Speed monitor can be parameterized via the operator interface and display unit	Speed monitor can be parameterized via software
Page	77	81	81	87	88

	Safe coupling relays			
Type	**PSR-FSP**	**PSR-ETP**	**Termination carrier**	**PSR-URM**
Description	Emergency stop coupling relays for failsafe controllers in the process industry	SIL coupling relays for F&G applications	Termination carriers for the alignment and easy mounting of suitable coupling relays	Forcibly guided coupling relays
Page	91	95	96	97

Configurable safety modules

Type	**PSR-TRISAFE-S**	**PSR-TRISAFE modular**	**PSR-...TS/SDI8/SDIO4**
Description	Configurable safety module, cannot be extended	Configurable safety module, can be extended	Extension module with safe I/Os
Page	101	102	103

Network safety solutions

Type	**IB IL 24 LPSDO 8**	**IB IL 24 PSDO**	**IB IL 24 PSDOR 4-PAC**	**IB IL 24 PSDI**
Description	Safety-related digital logic modules	Safety-related digital output modules	Safety-related relay output module	Safety-related digital input modules
Page	**105**	**106**	**107**	**108**

Software

Type	**SAFECONF**	**SAFETYPROG**		
Description	Configuration software for PSR-TRISAFE and SafetyBridge modules	Programming software for INTERBUS-Safety systems and PROFIsafe controllers		
Page	**110**	**111**		

Safe control technology

Type	**FL PN/PN SDIO-2TX/2TX**	**RFC 470S PN 3TX**
Description	Safe PROFINET gateway	High-performance controller with integrated safety controller
Page	**112**	**113**

Services for functional safety

	Detailed consulting	Presentation	Safety engineering	Safety service	Individual safety training
Type	**DETAILED CONSULTING 2700502**	**MODERATION 2700504**	**SAFETY ENGINEERING 2692089**	**SAFETY SERVICE 2851202**	**INDIVIDUAL SAFETY TRAINING 2700513**
Description	Individual consultation from the initial planning phase to startup	Intensive consultation at every stage of development	Support from the initial planning phase to startup and system modernization	Free 24-hour safety hotline for general queries about functions of components and for on-site assistance	Design of individual training courses
Page	**114**				

Safety solutions from Phoenix Contact: simplicity means safety

Our PSR safety devices demonstrate that innovative safety solutions do not necessarily have to be complex in order to meet the high requirements of machine building and systems manufacturing.

As well as offering easy integration and handling, the modules are characterized by their compact, space-saving design as well as their high quality, safety, and reliability.

PSR safety devices offer you solutions for all common applications such as monitoring the following protective tasks:
– Emergency stop
– Safety door
– Light grid
– Solenoid switch
– Two-hand control devices
– Enable switch

Convenient connection technology

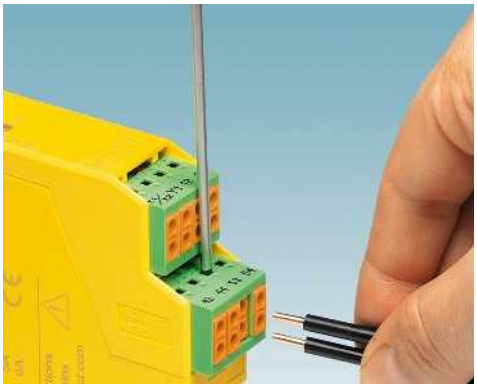
All PSR safety devices are available with plug-in screw or spring-cage connection technology. The twin spring-cage plugs provide enough space for two cables per terminal point.

Quick extension

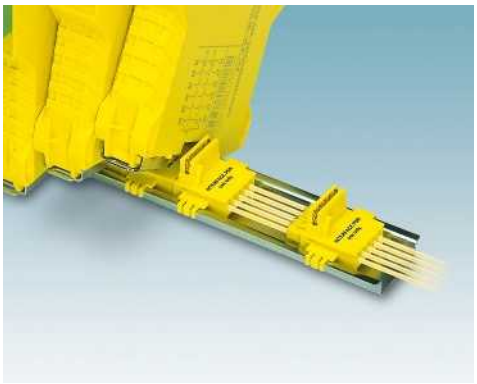
The modular safety systems allow additional extension modules to be integrated easily using the PSR-TBUS DIN rail connector. As a result, there is no longer any need to install cross-wiring for additional output contacts.

Numerous approvals

PSR safety devices conform to all applicable safety standards such as EN ISO 13849-1 and IEC 61508. In addition, modules with GL approval or certification according to EN 50156 are also available.



User-friendly connection technology

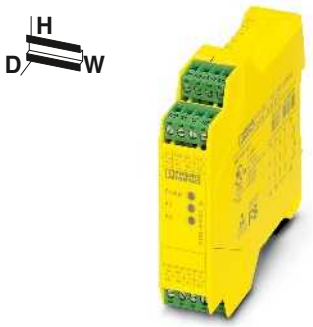


Quick extension

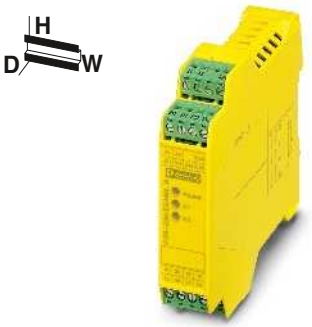
Numerous approvals

Safety relay for single-channel emergency stop and safety door monitoring

- Single-channel control
- 3 or 4 enabling current paths, 1 signaling current path
- Basic insulation
- Activation (depending on type): Manual/automatic or manually monitored/automatic
- Up to Cat. 1/PL c according to EN ISO 13849-1, SILCL 2 according to IEC 62061, SIL 2 according to IEC 61508



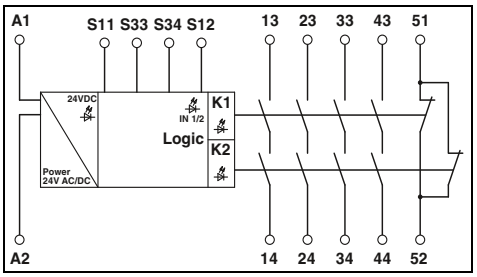
Manual and automatic activation, 24 V AC/DC

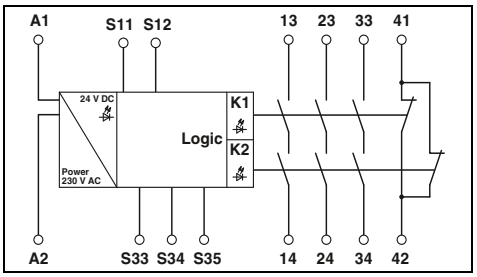


Manually monitored and automatic activation, 230 V AC

Notes:

1) EMC: Class A product, see page 553





	Technical data	Technical data
Input data		
Nominal input voltage U_N	24 V AC/DC	230 V AC
Permissible range (with reference to U_N)	0.85 ... 1.1	0.85 ... 1.1
Typ. current consumption (with reference to U_N)	140 mA AC / 65 mA DC	22 mA
Typ. response time (K1, K2) at U_N	65 ms	50 ms (manual start) / 300 ms (automatic start)
Typ. release time (K1, K2) at U_N	45 ms	20 ms (when controlled via S11/S12) / 150 ms (when controlled via A1)
Recovery time	1 s	1 s
Output data		
Contact type	4 enabling current paths 1 signaling current path	3 enabling current paths 1 signaling current path
Contact material	$AgSnO_2$, + 0.2 µm Au	$AgSnO_2$, gold-flashed
Max. / min. switching voltage	250 V AC/DC / 15 V AC/DC	250 V AC/DC / 10 V AC/DC
Limiting continuous current	6 A (N/O contact), 3 A (N/C contact)	6 A (N/O contact), 5 A (N/C contact)
Max. / min. inrush current	6 A / 25 mA	6 A / 10 mA
Min. switching power	0.4 W	100 mW
Switching capacity (360/h cycles)	4 A (24 V DC) ; 4 A (230 V AC)	6 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)	2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))	3 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits	6 A fast-blow, C6 (24 V AC/DC) automatic device	10 A gL/gG NEOZED (enabling current paths), 6 A gL/gG NEOZED (signaling current paths)
General data		
Ambient temperature range	-20 °C ... 55 °C	-25 °C ... 55 °C
Air and creepage distances between the circuits	DIN EN 50178/VDE 0160	DIN EN 50178/VDE 0160
Rated surge voltage / insulation	4 kV / basic isolation (safe isolation, reinforced insulation, and 6 kV between input circuit/N/C contacts and enabling current paths)	4 kV / basic insulation (safe isolation, reinforced insulation, and 6 kV between A1-A2/logic/enabling and signaling current paths)
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions Screw version	22.5 mm / 99 mm / 114.5 mm	22.5 mm / 99 mm / 114.5 mm
W / H / D Spring-cage version	22.5 mm / 112 mm / 114.5 mm	22.5 mm / 112 mm / 114.5 mm

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Emergency stop and safety door monitoring, single-channel, activation: manual and automatic						
With screw connection	**PSR-SCP- 24UC/ESA2/4X1/1X2/B[1])**	**2963802**	1			
With spring-cage connection	**PSR-SPP- 24UC/ESA2/4X1/1X2/B[1])**	**2963954**	1			
Emergency stop and safety door monitoring, single-channel, activation: manually monitored and automatic						
With screw connection				**PSR-SCP-230AC/ESAM2/3X1/1X2/B[1])**	**2901430**	1
With spring-cage connection				**PSR-SPP-230AC/ESAM2/3X1/1X2/B[1])**	**2901431**	1

Safety relay for two-channel emergency stop and safety door monitoring

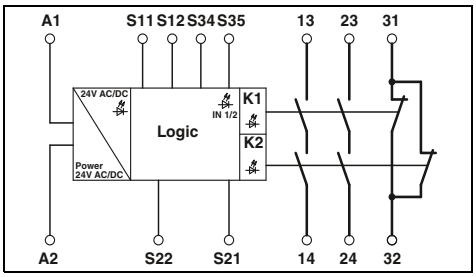
- Single and two-channel control
- 2 enabling current paths, 1 signaling current path
- Reinforced insulation
- Manually monitored and automatic activation in one device
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:

Additional PSR safety relays with either automatically or manually monitored activation (PSR-ESA4 and PSR-ESM4) are available in the e-shop.

1) EMC: Class A product, see page 553

Manually monitored and automatic activation, reinforced insulation



Technical data

Input data		
Nominal input voltage U_N		24 V AC/DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		140 mA AC / 65 mA DC
Typ. response time (K1, K2) at U_N		20 ms (manual start) / 150 ms (automatic start)
Typ. release time (K1, K2) at U_N		45 ms (single-channel) / 10 ms (two-channel)
Recovery time		1 s
Output data		
Contact type		2 enabling current paths 1 signaling current path
Contact material		$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		6 A (N/O contact)
Max. / min. inrush current		6 A / 25 mA
Min. switching power		0.4 W
Switching capacity (360/h cycles)		6 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)		3 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits		10 A gL/gG NEOZED (N/O contact), 6 A gL/gG NEOZED (N/C contact)
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		6 kV / safe isolation, increased insulation
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions W / H / D	Screw version	22.5 mm / 99 mm / 114.5 mm
	Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Emergency stop and safety door monitoring, single and two-channel, activation: automatic and manually monitored			
With screw connection	**PSR-SCP- 24UC/ESAM4/2X1/1X2[1])**	**2900525**	1
With spring-cage connection	**PSR-SPP- 24UC/ESAM4/2X1/1X2[1])**	**2900526**	1

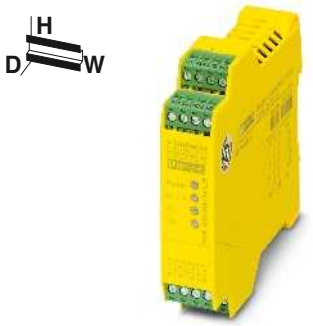
Safety relay for two-channel emergency stop and safety door monitoring

- Single and two-channel control
- 3 enabling current paths, 1 signaling current path
- Basic insulation
- Manually monitored and automatic activation in one device
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

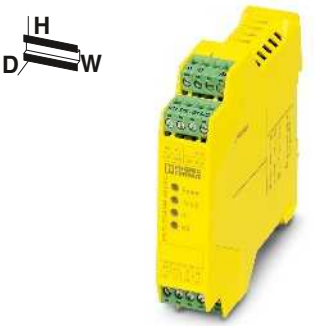
Notes:

Additional PSR safety relays with either automatically or manually monitored activation (PSR-ESA4 and PSR-ESM4) are available in the e-shop.

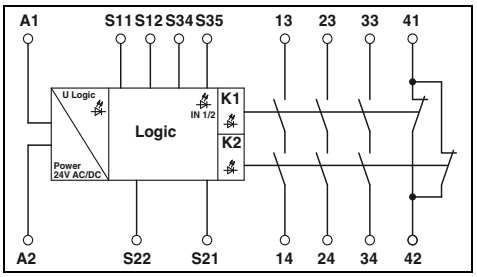
1) EMC: Class A product, see page 553

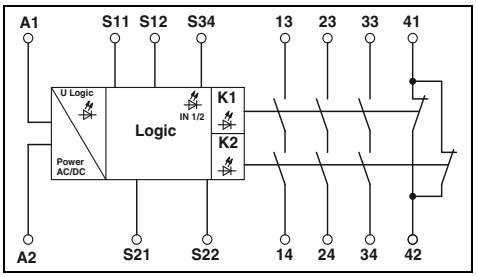


Basic insulation, 24 V AC/DC



Basic insulation, 42 - 48 V, 60 V, 120 V, 230 V AC/DC





Technical data

Input data			
Nominal input voltage U_N		24 V AC/DC	- / 230 V AC/DC
Nominal input voltage range		-	42 V AC/DC ... 48 V AC/DC / -
Permissible range (with reference to U_N)		0.85 ... 1.1	0.85 ... 1.1 / 0.85 ... 1.1
Typ. power consumption (with reference to U_N)		3.36 VA / 1.56 W	4.5 VA / 2 W / 4.5 VA / 2 W
Typ. response time (K1, K2) at U_N		20 ms (man. start)	40 ms (man. start) / 40 ms (man. start)
Typ. release time (K1, K2) at U_N		45 ms (single-channel) / 10 ms (two-channel)	90 ms (when controlled via A1) / 20 ms (when controlled via S11/S12 and S21/S22) / 150 ms (when controlled via A1)/ 20 ms (when controlled via S11/S12 and S21/S22)
Recovery time		1 s	1 s / 1 s
Output data			
Contact type		3 enabling current paths 1 signaling current path	3 enabling current paths 1 signaling current path
Contact material		$AgSnO_2$, + 0.2 µm Au	$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage		250 V AC/DC / 10 V AC/DC	250 V AC/DC / 10 V AC/DC
Limiting continuous current		6 A (N/O contact), 5 A (N/C contact)	6 A (N/O contact), 5 A (N/C contact)
Max. / min. inrush current		6 A / 10 mA	6 A / 10 mA
Min. switching power		100 mW	100 mW
Switching capacity (360/h cycles)		6 A (24 V DC) ; 5 A (230 V AC)	6 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)		3 A (24 V (DC13)) ; 3 A (230 V (AC 15))	3 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits		10 A gL/gG NEOZED (N/O contact), 6 A gL/gG NEOZED (N/C contact)	10 A gL/gG NEOZED (N/O contact), 6 A gL/gG NEOZED (N/C contact)
General data			
Ambient temperature range		-20 °C ... 55 °C	-25 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160	DIN EN 50178/VDE 0160
Rated surge voltage / insulation		4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling current paths)	4 kV / basic insulation (safe isolation, reinforced insulation, and 6 kV between A1-A2/logic/enabling and signaling current paths)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions W / H / D	Screw version	22.5 mm / 99 mm / 114.5 mm	22.5 mm / 114.5 mm / 99 mm
	Spring-cage version	22.5 mm / 112 mm / 114.5 mm	22.5 mm / 114.5 mm / 112 mm

Ordering data

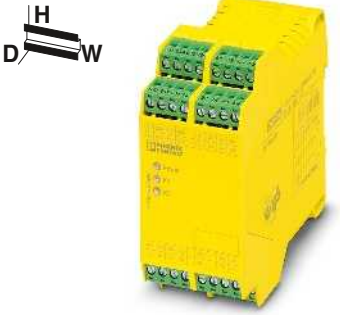
Description	Type	Order No.	Pcs. / Pkt.
Emergency stop and safety door monitoring, single and two-channel, activation: automatic and manually monitored **with screw connection**			
24 V AC/DC nominal input voltage	**PSR-SCP- 24UC/ESAM4/3X1/1X2/B[1])**	**2900509**	1
42 - 48 V AC/DC nominal input voltage	**PSR-SCP-42-48UC/ESAM4/3X1/1X2B[1])**	**2901416**	1
60 V AC/DC nominal input voltage	**PSR-SCP- 60UC/ESAM4/3X1/1X2/B[1])**	**2901426**	1
120 V AC/DC nominal input voltage	**PSR-SCP-120UC/ESAM4/3X1/1X2/B[1])**	**2901422**	1
230 V AC/DC nominal input voltage	**PSR-SCP-230UC/ESAM4/3X1/1X2/B[1])**	**2901428**	1
Emergency stop and safety door monitoring, single and two-channel, activation: automatic and manually monitored **with spring-cage connection**			
24 V AC/DC nominal input voltage	**PSR-SPP- 24UC/ESAM4/3X1/1X2/B[1])**	**2900510**	1
42 - 48 V AC/DC nominal input voltage	**PSR-SPP-42-48UC/ESAM4/3X1/1X2B[1])**	**2901417**	1
60 V AC/DC nominal input voltage	**PSR-SPP- 60UC/ESAM4/3X1/1X2/B[1])**	**2901427**	1
120 V AC/DC nominal input voltage	**PSR-SPP-120UC/ESAM4/3X1/1X2/B[1])**	**2901425**	1
230 V AC/DC nominal input voltage	**PSR-SPP-230UC/ESAM4/3X1/1X2/B[1])**	**2901429**	1

Safety relay for two-channel emergency stop and safety door monitoring

- Single and two-channel control
- 8 enabling current paths, 1 signaling current path
- Manually monitored and automatic activation in one device
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061

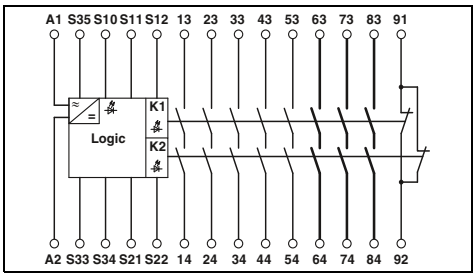
Notes:

1) EMC: Class A product, see page 553



Reinforced insulation, 8 enabling current paths

BG ETEM



Technical data

Input data		
Nominal input voltage U_N		24 V AC/DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		210 mA AC / 120 mA DC
Typ. response time (K1, K2) at U_N		60 ms (man. start) / 250 ms (auto-start)
Typ. release time (K1, K2) at U_N		20 ms
Recovery time		1 s
Output data		
Contact type		8 enabling current paths 1 signaling current path
Contact material		$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		6 A
Max. / min. inrush current		6 A / 25 mA
Min. switching power		0.4 W
Switching capacity (360/h cycles)		4 A (24 V DC) ; 4 A (230 V AC)
Switching capacity (3600/h cycles)		2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits		6 A fast-blow, C6 (24 V AC/DC) automatic device
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		4 kV / Basic insulation, (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling current paths **(63/64, 73/74, 83/84)** and between **63/64, 73/74, 83/84** between each other.)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	45 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	45 mm / 112 mm / 114.5 mm

Ordering data

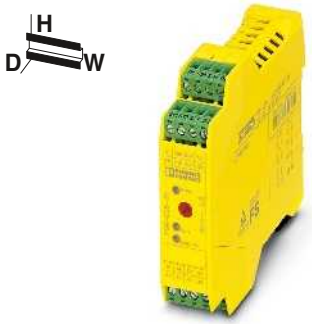
Description	Type	Order No.	Pcs. / Pkt.
Emergency stop and safety door monitoring, single and two-channel, with/without cross-circuit detection, activation: manually monitored and automatic			
With screw connection	**PSR-SCP- 24UC/ESAM4/8X1/1X2[1])**	**2963912**	1
With spring-cage connection	**PSR-SPP- 24UC/ESAM4/8X1/1X2[1])**	**2963996**	1

Safety relay with time functions

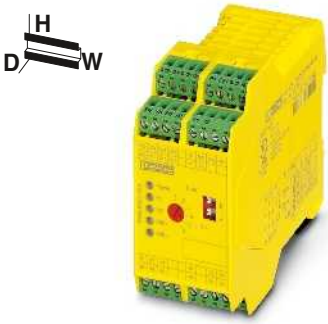
- For emergency stop and safety door monitoring and for evaluation of light grids (suitable light grids on request)
- Single and two-channel control
- Manually monitored and automatic activation
- Max. 3 undelayed and 2 dropout delayed contacts
- Delay times delay from 0.1 s to 30 s (PSR-ESD-30) or 0.2 s to 300 s (PSR-ESD-300)
- Protection labels against manipulation of the set time (PSR-ESD-300) or electronic manipulation protection (PSR-ESD-30)
- Up to Cat. 3/4 and PL d/e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:

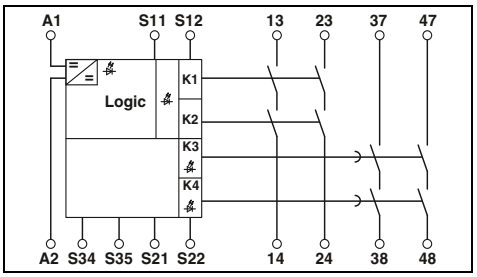
1) EMC: Class A product, see page 553

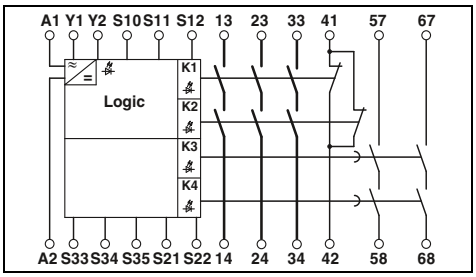


Adjustable release delay time
0.1 - 30 s



Adjustable release delay time
0.2 - 300 s





Technical data

Input data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		75 mA DC
Typ. response time (K1, K2) at U_N		150 ms (monitored/manual and auto-start)
Typ. release time (K1, K2) at U_N		20 ms (undelayed contacts) / 100 ms (delayed contacts)
Typ. release time range		0.1 s ... 30 s
Recovery time		330 ms (restart)
Output data		
Contact type		2 undelayed enabling current paths 2 enabling current paths delayed
Contact material		$AgSnO_2$
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		6 A (N/O contact)
Max. / min. inrush current		6 A / 25 mA
Min. switching power		0.4 W
Switching capacity (360/h cycles)		(on request) ; -
Switching capacity (3600/h cycles)		3 A (24 V (DC13)) ; 3 A (230 V (AC15))
Short-circuit protection of the output circuits		10 A gL/gG NEOZED (N/O contact)
General data		
Ambient temperature range		-20 °C ... 45 °C
Air and creepage distances between the circuits		DIN EN 60947-1
Rated surge voltage / insulation		4 kV / basic insulation
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Technical data

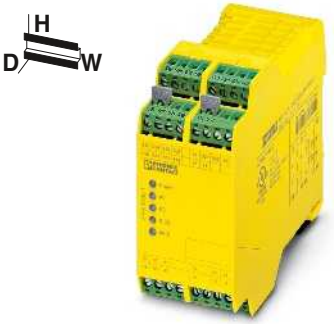
Input data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		155 mA DC
Typ. response time (K1, K2) at U_N		70 ms (manual start) / 600 ms (auto-start)
Typ. release time (K1, K2) at U_N		20 ms (undelayed contacts)
Typ. release time range		0.2 s ... 300 s
Recovery time		1 s
Output data		
Contact type		3 enabling current paths undelayed 2 enabling current paths delayed
Contact material		$AgSnO_2$
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		6 A (N/O contact), 3 A (N/C contact)
Max. / min. inrush current		6 A / 25 mA
Min. switching power		0.4 W
Switching capacity (360/h cycles)		4 A (24 V DC) ; 4 A (230 V AC)
Switching capacity (3600/h cycles)		2.5 A (24 V (DC13)) ; 3 A (230 V (AC15))
Short-circuit protection of the output circuits		6 A fast-blow (undelayed), 10 A gL/gG NEOZED (delayed)
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between the enabling current paths **(13/14, 23/24, 33/34)** and the remaining current paths and between **13/14, 23/24, 33/34** between each other.)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	45 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	45 mm / 112 mm / 114.5 mm

Ordering data

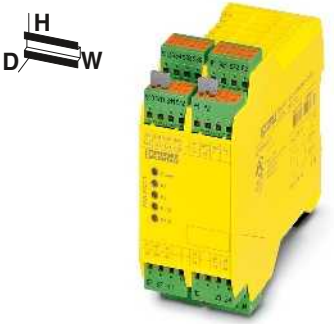
Description	Type	Order No.	Pcs. / Pkt.
Emergency stop, safety door and light grid monitoring, with delayed and undelayed contacts, single and two-channel, adjustable from 0.1 s to 30 s, with/without cross-circuit detection, activation: manually monitored and automatic			
With screw connection	**PSR-SCP- 24DC/ESD/4X1/30[1])**	**2981800**	1
With spring-cage connection	**PSR-SPP- 24DC/ESD/4X1/30[1])**	**2981813**	1
Emergency stop and safety door monitoring, with delayed and undelayed contacts, single and two-channel, adjustable from 0.2 s to 300 s, with/without cross-circuiting detection, activation: manually monitored and automatic			
With screw connection	**PSR-SCP- 24DC/ESD/5X1/1X2/300[1])**	**2981428**	1
With spring-cage connection	**PSR-SPP- 24DC/ESD/5X1/1X2/300[1])**	**2981431**	1

Safety relay with time functions

- For emergency stop and safety door monitoring and for evaluation of light grids (suitable light grids on request)
- Single and two-channel control
- Manually monitored and automatic activation
- 3 undelayed and 2 dropout delayed contacts
- Fixed delay times of 0.5 s ... 30 s (see ordering data)
- Up to Cat. 3/4 and PL d/e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

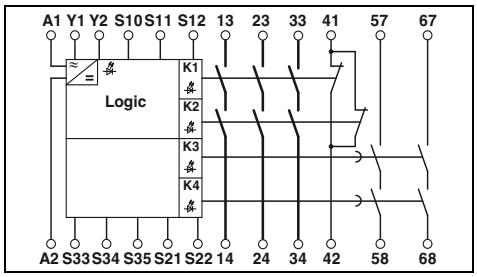


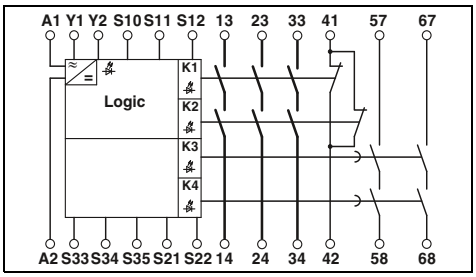
Fixed release delay time (versions), screw connection



Fixed release delay time (versions), spring-cage connection

Notes:
Other time options available on request
1) EMC: Class A product, see page 553





Technical data

Input data		
Nominal input voltage U_N	24 V DC	24 V DC
Permissible range (with reference to U_N)	0.85 ... 1.1	0.85 ... 1.1
Typ. current consumption (with reference to U_N)	150 mA DC	150 mA DC
Typ. response time (K1, K2) at U_N	70 ms (manual start) / 600 ms (auto-start)	70 ms (manual start) / 600 ms (auto-start)
Typ. release time (K1, K2) at U_N	20 ms (undelayed contacts)	20 ms (undelayed contacts)
Recovery time	1 s	1 s
Output data		
Contact type	3 enabling current paths undelayed 2 enabling current paths delayed 1 signaling current path undelayed	3 enabling current paths undelayed 2 enabling current paths delayed 1 signaling current path undelayed
Contact material	$AgSnO_2$	$AgSnO_2$
Max. / min. switching voltage	250 V AC/DC / 15 V AC/DC	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A	6 A
Max. / min. inrush current	6 A / 25 mA	6 A / 25 mA
Min. switching power	0.4 W	0.4 W
Switching capacity (360/h cycles)	4 A (24 V DC) ; 4 A (230 V AC)	4 A (24 V DC) ; 4 A (230 V AC)
Switching capacity (3600/h cycles)	2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))	2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits	6 A fast-blow (undelayed), C6 (24 V AC/DC) automatic device (undelayed), 10 A gL/gG NEOZED (delayed)	6 A fast-blow (undelayed), C6 (24 V AC/DC) automatic device (undelayed), 10 A gL/gG NEOZED (delayed)
General data		
Ambient temperature range	-20 °C ... 55 °C	-20 °C ... 55 °C
Air and creepage distances between the circuits	DIN EN 50178/VDE 0160	DIN EN 50178/VDE 0160
Rated surge voltage / insulation	4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between the enabling current paths **(13/14, 23/24, 33/34)** and the remaining current paths and between **13/14, 23/24, 33/34** between each other.)	4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between the enabling current paths **(13/14, 23/24, 33/34)** and the remaining current paths and between **13/14, 23/24, 33/34** between each other.)
Dimensions W / H / D	45 mm / 99 mm / 114.5 mm	45 mm / 112 mm / 114.5 mm
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Emergency stop and safety door monitoring			
Delay time 0.5 s	**PSR-SCP- 24DC/ESD/5X1/1X2/0T 5[1])**	**2981101**	1
Delay time 1 s	**PSR-SCP- 24DC/ESD/5X1/1X2/ T 1[1])**	**2981143**	1
Delay time 3 s	**PSR-SCP- 24DC/ESD/5X1/1X2/ T 3[1])**	**2981224**	1
Delay time 5 s	**PSR-SCP- 24DC/ESD/5X1/1X2/ T 5[1])**	**2981266**	1
Delay time 10 s	**PSR-SCP- 24DC/ESD/5X1/1X2/ T10[1])**	**2981088**	1
Delay time 30 s	**PSR-SCP- 24DC/ESD/5X1/1X2/ T30[1])**	**2981347**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSR-SPP- 24DC/ESD/5X1/1X2/0T 5[1])	**2981130**	1
PSR-SPP- 24DC/ESD/5X1/1X2/ T 1[1])	**2981156**	1
PSR-SPP- 24DC/ESD/5X1/1X2/ T 3[1])	**2981237**	1
PSR-SPP- 24DC/ESD/5X1/1X2/ T 5[1])	**2981279**	1
PSR-SPP- 24DC/ESD/5X1/1X2/ T10[1])	**2981091**	1
PSR-SPP- 24DC/ESD/5X1/1X2/ T30[1])	**2981350**	1

Safety relay for light grid, emergency stop and safety door monitoring

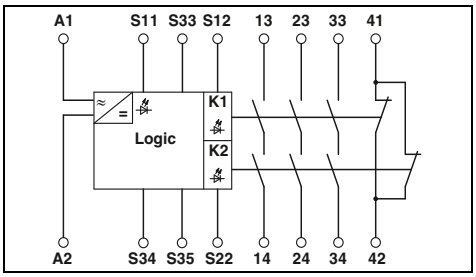
- Single and two-channel control
- Manually monitored and automatic activation
- 1 enabling and 1 signaling current path
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:

The PSR-SDC4 is also suitable for light grid monitoring, see page 81

1) EMC: Class A product, see page 553

Also ideal for light grid monitoring



Technical data

Input data		
Nominal input voltage U_N		24 V AC/DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		150 mA AC / 70 mA DC
Typ. response time (K1, K2) at U_N		25 ms (manual start) / 100 ms (automatic start)
Typ. release time (K1, K2) at U_N		10 ms
Recovery time		1 s
Output data		
Contact type		3 enabling current paths 1 signaling current path
Contact material		$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage		250 V / 15 V AC/DC
Limiting continuous current		6 A
Max. / min. inrush current		6 A / 25 mA
Min. switching power		0.4 W
Switching capacity (360/h cycles)		6 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)		3 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits		10 A gL/gG NEOZED (N/O contact)
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling current paths)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Optical data link emergency stop and safety door monitoring, single and two-channel, activation: manually monitored and automatic			
With screw connection	**PSR-SCP- 24UC/ESL4/3X1/1X2/B[1])**	**2981059**	1
With spring-cage connection	**PSR-SPP- 24UC/ESL4/3X1/1X2/B[1])**	**2981062**	1

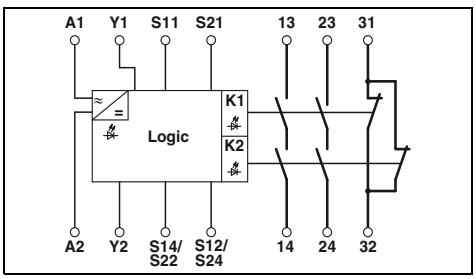
Safety relays for two-hand controls and for safety door monitoring

- Two-channel control
- Automatic activation
- For two-hand control devices as per EN 574 type IIIC
- Concurrence monitoring < 0.5 s
- 2 enabling and 1 signaling current path
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:

1) EMC: Class A product, see page 553

Also ideal for two-hand controls



Technical data

Input data		
Nominal input voltage U_N		24 V AC/DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		125 mA AC / 60 mA DC
Typ. response time (K1, K2) at U_N		50 ms
Typ. release time (K1, K2) at U_N		20 ms
Recovery time		1 s
Output data		
Contact type		2 enabling current paths 1 signaling current path
Contact material		$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		6 A
Max. / min. inrush current		6 A / 25 mA
Min. switching power		0.4 W
Switching capacity (360/h cycles)		4 A (24 V DC) ; 4 A (230 V AC)
Switching capacity (3600/h cycles)		2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits		10 A gL/gG NEOZED (N/O contact), 6 A gL/gG NEOZED (N/C contact)
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		6 kV / safe isolation, increased insulation
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Ordering data

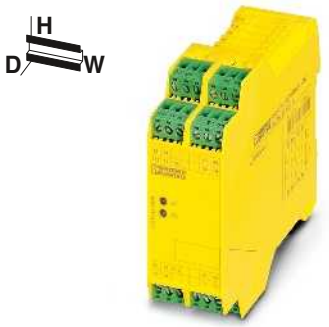
Description	Type	Order No.	Pcs. / Pkt.
Two-hand control units and safety door monitoring, two-channel, with cross-circuiting detection, activation: automatic			
With screw connection	**PSR-SCP- 24UC/THC4/2X1/1X2[1])**	**2963721**	1
With spring-cage connection	**PSR-SPP- 24UC/THC4/2X1/1X2[1])**	**2963983**	1

Extension module

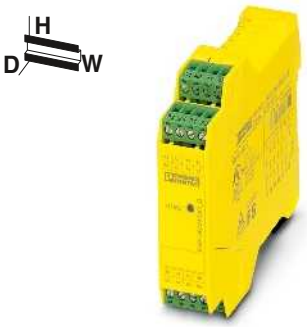
- Single and two-channel control
- 5 enabling, 1 signaling, and 1 confirmation current path
- Option of basic insulation or reinforced insulation
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:

1) EMC: Class A product, see page 553

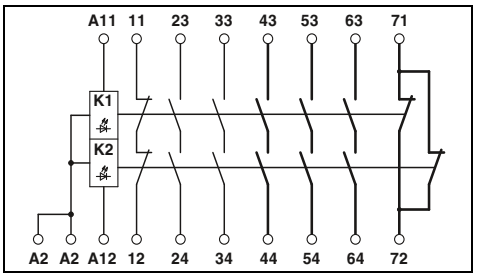


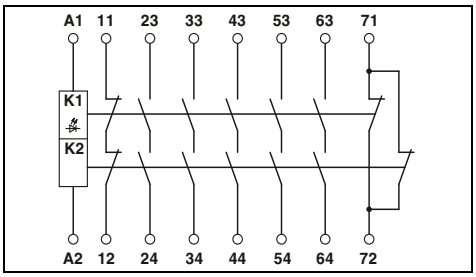
Contact extension with reinforced insulation



Contact extension with basic insulation

Applied for: functional safety





Technical data

Input data	
Nominal input voltage U_N	24 V AC/DC
Permissible range (with reference to U_N)	0.8 ... 1.1
Typ. current consumption (with reference to U_N)	47 mA (per channel)
Typ. response time (K1, K2) at U_N	20 ms
Typ. release time (K1, K2) at U_N	20 ms
Output data	
Contact type	5 enabling current paths 1 signaling current path 1 confirmation current path
Contact material	$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A (N/O contact), 3 A (N/C contact 11/12)
Max. / min. inrush current	6 A, 3 A (N/C contact 11/12) / 25 mA
Min. switching power	0.4 W
Switching capacity (360/h cycles)	4 A (24 V DC) ; 4 A (230 V AC)
Switching capacity (3600/h cycles)	2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits	6 A fast-blow, C6 (24 V AC/DC) automatic device
General data	
Ambient temperature range	-20 °C ... 55 °C
Air and creepage distances between the circuits	DIN EN 50178/VDE 0160
Rated surge voltage / insulation	4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling current paths **(43/44, 53/54, 63/64, 71/72)** and between **43/44, 53/54, 63/64, 71/72** each other)
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions (Screw version)	35 mm / 99 mm / 114.5 mm
W / H / D (Spring-cage version)	35 mm / 112 mm / 114.5 mm

Technical data

Input data	
Nominal input voltage U_N	24 V AC/DC
Permissible range (with reference to U_N)	0.8 ... 1.1
Typ. current consumption (with reference to U_N)	92 mA
Typ. response time (K1, K2) at U_N	20 ms
Typ. release time (K1, K2) at U_N	20 ms
Output data	
Contact type	5 enabling current paths 1 signaling current path 1 confirmation current path
Contact material	$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A (N/O contact), 3 A (N/C contact)
Max. / min. inrush current	6 A (N/O contact), 3 A (N/C contact) / 25 mA
Min. switching power	0.4 W
Switching capacity (360/h cycles)	4 A (24 V DC) ; 4 A (230 V AC)
Switching capacity (3600/h cycles)	2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits	6 A fast-blow, C6 (24 V AC/DC) automatic device
General data	
Ambient temperature range	-20 °C ... 55 °C
Air and creepage distances between the circuits	DIN EN 50178/VDE 0160
Rated surge voltage / insulation	4 kV / basic isolation (safe isolation, increased isolation and 6 kV between A1/A2, 11/12, 23/24, 71/72 and 33/34, 43/44, 53/54, 63/64)
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions (Screw version)	22.5 mm / 99 mm / 114.5 mm
W / H / D (Spring-cage version)	22.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Extension module with single or two-channel control			
With screw connection	**PSR-SCP- 24UC/URM4/5X1/2X2**	**2963734**	1
With spring-cage connection	**PSR-SPP- 24UC/URM4/5X1/2X2**	**2964005**	1
Extension module, with single-channelcontrol			
With screw connection			
With spring-cage connection			

Ordering data

Type	Order No.	Pcs. / Pkt.
PSR-SCP- 24UC/URM4/5X1/2X2/B[1])	**2981033**	1
PSR-SPP- 24UC/URM4/5X1/2X2/B[1])	**2981046**	1

Extension module

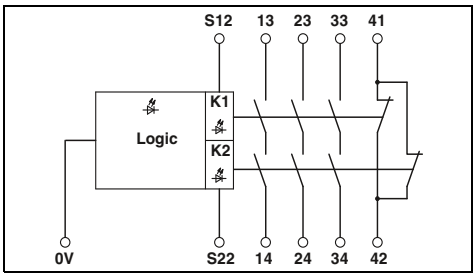
N

- Contact extension for light grids with OSSD signals
- 3 enabling current paths, 1 signaling current path
- Basic insulation
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061

Notes:

1) EMC: Class A product, see page 553

Contact extension for light grid



Technical data

Input data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		70 mA DC
Typ. response time (K1, K2) at U_N		25 ms (man. start)
Typ. release time (K1, K2) at U_N		10 ms
Output data		
Contact type		3 enabling current paths 1 signaling current path
Contact material		$AgSnO_2$
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		6 A (N/C contact / N/O contact)
Max. / min. inrush current		6 A / 25 mA
Min. switching power		0.4 W
Switching capacity (360/h cycles)		6 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)		3 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits		10 A gL/gG NEOZED (N/O contact), 4 A gL/gG NEOZED (signaling current path)
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling current paths)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions W / H / D	Screw version	22.5 mm / 99 mm / 114.5 mm
	Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Ordering data

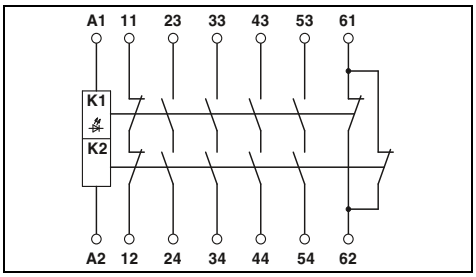
Description	Type	Order No.	Pcs. / Pkt.
Extension module, for electrosensitive protective equipment, with single or two-channel control			
With screw connection	**PSR-SCP-24DC/URML4/3X1/1X2/B[1])**	**2903583**	1
With spring-cage connection	**PSR-SPP-24DC/URML4/3X1/1X2/B[1])**	**2903584**	1

N

Extension module

- Contact extension with 42 ... 230 V wide range input
- 4 enabling current paths, 1 confirmation current path, 1 signaling current path
- Basic insulation
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061

Contact extension with wide range input



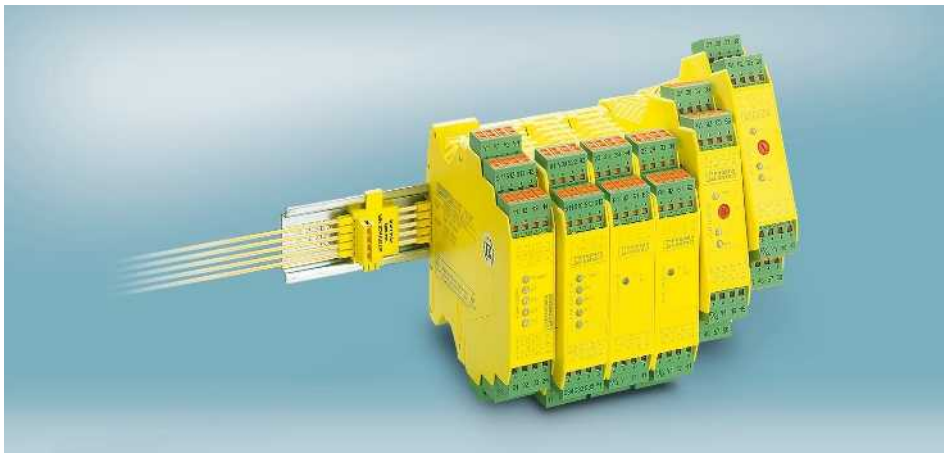
Technical data

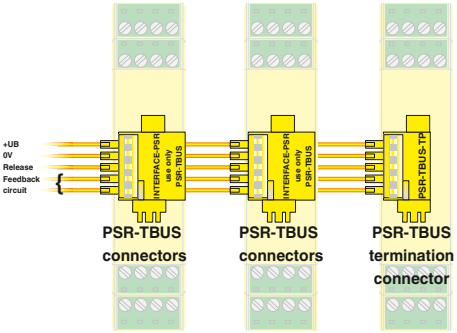
Input data		
Nominal input voltage range		42 V AC/DC ... 230 V AC/DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. release time (K1, K2) at U_N		20 ms (Control via A1 at 42 V DC) / 20 ms (Control via A1 at 48 V DC)
Output data		
Contact type		4 enabling current paths 1 signaling current path 1 confirmation current path
Contact material		$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		6 A (N/O contact), 6 A (N/C contact)
Max. / min. inrush current		8 A / 25 mA
Min. switching power		0.4 W
Switching capacity (360/h cycles)		4 A (24 V (DC13)) ; 4 A (230 V (AC 15))
Switching capacity (3600/h cycles)		2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits		6 A gL/gG NEOZED (enabling current paths), 6 A gL/gG NEOZED (enabling current paths), (Miniature circuit breaker C6 (24 V / 20 A power supply unit))
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		4 kV/basic isolation (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling, signaling and confirmation current paths)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Extension module, with wide range input			
With screw connection	**PSR-SCP-42-230UC/URM4/4X1/2X2B**	**2902935**	1
With spring-cage connection	**PSR-SPP-42-230UC/URM4/4X1/2X2B**	**2902936**	1

Modular safety relay system





The TBUS connectors carry out the cross-wiring between the modules.

The PSR safety relay system reduces planning effort, simplifies wiring, and minimizes storage costs.

The PSR-SDC4 multifunctional master (can also be used as a stand-alone component) monitors the various safety-related signals - without the need for programming or additional switch settings. The relevant safety equipment (emergency stop buttons, safety door/solenoid switches, and light grids) is simply connected to the module.

If required, the PSR-URM4/B and PSR-URD3 extension devices can be used to integrate additional undelayed and dropout delayed contacts via the PSR-TBUS DIN rail connector.

The PSR-SIM4 interface module and PSR-SACB sensor box are suitable for wiring several safety switches with N/C or N/O contacts (e.g., in the case of multiple safety doors or safety flaps). The individual switches are automatically linked to one another and connected to the PSR-SDC4 master.

Additional signal outputs enable precise diagnostics.

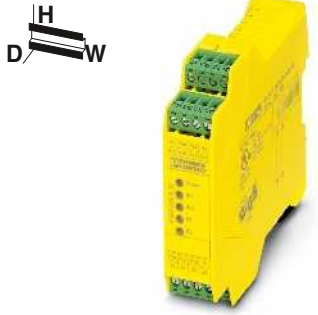
– Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508 (extension modules with adjustable release time up to Cat. 3/PL d according to EN ISO 13849-1, SILCL 2 according to IEC 62061, SIL 2 according to IEC 61508)

Notes:

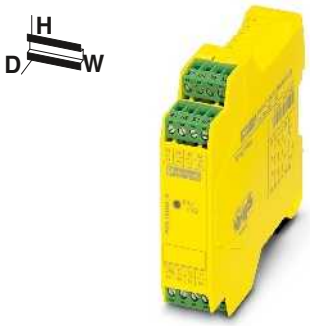
1) EMC: Class A product, see page 553

Input data	
Nominal input voltage U_N	
Permissible range (with reference to U_N)	
Typ. current consumption (with reference to U_N)	
Typ. response time (K1, K2) at U_N	
Typ. release time (K1, K2) at U_N	
Typ. release time range	
Recovery time	
Output data	
Contact type	
Contact material	
Max. / min. switching voltage	
Limiting continuous current	
Max. / min. inrush current	
Min. switching power	
Switching capacity (360/h cycles)	
Switching capacity (3600/h cycles)	
Short-circuit protection of the output circuits	
General data	
Ambient temperature range	
Air and creepage distances between the circuits	
Rated surge voltage / insulation	
Screw connection solid/stranded/AWG	
Spring-cage connection solid/stranded/AWG	
Dimensions	Screw version
W / H / D	Spring-cage version

Description
Master module for emergency stop, protective door, light grid and magnetic switch, single-channel and two-channel, with/without cross-circuit detection, activation: manually monitored and automatic
With screw connection
With spring-cage connection
Extension module, with single-channel control
With screw connection
With spring-cage connection
PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)
PSR TBUS dummy plug



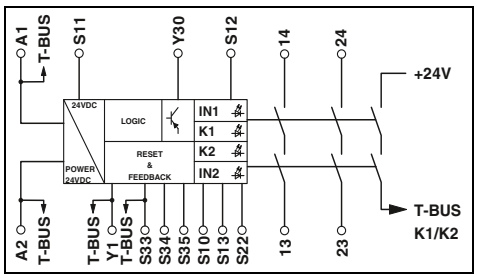
Multifunctional master module

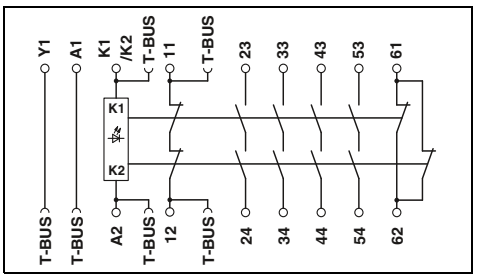


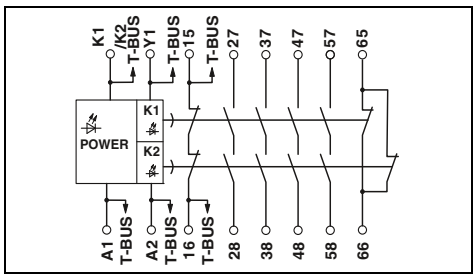
Extension module with
4 additional enabling current paths

Extension module with
dropout delayed contacts
(adjustable up to a max. of 3 s)

BG ETEM







Technical data

Supply voltage	24 V DC
Supply voltage range	0.85 ... 1.1
Power consumption	70 mA
Response time	20 ms (manual start) / 150 ms (automatic start)
Delay time	10 ms
Dropout delay	-
Recovery time	1 s
Number of enabling current paths	2
Number of signaling current paths	1 semiconductor signaling output
Contact material	$AgSnO_2$
Switching voltage	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A (N/O contact), 100 mA (signal output)
Inrush current	6 A / 25 mA
Power dissipation	0.4 W
Switching capacity	6 A (24 V DC) ; 5 A (230 V (AC15))
	3 A (24 V (DC13)) ; 3 A (230 V (AC15))
Fuse protection	10 A gL/gG NEOZED (N/O contact), (Miniature circuit breaker C6 (24 V / 20 A power supply unit))
Ambient temperature (operation)	-20 °C ... 55 °C
Standard	DIN EN 50178/VDE 0160
Insulation coordination	4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling current paths)
Connection data	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	22.5 mm / 99 mm / 114.5 mm
	22.5 mm / 112 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
PSR-SCP- 24DC/SDC4/2X1/B[1])	**2981486**	1
PSR-SPP- 24DC/SDC4/2X1/B[1])	**2981499**	1

Accessories

PSR-TBUS	**2890425**	50
PSR-TBUS-TP	**2981716**	50

Technical data

Supply voltage	24 V DC
Supply voltage range	0.9 ... 1.1
Power consumption	42 mA
Response time	10 ms
Delay time	10 ms
Dropout delay	-
Recovery time	1 s
Number of enabling current paths	4
Number of signaling current paths	1 signaling current path
Contact material	$AgSnO_2$
Switching voltage	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A (N/O contact), 3 A (N/C contact)
Inrush current	6 A (N/O contact), 3 A (N/C contact) / 25 mA
Power dissipation	0.4 W
Switching capacity	6 A (24 V DC) ; 5 A (230 V AC)
	3 A (24 V (DC13)) ; 3 A (230 V (AC15))
Fuse protection	10 A gL/gG NEOZED (N/O contact), 4 A gL/gG NEOZED (N/C contact)
Ambient temperature (operation)	-20 °C ... 55 °C
Standard	DIN EN 50178/VDE 0160
Insulation coordination	4 kV / basic isolation (safe isolation, reinforced insulation, and 6 kV between input circuit/N/C contacts and enabling current paths).
Connection data	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	22.5 mm / 99 mm / 114.5 mm
	22.5 mm / 112 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
PSR-SCP- 24DC/URM4/4X1/2X2/B	**2981677**	1
PSR-SPP- 24DC/URM4/4X1/2X2/B	**2981680**	1

Accessories

PSR-TBUS	**2890425**	50
PSR-TBUS-TP	**2981716**	50

Technical data

Supply voltage	24 V DC
Supply voltage range	0.85 ... 1.1
Power consumption	84 mA
Response time	20 ms
Delay time	-
Dropout delay	0.3 s ... 3 s
Recovery time	1 s
Number of enabling current paths	4 delayed enabling current paths
Number of signaling current paths	1 delayed signaling current path
Contact material	$AgSnO_2$
Switching voltage	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A (N/O contact), 3 A (N/C contact)
Inrush current	6 A (N/O contact), 3 A (N/C contact) / 25 mA
Power dissipation	0.4 W
Switching capacity	6 A (24 V DC) ; 5 A (230 V AC)
	3 A (24 V (DC13)) ; 3 A (230 V (AC15))
Fuse protection	10 A gL/gG NEOZED (N/O contact), 4 A gL/gG NEOZED (N/C contact)
Ambient temperature (operation)	-20 °C ... 55 °C
Standard	DIN EN 50178/VDE 0160
Insulation coordination	4 kV / basic isolation (safe isolation, reinforced insulation, and 6 kV between input circuit/N/C contacts and enabling current paths).
Connection data	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	22.5 mm / 99 mm / 114.5 mm
	22.5 mm / 112 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
PSR-SCP- 24DC/URD3/4X1/2X2/3[1])	**2981732**	1
PSR-SPP- 24DC/URD3/4X1/2X2/3[1])	**2981745**	1

Accessories

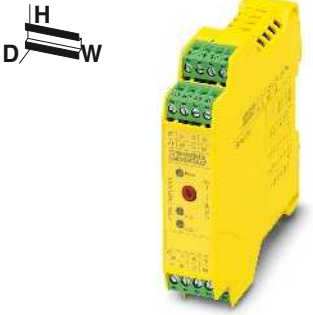
PSR-TBUS	**2890425**	50
PSR-TBUS-TP	**2981716**	50

Modular safety relay system

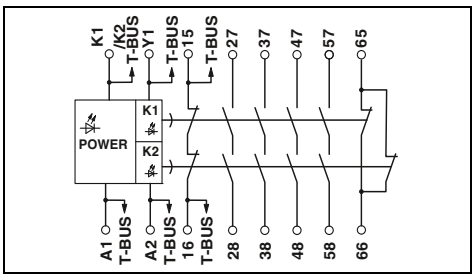
- Single-channel control
- With 4 enabling, 1 signaling and 1 confirmation current path each, all dropout delayed
- Up to Cat. 3/PL d according to EN ISO 13849-1, SILCL 2 according to IEC 62061, SIL 2 according to IEC 61508

Notes:

1) EMC: Class A product, see page 553



Extension module with dropout delayed contacts (adjustable up to a max. of 30 s)



Technical data

Input data	
Nominal input voltage U_N	24 V DC
Permissible range (with reference to U_N)	0.85 ... 1.1
Typ. current consumption (with reference to U_N)	84 mA
Typ. response time (K1, K2) at U_N	20 ms
Typ. release time (K1, K2) at U_N	-
Typ. release time range	0.5 s ... 38 s ±20% (BG rating to max. 30 s)
Recovery time	1 s
Output data	
Contact type	4 delayed enabling current paths 1 delayed signaling current path 1 delayed confirmation current path
Contact material	$AgSnO_2$
Max. / min. switching voltage	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A (N/O contact), 3 A (N/C contact)
Max. / min. inrush current	6 A (N/O contact), 3 A (N/C contact) / 25 mA
Min. switching power	0.4 W
Switching capacity (360/h cycles)	6 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)	3 A (24 V (DC13)) ; 3 A (230 V (AC15))
Short-circuit protection of the output circuits	10 A gL/gG NEOZED (N/O contact), 4 A gL/gG NEOZED (N/C contact)
General data	
Ambient temperature range	-20 °C ... 55 °C
Air and creepage distances between the circuits	DIN EN 50178/VDE 0160
Rated surge voltage / insulation	4 kV / basic isolation (safe isolation, reinforced insulation, and 6 kV between input circuit/N/C contacts and enabling current paths).
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions W / H / D — Screw version	22.5 mm / 99 mm / 114.5 mm
Dimensions W / H / D — Spring-cage version	22.5 mm / 112 mm / 114.5 mm

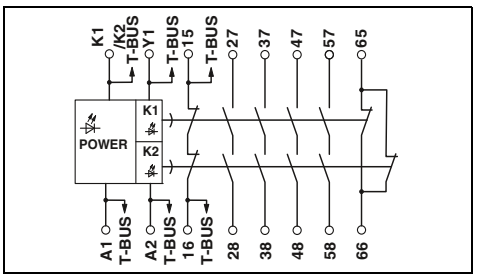
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Extension module with drop-out delayed contacts, single-channelcontrol			
With screw connection	**PSR-SCP- 24DC/URD3/4X1/2X2[1])**	**2981512**	1
With spring-cage connection	**PSR-SPP- 24DC/URD3/4X1/2X2[1])**	**2981525**	1

Accessories

PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	**2890425**	50
PSR TBUS dummy plug	**PSR-TBUS-TP**	**2981716**	50

Extension module with dropout delayed contacts (permanently set to 2 seconds)



Technical data

Input data	
Nominal input voltage U_N	24 V DC
Permissible range (with reference to U_N)	0.85 ... 1.1
Typ. current consumption (with reference to U_N)	84 mA
Typ. response time (K1, K2) at U_N	20 ms
Typ. release time (K1, K2) at U_N	2 s
Typ. release time range	-
Recovery time	1 s
Output data	
Contact type	4 delayed enabling current paths 1 delayed signaling current path 1 delayed confirmation current path
Contact material	$AgSnO_2$
Max. / min. switching voltage	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A (N/O contact), 3 A (N/C contact)
Max. / min. inrush current	6 A (N/O contact), 3 A (N/C contact) / 25 mA
Min. switching power	0.4 W
Switching capacity (360/h cycles)	6 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)	3 A (24 V (DC13)) ; 3 A (230 V (AC15))
Short-circuit protection of the output circuits	10 A gL/gG NEOZED (N/O contact), 4 A gL/gG NEOZED (N/C contact)
General data	
Ambient temperature range	-20 °C ... 55 °C
Air and creepage distances between the circuits	DIN EN 50178/VDE 0160
Rated surge voltage / insulation	4 kV / basic isolation (safe isolation, reinforced insulation, and 6 kV between input circuit/N/C contacts and enabling current paths).
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions W / H / D — Screw version	22.5 mm / 99 mm / 114.5 mm
Dimensions W / H / D — Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Extension module with drop-out delayed contacts, single-channelcontrol			
With screw connection	**PSR-SCP- 24DC/URD3/4X1/2X2/T 2[1])**	**2981703**	1
With spring-cage connection	**PSR-SPP- 24DC/URD3/4X1/2X2/T 2[1])**	**2981729**	1

Accessories

PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	**2890425**	50
PSR TBUS dummy plug	**PSR-TBUS-TP**	**2981716**	50

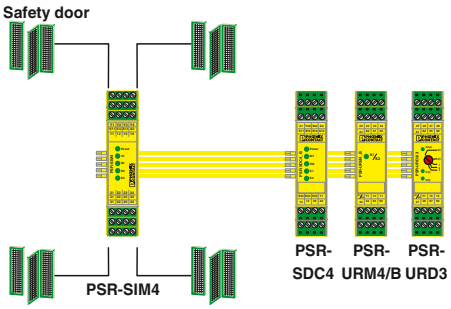
Modular safety relay system

In machines and systems, connecting several two-channel safety switches to the evaluating safety relay is often time-consuming and requires a lot of wiring.

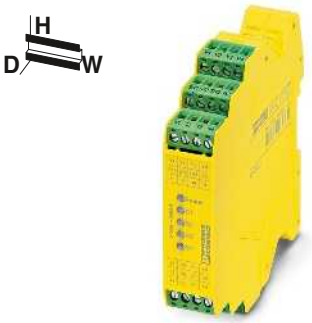
The PSR-SIM4 interface module can be used to connect up to two safety sensors or switches with one N/O or N/C combination each to the PSR-SDC4 safety relay easily and conveniently.

If more than four safety switches are required, several PSR-SIM4 modules can be quickly and easily interconnected via the PSR-TBUS DIN rail connector and evaluated by the PSR-SDC4 master safety relay.

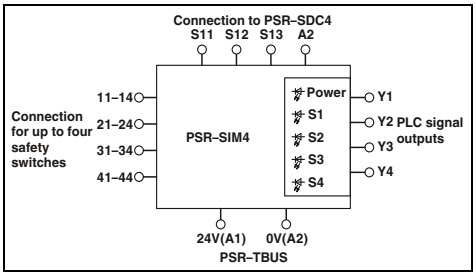
- Four two-channel N/O or N/C inputs
- Four LEDs as the status indicator of the relevant sensor/switch
- Four PLC diagnostics outputs for evaluating the switching status of the safety sensors
- PSR-TBUS connection
- Up to Cat. 3/PL d according to EN ISO 13849-1, SILCL 2 according to IEC 62061, SIL 2 according to IEC 61508 (in conjunction with the PSR-SDC4 master)



Up to 4 safety door switches can be connected to one PSR-SIM4.



Interface module for safety sensors and switches



Technical data

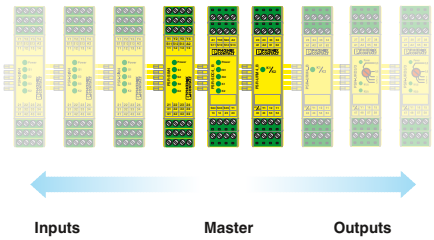
Input data		
Nominal input voltage U_N		24 V DC (from PSR)
Input voltage range in reference to U_N		0.85 ... 1.1
Max. permissible current		100 mA (per signal output)
Max. permissible total current		100 mA (alarm outputs)
Status display		Green LED
General data		
Ambient temperature (operation)		-20 °C ... 55 °C
Nominal operating mode		100% operating factor
Degree of protection		IP20
Mounting position		Any
Mounting		In rows with zero spacing
Air and creepage distances		DIN EN 50178
Rated insulation voltage		50 V DC
Rated surge voltage		0.8 kV
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 106 mm
W / H / D	Spring-cage version	22.5 mm / 117 mm / 106 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Interface module, for up to four safety sensors/switches with N/O or N/C contacts			
With screw connection	**PSR-SCP- 24DC/SIM4**	**2981936**	1
With spring-cage connection	**PSR-SPP- 24DC/SIM4**	**2981949**	1

Accessories

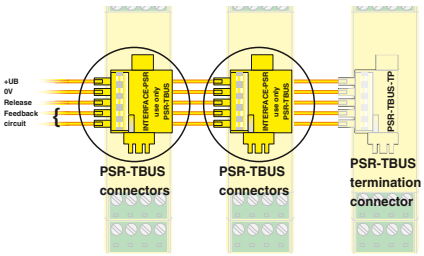
PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	**2890425**	50



Additional inputs are aligned on the left of the PSR-SDC4, outputs are to its right.

Modular safety relay system

The safety-related wiring between the individual PSR modules is established automatically by the PSR-TBUS DIN rail connector. In addition to the supply voltage, an enable signal and the confirmation current path of the extension modules are routed via the connector. The dummy plug (see below) closes the checkback circuit in the system.

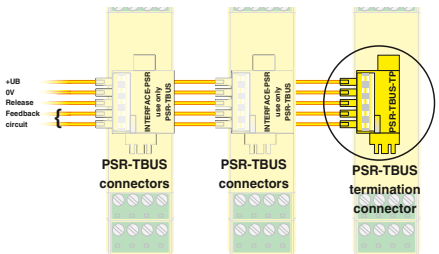


PSR-TBUS DIN rail connector

Description	Ordering data		
	Type	Order No.	Pcs. / Pkt.
PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	**2890425**	50

Modular safety relay system

When structuring a modular safety relay system, the PSR-TBUS-TP is mounted under the module that completes the entire module on the right side. This closes the confirmation circuit of the system.



PSR-TBUS-TP dummy plug

Description	Ordering data		
	Type	Order No.	Pcs. / Pkt.
PSR TBUS dummy plug	**PSR-TBUS-TP**	**2981716**	50

Modular safety relay system

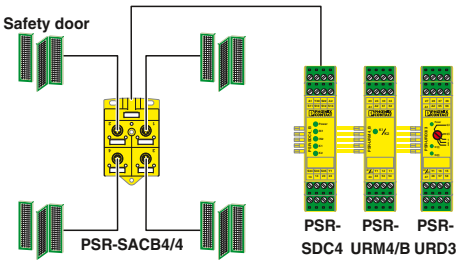
PSR-SACB sensor box with M12 slots

The PSR-SACB box for safety limit switches supports space-saving installation. It safely connects four connected limit switches, each with an N/C contact and an N/O contact, to a safety relay combination, e.g., PSR-SDC4. The N/C contacts are connected in series and the N/O contacts in parallel, which means that safe evaluation according to Cat. 3/PL d of EN ISO 13849-1 is ensured. Unused slots are bridged using dummy plugs.

The LEDs are used for signaling. In addition, four signal outputs (Y1-Y4) are also available and they can be evaluated in the control unit. The boxes are suitable for a rough industrial environment, correspond to the requirements of the IP65/67 degree of protection and are supplied with either 5 m or 10 m cable length.

The appropriate connection cables for connection with sensors are available from a comprehensive range of products, see the PLUSCON catalog.

– Up to Cat. 3/PL d according to EN ISO 13849-1, SILCL 2 according to IEC 62061, SIL 2 according to IEC 61508 (in conjunction with the PSR-SDC4 master)



Signals of up to 4 safety door switches can be switched together directly in the field.

Sensor box, with connected master cable, with LED

Technical data

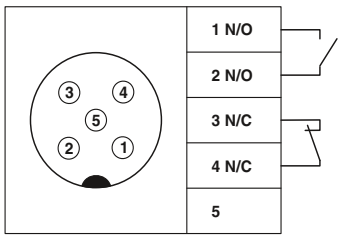
Nominal input voltage U_N	24 V DC (from PSR)
Input voltage range in reference to U_N	0.8 ... 1.1
Max. permissible current	100 mA (per signal output)
Max. permissible total current	100 mA (alarm outputs)
Status display	Yellow LED
Number of positions per slot	4
Master cable (flexible cable conduit-capable)	
Signal line cross section, stranded	6x 0.34 mm²
Power supply cross section, stranded	2x 0.75 mm²
External diameter	8.2 mm
Ambient temperature (operation)	-30 °C ... 70 °C (for fixed installation) -5 °C ... 70 °C (for flexible installation)
General data	
Ambient temperature (operation)	-20 °C ... 70 °C
Degree of protection	IP65/67
Mounting position	Any
Mounting	In rows with zero spacing
Interfaces	Master cable suitable for flexible cable conduit / M12 socket
Air and creepage distances	DIN EN 50178
Rated insulation voltage	50 V DC
Rated surge voltage	0.8 kV
Insulation material (housing)	PA 6.6
Inflammability class in acc. with UL 94	V0
Dimensions W / H / D	54 mm / 82 mm / 19 mm

Ordering data

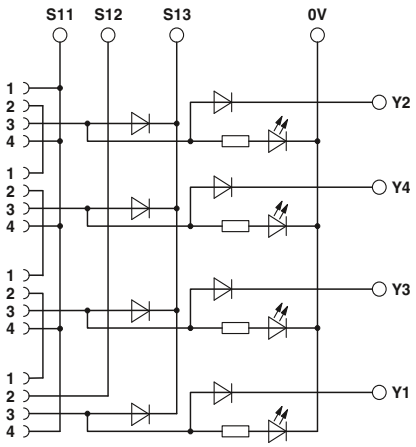
Description	Type	Order No.	Pcs. / Pkt.
Sensor box, with markers, for magnet limit switch with N/C / N/O contacts			
Length of cable: 5 m	**PSR-SACB-4/4-L- 5,0PUR-SD**	**2981871**	1
Length of cable: 10 m	**PSR-SACB-4/4-L-10,0PUR-SD**	**2981884**	1

Accessories

Dummy plug, for free slots	**SAC-2P-M12MS ASI TR**	**1539570**	5
Labeling material	**ZBN 18:UNBEDRUCKT**	**2809128**	10



Wiring of the M12 contacts (open safety door)



Block diagram

Two-channel downtime and speed monitors

The parameterizable PSR-MOTIONSTOP downtime and speed monitor is used to monitor hazardous movements of a machine or system - and, in the event of an error, safely shut down the machine or system.

Essential safety-related functions according to EN 61800-5-2 covered

The integrated safe torque off (STO) safety function enables shutdown to be performed by immediately disabling the power to the drive units of a machine. Other safety-related movement functions can be implemented with PSR-MOTIONSTOP:

– SLS: safe limited speed
– SMS: safe speed monitoring
– SDI: safe direction

Depending on the external wiring, applications can be implemented up to Cat. 4/PL e according to EN ISO 13849-1 and SIL 3 according to IEC 61508.

Motor feedback via conventional encoder systems

The following sensors are suitable for movement acquisition:

– Incremental encoders (HTL and TTL)
– Sin/cos encoders
– Safe (certified) SIL encoders
– Proximity switches (2- and 3-wire initiators)

Existing motor feedback systems can be easily and quickly connected with PSR-MOTIONSTOP via pre-assembled cable adapters.

Removable operating and display unit

The removable operating and display unit (PSR-OP-UNIT) can be used for convenient parameterization of the basic device. During operation, the actual values and diagnostic information can be shown on the illuminated LCD display. The operating and display unit is not required to operate the basic device ; in the case of a remote PSR-OP-UNIT, this ensures maximum protection against manipulation. One operating and display unit can be used to parameterize as many basic devices as required.

Option to connect mode selector switch and safety doors

One device can be used to monitor up to three different operating states (speeds) as well as downtime. In addition, safety doors or safety switches which enable and disable the monitoring function using secure monitoring inputs can be reliably evaluated.

Seamless service concept

Parameters can also be saved on the memory module (IFS-CONFSTICK), which is available as an accessory. In order for the right parameters to be made available quickly if service work needs to be carried out, the module is stored in the IFS-CONFSTICK storage area of the basic device.

Safe relay and semiconductor outputs

Relay and semiconductor outputs quickly and safely disable hazardous movements in the event of an error.

Speed and downtime monitors

- Option to connect encoders and proximity switches
- With 4 safe relay outputs, 2 safe semiconductor outputs, 1 signal output
- Monitors up to 3 different speeds plus downtime
- Safe monitoring function (safety door connection) for activating/deactivating overspeed monitoring
- Manually monitored and automatic activation
- Narrow 35 mm housing
- Can be parameterized via the PSR-OP-UNIT operating and display unit
- Can be ordered with or without PSR-OP-UNIT operating and display unit
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

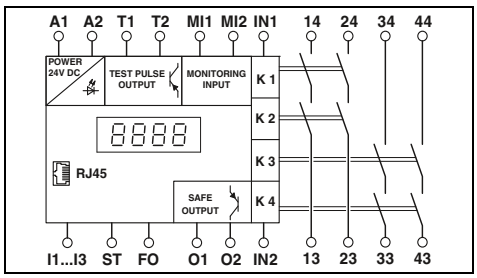
Notes:

Pre-assembled cable adapters are available for connecting PSR-MOTIONSTOP to the motor feedback system (of the controller) - order number on request.

1) EMC: Class A product, see page 553

Can be parameterized via the operating and display unit

Applied for:
cUL / UL / functional safety



Technical data

Input data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		150 mA
Typ. response time (K1, K2) at U_N		30 ms
Typ. release time (K1, K2) at U_N		20 ms
Recovery time		1 s
Output data		
Contact type		4 enabling current paths 3 semiconductor outputs
Contact material		$AgSnO_2$
Max. / min. switching voltage		250 V AC/DC / 5 V AC/DC
Limiting continuous current		5 A (N/O contact), 500 mA (semiconductor output)
Max. / min. inrush current		6 A (N/O contact) / 10 mA
Min. switching power		0.24 W
Switching capacity (360/h cycles)		6 A (at 24 V) ; 5 A (at 230 V)
Switching capacity (3600/h cycles)		3 A (at 24 V) ; 3 A (at 230 V)
Short-circuit protection of the output circuits		10 A gL/gG NEOZED (N/O contact)
General data		
Ambient temperature range		-20 °C ... 45 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		4 kV
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 14
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	35 mm / 112 mm / 125 mm
W / H / D	Spring-cage version	35 mm / 117.5 mm / 125 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Downtime and speed monitor, 2-channel, 4 safe relay outputs, 2 safe semiconductor outputs, 1 error message output, including PSR-OP-UNIT operating and display unit			
With screw connection	**PSR-SCP- 24DC/MSTO/D/4X1**	**2902363**	1
With spring-cage connection	**PSR-SPP- 24DC/MSTO/D/4X1**	**2902364**	1
Downtime and speed monitor, 2-channel, 4 safe relay outputs, 2 safe semiconductor outputs, 1 error message output, basic device without PSR-OP-UNIT			
With screw connection	**PSR-SCP- 24DC/MSTO/4X1**	**2902786**	1
With spring-cage connection	**PSR-SPP- 24DC/MSTO/4X1**	**2902787**	1

Accessories

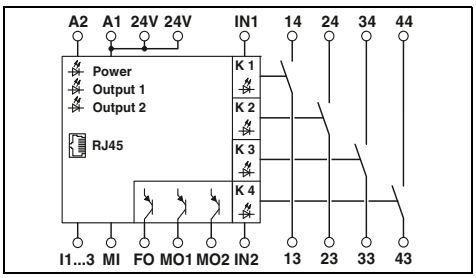
Operating and display unit for entering parameters and displaying actual values, can be directly snapped onto PSR-MOTIONSTOP basic devices	**PSR-OP-UNIT**	**2902578**	1
Multi-functional memory block for the INTERFACE system	**IFS-CONFSTICK[1])**	**2986122**	1

Speed and downtime monitors

- Option to connect encoders (TTL, HTL, SIN/COS) and proximity switches
- Monitors up to three different speeds plus downtime
- Can be parameterized using free PSR-CONF-WIN configuration software
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:
Pre-assembled cable adapters are available for connecting the PSR-RSM4 safe speed and downtime monitor to the motor feedback system (of the controller) - order No. on request.
The necessary PSR-CONF-WIN configuration software can be downloaded free of charge from www.phoenixcontact.com.
1) EMC: Class A product, see page 553

Can be parameterized via software



Technical data

Input data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		100 mA
Typ. response time (K1, K2) at U_N		15 ms
Typ. release time (K1, K2) at U_N		12 ms
Recovery time		1 s
Output data		
Contact type		4 enabling current paths
Contact material		AgNi10, + 5 µm Au
Max. / min. switching voltage		250 V AC/DC / 100 mV AC/DC
Limiting continuous current		5 A, 100 mA (alarm outputs)
Max. / min. inrush current		6 A / 1 mA
Min. switching power		1 mW
Switching capacity (3600/h cycles)		2 A (24 V (DC13)) ; 3 A (230 V (AC15))
Short-circuit protection of the output circuits		6 A gL
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		EN 60664/VDE 0110
Rated surge voltage / insulation		4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling current paths)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	45 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	45 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Speed and downtime monitor, 2-channel, automatic control with cable adapter or two initiators, activation: manual and automatic			
With screw connection	**PSR-SCP- 24DC/RSM4/4X1**[1]	**2981538**	1
With spring-cage connection	**PSR-SPP- 24DC/RSM4/4X1**[1]	**2981541**	1

Accessories

Cable adapter for PSR-RSM4, cable length 2.5 m, for control unit:			
Lenze	**CABLE- 9/8/250/RSM/LENZE**	**2981826**	1
Siemens Heidenhain, 15/8-pos.	**CABLE-15/8/250/RSM/SIMO611D**	**2981606**	1
Siemens Heidenhain, 25/8-pos.	**CABLE-25/8/250/RSM/SIMO611D**	**2981583**	1
Further types on request			
PSR configuration software with connecting cable, language: German, English, French, Italian, and Spanish	**PSR-CONF-WIN1.0**	**2981554**	1

PLC series
Terminal block with integrated test pulse and EMC filter

The **PSR-FTB** filter terminal block is used in the event of problems with 24 V signals affected by EMI and test-pulse-sensitive loads.

– Filtering of test-pulse-safe electronic outputs
– EMC filter for constant 24 V signals
– Easy wiring using push-in connection technology

Notes:

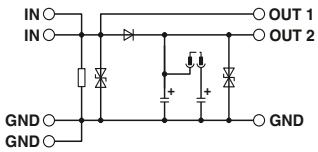
The selection of the filter terminal block depends on several parameters (load resistance/current, voltage drop, accepted shutdown time). The parameters can be determined with the aid of more detailed documentation, see www.phoenixcontact.net/products.

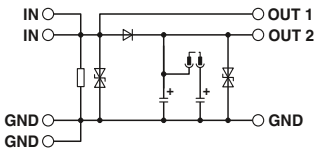
N

For low loads up to a maximum of 65 mA

N

For high loads up to a maximum of 530 mA





Technical data

Input data			
Nominal input voltage U_N		24 V DC ± 20% (Control voltage U_{ST} right/left)	24 V DC ± 20% (Control voltage U_{ST} right/left)
Typ. input current at U_N		max. 15 mA	max. 20 mA
Protective circuit		Surge protection	Surge protection
General data			
Ambient temperature range		-25 °C ... 50 °C	-25 °C ... 50 °C
Air and creepage distances between the circuits		EN 61131	EN 61131
Rated surge voltage / insulation		1.5 kV / basic insulation	1.5 kV / basic insulation
Dimensions	W / H / D	6.2 mm / 94 mm / 80 mm	6.2 mm / 94 mm / 80 mm
Spring-cage connection Solid/stranded/AWG		0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14	0.14 - 2.5 mm² / 0.14 - 2.5 mm² / 26 - 14

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PLC filter terminal block, with integrated test pulse and EMC filter	**PSR-FTB/1.5/11.5**	**2904476**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSR-FTB/20/86	**2904477**	1

Termination carriers are compact solutions for conveniently and smoothly connecting standard DIN rail devices from the PSR range to output modules of automation systems.

Both safety-related circuit interrupts and safe switch on are becoming increasingly important. These modules for electrically isolating actuators and power adaptation are used in the process industry in particular.

The PSR-ETP from Phoenix Contact is a coupling relay that has been specially developed for this purpose and is SIL 3 certified.

This means that PSR-SIL coupling relays are now available for both ESD and F&G applications.

Easy diagnostics

The optionally connectable line/load monitoring function, which can be configured according to the load, enables end-to-end diagnostics from the controller to the actuator.

Diagnostic messages about open circuits or missing/incorrect loads are sent via the existing wiring. This eliminates the need for additional installation time and other digital inputs required for actuator readback.

Compatible with a range of different higher-level control systems

Test pulses from safe controllers can often cause premature wear of the relays. The integrated test pulse filter and adapted current control circuit ensure both a long service life and a high level of compatibility between all PSR-SIL coupling relays and the various higher-level control systems.

High level of availability and safety

Particular emphasis is always placed on carefully selecting the relay used. The combination of the relay and application-specific design create the ideal conditions for a high level of availability and safety.

Select PRS-SIL coupling relay

Select termination carrier TC... termination carrier

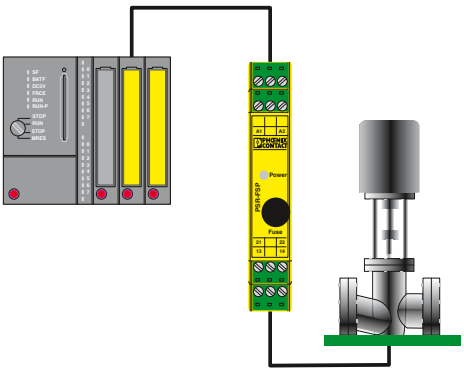
Select controller-specific front adapter and system cable

Solutions also available for MACX and MINI Analog

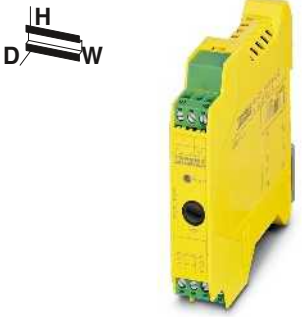
Safe coupling relays

- Couples digital output signals from failsafe controllers to I/O devices (valves, etc.) for electrical isolation and power adaptation
- 1 enabling current path
- 17.5 mm narrow housing
- Long service life thanks to filtering of controller test pulses
- With installed and replaceable fuse in the enabling current path
- Forcibly guided contacts according to EN 50205
- Simple proof test as per IEC 61508 due to integrated signaling contact
- Up to SIL 3 according to IEC 61508

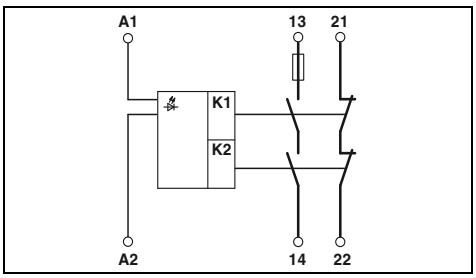
Notes:
Can be used for system cabling with the termination carrier. For further information, see page 96
Additional products for SIL applications can be found on page 71
1) EMC: Class A product, see page 553



Example of electrical isolation of a safety PLC output from the field.



Safe coupling relay
SIL 3 according to IEC 61508



Technical data

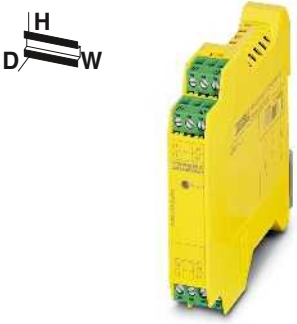
Input data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		55 mA
Typ. response time (K1, K2) at U_N		50 ms
Typ. release time (K1, K2) at U_N		50 ms
Recovery time		1 s
Output data		
Contact type		1 undelayed enabling current path 1 undelayed confirmation current path
Contact material		AgCuNi, + 0.2 µm Au
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		5 A (N/O contact, pay attention to the derating), 100 mA (N/C contact)
Max. / min. inrush current		5 A / 5 mA
Min. switching power		75 mW
Switching capacity (3600/h cycles)		5 A (24 V (DC13)) ; 5 A (230 V (AC15))
Short-circuit protection of the output circuits		5 A T fuse
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178
Rated surge voltage / insulation		6 kV / safe isolation, increased insulation
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	17.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	17.5 mm / 112 mm / 114.5 mm

Ordering data

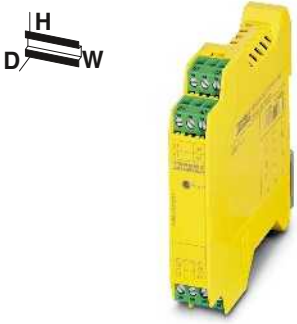
Description	Type	Order No.	Pcs. / Pkt.
Emergency stop coupling relay for failsafe controllers in process engineering, with secured enabling current path			
With screw connection	**PSR-SCP- 24DC/FSP/1X1/1X2[1])**	**2981978**	1
With spring-cage connection	**PSR-SPP- 24DC/FSP/1X1/1X2[1])**	**2981981**	1

Safe coupling relays

- Couples digital output signals from failsafe controllers to I/O devices (valves, etc.) for electrical isolation and power adaptation
- 2 enabling current paths
- 17.5 mm narrow housing
- Long service life thanks to filtering of controller test pulses
- Forcibly guided contacts according to EN 50205
- Simple proof test as per IEC 61508 due to integrated signaling contact
- Up to SIL 3 according to IEC 61508

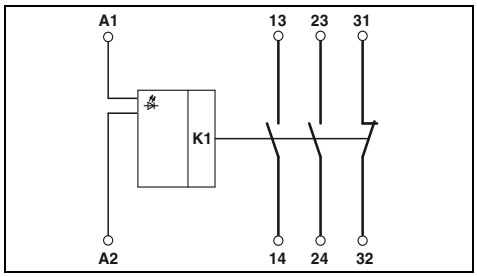


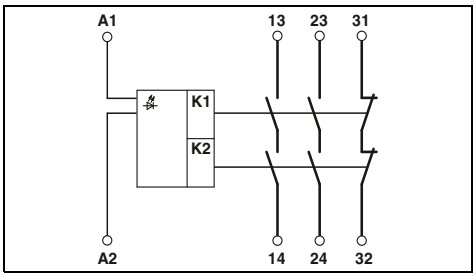
Safe coupling relay, SIL 2 according to IEC 61508



Safe coupling relay, SIL 3 according to IEC 61508

Notes:
Can be used for system cabling with the termination carrier. For further information, see page 96
Additional products for SIL applications can be found on page 71
1) EMC: Class A product, see page 553





Technical data

Input data			
Nominal input voltage U_N		24 V DC	24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1	0.85 ... 1.1
Typ. current consumption (with reference to U_N)		55 mA	55 mA
Typ. response time (K1, K2) at U_N		50 ms	50 ms
Typ. release time (K1, K2) at U_N		50 ms	50 ms
Output data			
Contact type		2 undelayed enabling current paths 1 undelayed confirmation current path	2 undelayed enabling current paths 1 undelayed confirmation current path
Contact material		AgCuNi, + 0.2 µm Au	AgCuNi, + 0.2 µm Au
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC	250 V AC/DC / 15 V AC/DC
Limiting continuous current		5 A (N/O contact), 100 mA (N/C contact)	5 A (N/O contact), 100 mA (N/C contact)
Max. / min. inrush current		5 A / 5 mA	5 A / 5 mA
Min. switching power		75 mW	75 mW
Switching capacity (3600/h cycles)		5 A (24 V (DC13)) ; 5 A (230 V (AC15))	5 A (24 V (DC13)) ; 5 A (230 V (AC15))
Short-circuit protection of the output circuits		10 A gL/gG (N/O contact), 6 A gL/gG (N/C contact)	10 A gL/gG (N/O contact), 6 A gL/gG (N/C contact)
General data			
Ambient temperature range		-20 °C ... 55 °C	-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160	DIN EN 50178/VDE 0160
Rated surge voltage / insulation		6 kV / safe isolation, increased insulation	6 kV / safe isolation, increased insulation
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	17.5 mm / 99 mm / 114.5 mm	17.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	17.5 mm / 112 mm / 114.5 mm	17.5 mm / 112 mm / 114.5 mm

Ordering data

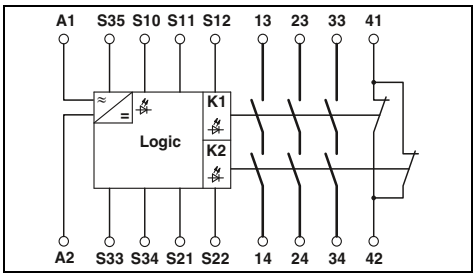
Description	Type	Order No.	Pcs. / Pkt.
Emergency stop coupling relay, for failsafe controllers, two enabling current paths**, SIL 2 according to IEC 61508**			
With screw connection	**PSR-SCP- 24DC/FSP2/2X1/1X2[1])**	**2986575**	1
With spring-cage connection	**PSR-SPP- 24DC/FSP2/2X1/1X2[1])**	**2986588**	1
Emergency stop coupling relay, for failsafe controllers, two enabling current paths, **SIL 3 according to IEC 61508**			
With screw connection	**PSR-SCP- 24DC/FSP/2X1/1X2[1])**	**2986960**	1
With spring-cage connection	**PSR-SPP- 24DC/FSP/2X1/1X2[1])**	**2986957**	1

Safe coupling relays

- Single and two-channel control
- Manual and automatic activation
- Max. 3 enabling current paths
- With wide range input
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:
Additional products for SIL applications can be found on page 71
1) EMC: Class A product, see page 553

Wide-range input (24 - 230 V), manually monitored with automatic activation



Technical data

Input data		
Nominal input voltage range		24 V AC/DC ... 230 V AC/DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		120 mA (at 24 V DC) / 20 mA (for 120 V AC)
Typ. response time (K1, K2) at U_N		50 ms (manual start) / 60 ms (automatic start)
Typ. release time (K1, K2) at U_N		20 ms (when controlled via S11/S12 and S21/S22) / 500 ms (when controlled via A1)
Recovery time		1 s
Output data		
Contact type		3 enabling current paths 1 signaling current path
Contact material		$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage		250 V AC/DC / 10 V AC/DC
Limiting continuous current		6 A
Max. / min. inrush current		6 A / 10 mA
Min. switching power		360 mW
Switching capacity (360/h cycles)		4 A (24 V DC) ; 4 A (230 V AC)
Switching capacity (3600/h cycles)		2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits		6 A gL/gG NEOZED (enabling current paths), 6 A gL/gG NEOZED (signaling current paths)
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		6 kV/safe isolation, reinforced insulation, and 6 kV between input circuits and output contact current paths (13/14, 23/24, 33/34), as well as between output contact current paths (13/14, 23/24, 33/34)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	45 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	45 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Emergency stop and safety door monitoring, single and two-channel, with/without cross-circuit detection, activation: manually monitored and automatic			
With screw connection	**PSR-SCP-24-230UC/ESAM4/3X1/1X2[1])**	**2981114**	1
With spring-cage connection	**PSR-SPP-24-230UC/ESAM4/3X1/1X2[1])**	**2981127**	1

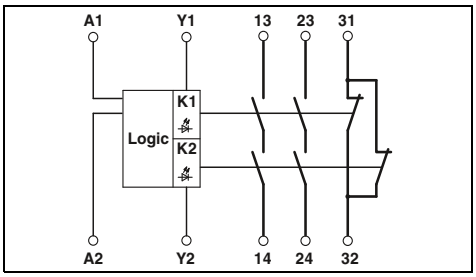
Safe coupling relays

- Single and two-channel control
- Manual and automatic activation
- Max. 3 enabling current paths
- With inrush current reduction, therefore suitable for coupling to failsafe controllers
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:

1) EMC: Class A product, see page 553

24 V DC, manual and automatic activation



Technical data

Input data		
Nominal input voltage U_N		24 V AC/DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		50 mA DC
Typ. response time (K1, K2) at U_N		60 ms (automatic/manual start)
Typ. release time (K1, K2) at U_N		20 ms
Recovery time		Approx. 1 s
Output data		
Contact type		2 enabling current paths 1 signaling current path (type B according to EN 50205)
Contact material		$AgSnO_2$, gold-flashed
Max. / min. switching voltage		250 V AC/DC / 10 V
Limiting continuous current		6 A (N/O contact/N/C contact, high demand), 4 A (N/O contact/N/C contact, low demand)
Max. / min. inrush current		6 A / 10 mA
Min. switching power		0.2 W
Switching capacity (360/h cycles)		5 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)		5 A (24 V (DC13)) ; 5 A (230 V (AC 15))
Short-circuit protection of the output circuits		6 A gL/gG NEOZED (high demand), 4 A gL/gG NEOZED (low demand)
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		6 kV / safe isolation, increased insulation
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Process technology, emergency stop and safety door monitoring, one-channel, activation: manual and automatic			
With screw connection	**PSR-SCP- 24DC/ESP4/2X1/1X2[1])**	**2981020**	1
With spring-cage connection	**PSR-SPP- 24DC/ESP4/2X1/1X2[1])**	**2981017**	1

Safe coupling relays

PSR-SIL coupling relay for F&G applications

- Couples digital output signals to I/O devices (valves, etc.) for electrical isolation and power adaptation
- Long service life, thanks to integrated test pulse filters
- Connectable, configurable open circuit and load monitoring
- Special design for avoiding spurious trips
- 1 enabling current path
- 17.5 mm narrow housing
- Up to SIL 3 according to IEC 61508 (low demand)

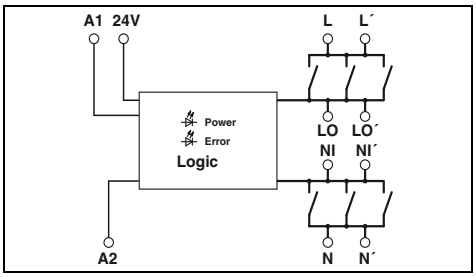
Notes:

Can be used for system cabling with the termination carrier. For further information, see page 96

1) EMC: Class A product, see page 553

Coupling relay for safe switch-on certified according to SIL 3

Applied for: cUL / UL



Technical data

Input data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		75 mA
Typ. response time at U_N		30 ms
Recovery time		1 s
Output data		
Contact type		1 enabling current path
Contact material		AgNi, gold-flashed
Max. / min. switching voltage		250 V AC / 15 V AC/DC
Limiting continuous current		5 A (N/O contact, pay attention to the derating)
Max. / min. inrush current		5 A / 100 mA
Min. switching power		1.5 W
Short-circuit protection of the output circuits		-
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178
Rated surge voltage / insulation		6 kV/safe isolation (through protective impedance)
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	17.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	17.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
F&G coupling relay for failsafe controllers, one enabling current path, SIL 3 according to IEC 61508 (low demand)			
With screw connection	**PSR-SCP- 24DC/ETP/1X1[1])**	**2986711**	1
With spring-cage connection	**PSR-SPP- 24DC/ETP/1X1[1])**	**2986562**	1

Termination carriers for safe coupling relays

- Convenient and faultless connection using pre-assembled system cables
- 1:1 signal allocation to a 37-pos. D-SUB connector
- Redundant power supply, decoupled from diode and protected against polarity reversal
- Integrated undervoltage detection with separate signal path

Notes:

Cable and jumper plugs are not supplied as standard with the termination carriers.

1) EMC: Class A product, see page 553

Termination carrier for up to 16 PSR-FSP modules

Termination carrier for up to 16 PSR-ETP modules

Housing width 304 mm

Technical data

General data	
Connection to the control system level	D-SUB pin strip
Number of positions	37
Max. operating voltage	< 50 V DC (per signal/channel)
Max. permissible current	1 A (signal/channel)
Rated insulation voltage	50 V
Surge voltage category	II
Pollution degree	2
Ambient temperature range	-20 °C ... 80 °C
Inflammability class in acc. with UL 94	V0
Dimensions W / H / D	304 / 170 / 160 mm
Supply	
Input voltage range	21.1 V DC ... 26.4 V DC
Redundant supply	Yes, decoupled from diodes
Polarization and surge protection	Yes
Fuse	2.5 A slow-blow
Status indication	2 x green LEDs (PWR1 and PWR2)
Undervoltage monitoring	At < 18 V (alarm contact, 1 N/O contact)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Termination carrier for 16 coupling relays For safety-related **switching off** For safety-related **switching on**	**TC-2D37SUB-DO16-ESD-AR-UNI**[1])	**2902913**	1

Accessories

Cable set without use of confirmation contact, suitable for PSR-FSP/Order No.: 2981978	**TC-C-PSR3-SC-A10000A20000**	**2903389**	16
Cable set with use of confirmation contact, suitable for PSR-FSP/Order No.: 2986960 and 2986575	**TC-C-PSR3-SC-A10000A23132**	**2903390**	16
Jumper plug for occupying unused module slots, suitable for PSR-FSP/Order No.: 2986960 and 2986575	**TC-C-PTSM-50-00000000J1J1**	**2903388**	8
Cable set with 24 V module supply, suitable for PSR-ETP/Order No.: 2986711			

Housing width 304 mm

Technical data

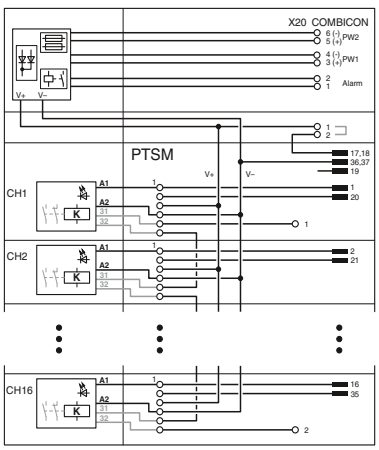
General data	
Connection to the control system level	D-SUB pin strip
Number of positions	37
Max. operating voltage	< 50 V DC (per signal/channel)
Max. permissible current	1 A (signal/channel)
Rated insulation voltage	50 V
Surge voltage category	II
Pollution degree	2
Ambient temperature range	-20 °C ... 80 °C
Inflammability class in acc. with UL 94	V0
Dimensions W / H / D	304 / 170 / 160 mm
Supply	
Input voltage range	21.1 V DC ... 26.4 V DC
Redundant supply	Yes, decoupled from diodes
Polarization and surge protection	Yes
Fuse	2.5 A slow-blow
Status indication	2 x green LEDs (PWR1 and PWR2)
Undervoltage monitoring	At < 18 V (alarm contact, 1 N/O contact)

Ordering data

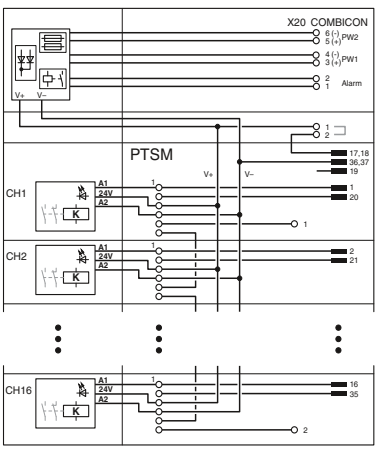
Type	Order No.	Pcs. / Pkt.
TC-2D37SUB-DO16-F&G-AR-UNI[1])	**2902914**	1

Accessories

TC-C-PSR3-SC-A100V+A20000	**2903391**	16



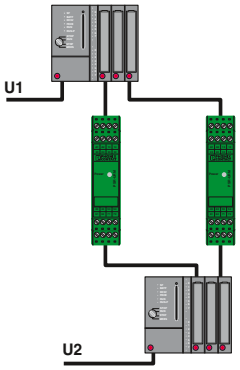
TC-2D37SUB-DO16-ESD-AR-UNI connection scheme



TC-2D37SUB-DO16-F&G-AR-UNI connection scheme

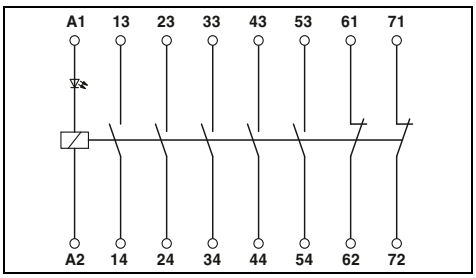
Forcibly guided coupling relays

– Single-channel control
– Forcibly guided contacts according to EN 50205



Reliable signal exchange between two systems with confirmation function.

Forcibly guided coupling relay, 5 N/O contacts, 2 N/C contacts



Technical data

Input data		
Nominal input voltage U_N		24 V AC/DC
Permissible range (with reference to U_N)		0.8 ... 1.1
Typ. current consumption (with reference to U_N)		47 mA
Typ. response time (K1, K2) at U_N		20 ms
Typ. release time (K1, K2) at U_N		20 ms
Output data		
Contact type		5 N/O contacts 2 N/C contacts
Contact material		$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage		250 V AC/DC / 15 V AC/DC
Limiting continuous current		6 A
Max. / min. inrush current		6 A / 25 mA
Min. switching power		0.4 W
Switching capacity (360/h cycles)		4 A (24 V DC) ; 4 A (230 V AC)
Switching capacity (3600/h cycles)		2.5 A (24 V (DC13)) ; 3 A (230 V (AC 15))
Short-circuit protection of the output circuits		6 A fast-blow, C6 (24 V AC/DC) automatic device
General data		
Ambient temperature range		-20 °C ... 55 °C
Air and creepage distances between the circuits		DIN EN 50178/VDE 0160
Rated surge voltage / insulation		4 kV / basic insulation
Screw connection solid/stranded/AWG		0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	22.5 mm / 112 mm / 114.5 mm

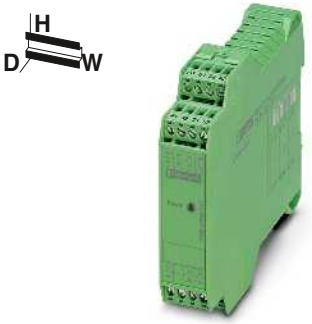
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Coupling relay, with forcibly guided contacts			
With screw connection for 24 V AC/DC	**PSR-SCP- 24UC/URM/5X1/2X2**	**2963747**	1
With spring-cage connection for 24 V AC/DC	**PSR-SPP- 24UC/URM/5X1/2X2**	**2963970**	1
Coupling relay, with forcibly guided contacts			
With screw connection for 120 V AC/DC	**PSR-SCP-120UC/URM/5X1/2X2**	**2981402**	1
With spring-cage connection for 120 V AC/DC	**PSR-SPP-120UC/URM/5X1/2X2**	**2981415**	1

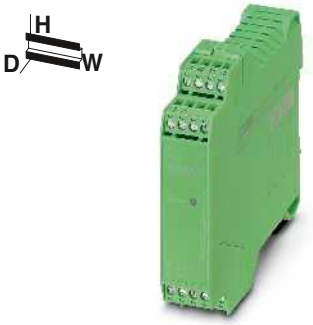
Forcibly guided coupling relays

– Single-channel control
– Forcibly guided contacts according to EN 50205

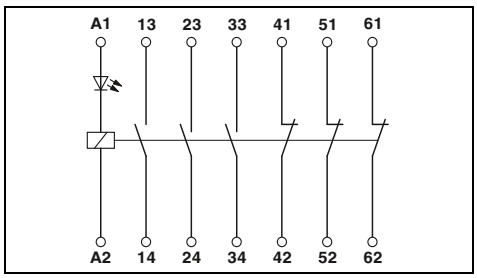
Notes:
For marking systems and mounting material see Catalog 5
1) EMC: Class A product, see page 553

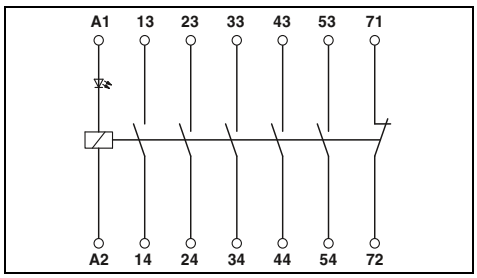


Forcibly guided coupling relay, 3 N/O contacts, 3 N/C contacts



Forcibly guided coupling relay, 5 N/O contacts, 1 N/C contact





Technical data

Input data	
Nominal input voltage U_N	24 V AC/DC
Permissible range (with reference to U_N)	0.85 ... 1.1
Typ. current consumption (with reference to U_N)	45 mA
Typ. response time (K1, K2) at U_N	15 ms
Typ. release time (K1, K2) at U_N	15 ms
Output data	
Contact type	3 N/O contacts 3 N/C contacts
Contact material	$AgSnO_2$
Max. / min. switching voltage	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A (N/O contact), 6 A (N/C contact)
Max. / min. inrush current	6 A / 25 mA
Min. switching power	0.4 W
Switching capacity (360/h cycles)	6 A (24 V DC) ; 5 A (230 V AC)
Switching capacity (3600/h cycles)	3 A (24 V (DC13)) ; 3 A (230 V (AC15))
Short-circuit protection of the output circuits	10 A gL/gG NEOZED (N/O contact), 4 A gL/gG NEOZED (N/C contact)
General data	
Ambient temperature range	-20 °C ... 55 °C
Air and creepage distances between the circuits	DIN EN 50178/VDE 0160
Rated surge voltage / insulation	4 kV / Basic isolation (safe isolation, reinforced insulation, and 6 kV between the input circuit and the output (13/14, 23/24, 33/34).)
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Technical data

Input data	
Nominal input voltage U_N	24 V AC/DC
Permissible range (with reference to U_N)	0.8 ... 1.1
Typ. current consumption (with reference to U_N)	47 mA
Typ. response time (K1, K2) at U_N	20 ms
Typ. release time (K1, K2) at U_N	20 ms
Output data	
Contact type	5 enabling current paths 1 signaling current path
Contact material	$AgSnO_2$, + 0.2 µm Au
Max. / min. switching voltage	250 V AC/DC / 15 V AC/DC
Limiting continuous current	6 A
Max. / min. inrush current	6 A / 25 mA
Min. switching power	0.4 W
Switching capacity (360/h cycles)	4 A (24 V DC) ; 4 A (230 V AC)
Switching capacity (3600/h cycles)	2.5 A (24 V (DC13)) ; 3 A (230 V (AC15))
Short-circuit protection of the output circuits	6 A fast-blow (N/O contact), 6 A fast-blow (N/C contact)
General data	
Ambient temperature range	-20 °C ... 55 °C
Air and creepage distances between the circuits	DIN EN 50178
Rated surge voltage / insulation	4 kV / basic isolation (safe isolation, reinforced isolation and 6 kV between A1/A2, 53/54, 71/72 and 13/14, 23/24, 33/34, 43/44.)
Screw connection solid/stranded/AWG	0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12
Spring-cage connection solid/stranded/AWG	0.2 - 1.5 mm^2 / 0.2 - 1.5 mm^2 / 24 - 16
Dimensions Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Coupling relay, with forcibly guided contacts			
With screw connection	**PSR-SCP- 24UC/URM/3X1/3X2**	**2981839**	1
With spring-cage connection	**PSR-SPP- 24UC/URM/3X1/3X2**	**2981842**	1
Coupling relay, with forcibly guided contacts			
With screw connection for 120 V AC/DC			
With spring-cage connection for 120 V AC/DC			
Relay, with forcibly guided contacts, suitable for PR1 relay base			

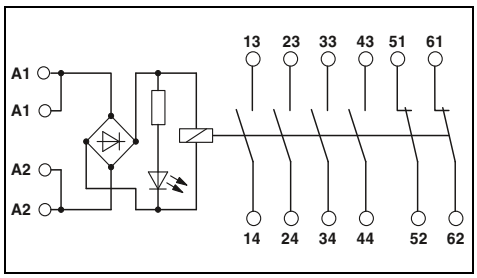
Ordering data

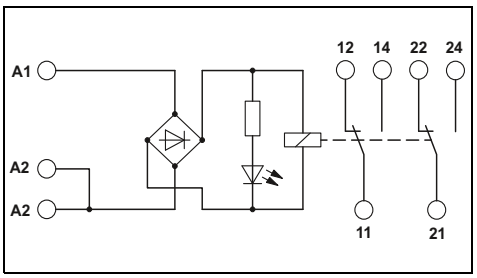
Type	Order No.	Pcs. / Pkt.
PSR-SCP- 24UC/URM/5X1/1X2	**2981952**	1
PSR-SPP- 24UC/URM/5X1/1X2	**2981965**	1

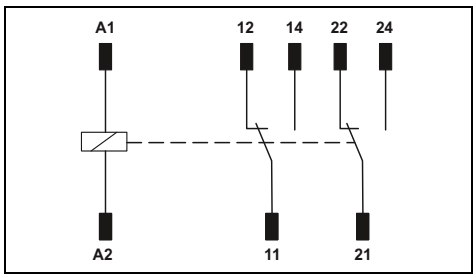
Forcibly guided coupling relay, 4 N/O contacts, 2 N/C contacts

Forcibly guided coupling relay, 2 PDTs

Safety relay with forcibly guided contacts, as per EN 50205, application type B







Technical data

24 V AC/DC	120 V AC/DC
0.8 ... 1.1	0.8 ... 1.1
52 mA	12 mA
10 ms	10 ms
10 ms	10 ms
4 N/O contacts 2 N/C contacts	
$AgSnO_2$	
250 V AC/DC / 15 V AC/DC	
6 A (total current on request)	
6 A / 25 mA	
0.4 W	
6 A (24 V DC) ; 5 A (230 V AC)	
3 A (24 V (DC13)) ; 3 A (230 V (AC15))	
10 A gL/gK NEOZED (N/O contact), 4 A gL/gK NEOZED (N/C contact)	
-20 °C ... 55 °C	
DIN EN 50178/VDE 0160	
4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling current paths)	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	
40 mm / 111 mm / 56 mm	
40 mm / 111 mm / 56 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSR-SCF- 24UC/URM/4X1/2X2[1])	**2981444**	1
PSR-SPF- 24UC/URM/4X1/2X2[1])	**2981457**	1
PSR-SCF-120UC/URM/4X1/2X2[1])	**2981460**	1
PSR-SPF-120UC/URM/4X1/2X2[1])	**2981473**	1

Technical data

24 V AC/DC	120 V AC/DC
0.85 ... 1.1	0.85 ... 1.1
30 mA	9 mA
10 ms	10 ms
10 ms	10 ms
2 PDT	
AgNi	
250 V AC/DC / 15 V AC/DC	
5 A (N/O contact), 3.5 A (N/C contact)	
6 A / 10 mA	
0.24 W	
6 A (24 V DC ; N/O contact) ; 3 A (230 V AC ; N/O contact)	
2 A (24 V (DC13) ; N/O contact) ; 3 A (230 V (AC15) ; N/O contact)	
6 A gL/gG NEOZED (N/O contact), 4 A gL/gG NEOZED (N/C contact)	
-20 °C ... 50 °C	
DIN EN 50178/VDE 0160	
4 kV / basic isolation, (safe isolation, reinforced insulation, and 6 kV between input circuit and enabling current paths)	
0.2 - 2.5 mm^2 / 0.2 - 2.5 mm^2 / 24 - 12	
-	
17.5 mm / 75 mm / 60.5 mm	
-	

Ordering data

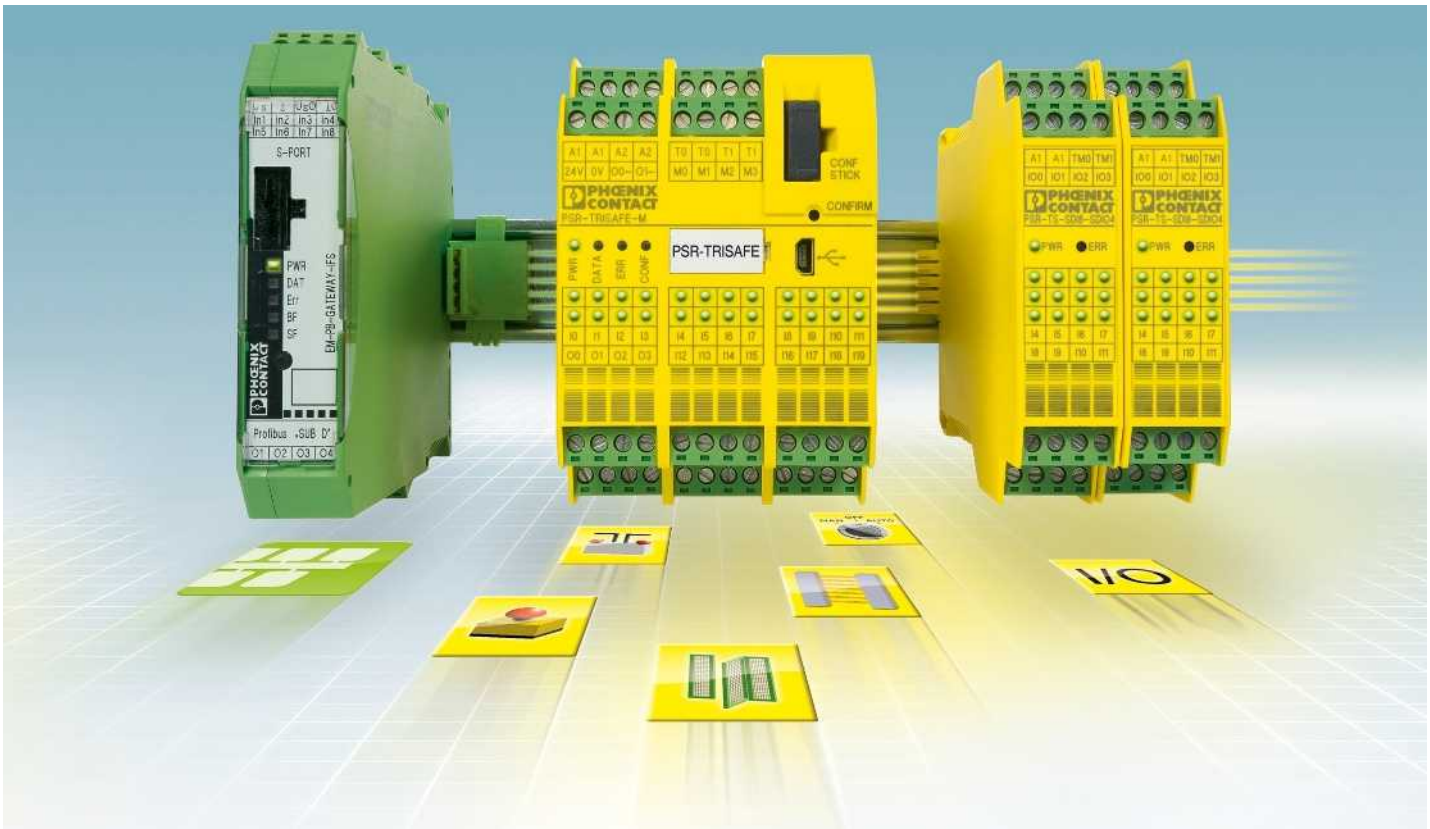
Type	Order No.	Pcs. / Pkt.
PSR-SCF- 24UC/URM/2X21[1])	**2981363**	10
PSR-SCF-120UC/URM/2X21[1])	**2981376**	10

Technical data

24 V DC	
(on request)	
29 mA	
10 ms	
4 ms	
2 PDT	
AgNi	
250 V AC/DC / 15 V	
6 A (N/O contact), 6 A (N/C contact)	
6 A / 10 mA	
0.24 W	
6 A (24 V DC ; N/O contact) ; 3 A (230 V AC ; N/O contact)	
2 A (24 V (DC13) ; N/O contact) ; 3 A (230 V (AC15) ; N/O contact)	
-	
-25 °C ... 70 °C	
DIN EN 50178	
6 kV / safe isolation, increased insulation	
-	
-	
12.6 mm / 29 mm / 25.5 mm	
-	

Ordering data

Type	Order No.	Pcs. / Pkt.
REL-SR- 24DC/2X21	**2961574**	10



PSR-TRISAFE can meet all safety function requirements quickly and easily.

PSR-TRISAFE offers many advantages:

– Multifunctional use for a wide range of safety functions
– Flexible extension with safe inputs and outputs
– Easy graphical configuration instead of complex programming
– Quick startup thanks to user-friendly simulation and test options

Flexible extension of master module

The configurable safety module is supplied with 20 safe inputs, 4 safe outputs, and 4 alarm outputs integrated as standard.

If more inputs and outputs are required, up to 10 extension modules can be connected alongside the extendable PSR−TRISAFE−M safety module. Safe digital I/O modules are available for flexible system expansion.

Integration in a bus system

Adaptable fieldbus gateways, available as an option, can be used to integrate the PSR-TRISAFE system in a bus system such as a PROFIBUS DP network. This enables communication with the higher-level control system for diagnostic and visualization purposes.

INTERFACE TBUS DIN rail

The INTERFACE TBUS DIN rail provides the link between extension modules and the safety module.

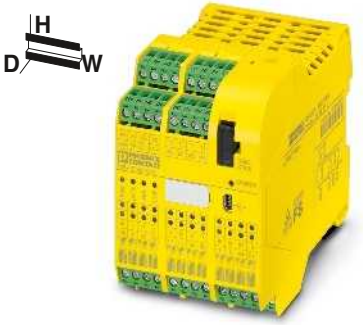
Easy device configuration

Functions are easy to configure using drag & drop in the free SAFECONF software.

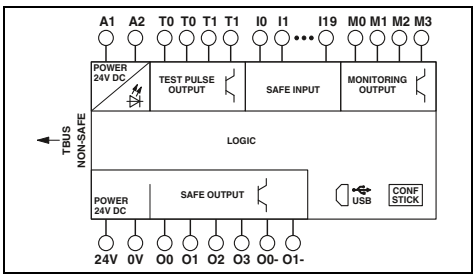
PSR-TRISAFE-S

- Freely configurable safety module for monitoring emergency stop, safety doors, light grids, etc.
- With 20 safe inputs, 4 safe outputs, 4 alarm outputs, and 2 clock outputs on a design width of just 67.5 mm
- Easily graphically configurable with the SAFECONF software
- Quick commissioning by means of comprehensive simulation and test functions
- Option for connecting fieldbus gateways for diagnostics and signaling functions
- Incl. IFS-CONFSTICK memory stick for easy storage and backup of the configuration
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:
The necessary SAFECONF configuration software can be downloaded free of charge from www.phoenixcontact.com.
Further information on the SAFECONF configuration software can be found on page 110
Further information on fieldbus gateways can be found in the “Motor management” section of Catalog 7 or at www.phoenixcontact.net/products.
1) EMC: Class A product, see page 553



Configurable safety module, cannot be extended



Technical data

Module data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		110 mA
Max. response time		< 30 ms
Interfaces		USB
Input data		
Number of safe inputs		20
Nominal voltage		24 V DC
Output data		
Safe semiconductor outputs		4 (Cat.4 / ISO 13849)
Nominal voltage		24 V DC
Limiting continuous current		2 A (see derating curve)
Ground switching outputs		2
Clock outputs		2
Alarm outputs		4
General data		
Ambient temperature range		-20 °C ... 55 °C
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	67.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	67.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Freely configurable safety module, for monitoring emergency stop, safety doors, light grids, etc., with 20 safe inputs and 4 safe outputs, 4 signaling and 2 cycle outputs			
With screw connection	**PSR-SCP- 24DC/TS/S[1])**	**2986229**	1
With spring-cage connection	**PSR-SPP- 24DC/TS/S[1])**	**2986232**	1

Accessories

Configuration package for the PSR-TRISAFE safety module, consists of SAFECONF software, USB connecting cable, and quick start guide			
German	**PSR-SAFECONF-BOX-DE**	**2986151**	1
English	**PSR-SAFECONF-BOX-EN**	**2986164**	1
Starter kit for the PSR-TRISAFE safety module, consists of PSR-TRISAFE demo board (with inputs and outputs), SAFECONF software, USB connecting cable (3 m), power supply with international plug adapters, quick start guide	**PSR-TRISAFE STARTER KIT**	**2986300**	1
Multi-functional memory block for the INTERFACE system	**IFS-CONFSTICK[1])**	**2986122**	1
PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	**2890425**	50

PSR-TRISAFE modular

- Freely configurable safety module for monitoring emergency stop, safety doors, light grids, etc.
- Safe and standard extension via INTERFACE DIN rail TBUS
- With 20 safe inputs, 4 safe outputs, 4 alarm outputs, and 2 clock outputs on a design width of just 67.5 mm
- Easily graphically configurable with the SAFECONF software
- Option for connecting fieldbus gateways for diagnostics and signaling functions
- Incl. IFS-CONFSTICK memory stick for easy storage and backup of the configuration
- Incl. PSR-TBUS connector (DIN rail connector) for adapting safe extension modules
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:

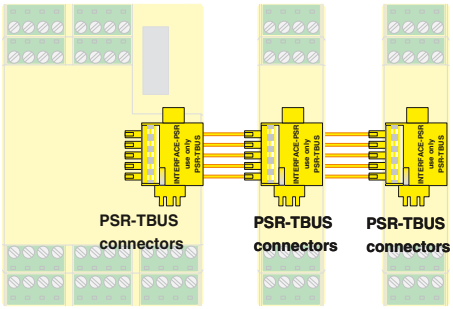
For extension modules for PSR-TRISAFE modular, see page 103

The necessary SAFECONF configuration software can be downloaded free of charge from www.phoenixcontact.com.

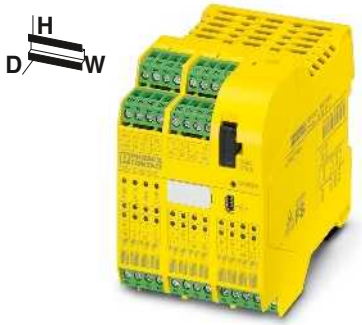
Further information on the SAFECONF configuration software can be found on page 110

Further information on fieldbus gateways can be found in the "Motor management" section of Catalog 7 or at www.phoenixcontact.net/products.

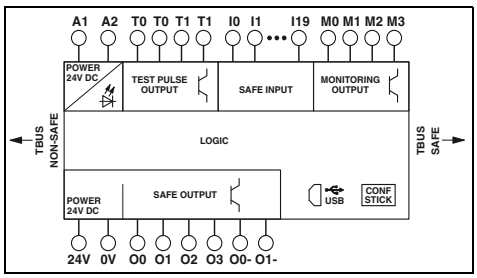
1) EMC: Class A product, see page 553



The TBUS connectors carry out the cross-wiring between the modules.



Configurable safety module, can be extended



Technical data

Module data		
Nominal input voltage U_N		24 V DC
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		110 mA
Max. response time		< 30 ms
Interfaces		USB
Input data		
Number of safe inputs		20
Nominal voltage		24 V DC
Output data		
Safe semiconductor outputs		4 (Cat.4 / ISO 13849)
Nominal voltage		24 V DC
Limiting continuous current		2 A (see derating curve)
Ground switching outputs		2
Clock outputs		2
Alarm outputs		4
General data		
Ambient temperature range		-20 °C ... 55 °C
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	67.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	67.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Freely configurable master module, for monitoring emergency stops, safety doors, light grids, etc., with 20 safe inputs and 4 safe outputs, 4 alarm outputs and 2 clock outputs, safe and standard extension, including memory stick and PSR-TBUS connector			
With screw connection	**PSR-SCP- 24DC/TS/M[1])**	**2986012**	1
With spring-cage connection	**PSR-SPP- 24DC/TS/M[1])**	**2986025**	1

Accessories

Configuration package for the PSR-TRISAFE safety module, consists of SAFECONF software, USB connecting cable, and quick start guide			
German	**PSR-SAFECONF-BOX-DE**	**2986151**	1
English	**PSR-SAFECONF-BOX-EN**	**2986164**	1
Starter kit for the PSR-TRISAFE safety module, consists of PSR-TRISAFE demo board (with inputs and outputs), SAFECONF software, USB connecting cable (3 m), power supply with international plug adapters, quick start guide	**PSR-TRISAFE STARTER KIT**	**2986300**	1
Multi-functional memory block for the INTERFACE system	**IFS-CONFSTICK[1])**	**2986122**	1
PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	**2890425**	50

PSR-TRISAFE modular

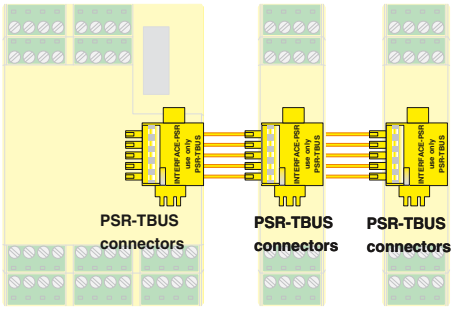
I/O extension for PSR-TRISAFE-M

- I/O extension for PSR-TRISAFE-M
- 8 safe digital inputs
- 4 safe digital outputs or 4 additional digital inputs (that can be configured using SAFECONF)
- 2 alarm outputs or 2 clock outputs (that can be configured using SAFECONF)
- Narrow 22.5 mm housing
- Including PSR-TBUS connector (DIN rail connector) for adapting to the PSR-TRISAFE-M master module
- Up to Cat. 4/PL e according to EN ISO 13849-1, SILCL 3 according to IEC 62061, SIL 3 according to IEC 61508

Notes:

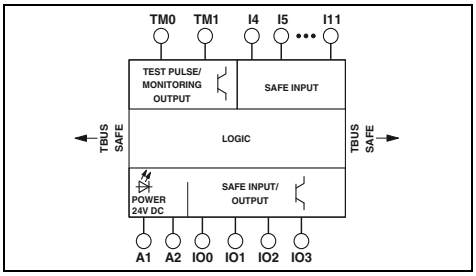
For PSR-TRISAFE-M master module, see page 102

1) EMC: Class A product, see page 553



The TBUS connectors carry out the cross-wiring between the modules.

Extension module with 8 safe inputs, plus 4 safe inputs or outputs



Technical data

Module data		
Nominal input voltage U_N		24 V DC (A1 / A2)
Permissible range (with reference to U_N)		0.85 ... 1.1
Typ. current consumption (with reference to U_N)		100 mA
Max. response time		< 30 ms
Interfaces		TBUS DIN rail for connection to the master module, supplied as standard
Input data		
Number of safe inputs		12 (of which 4 can be configured as input or output)
Nominal voltage		24 V DC
Output data		
Safe semiconductor outputs		4 (if the four parameterizable inputs/outputs are used as outputs)
Nominal voltage		24 V DC
Limiting continuous current		4x 0.5 A (see derating curve)
Cycle/alarm outputs		2
General data		
Ambient temperature range		-20 °C ... 55 °C
Screw connection solid/stranded/AWG		0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Spring-cage connection solid/stranded/AWG		0.2 - 1.5 mm² / 0.2 - 1.5 mm² / 24 - 16
Dimensions	Screw version	22.5 mm / 99 mm / 114.5 mm
W / H / D	Spring-cage version	22.5 mm / 112 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Extension module, 8 safe inputs and 4 safe freely parameterizable channels (as safe inputs or outputs), including PSR-TBUS connector			
With screw connection	**PSR-SCP- 24DC/TS/SDI8/SDIO4[1])**	**2986038**	1
With spring-cage connection	**PSR-SPP- 24DC/TS/SDI8/SDIO4[1])**	**2986041**	1

Accessories

PSR-TBUS DIN rail connector, for supplying/controlling/monitoring (depending on the module)	**PSR-TBUS**	**2890425**	50

SafetyBridge technology is the controller type and network-independent safety concept from Phoenix Contact.

It can be used to easily integrate functional safety in your machine or system and therefore eliminates the need for a safety controller.

SafetyBridge technology is integrated in the proven Inline I/O system. This means that additional installation guidelines do not have to be observed when installing SafetyBridge modules.

The safe modules can be used in an I/O station and distributed at any point in the network.

The SafetyBridge system is approved for PROFIBUS, PROFINET, EtherNet/IP™, sercos III, INTERBUS, DeviceNet™, Modbus, and CANopen® bus systems. The system is therefore completely controller and network-independent, and can therefore be used flexibly.

The input and output modules exchange safe signals with the logic module via the relevant automation network. The standard control system and the existing network are then only used as a transport medium and do not perform any safety-related tasks.

In this safety system, the safe logic module performs the task of generating and monitoring the SafetyBridge protocol.

The safety logic is also processed directly in the safe logic module. The configuration of the safety function and the parameterization of the safe SafetyBridge modules is performed seamlessly using SAFECONF software.

The new third generation SafetyBridge logic module supports connection to a maximum of 16 safe input and output modules.

Logic modules

The IB IL 24 LPSDO 8 V3-PAC logic module extends the possible field of application of the system significantly. In addition to the 16 possible connections for remote safe I/O modules, it also supports direct communication between the logic modules.

Features:

- Generation and monitoring of the SafetyBridge protocol
- Processing of the parameterized safety logic
- Control of 8 safe outputs onboard

Notes:
Further information on the SAFECONF configuration software can be found on page 110
1) EMC: Class A product, see page 553

Connection of up to 5 safe input/output modules

Connection of up to 16 safe input/output modules

	Technical data	Technical data
Local bus interface		
Connection method	Inline data jumper	Inline data jumper
Transmission speed	500 kbaud/2 Mbaud, can be selected	500 kbaud/2 Mbaud, can be selected
Power supply for module electronics		
Supply voltage	24 V DC (via voltage jumper)	24 V DC (via voltage jumper)
Supply voltage range	19.2 V DC ... 30 V DC	19.2 V DC ... 30 V DC
Digital outputs		
Connection technology	2, 3, 4-wire	2, 3, 4-wire
Maximum number of outputs	8	8
Maximum output current per channel	2 A	2 A
Protective circuit	Overload protection, short-circuit protection of outputs	Overload protection, short-circuit protection of outputs
SafetyBridge properties		
Connection to I/O modules	max. 5 (safe digital I/O modules)	max. 16 (safe digital I/O modules)
Logic memory	24 kbyte	60 kbyte
General data		
Connection method	Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	200 g	200 g
Width	48.8 mm	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Safety-related digital logic module						
- Connection to a maximum of five safe I/O modules	**IB IL 24 LPSDO 8 V2-PAC[1])**	**2700606**	1			
- Connection to a maximum of 16 safe I/O modules				**IB IL 24 LPSDO 8 V3-PAC**	**2701625**	1
	Accessories			**Accessories**		
Plug set, consisting of four Inline plugs with integrated discharge electronics	**IB IL 24 PSDO 8-PLSET/CP/R[1])**	**2700722**	1	**IB IL 24 PSDO 8-PLSET/CP/R[1])**	**2700722**	1
Configuration software for SafetyBridge and PSR-TRISAFE modules, can be downloaded free of charge at www.phoenixcontact.net/products	**SAFECONF**	**2986119**	1	**SAFECONF**	**2986119**	1
Starter kit, including ILC 130 ETH, LPSDO and PSDI SafetyBridge modules, control panel, power supply unit, plus accessories with preconfigured safety application	**ILC 130 SBT V2 STARTERKIT**	**2700993**	1			
Zack marker strip, flat (see Catalog 5)	ZBF 6...			ZBF 6...		

Safe I/O modules

The safe I/O modules can be used universally. The modules can be used in INTERBUS-Safety systems, PROFIsafe systems via PROFIBUS or PROFINET, and SafetyBridge systems.

The product range consists of safe input modules, positive wired output modules, positive/negative wired output modules, and floating output modules with integrated relay contacts.

An Inline station can be made up of safe and standard modules here, whereby a variety of function terminals are available to the user. The station is configured with high granularity with digital and analog inputs or outputs.

Within the relevant safety system, safety functions can be implemented in accordance with the following requirements:
– SIL 3 according to IEC 61508/EN 61508
– SILCL 3 according to IEC 62061/EN 62061
– PL e according to EN ISO 13849-1

Notes:
Further information on the SAFECONF configuration software can be found on page 110
1) EMC: Class A product, see page 553

Digital output module

Technical data

Local bus interface	
Fieldbus system	INTERBUS
Connection method	Inline data jumper
Transmission speed	500 kbaud/2 Mbaud, can be selected
Power supply for module electronics	
Supply voltage	24 V DC (via voltage jumper)
Supply voltage range	19.2 V DC ... 30 V DC
Digital outputs	
Connection method	2, 3, 4-wire
Number of outputs	4 (with two-channel assignment)
Maximum output current per channel	2 A
Protective circuit	Overload protection, short-circuit protection of outputs
General data	
Weight	200 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fail-safe digital output module - 8 outputs	**IB IL 24 PSDO 8-PAC**[1]**)**	**2985631**	1
Fail-safe relay output module - 4 outputs			
Safety digital output module, +/- switching - 4 outputs			

Accessories

Plug set, consisting of four Inline plugs with integrated discharge electronics	**IB IL 24 PSDO 8-PLSET/CP/R**[1]**)**	**2700722**	1
Zack marker strip, flat (see Catalog 5)	ZBF 6...		

Relay output module

Digital output module, +/- wired

Technical data

INTERBUS	
Inline data jumper	
500 kbaud/2 Mbaud, can be selected	
24 V DC (via voltage jumper)	
19.2 V DC ... 30 V DC	
2, 3, 4-wire	
4 (safety relays)	
4 A	
-	
310 g	
73.2 mm	
-25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 PSDOR 4-PAC[1])	**2985864**	1

Accessories

ZBF 6...

Technical data

INTERBUS	
Inline data jumper	
500 kbaud/2 Mbaud, can be selected	
24 V DC (via voltage jumper)	
19.2 V DC ... 30 V DC	
2, 3, 4-wire	
4 (for two-channel assignment, +/- switching)	
2 A	
Overload protection, short-circuit protection of outputs	
200 g	
48.8 mm	
-25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 PSDO 4/4-PAC[1])	**2916493**	1

Accessories

IB IL 24 PSDO 4/4-PLSET/CP/R[1])	**2700721**	1

ZBF 6...

Safe I/O modules

N

The safe input modules can be used universally. The modules can be used in INTERBUS-Safety systems, PROFIsafe systems via PROFIBUS or PROFINET, and SafetyBridge systems.

Within the relevant safety system, safety functions can be implemented in accordance with the following requirements:
– SIL 3 according to IEC 61508/EN 61508
– SILCL 3 according to IEC 62061/EN 62061
– PL e according to EN ISO 13849-1

Notes:
Further information on the SAFECONF configuration software can be found on page 110
1) EMC: Class A product, see page 553

Digital input module, 16 inputs

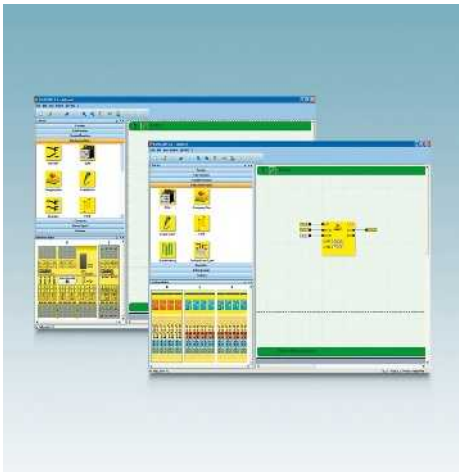
Digital input module, 8 inputs

Applied for:
Functional safety

	Technical data	Technical data
Local bus interface		
Fieldbus system	Local bus	INTERBUS
Connection method	Inline data jumper	Inline data jumper
Transmission speed	500 kbaud/2 Mbaud, can be selected	500 kbaud/2 Mbaud, can be selected
Power supply for module electronics		
Supply voltage	24 V DC (via voltage jumper)	24 V DC (via voltage jumper)
Supply voltage range	19.2 V DC ... 30 V DC	19.2 V DC ... 30 V DC
Digital inputs		
Connection method	2, 3, 4-wire	2, 3, 4-wire
Number of inputs	8 /16 (two channel/one channel)	4 / 8 (two channel/one channel)
General data		
Weight	225 g	200 g
Width	48.8 mm	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Fail-safe digital input module						
- 16 inputs	**IB IL 24 PSDI 16-PAC**	**2700994**	1			
- 8 inputs				**IB IL 24 PSDI 8-PAC[1])**	**2985688**	1
	Accessories			**Accessories**		
Plug set, consisting of four Inline plugs with integrated discharge electronics				**IB IL 24 PSDI 8-PLSET/CP/R[1])**	**2700720**	1
Zack marker strip, flat (see Catalog 5)	ZBF 6...			ZBF 6...		

SAFECONF – configuration software



The software implements the consistent configuration of the safety function and the parameterization of the safe SafetyBridge and PSR-TRISAFE modules.

Instead of being programmed, the required functions and components are simply dragged to the connection editor, where they can be linked. It takes just three steps to create a project, test it, and transfer it to the safety module.

When using SafetyBridge modules, you can create the safe configuration regardless of the controller and automation network used.

Configuration software for PSR-TRISAFE and SafetyBridge modules

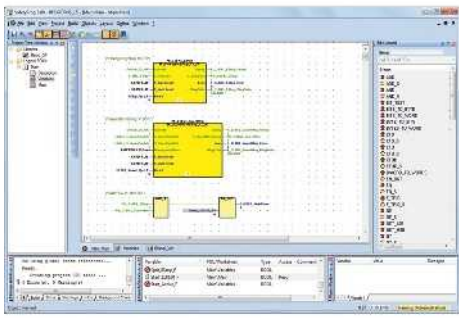
Technical data

Hardware requirements	
CPU	Pentium, 2 GHz (recommended), 1 GHz (min.)
Main memory (RAM)	(Under Windows 7/Windows Vista: 2 Gbytes (recommended) or 1 Gbyte (minimum), under Windows XP/2000: 1 Gbyte (recommended) or 512 Mbytes (minimum))
Hard disk memory	min. 250 MB
Optical drive	CD-ROM
Operating equipment	Keyboard, mouse
Monitor resolution	800x600
Software requirements	
Operating systems	MS Windows 2000 (SP4), MS Windows XP (SP2), MS Windows Vista, MS Windows 7
Supported browsers	Internet Explorer 5.0 or higher
Basic functions	
	Configuration software for PSR-TRISAFE and SafetyBridge technology
Languages supported	
	German, English, French, Spanish, Italian, Japanese

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Configuration software for SafetyBridge and PSR-TRISAFE modules, can be downloaded free of charge at www.phoenixcontact.net/products	**SAFECONF**	**2986119**	1

SAFETYPROG – programming software



SAFETYPROG can be used to develop safe applications with safety controllers - using PROFIsafe or INTERBUS-Safety networks.

The TÜV-certified programming tool guides you through the various development phases of a safety application:

– IEC 61131-compliant programming in function block diagram (FBD), ladder diagram (LD), and structured text (ST)
– Compiling the project
– Sending the project to the safety controller
– Controlling the safety controller, e.g., start, stop or reset
– Performing function tests
– Monitoring the safety controller and debugging the safety application
– Project documentation
– Printing project documentation

SAFETYPROG contains a comprehensive library with 20 certified function blocks for safety technology, all in accordance with PLCopen safety specification 1.0.

Useful tools

SAFETYPROG offers many innovative tools, which enable you to integrate functional safety in your automation system:

– User management
– Bus configuration project for importing process and diagnostic data
– Bus navigator
– Code editor and Edit wizard
– Coupling of safe and standard PLC
– Project tree
– Cross-reference and message windows
– Controller simulation
– Variable editor

Notes:

Further information on the safe PROFIsafe controller can be found on page 113

Programming software for INTERBUS-Safety systems and PROFIsafe controllers

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Programming software for INTERBUS-Safety systems and PROFIsafe controllers, with graphical user interface according to IEC 61131-3 in function block diagram (FBD) and ladder diagram (LD). **One library** from the corresponding **PLCopen libraries** can be used per project.	**SAFETYPROG BASIC**	**2700443**	1
Programming software for INTERBUS-Safety systems and PROFIsafe controllers, with graphical user interface according to IEC 61131-3 in function block diagram (FBD) and ladder diagram (LD). **Three of the libraries** from the corresponding **PLCopen libraries** can be used per project.	**SAFETYPROG ADVANCED**	**2700441**	1
Programming software for INTERBUS-Safety systems and PROFIsafe controllers, with graphical user interface according to IEC 61131-3 in function block diagram (FBD) and ladder diagram (LD). **All of the libraries** from the corresponding **PLCopen libraries** can be used per project.	**SAFETYPROG PROFESSIONAL**	**2700442**	1

Safe PROFINET gateway

The safe PROFINET gateway from Phoenix Contact enables secure communication between two PROFINET networks. This means that you can implement system-wide and manufacturer-independent functional safety, such as emergency stop concepts.

Your advantages:
– Coupling of two PROFINET systems
– Transmission of standard I/O data via PROFINET
– Transmission of safe I/O data via PROFIsafe
– Redundant power supply
– Control-independent

Within a PROFIsafe system, the safety functions associated with the following requirements are supported:
– SIL 3 according to IEC 61508
– SILCL 3 according to EN 62061
– PL e according to EN ISO 13849-1

Notes:
1) EMC: Class A product, see page 553

Safe PROFINET gateway

PROFIBUS PROFIsafe

Technical data

Supply	
Supply voltage	24 V DC
Supply voltage range	18.5 V DC ... 30 V DC (including ripple)
Max. current consumption	max. 250 mA
Programming data	
IN and OUT process data	128 Byte (2 - 11 bytes of safe IO process data)
General data	
Weight	550 g
Width	130 mm
Height	27 mm
Depth	145 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Safe **PROFINET gateway**	**FL PN/PN SDIO-2TX/2TX[1])**	**2700651**	1

Accessories

Color marking for FL CAT ...patch...			
- Blue	**FL PATCH CCODE BU**	**2891291**	20
- Red	**FL PATCH CCODE RD**	**2891893**	20
Lockable security element for FL PATCH...	**FL PATCH GUARD**	**2891424**	20
Key for FL PATCH GUARD	**FL PATCH GUARD KEY**	**2891521**	1
Security element for FL CAT ...patch...	**FL PATCH SAFE CLIP**	**2891246**	20

Safe PROFIsafe controller

The RFC 470S is the safety version of the most powerful high-end PLC and offers all the features of the class 400 high-performance controller. In addition, it has an integrated safety controller. This combination can be used to integrate safety functions up to SIL 3 into existing systems.

Your advantages:
- The use of PROFIsafe reduces wiring effort and installation time
- Thanks to the integrated PROFINET interface, the RFC 470S communicates directly with PROFIsafe modules
- The safety function is programmed using the SAFETYPROG software

Depending on the parameterization of the I/O modules and the programming, the RFC 470S can meet the following requirements:
- SIL 3 according to IEC 61508
- SILCL 3 according to EN 62061
- PL e according to EN ISO 13849-1

Notes:
Further information on class 400 high-performance controllers can be found in the "Controllers" section of this catalog.
Further information on the SAFETYPROG programming software can be found on page 111
1) EMC: Class A product, see page 553

Class 400 high-performance controller with integrated safety controller

Technical data

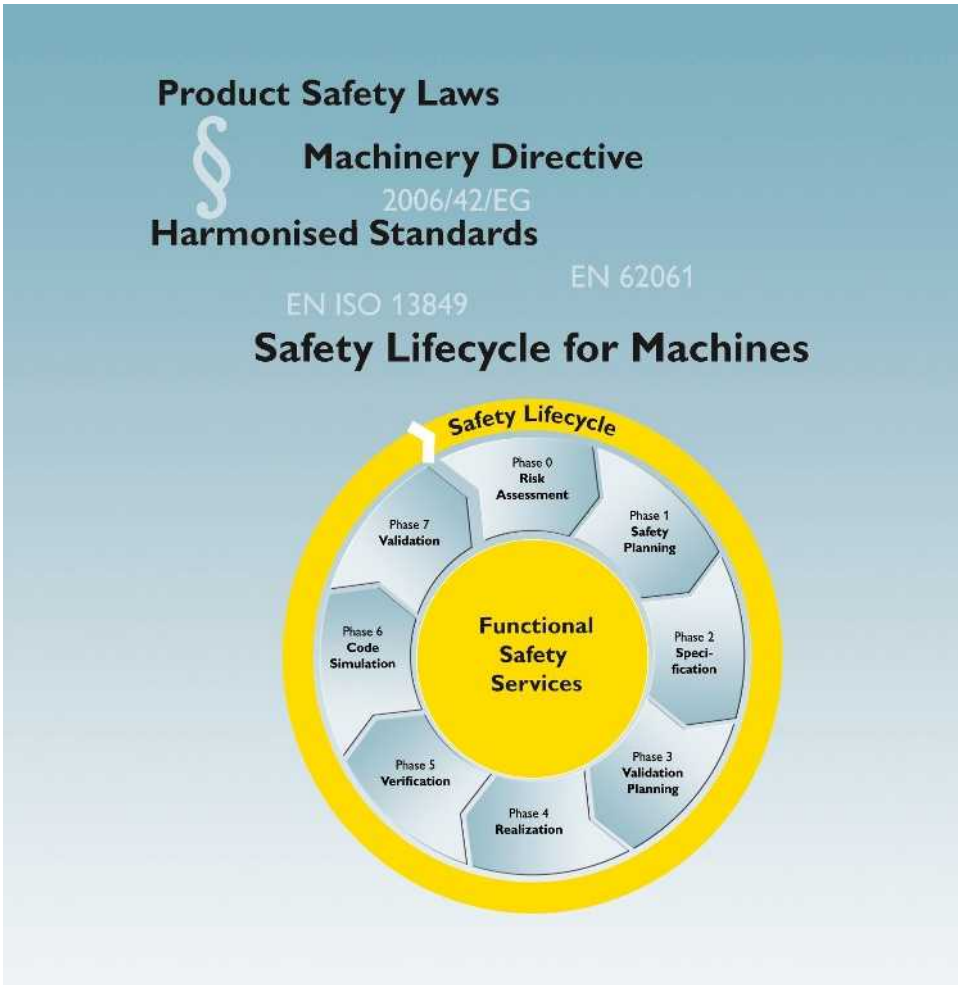
Interfaces	
INTERBUS (Master)	D-SUB-9 socket
Ethernet	3x RJ45 sockets
Parameterization/operation/diagnostics	V.24 (RS-232-C), D-SUB plug, 10/100 Ethernet (RJ45), 2x USB
INTERBUS master	
Number of possible parameter channels	max. 126
Number of I/O nodes	max. 8192
Number of supported devices	max. 512 (of which 254 are remote bus devices/bus segments)
Direct I/Os	
Connection method	14-pos. FLK pin strip
Number of inputs	5
Number of outputs	3
IEC-61131 runtime system	
Processing speed	0.005 ms (1 K mix instructions) 1 µs (1 K bit instructions)
Program memory	Typ. 8 Mbyte (680 K instructions (IL))
Data memory	16 Mbyte
Retentive data memory	240 kbyte (NVRAM)
Number of data blocks	(depends on data memory)
Number of timers, counters	(depends on data memory)
Number of control tasks	16
Realtime clock	Integrated (battery backup)
Power supply	
Power supply connection	Screw terminal blocks, plug-in
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including ripple)
Typical current consumption	1 A
General data	
Width	124 mm
Height	185 mm
Depth	190 mm
Degree of protection	IP20
Ambient temperature (operation)	0 °C ... 55 °C (from 45°C only with fan module)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Safety controller			
	RFC 470S PN 3TX[1])	**2916794**	1

Accessories

Parameterization memory			
- 256 MB	**CF FLASH 256MB**	**2988780**	1
- 2 GB	**CF FLASH 2GB**	**2701185**	1
Programming cable, to connect the controller boards to the PC (V.24 (RS-232-C)), length 3 m	**IBS PRG CAB**	**2806862**	1
V.24 (RS-232) null modem adapter			
- 9-pos. socket to 9-pos. plug	**PSM-AD-D9-NULLMODEM**	**2708753**	1
Fan module for Remote Field Controller	**RFC DUAL-FAN[1])**	**2730239**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1
SAFETYPROG programming software			
- Basic	**SAFETYPROG BASIC**	**2700443**	1
- Advanced	**SAFETYPROG ADVANCED**	**2700441**	1
- Professional	**SAFETYPROG PROFESSIONAL**	**2700442**	1
Engineering software	**PC Worx ... (see "Software" section)**		



Safety lifecycle

Based on the harmonized standards of the Machinery Directive, Phoenix Contact has developed a phase model, which represents the safety lifecycle. This structured procedure assists in the application of and conformance with the harmonized standards of the Machinery Directive.

The safety lifecycle represents a specific process for the design and manufacture of machinery, which fully includes the requirements for functional safety. The phase-specific verification documentation already includes the contents required in order to demonstrate CE conformance. This is a legal requirement for placing items on the market in the European Economic Area.

Expert support

With our services for functional safety, we focus on the safety lifecycle for machines. This means that as the person responsible, you can be sure that all systematic errors will be eliminated on your machine and all requirements of standards will be met.

We are on hand to assist you throughout the entire lifecycle of your application: we provide support from the initial risk assessment, drafting the concept, implementation, startup, and operation right up to system modernization.

The choice is yours:

– Appoint one of our safety experts for consultation, process assistance, engineering or service activities
– Ask us to train and qualify your employees

Your advantages from our safety services

– Time saved by transferring safety requirements
– Maximum legal certainty
– Optimum technical safety solution
– Sophisticated process management
– Target-oriented project management
– Traceable, legal protection thanks to consistent documentation

First aid

If queries arise during startup and operation, in addition to your local specialists you can also contact our free 24-hour safety hotline at any time (+ 49 5281 9-462777) or e-mail us on safety-service@phoenixcontact.com.

Detailed consulting

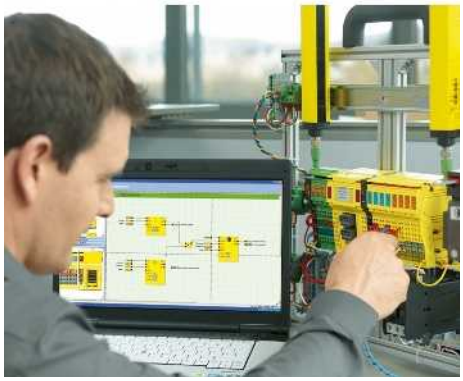
We are here to advise you from the initial planning of your safety-related application right up to startup.

Individual consultation sessions focusing on your specific requirements are a solid basis for further measures.

Presentation

Our safety specialists provide support by consulting with your company's design experts.

Through intensive consultation, we will work with you at each stage to develop the ideal solution for your requirements.



Safety engineering

Our safety specialists support you from the initial planning of your safety-related application right up to startup and system modernization.

Safety service

Use our range of safety services for startup, operation or system modernization.

Should you have any general queries about the functions of components, use our free 24-hour safety hotline and we will assist you directly on site while the process is running.

Individual safety training

If you require specialist knowledge for your safety environment and wish to arrange the training location and schedule yourself, then we can create an individual training course for you.

Services for Industrial Ethernet can be found on page 46.

Services for automation can be found on page 546.

PHOENIX CONTACT
WARTEZEIT
45,1
4,2
58
59
88,8
25,2
17,6
59,4
448
Status: ok
Mode: automatic
Level 87 %
Temperature: 55 °C
Pressure: 2,71 bar
F1
F2
F3
F4

HMIs and industrial PCs

HMIs and industrial PCs are the key to the efficient operation and monitoring of your systems and machines. You can work with a portable Bluetooth tablet PC directly on site – or design detailed user interfaces as the interface to your system using a powerful HMI device.

Industrial PCs and HMIs from Phoenix Contact are so versatile and flexible that they do not present any restrictions for your operation and monitoring concepts. Visu+ and WebVisit are the corresponding visualization software tools. In addition to the wide range of products, we also provide worldwide service.

HMIs

Human-machine interfaces, or HMIs for short, represent cost-effective automation based on efficient input and monitoring. Depending on your requirements, you can select devices for basic, standard or high-end applications. Whether directly on site, centrally in the control center, high performance or multifunctional: it is you who determines the features of the HMIs.

Industrial PCs

Industrial PCs, or IPCs for short, combine the computing capacity of modern processors with the robustness and reliability of industrial components. Together with the right software, IPCs are efficient and versatile solutions for controlling, operating, and monitoring systems and machines.

Product overview	**118**
HMIs	
HMIs for basic applications	**120**
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Industrial PCs	
Box PCs	**128**
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Panel PCs	**134**
Tablet PCs	**142**

Minitouch

Web panels

Type	**TD 1030T**	**WP 04T WP 06T**	**WP 10T WP 15T**	**WP 07T/WS WP 09T/WS**	**WP 06T/XC WP 07T/XC**
Description	2.8" color TFT display	3.5"/5.7" color TFT display	10.4" … 15" color TFT display	Widescreen 7" … 9" color TFT display	Outdoor 5.7" … 7" color TFT display
Page	**120**	**120**	**121**	**121**	**121**

Touch panels

Type	**TP 3057M …**	**TP 3xxxT …**	**TP 5xxxT**	**TP 5xxxC**	**TP .../M 201**
Description	5.7" monochrome display PROFIBUS DP, MPI, CANopen® or serial interface as an option	5.7" … 12.1" color TFT display	12.1" ... 17" color TFT display Intel Atom CPU	12.1" ... 17" color TFT display Celeron M CPU	7" … 15" display Touch panel for maritime applications
Page	**122**	**122**	**124**	**124**	**126**

Box PCs

Type	**VL BPC MINI**	**VL BPC 1000**	**VL BPC 1001**	**VALUELINE IPC**	**VL IPC P7000**
Description	Box PC for DIN rail mounting	Box PC for DIN rail mounting	Box PC for DIN rail mounting	Configurable box PC for wall mounting without/with PCI extension	Configurable box PC for wall mounting
Page	**128**	**129**	**129**	**130**	**131**

Monitors with touch function

Type	**VL FPM 12(U)**	**VL FPM 15(U)**	**VL FPM 17(U)**	**VL FPM 19U**	**Accessories**
Description	12.1" color TFT display, optional USB port on front	15" color TFT display, optional USB port on front	17" color TFT display, optional USB port on front	19" color TFT display, with USB port on front	Transparent, silicon-free protective foil for 15" touch screen
Page	**132**	**133**	**133**	**133**	**133**

Panel PCs

Type	**EL PPC7 1000 EL PPC9 1000**	**EL PPC12 1000 EL PPC15 1000**	**VALUELINE IPC**	**VL IPC P7000**	**Accessories**
Description	Configurable panel PC with 7" … 9" widescreen display	Configurable panel PC with 12" … 15.4" widescreen display	Configurable panel PC with 12" ... 24" display without/with PCI extension	Configurable panel PC with 12" … 24" display	Mounting kit, protective foil for 15" touch screen
Page	**134**	**135**	**134**	**134**	

IP65 panel PCs

Type	**DL PPC15 1000**	**DL PPC15M 1000**	**VMT 30xx**	**VMT 30xx EXP SUN**	**Accessories**
Description	Configurable panel PC with IP65 protection with touch screen, 15" display	Configurable panel PC with IP65 protection with multi-touch screen, 15" display	Configurable panel PC with IP65 protection with touch screen, 8" … 15" display	Panel PC with IP65 protection with touch screen, 10.4" … 12.1" sunlight readable display	Brackets, external power supply unit
Page	**138**	**139**	**140**	**141**	**140**

Tablet PCs

Type	**TPC 6013…**	**Accessories**
Description	Mobile tablet PC with touch screen, 13.3" display	3-point belt, hand strap, touch pen, mechanical docking with lock, replacement battery
Page	**142**	**142**

Software

Software PLC

Type	**WEBVISIT …**	**VISU+ 2 …**	**PORTICO**	**PC Worx RT BASIC**
Description	Development software for all web panels	Development software for all touch panels and operator terminals	Remote control of networked IPCs	The software PLC transforms your PC into a controller
Page	**See "Software" section**			**See "Controllers" section**

Minitouch and web panels

N

Web panel and minitouch devices are inexpensive operator panels for basic operation and monitoring tasks.

Features:

- Tailor-made for class 100 compact controllers
- Fast startup thanks to plug & play
- **Minitouch:** alphanumeric 4-color display
- **Web panel:** full graphic color display for clear representation
- Quick and user-friendly representation of your control variables using PC Worx EXPRESS and WebVisit software tools
- Multi-user operation thanks to server/client structure
- Easy device replacement, as the project is saved on the PLC

Notes:

1) EMC: Class A product, see page 553

Minitouch
7.1 cm (2.8") TFT color display

Web panel
8.9 cm (3.5")/14.5 cm (5.7")
TFT color display

	Technical data	Technical data	
		WP 04T[1])	WP 06T[1])
Display data			
Display	7.1 cm/2.8" TFT active	8.9 cm/3.5" TFT active	14.5 cm/5.7" TFT active
Monitor resolution	320 x 240 Pixel (QVGA)	320 x 240 Pixel (QVGA)	
Display lighting type	LED	LED	
Brightness	280 cd/m², typical (adjustable)	350 cd/m², typical (adjustable)	380 cd/m², typical (adjustable)
Display backlight MTBF	40000 h	40000 h	
Color spectrum	4 colors	65,536 colors	
Touch screen	Resistive industrial touch screen	Resistive industrial touch screen	
Computer data			
Operating systems	Keil RTX (RTOS)	Windows CE 5.0	
Processor	Cortex™-M3 120 MHz	RISC ARM9™ CPU ; 200 MHz	
Main memory	96 kB SRAM	64 Mbyte SDRAM	
Data memory	512 kB flash memory	32 Mbyte flash memory	
Interfaces	None	2x USB Host 2.0	
External dimensions			
Width	96 mm	120 mm	168 mm
Height	72 mm	90 mm	126 mm
Depth	60 mm	5 mm	
Installation dimensions			
Width	92.8 mm	112 mm	160 mm
Height	68.7 mm	82 mm	118 mm
Installation depth	53.5 mm	35 mm	42 mm
General data			
Degree of protection	IP54 (front), IP20 (back)	IP65 (front), IP20 (back)	
Ambient temperature (operation)	0 °C ... 50 °C	0 °C ... 50 °C	
Mounting type	Installation in front plate	Installation in front plate	
Vibration (operation)	DIN EN 60068-2-6	DIN EN 60068-2-6	
Shock	DIN EN 60068-2-27	DIN EN 60068-2-27	

Description	Ordering data Type	Order No.	Pcs. / Pkt.	Ordering data Type	Order No.	Pcs. / Pkt.
Minitouch						
- 7.1 cm (2.8") display	**TD 1030T**	**2701257**	1			
Web panel						
- 8.9 cm (3.5") display				**WP 04T[1])**	**2913632**	1
- 14.5 cm (5.7") display				**WP 06T[1])**	**2913645**	1
- 26.4 cm (10.5") display						
- 38.1 cm (15") display						
Widescreen web panel						
- 17.8 cm (7") display						
- 22.9 cm (9") display						
Web panel, extended temperature range						
- 14.5 cm (5.7") display						
- 17.8 cm (7") display						

Web panel
26.4 cm (10.4")/38.1 cm (15")
TFT color display

Widescreen web panel
17.8 cm (7")/22.9 cm (9")
TFT color display

Outdoor web panel
14.5 cm (5.7")/17.8 cm (7")
TFT color display

Technical data

	WP 10T[1])	WP 15T[1])
	26.4 cm/10.4" TFT active 800 x 600 Pixel (SVGA)	38.1 cm/15" TFT active 1024 x 768 Pixel (XGA)
	LED	
	330 cd/m²	480 cd/m²
	50000 h	
	65,536 colors	
	Resistive industrial touch screen	
	Windows CE 5.0 RISC ARM9™ CPU ; 200 MHz 64 Mbyte SDRAM 32 Mbyte flash memory 2x USB Host 2.0	
	295 mm 220 mm	400 mm 329 mm
	5 mm	
	287 mm 212 mm 55 mm	374 mm 303 mm 60 mm
	IP65 (front), IP20 (back) 0 °C ... 50 °C Installation in front plate DIN EN 60068-2-6 DIN EN 60068-2-27	

Ordering data

Type	Order No.	Pcs. / Pkt.
WP 10T[1])	**2700934**	1
WP 15T[1])	**2700935**	1

Technical data

	WP 07T/WS[1])	WP 09T/WS[1])
	17.8 cm/7" TFT active 800 x 480 Pixel (WVGA)	22.9 cm/9" TFT active
	CCFL	
	400 cd/m², typical (adjustable)	240 cd/m², typical (adjustable)
	50000 h	
	65,536 colors	
	Resistive industrial touch screen	
	Windows CE 5.0 RISC ARM9™ CPU ; 200 MHz 64 Mbyte SDRAM 32 Mbyte flash memory 2x USB Host 2.0	
	203 mm 147 mm	260 mm 172 mm
	5 mm	
	195 mm 139 mm	252 mm 164 mm
	54 mm	
	IP65 (front), IP20 (back) 0 °C ... 50 °C Installation in front plate DIN EN 60068-2-6 DIN EN 60068-2-27	

Ordering data

Type	Order No.	Pcs. / Pkt.
WP 07T/WS[1])	**2700307**	1
WP 09T/WS[1])	**2700309**	1

Technical data

	WP 06T/XC	WP 07T/XC
	14.5 cm/5.7" TFT active 320 x 240 Pixel (QVGA)	17.8 cm/7" TFT active 800 x 480 Pixel (WVGA)
	LED	
	400 cd/m², typical (adjustable)	350 cd/m², typical (adjustable)
	40000 h	
	65,536 colors	
	Resistive industrial touch screen	
	Windows CE 5.0 RISC ARM9™ CPU ; 184 MHz 128 Mbyte SDRAM 64 Mbyte flash memory 2x USB Host 2.0	
	195 mm 153 mm	234 mm 173 mm
	5 mm	
	161 mm 119 mm	200 mm 140 mm
	42 mm	
	IP67 (front), IP20 (back) -20 °C ... 70 °C Installation in front plate DIN EN 60068-2-6 DIN EN 60068-2-27	

Ordering data

Type	Order No.	Pcs. / Pkt.
WP 06T/XC	**2701555**	1
WP 07T/XC	**2701556**	1

Touch panels

Thanks to the numerous interfaces, drivers, and display sizes, touch panels from Phoenix Contact can be optimally adapted to your requirements. Licenses are already included for the Visu+ software and the OPC server.

Your advantages:

– Save costs and increase service life, thanks to LED backlighting that can be adjusted directly via buttons
– Increase system availability, thanks to temperature and voltage monitoring
– Quick response in the event of an alarm with integrated buzzer (85 dB)
– Global use: additional fonts are easy to install
– Available with PROFIBUS DP, MPI, CANopen®, and serial interface as an option
– Expansion with external flash mass storage

14.5 cm (5.7") monochrome display

14.5 cm (5.7") TFT color display

Notes:

1) EMC: Class A product, see page 553

	Technical data	Technical data
Display data		
Display	14.5 cm/5.7" TFT active	14.5 cm/5.7" TFT active
Monitor resolution	320 x 240 Pixel (QVGA)	320 x 240 Pixel (QVGA)
Display lighting type	LED	LED
Brightness	250 cd/m², typical (adjustable)	350 cd/m², typical (adjustable)
Display backlight MTBF	40000 h	40000 h
Color spectrum	256-step grayscale	65,536 colors
Touch screen	Resistive industrial touch screen	Resistive industrial touch screen
Computer data		
Operating systems	Windows CE 6.0	Windows CE 6.0
Processor	Xscale® PXA320, 806 MHz	Xscale® PXA320, 806 MHz
Main memory	128 Mbyte SDRAM	128 Mbyte SDRAM
Data memory	1 GB flash memory	1 GB flash memory
Interfaces	2x USB Host 1.1, 1x Compact Flash®	2x USB Host 1.1, 1x Compact Flash®
External dimensions		
Width	203 mm	203 mm
Height	147 mm	147 mm
Depth	5 mm	5 mm
Installation dimensions		
Width	195 mm	195 mm
Height	139 mm	139 mm
Installation depth	49 mm	49 mm
	55 mm, approximately with fieldbus interface	55 mm, approximately with fieldbus interface
General data		
Degree of protection	IP65 (front), IP20 (back)	IP65 (front), IP20 (back)
Ambient temperature (operation)	0 °C ... 50 °C	0 °C ... 50 °C
Mounting type	Installation in front plate	Installation in front plate
Vibration (operation)	DIN EN 60068-2-6	DIN EN 60068-2-6
Shock	DIN EN 60068-2-27	DIN EN 60068-2-27

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Touch panel with graphics-capable TFT display, 1 x Ethernet, 2 x USB, and integrated runtime of the Visu+ visualization software						
- Without fieldbus interface	**TP 3057M[1])**	**2700901**	1	**TP 3057T[1])**	**2700906**	1
Touch panel with graphics-capable TFT display, 1 x Ethernet, 2 x USB, and integrated runtime of the Visu+ visualization software						
- PROFIBUS DP interface	**TP 3057M PB[1])**	**2700902**	1	**TP 3057T PB[1])**	**2700907**	1
- MPI interface	**TP 3057M MPI[1])**	**2700903**	1	**TP 3057T MPI[1])**	**2700908**	1
- CANopen® interface	**TP 3057M CO[1])**	**2700904**	1	**TP 3057T CO[1])**	**2700909**	1
- RS-232 interface	**TP 3057M SER[1])**	**2700905**	1	**TP 3057T SER[1])**	**2700910**	1
	Accessories			**Accessories**		
Mounting kit, including hardware for installation						
- Panel installation	**HMI SCB MOUNTING KIT 6**	**2701385**	1	**HMI SCB MOUNTING KIT 6**	**2701385**	1

17.8 cm (7") TFT color display

26.4 cm (10.4") TFT color display

30.7 cm (12.1") TFT color display

Technical data

Display	17.8 cm/7" TFT active
	800 x 480 Pixel (WVGA)
	LED
	350 cd/m², typical (adjustable)
	40000 h
	65,536 colors
	Resistive industrial touch screen
System	Windows CE 6.0
	Xscale® PXA320, 806 MHz
	128 Mbyte SDRAM
	1 GB flash memory
	2x USB Host 1.1, 1x Compact Flash®
Dimensions	203 mm
	147 mm
	5 mm
Mounting cutout	195 mm
	139 mm
	49 mm
	55 mm, approximately with fieldbus interface
Ambient conditions	IP65 (front), IP20 (back)
	0 °C ... 50 °C
	Installation in front plate
	DIN EN 60068-2-6
	DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
TP 3070T[1])	**2700911**	1
TP 3070T PB[1])	**2700912**	1
TP 3070T MPI[1])	**2700913**	1
TP 3070T CO[1])	**2700914**	1
TP 3070T SER[1])	**2700915**	1

Accessories

HMI SCB MOUNTING KIT 6	**2701385**	1

Technical data

Display	26.4 cm/10.4" TFT active
	800 x 600 Pixel (SVGA)
	LED
	350 cd/m², typical (adjustable)
	50000 h
	65,536 colors
	Resistive industrial touch screen
System	Windows CE 6.0
	Xscale® PXA320, 806 MHz
	128 Mbyte SDRAM
	1 GB flash memory
	2x USB Host 1.1, 1x Compact Flash®
Dimensions	295 mm
	220 mm
	5 mm
Mounting cutout	287 mm
	212 mm
	56 mm
	61 mm, approximately with fieldbus interface
Ambient conditions	IP65 (front), IP20 (back)
	0 °C ... 50 °C
	Installation in front plate
	DIN EN 60068-2-6
	DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
TP 3105T[1])	**2700916**	1
TP 3105T PB[1])	**2700917**	1
TP 3105T MPI[1])	**2700918**	1
TP 3105T CO[1])	**2700919**	1
TP 3105T SER[1])	**2700920**	1

Accessories

HMI SCB MOUNTING KIT 8	**2701387**	1

Technical data

Display	30.7 cm/12.1" TFT active
	800 x 600 Pixel (SVGA)
	LED
	300 cd/m², typical (adjustable)
	50000 h
	65,536 colors
	Resistive industrial touch screen
System	Windows CE 6.0
	Xscale® PXA320, 806 MHz
	128 Mbyte SDRAM
	1 GB flash memory
	2x USB Host 1.1, 1x Compact Flash®
Dimensions	340 mm
	270 mm
	5 mm
Mounting cutout	315 mm
	243.5 mm
	60 mm
	65 mm, approximately with fieldbus interface
Ambient conditions	IP65 (front), IP20 (back)
	0 °C ... 50 °C
	Installation in front plate
	DIN EN 60068-2-6
	DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
TP 3121T[1])	**2700921**	1
TP 3121T PB[1])	**2700922**	1
TP 3121T MPI[1])	**2700923**	1
TP 3121T CO[1])	**2700924**	1
TP 3121T SER[1])	**2700925**	1

Accessories

HMI SCB MOUNTING KIT 8	**2701387**	1

Touch panels

N

Powerful touch panels with PC platform are the ideal solution for graphics-intensive visualization applications. The devices in the 5000 series are ideal for use in large networked machines and systems. Thanks to technical properties such as the X86 platform with Windows CE, the HMIs offer a fair price/performance ratio. You can therefore even implement intelligent operating concepts in complex systems.

Additional features:

– Cost-effective solution, since there are no additional costs for SCADA runtime: unlimited runtime license for VISU+ RT and AX OPC SERVER included
– Ethernet-based drivers available for connection to third-party systems
– Additional monitor connection possible by using the VGA interface (multi-user function)
– Remote access to user interface via web-capable devices thanks to Visu+ web client functionality
– Easy to maintain thanks to external data backup and event-oriented e-mail/SMS messaging
– High system availability thanks to OPC with redundancy support
– Particularly reliable thanks to integrated connection for uninterruptible power supply (UPS)

30.7 cm (12.1") TFT color display

Technical data

	TP 5120T	TP 5120C
Display data		
Display	30.7 cm/12.1" TFT active	
Monitor resolution	800 x 600 Pixel (SVGA)	
Display lighting type	CCFL	
Brightness	400 cd/m², typical (adjustable)	
Display backlight MTBF	50000 h	
Color spectrum	65,536 colors	
Touch screen	Resistive industrial touch screen	
Computer data		
Operating systems	Windows CE 6.0	
Processor	Atom™ 1.6 GHz	Celeron® M 1.01 GHz
Main memory	1 GB DDR	
Data memory	CompactFlash®, 2 GB	
Interfaces	COM 1 (RS-232), 1x VGA, 4x USB, 2x CompactFlash®	
External dimensions		
Width	365 mm	
Height	282 mm	
Depth	10 mm	
Installation dimensions		
Width	334 mm	
Height	253 mm	
Installation depth	94 mm	
General data		
Degree of protection	IP65 (front), IP20 (back)	
Ambient temperature (operation)	-20 °C ... 55 °C	
Mounting type	Installation in front plate	
Vibration (operation)	DIN EN 60068-2-6	
Shock	15g, 11 ms in accordance with IEC 60068-2-27	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Touch panel			
- Atom 1.6 GHz	**TP 5120T**	**2700621**	1
- Celeron M 1.01 GHz processor	**TP 5120C**	**2701719**	1

Accessories

Stylus for touch screens	**TOUCH PEN**	**2701379**	1
USB flash memory	**2 GB USB STICK**	**2701382**	1
Mounting kit, including hardware for installation			
- Panel installation	**VL PANEL MOUNTING KIT**	**2913159**	1

N

38.1 cm (15") color TFT display

N

43.2 cm (17") TFT color display

Technical data

TP 5150T	TP 5150C
38.1 cm/15" TFT active 1024 x 768 Pixel (XGA) CCFL 350 cd/m², typical (adjustable) 50000 h 65,536 colors Resistive industrial touch screen	
Windows CE 6.0 Atom™ 1.6 GHz	Celeron® M 1.01 GHz 1 GB DDR CompactFlash®, 2 GB COM 1 (RS-232), 1x VGA, 4x USB, 2x CompactFlash®
410 mm 309 mm 10 mm	
386.6 mm 285 mm 96 mm	
IP65 (front), IP20 (back) -20 °C ... 55 °C Installation in front plate DIN EN 60068-2-6 15g, 11 ms in accordance with IEC 60068-2-27	

Technical data

TP 5170T	TP 5170C
43.2 cm/17" TFT active 1280 x 1024 Pixel (SXGA) CCFL 350 cd/m², typical (adjustable) 50000 h 65,536 colors Resistive industrial touch screen	
Windows CE 6.0 Atom™ 1.6 GHz	Celeron® M 1.01 GHz 1 GB DDR CompactFlash®, 2 GB COM 1 (RS-232), 1x VGA, 4x USB, 2x CompactFlash®
452 mm 356.5 mm 10 mm	
424 mm 329.5 mm 99 mm	
IP65 (front), IP20 (back) -20 °C ... 50 °C Installation in front plate DIN EN 60068-2-6 15g, 11 ms in accordance with IEC 60068-2-27	

Ordering data

Type	Order No.	Pcs. / Pkt.
TP 5150T	**2700622**	1
TP 5150C	**2701720**	1

Accessories

TOUCH PEN	**2701379**	1
2 GB USB STICK	**2701382**	1
VL PANEL MOUNTING KIT	**2913159**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
TP 5170T	**2700623**	1
TP 5170C	**2701721**	1

Accessories

TOUCH PEN	**2701379**	1
2 GB USB STICK	**2701382**	1
VL PANEL MOUNTING KIT	**2913159**	1

Touch panels

HMI devices for maritime applications are the reliable and robust solution for demanding applications on ships. The devices are specifically tested and approved for shipbuilding.

Your advantages:

- Tested quality - certified according to GL, LR, BV, DNV, and ABS
- Flexible communication, even with third-party systems, thanks to numerous drivers
- Save costs and increase service life, thanks to LED backlighting that can be adjusted directly via buttons
- Increase system availability, thanks to temperature and voltage monitoring
- Save costs for acoustic signaling devices: integrated buzzer
- Global use: additional fonts are easy to install
- Cost-effective solution, since there are no additional costs for SCADA runtime: unlimited runtime license for VISU+ RT and AX OPC SERVER included

Notes:

1) EMC: Class A product, see page 553

17.8 cm (7") TFT color display

Technical data

Display data	
Display	17.8 cm/7" TFT active
Monitor resolution	800 x 480 Pixel (WVGA)
Display lighting type	CCFL
Brightness	400 cd/m², typical (adjustable)
Display backlight MTBF	50000 h
Color spectrum	65,536 colors
Touch screen	Resistive industrial touch screen
Computer data	
Operating systems	Windows CE 5.0
Processor	RISC ARM9™ CPU ; 200 MHz
Main memory	64 Mbyte SDRAM
Data memory	32 Mbyte flash memory
Interfaces	2x USB Host 2.0
External dimensions	
Width	203 mm
Height	165 mm
Depth	5 mm
Installation dimensions	
Width	195 mm
Height	157 mm
Installation depth	56 mm
General data	
Degree of protection	IP65 (front), IP20 (back)
Ambient temperature (operation)	0 °C ... 50 °C
Mounting type	Installation in front plate
Vibration (operation)	DIN EN 60068-2-6
Shock	DIN EN 60068-2-27

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Touch panel with graphic-capable display - 7" TFT display - 10.4" TFT display - 12.1" TFT display - 15.1" TFT display	**TP 07T/M 201[1])**	**2913234**	1

Accessories

Stylus for touch screens	**TOUCH PEN**	**2701379**	1
USB flash memory	**2 GB USB STICK**	**2701382**	1
CMOS battery	**HMI BATTERY**	**2701383**	1
Mounting kit, including hardware for installation - Panel installation	**HMI SCB MOUNTING KIT 6**	**2701385**	1
Protective foil for touch screen	**7" DISPLAY PROTECTIVE FOIL**	**2701374**	1

26.4 cm (10.4") TFT color display

30.7 cm (12.1") TFT color display

38.1 cm (15") color TFT display

Technical data

26.4 cm/10.4" TFT active	
640 x 480 Pixel (VGA)	
LED	
350 cd/m², typical (adjustable)	
50000 h	
65,536 colors	
Resistive industrial touch screen	
Windows CE 5.0	
Xscale® PXA320, 806 MHz	
64 Mbyte SDRAM	
1 GB flash memory	
2x USB Host 1.1, 1x Compact Flash®	
328 mm	
265 mm	
5 mm	
303 mm	
238 mm	
57 mm	
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Installation in front plate	
DIN EN 60068-2-6	
DIN EN 60068-2-27	

Ordering data

Type	Order No.	Pcs. / Pkt.
TP 10T/M 201[1])	**2913247**	1

Accessories

TOUCH PEN	**2701379**	1
2 GB USB STICK	**2701382**	1
HMI BATTERY	**2701383**	1
HMI SCB MOUNTING KIT 8	**2701387**	1
10,4" DISPLAY PROTECTIVE FOIL	**2701376**	1

Technical data

30.7 cm/12.1" TFT active	
800 x 600 Pixel (SVGA)	
LED	
300 cd/m², typical (adjustable)	
50000 h	
65,536 colors	
Resistive industrial touch screen	
Windows CE 5.0	
Xscale® PXA320, 806 MHz	
64 Mbyte SDRAM	
1 GB flash memory	
2x USB Host 1.1, 1x Compact Flash®	
340 mm	
285 mm	
5 mm	
315 mm	
259 mm	
62 mm	
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Installation in front plate	
DIN EN 60068-2-6	
DIN EN 60068-2-27	

Ordering data

Type	Order No.	Pcs. / Pkt.
TP 12T/M 201[1])	**2913250**	1

Accessories

TOUCH PEN	**2701379**	1
2 GB USB STICK	**2701382**	1
HMI BATTERY	**2701383**	1
HMI SCB MOUNTING KIT 8	**2701387**	1
12,1" DISPLAY PROTECTIVE FOIL	**2701377**	1

Technical data

38.1 cm/15" TFT active	
1024 x 768 Pixel (XGA)	
LED	
480 cd/m²	
50000 h	
256 colors	
Resistive industrial touch screen	
Windows CE 5.0	
Xscale® PXA320, 806 MHz	
64 Mbyte SDRAM	
1 GB flash memory	
2x USB Host 1.1, 1x Compact Flash®	
400 mm	
338 mm	
5 mm	
373 mm	
312 mm	
62 mm	
IP65 (front), IP20 (back)	
0 °C ... 50 °C	
Installation in front plate	
DIN EN 60068-2-6	
DIN EN 60068-2-27	

Ordering data

Type	Order No.	Pcs. / Pkt.
TP 15T/M 201[1])	**2913263**	1

Accessories

TOUCH PEN	**2701379**	1
2 GB USB STICK	**2701382**	1
HMI BATTERY	**2701383**	1
HMI SCB MOUNTING KIT 8	**2701387**	1
15,1" DISPLAY PROTECTIVE FOIL	**2701378**	1

Box PC for DIN rail mounting

Box PCs are compact, easy to maintain, and powerful. They impress above all in sophisticated applications such as the measurement, control, and testing of process and machine data or distributed visualizations in conjunction with remote monitors. The numerous mounting options and scalable performance make box PCs the ideal platform for machine building and systems manufacturing.

Your advantages:

– High system availability, thanks to a fanless design which is suitable for industrial applications and the absence of moving parts
– Versatile use, thanks to various mounting options, e.g., on the DIN rail
– Energy-efficient Intel® ATOM™ processors
– Large-scale compatibility, thanks to open IT standards, numerous interfaces and operating systems
– Particularly easy to maintain, thanks to easily accessible components in the IPC housing
– Can be used in harsh environments, thanks to the extended temperature range (-40°C to +65°C) and shock resistance up to 20g

Additional features:

– Configurable based upon customer requirements
– One CF card slot with option for industrial CompactFlash up to 32 GB (no HDD support)
– System protection through the use of embedded operating systems

Notes:

1) EMC: Class A product, see page 553

Box PC with extended temperature range

Technical data

Computer data	
Operating systems	Windows Embedded Standard 2009
Processor (configuration option)	Atom™ 1.1 GHz Z510PT
Main memory (configuration option)	1 GB DDR2 SODIMM
Data memory (configuration option)	CompactFlash®
Interfaces	COM 1 (RS-232/ RS-422/ RS-485 selectable), 6x USB, 1x VGA
Slots	None
Monitor output	VGA
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply unit	24 V DC ±20%
General data	
Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 65 °C
Permissible humidity (operation)	0% ... 95% (no condensation)
Mounting type	Wall or DIN rail
Vibration (operation)	DIN EN 60068-2-6
Shock	20g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial computer			
	VL BPC MINI	**2700773**	1

Accessories

CompactFlash® card			
- 1 GB	**VL 1 GB CF**	**2913155**	1
- 2 GB	**VL 2 GB CF**	**2913156**	1
- 4 GB	**VL 4 GB CF**	**2913157**	1
- 8 GB	**VL 8 GB CF**	**2913158**	1

N

Configurable box PC

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Box PC

Technical data	
Windows Embedded Standard 7	
Atom™ 1.66 GHz N455	
2 GB DDR3 SODIMM	
CompactFlash®	
1x COM (RS-232/ RS-422/ RS-485 selectable), 2x COM (RS-232), 4x USB, 1x VGA	
None	
VGA	
2x Ethernet (10/100/1000 Mbps), RJ45	
24 V DC ±20%	
IP20	
0 °C ... 50 °C	
5% ... 95%	
Wall or DIN rail	
DIN EN 60068-2-6	
15g, 11 ms in accordance with IEC 60068-2-27	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
VL BPC 1000[1])	**2701291**	1

Accessories		
VL 1 GB CF	**2913155**	1
VL 2 GB CF	**2913156**	1
VL 4 GB CF	**2913157**	1
VL 8 GB CF	**2913158**	1

Technical data	
No operating system	
Atom™ 1.66 GHz N455	
2 GB DDR3 SODIMM	
Empty CompactFlash® slot	
1x COM (RS-232/ RS-422/ RS-485 selectable), 2x COM (RS-232), 4x USB, 1x VGA	
None	
VGA	
2x Ethernet (10/100/1000 Mbps), RJ45	
24 V DC ±20%	
IP20	
0 °C ... 50 °C	
5% ... 95%	
Wall mount	
DIN EN 60068-2-6	
15g, 11 ms in accordance with IEC 60068-2-27	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
VL BPC 1001[1])	**2701290**	1

Accessories		
VL 1 GB CF	**2913155**	1
VL 2 GB CF	**2913156**	1
VL 4 GB CF	**2913157**	1
VL 8 GB CF	**2913158**	1

Box PCs for "book" and wall mounting

The box PCs for "book" and wall mounting offer all the technical features and functions of DIN rail box PCs.

Additional features:

- Energy-efficient Intel® Atom™, Celeron® M and Core™2 Duo processors
- Mounting in "book" form or wall mounting
- Easily removable HDD (hard disk drive) and SSD (solid state drive)
- Large-scale compatibility, thanks to open IT standards, numerous interfaces and operating systems
- Two CF card slots with option for industrial CompactFlash up to 32 GB
- Optional expansion slots for installation of PCI cards

Notes:

[1]) Configuration options can affect the operating temperature. See user manual for details.

Box PC with or without PCI

Technical data

Computer data	
Processor (configuration option)	Atom™ 1.6 GHz N270 Celeron® M 1.01 GHz Core™2 Duo 1.5 GHz
Main memory (configuration option)	512 MB DDR SODIMM 1 GB DDR SODIMM 2 GB DDR SODIMM 3 GB DDR SODIMM
Data memory (configuration option)	2.5 in. SATA hard drive 2.5 in. SATA solid-state drive
Optical drive (configuration option)	DVD-RW
Interfaces	COM 1 (RS-232), 1x VGA, 4x USB, 2x CompactFlash®
Slots	2x PCI
Monitor output	VGA, DVI-D
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply unit	24 V DC ±20%
General data	
Degree of protection	IP65 (front), IP20 (back)
Ambient temperature (operation)	-20 °C ... 55 °C[1])
Permissible humidity (operation)	5% ... 95% (no condensation)
Mounting type	Panel mount for control cabinet, wall mount, or bookshelf mount
Vibration (operation)	DIN EN 60068-2-6
Shock	15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial computer			
	VALUELINE IPC	**2913108**	1

Accessories

Mounting kit, including hardware for installation			
- For bookshelf installation	**VL BOOKSHELF MOUNTING KIT**	**2913160**	1
- Bookshelf installation with PCI expansion slots	**VL BOOKSHELF MOUNTING KIT/EXPANSION**	**2913164**	1
Removable hard drive tray			
	HDD TRAY KIT	**2913185**	1
2.5" SATA solid state drive kit, including tray			
- 16 GB	**VL 16 GB SSD (SLC) KIT**	**2913199**	1
- 32 GB	**VL 32 GB SSD (SLC) KIT**	**2913200**	1
CompactFlash® card			
- 512 MB	**VL 512 MB CF**	**2913154**	1
- 1 GB	**VL 1 GB CF**	**2913155**	1
- 2 GB	**VL 2 GB CF**	**2913156**	1
- 4 GB	**VL 4 GB CF**	**2913157**	1
- 8 GB	**VL 8 GB CF**	**2913158**	1

Box PCs for "book" and wall mounting

The latest generation of box PCs for "book" and wall mounting offer maximum computing capacity thanks to their powerful Intel® Core™ i7 processors. In addition, the box PC does not require an internal fan – cooling is ensured with just one external convection fan.

Additional features:

- Energy efficient and powerful Intel® i7 1.33 GHz and i7 2.53 GHz Core processors.
- Mounting in "book" form or wall mounting
- Easily removable HDD (hard disk drive) and SSD (solid state drive)
- One CF card slot with option for industrial CompactFlash up to 32 GB (no HDD support)

Notes:

1) EMC: Class A product, see page 553

Box PC with Intel® i7 technology

Technical data

Computer data	
Processor (configuration option)	Intel® Core™ i7-660UE (4 MB L2 cache, 1.33 GHz) Intel® Core™ i7-610E (4 MB L2 cache, 2.53 GHz)
Main memory (configuration option)	2 GB DDR3-1066 SODIMM 4 GB DDR3-1066 SODIMM 8 GB DDR3-1066 SODIMM
Data memory (configuration option)	2.5 in. SATA hard drive 2.5 in. SATA solid-state drive CompactFlash®
Interfaces	COM 1 (RS-232), 1x DVI-I, 4x USB, 1x Compact Flash®
Monitor output	DVI-I
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply unit	24 V DC ±20%
General data	
Degree of protection	IP65 (front), IP20 (back)
Ambient temperature (operation)	0 °C ... 45 °C
Permissible humidity (operation)	5% ... 95% (no condensation)
Mounting type	Panel mount for control cabinet, wall mount, or bookshelf mount
Vibration (operation)	DIN EN 60068-2-6
Shock	15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial computer, high performance with Intel® i7 processor			
	VL IPC P7000[1])	**2701127**	1

Accessories

Mounting kit, including hardware for installation			
- For bookshelf installation	**VL BOOKSHELF MOUNTING KIT**	**2913160**	1
- For wall installation	**VL WALL MOUNTING KIT**	**2913161**	1
Removable hard drive tray			
	VL I7 HDD TRAY	**2701015**	1
2.5" SATA HDD kit, including tray			
- 250 GB	**VL I7 250 GB HDD KIT**	**2701011**	1
- 320 GB	**VL I7 320 GB HDD KIT**	**2701012**	1
2.5" SATA solid state drive kit, including tray			
- 80 GB	**VL I7 80 GB SSD KIT**	**2701013**	1
- 160 GB	**VL I7 160 GB SSD KIT**	**2701014**	1
CompactFlash® card			
- 1 GB	**VL 1 GB CF**	**2913155**	1
- 2 GB	**VL 2 GB CF**	**2913156**	1
- 4 GB	**VL 4 GB CF**	**2913157**	1
- 8 GB	**VL 8 GB CF**	**2913158**	1

Monitors with touch function

Monitors with touch function are the ideal extension to the industrial PC: operation and monitoring without mouse and keyboard. The robust LCD devices can be used directly on the machine, e.g., as a remote operating solution. Thanks to their numerous interfaces, they provide the best possible connection to your industrial PC.

Your advantages:

– Intuitive operation without mouse or keyboard, thanks to touch function
– High shock resistance and electromagnetic compatibility, thanks to robust housing suitable for industrial applications
– Large-scale compatibility, thanks to open IT standards and numerous interfaces
– Individual solutions, thanks to customer-specific hardware adaptations

Additional features:

– Monitors in various display sizes for connection to any industrial PC with VGA or DVI port
– Optional front USB interface provides additional connection options for I/O devices

30.7 cm (12.1") touch screen

Technical data

Display data	
Display	30.7 cm/12.1" TFT active
Monitor resolution	800 x 600 Pixel (SVGA)
Display lighting type	CCFL
Brightness	400 cd/m², typical (adjustable)
Display backlight MTBF	> 50000 h
Touch screen	Resistive industrial touch screen
General data	
Degree of protection	IP65 (front), IP20 (back)
Ambient temperature (operation)	0 °C ... 55 °C
Permissible humidity (operation)	5% ... 95%
Mounting type	Panel cutout or VESA mount
Vibration (operation)	DIN EN 60068-2-6
Shock	15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Flat panel monitor with resistive touch screen			
- Without front USB port	**VL FPM 12**	**2913015**	1
Flat panel monitor with resistive touch screen			
- With front USB port	**VL FPM 12U**	**2913016**	1

Accessories

Mounting kit, including hardware for installation			
- Panel installation	**VL PANEL MOUNTING KIT**	**2913159**	1
- Panel installation for 15- and 17-in. displays in heavier gauge panels	**VL PANEL+ MOUNTING KIT**	**2701177**	1
Protective cover for 15-in touchscreen			

38.1 cm (15") touch screen

43.2 cm (17") touch screen

48 cm (19") touch screen

Technical data

38.1 cm/15" TFT active
1024 x 768 Pixel (XGA)
CCFL
350 cd/m², typical (adjustable)
> 50000 h
Resistive industrial touch screen

IP65 (front), IP20 (back)
0 °C ... 55 °C
5% ... 95%
Panel cutout or VESA mount
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
VL FPM 15	2913017	1
VL FPM 15U	2913018	1

Accessories

VL PANEL MOUNTING KIT	2913159	1
VL PANEL+ MOUNTING KIT	2701177	1
VL 15" DISPLAY PROTECTIVE FOIL	2913165	1

Technical data

43.2 cm/17" TFT active
1280 x 1024 Pixel (SXGA)
CCFL
350 cd/m², typical (adjustable)
> 50000 h
Resistive industrial touch screen

IP65 (front), IP20 (back)
0 °C ... 50 °C
5% ... 95%
Panel cutout or VESA mount
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
VL FPM 17	2913019	1
VL FPM 17U	2913020	1

Accessories

VL PANEL MOUNTING KIT	2913159	1
VL PANEL+ MOUNTING KIT	2701177	1

Technical data

48.3 cm/19" TFT active
1280 x 1024 Pixel (SXGA)
CCFL
300 cd/m², typical (adjustable)
> 50000 h
Resistive industrial touch screen

IP65 (front), IP20 (back)
0 °C ... 55 °C
5% ... 95%
Panel cutout or VESA mount
DIN EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
VL FPM 19U	2913021	1

Accessories

VL PANEL MOUNTING KIT	2913159	1
VL PANEL+ MOUNTING KIT	2701177	1

Embedded panel PCs

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The EL 1000 series consists of configurable embedded panel PCs with widescreen display and appropriate design. When it comes to automating simple applications in restricted spaces, they are the ideal solution: narrow, fanless, and with comprehensive functions. Depending on your requirements, use Intel® Atom™ processors or – for graphics-intensive applications – processors from the AMD G series.

Additional features:

– Front plate made from anodized aluminum
– Can be configured according to customer requirements
– Widescreen displays from 7" to 15.4"
– With Windows Embedded Standard 7 as an option

17.8 cm (7") widescreen display

Technical data

Display data	
Display	17.8 cm/7" TFT active
Monitor resolution	800 x 480 Pixel (WVGA)
Display lighting type	LED
Brightness	350 cd/m² typical (adjustable)
Display backlight MTBF	40000 h
Touch screen	Resistive industrial touch screen
Computer data	
Processor (configuration option)	Atom™ 1.6 GHz Z530 AMD Embedded G-Series (T40R), 1.0 GHz
Main memory (configuration option)	1 GB DDR2 RAM 2 GB DDR3 RAM
Data memory (configuration option)	Flash SSD 8 GB Flash SSD 16 GB Flash SSD 32 GB
Optical drive (configuration option)	None
Interfaces	4 x USB host 2.0
Slots	SD card
Monitor output	None
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply unit	24 V DC +/- 20%
General data	
Degree of protection	IP65 (front), IP20 (back)
Ambient temperature (operation)	0 °C ... 50 °C
Permissible humidity (operation)	20% ... 85% (no condensation)
Mounting type	Panel PC for mounting in the front panel
Vibration (operation)	DIN EN 60068-2-6
Shock	DIN EN 60068-2-27

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Panel PC			
	EL PPC7 1000	**2701481**	1

Accessories

Mounting kit, including hardware for installation			
- Panel installation	**HMI SCB MOUNTING KIT 4**	**2701384**	1
Stylus for touch screens	**TOUCH PEN**	**2701379**	1
Protective foil for touch screen	**7" DISPLAY PROTECTIVE FOIL**	**2701374**	1

N

22.9 cm (9") widescreen display

N

30.5 cm (12.1") widescreen display

N

39.05 cm (15.4") widescreen display

Technical data

22.9 cm/9" TFT active
800 x 480 Pixel (WVGA)
LED
360 cd/m² typical (adjustable)
70000 h
Resistive industrial touch screen
Atom™ 1.6 GHz Z530
AMD Embedded G-Series (T40R), 1.0 GHz
1 GB DDR2 RAM
2 GB DDR3 RAM
Flash SSD 8 GB
Flash SSD 16 GB
Flash SSD 32 GB
None
4 x USB host 2.0
SD card
None
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC +/- 20%
IP65 (front), IP20 (back)
0 °C ... 50 °C
20% ... 85% (no condensation)
Panel PC for mounting in the front panel
DIN EN 60068-2-6
DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
EL PPC9 1000	2701482	1

Accessories

HMI SCB MOUNTING KIT 6	2701385	1
TOUCH PEN	2701379	1
9" DISPLAY PROTECTIVE FOIL	2701375	1

Technical data

30.5 cm/12" TFT active
1280 x 800 Pixel (WXGA)
LED
320 cd/m² typical (adjustable)
50000 h
Resistive industrial touch screen
Atom™ 1.6 GHz Z530
AMD Embedded G-Series (T40R), 1.0 GHz
1 GB DDR2 RAM
2 GB DDR3 RAM
Flash SSD 8 GB
Flash SSD 16 GB
Flash SSD 32 GB
None
4 x USB host 2.0
SD card
None
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC +/- 20%
IP65 (front), IP20 (back)
0 °C ... 50 °C
20% ... 85% (no condensation)
Panel PC for mounting in the front panel
DIN EN 60068-2-6
DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
EL PPC12 1000	2701484	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1
TOUCH PEN	2701379	1

Technical data

39.05 cm/15.4" TFT active
1280 x 800 Pixel (WXGA)
LED
360 cd/m² typical (adjustable)
50000 h
Resistive industrial touch screen
Atom™ 1.6 GHz Z530
AMD Embedded G-Series (T40R), 1.0 GHz
1 GB DDR2 RAM
2 GB DDR3 RAM
Flash SSD 8 GB
Flash SSD 16 GB
Flash SSD 32 GB
None
4 x USB host 2.0
SD card
None
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC +/- 20%
IP65 (front), IP20 (back)
0 °C ... 50 °C
20% ... 85% (no condensation)
Panel PC for mounting in the front panel
DIN EN 60068-2-6
DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
EL PPC15 1000	2701485	1

Accessories

HMI SCB MOUNTING KIT 8	2701387	1
TOUCH PEN	2701379	1

Panel PCs

Panel PCs combine the advantages of a modern industrial PC with the operation and monitoring functions of a touch monitor. They are designed for installation in the front of the control cabinet or for use at field level. This means that you benefit from high-performance PC technology directly on site.

Your advantages:

- High system availability, thanks to a fanless design which is suitable for industrial applications and the absence of moving parts
- Processor performance suited to the application: with energy-efficient Intel® Core™ i7, Intel® Core™2 Duo or Intel® Atom™ processors
- Operating systems for every application, such as Windows XP, Windows 7, Windows Embedded Standard 2009 or Windows Embedded Standard 7
- Individual solutions thanks to customer-specific adaptations to hardware and software
- Particularly easy to maintain thanks to easily accessible components in the appropriately designed PC housing
- Large-scale compatibility, thanks to open IT standards and numerous interfaces
- Display diagonals from 12" to 24"
- Optional expansion slots for installation of PCI cards

Notes:

1) Configuration options can affect the operating temperature. See user manual for details.

2) EMC: Class A product, see page 553

Configurable panel PC

Technical data

Display data	
Display (configuration option)	Without 30.7 cm/12.1" TFT active 38.1 cm/15" TFT active 43.2 cm/17" TFT active 48.3 cm/19" TFT active 60.9 cm/24" - TFT active
Computer data	
Processor (configuration option)	Atom™ 1.6 GHz N270 Celeron® M 1.01 GHz Core™2 Duo 1.5 GHz
Main memory (configuration option)	512 MB DDR SODIMM 1 GB DDR SODIMM 2 GB DDR SODIMM 3 GB DDR SODIMM
Data memory (configuration option)	2.5 in. SATA hard drive 2.5 in. SATA solid-state drive
Optical drive (configuration option)	DVD-RW
Interfaces	COM 1 (RS-232), 1x VGA, 4x USB, 2x CompactFlash®
Slots	2x PCI
Monitor output	VGA, DVI-D
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply unit	24 V DC ±20%
General data	
Degree of protection	IP65 (front), IP20 (back)
Ambient temperature (operation)	-20 °C ... 55 °C[1])
Permissible humidity (operation)	5% ... 95% (no condensation)
Mounting type	Panel mount for control cabinet, wall mount, or bookshelf mount
Vibration (operation)	DIN EN 60068-2-6
Shock	15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial computer			
Industrial computer, high performance with Intel® i7 processor	**VALUELINE IPC**	**2913108**	1

Accessories

Mounting kit, including hardware for installation			
- Panel installation	**VL PANEL MOUNTING KIT**	**2913159**	1
- Panel installation for 15- and 17-in. displays in heavier gauge panels	**VL PANEL+ MOUNTING KIT**	**2701177**	1
Protective cover for 15-in touchscreen	**VL 15" DISPLAY PROTECTIVE FOIL**	**2913165**	1

Configurable panel PC with Intel® i7 technology

Technical data

	Without
	30.7 cm/12.1" TFT active
	38.1 cm/15" TFT active
	43.2 cm/17" TFT active
	48.3 cm/19" TFT active
	60.9 cm/24" - TFT active
	Intel® Core™ i7-660UE (4 MB L2 cache, 1.33 GHz)
	Intel® Core™ i7-610E (4 MB L2 cache, 2.53 GHz)
	2 GB DDR3-1066 SODIMM
	4 GB DDR3-1066 SODIMM
	8 GB DDR3-1066 SODIMM
	2.5 in. SATA hard drive
	2.5 in. SATA solid-state drive
	CompactFlash®
	None
	COM 1 (RS-232), 1x DVI-I, 4x USB, 1x Compact Flash®
	None
	DVI-I
	2x Ethernet (10/100/1000 Mbps), RJ45
	24 V DC ±20%
	IP65 (front), IP20 (back)
	0 °C ... 45 °C
	5% ... 95% (no condensation)
	Panel mount for control cabinet, wall mount, or bookshelf mount
	DIN EN 60068-2-6
	15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
VL IPC P7000[2])	**2701127**	1

Accessories

VL PANEL MOUNTING KIT	**2913159**	1
VL PANEL+ MOUNTING KIT	**2701177**	1
VL 15" DISPLAY PROTECTIVE FOIL	**2913165**	1

IP65 panel PCs

N

The panel PCs of the DL 1000 series combine high-performance technology and attractive design. They are narrow, feature IP65 protection, multi-touch capability, and are always close to the action as they can be installed quickly and easily directly on the machine.

Thanks to their fanless and energy-efficient design, they are the ideal solution for future operating concepts in industrial systems: easy maintenance, custom configuration, and robust.

Additional features:

– Single or multi-touch screen
– Energy-efficient Intel® ATOM™ E series processors
– Can be configured individually
– Fully enclosed housing with IP65 protection
– Extended temperature range of -20°C to +55°C
– User-friendly handling thanks to the attractive and practical industrial design
– Easy access to all important components

Notes:

[1]) Configuration options can affect the operating temperature. See user manual for details.

Panel PC in IP65, 37.8 cm (15") display

Technical data

Display data	
Display	37.8 cm/15 in. TFT
Monitor resolution	1024 x 768 Pixel (XGA)
Display lighting type	LED
Brightness	400 cd/m², typical (adjustable)
Display backlight MTBF	50000 h
Touch screen	Resistive industrial touch screen
Computer data	
Processor (configuration option)	Atom™ 1.6 GHz E680T
Main memory (configuration option)	2 GB DDR2 800
Data memory (configuration option)	2.5 in. SATA hard drive
Optical drive (configuration option)	None
Interfaces	1x COM selectable (RS-232, RS-485, RS-422), 5x USB 2.0, 1x audio
Slots	None
Monitor output	None
Network	2x Ethernet (10/100/1000 Mbps), RJ45
Power supply unit	24 V DC ±20%
General data	
Degree of protection	IP65
Ambient temperature (operation)	-20 °C ... 55 °C[1])
Permissible humidity (operation)	5% ... 95%
Mounting type	VESA MIS-D (100 x 100)
Vibration (operation)	1g according to EN 60068-2-6
Shock	15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
IPC with IP65 protection with touch screen, enclosed housing	**DL PPC15 1000**	**2701665**	1
IPC with IP65 protection with touch screen, enclosed housing			

N

**Panel PC in IP65,
37.8 cm (15") display
Multi-touch**

Technical data

37.8 cm/15 in. TFT
1024 x 768 Pixel (XGA)
LED
400 cd/m², typical (adjustable)
50000 h
Resistive industrial touch screen
Atom™ 1.6 GHz E680T
2 GB DDR2 800
2.5 in. SATA hard drive
None
1x COM selectable (RS-232, RS-485, RS-422), 5x USB 2.0, 1x audio
None
None
2x Ethernet (10/100/1000 Mbps), RJ45
24 V DC ±20%
IP65
-20 °C ... 55 °C[1])
5% ... 95%
VESA MIS-D (100 x 100)
1g according to EN 60068-2-6
15g, 11 ms in accordance with IEC 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
DL PPC15M 1000	**2701666**	1

IP65 panel PCs

The compact and robust panel PCs with IP65 protection allow you to use reliable PC technology directly on the machine. Thanks to WLAN capability, the devices can be installed without any time-consuming or costly wiring – a huge advantage for machines used in various locations. High-performance wireless technology allows you to transmit even large volumes of data reliably and quickly.

Additional features:

– Optimum network connection by means of Gigabit Ethernet or WLAN
– Energy-efficient Intel® ATOM™ processors
– High system availability, thanks to a fanless design which is suitable for industrial applications and the absence of moving parts
– Fully enclosed housing with IP65 protection
– Extended temperature range of -20°C to +55°C
– Comprehensive range of accessories including practical brackets that allow you to install your panel PC in a space-saving and reliable manner.

Notes:

1) EMC: Class A product, see page 553

20.3 cm (8") display

Technical data

Display data	
Display	20.3 cm/8" TFT active
Monitor resolution	800 x 480 Pixel (WVGA)
Display lighting type	LED
Brightness	400 cd/m², typical (adjustable)
Display backlight MTBF	> 50000 h
Touch screen	Resistive industrial touch screen
Computer data	
Processor (configuration option)	Atom™ 1.1 GHz Z510
Main memory (configuration option)	1 GB DDR2 RAM 2 GB DDR2 RAM
Data memory (configuration option)	Flash SSD 1 GB Flash SSD 2 GB Flash SSD 4 GB Flash SSD 8 GB
Interfaces	COM 1 (RS-232), 3 x USB 2.0, 1 x on the front (can be deactivated via software), 1 x PS/2 keyboard/mouse
Optional interfaces	Wireless LAN
Graphics card	Intel® SCH US15W with integrated graphics
Network	2x Ethernet (10/100/1000 MBit), RJ45
Power supply unit	24 V DC +/- 20%
External dimensions	
Width	254 mm
Height	182 mm
Depth	62 mm
General data	
Degree of protection	IP65
Ambient temperature (operation)	-20 °C ... 55 °C
Permissible humidity (operation)	10% ... 85% (no condensation)
Mounting type	Depends on the configuration
Vibration (operation)	DIN EN 60068-2-6
Shock	DIN EN 60068-2-27

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Panel PC in IP65 with touchscreen, configurable			
Panel PC with IP65 protection with touch screen, sunlight readable display, closed housing	**VMT 3008[1])**	**2913852**	1

Accessories

Connector	**FMC 1,5/ 4-STF-3,81 BD:PE-24V**	**1701307**	50
External power supply unit	**VMT 300X EXT PS**	**2913881**	1
Table stand	**VMT TISCHFUSS**	**2900946**	1
Support bracket left/right	**VMT HALTEWINKEL LI/RE**	**2900933**	1
Bracket connection adapter	**VMT GALGENANSCHLUSSADAPTER**	**2900962**	1
Bracket according to VESA standard	**VMT HALTERUNG VESA**	**2900959**	1

26.4 cm (10.4")
Sunlight readable display

30.7 cm (12.1")
Sunlight readable display

38.1 cm (15") display

Technical data

VMT 3010	VMT 3010 EXP SUN[1])
26.4 cm/10.4" TFT active 1024 x 768 Pixel (XGA) LED	
400 cd/m², typical (adjustable)	Optical bonding
> 50000 h Resistive industrial touch screen	
Atom™ 1.1 GHz Z510 Atom™ 1.6 GHz Z530	Atom™ 1.6 GHz Z530
1 GB DDR2 RAM 2 GB DDR2 RAM	2 GB DDR2 RAM
Flash SSD 1 GB Flash SSD 2 GB Flash SSD 4 GB Flash SSD 8 GB 2.5" SSD 8 GB 2.5" SSD 16 GB 2.5" SSD 32 GB 2.5" HDD, min. 80 GB, 24 x 7 Automotive	2.5" HDD, min. 80 GB, 24 x 7 Automotive
COM 1 (RS-232), 3 x USB 2.0, 1 x on the front (can be deactivated via software), 1 x PS/2 keyboard/mouse	
Wireless LAN	-
Intel® SCH US15W with integrated graphics 2x Ethernet (10/100/1000 MBit), RJ45 24 V DC +/- 20%	
294 mm 244 mm 62 mm	
IP65 -20 °C ... 55 °C 10% ... 85% (no condensation) Depends on the configuration DIN EN 60068-2-6 DIN EN 60068-2-27	

Ordering data

Type	Order No.	Pcs. / Pkt.
VMT 3010	**2701003**	1
VMT 3010 EXP SUN[1])	**2700969**	1

Accessories

MC 1,5/ 4-STF-3,81 BD:PE-24VSO	**1771240**	50
VMT 301X EXT PS	**2913933**	1
VMT TISCHFUSS	**2900946**	1
VMT HALTEWINKEL LI/RE	**2900933**	1
VMT GALGENANSCHLUSSADAPTER	**2900962**	1
VMT HALTERUNG VESA	**2900959**	1

Technical data

VMT 3012[1])	VMT 3012 EXP SUN[1])
30.7 cm/12.1" TFT active 800 x 600 Pixel (SVGA) CCFL	
400 cd/m², typical (adjustable)	Optical bonding
> 50000 h Resistive industrial touch screen	
Atom™ 1.1 GHz Z510 Atom™ 1.6 GHz Z530	Atom™ 1.6 GHz Z530
1 GB DDR2 RAM 2 GB DDR2 RAM	2 GB DDR2 RAM
Flash SSD 1 GB Flash SSD 2 GB Flash SSD 4 GB Flash SSD 8 GB 2.5" SSD 8 GB 2.5" SSD 16 GB 2.5" SSD 32 GB 2.5" HDD, min. 80 GB, 24 x 7 Automotive	2.5" HDD, min. 80 GB, 24 x 7 Automotive
COM 1 (RS-232), 3 x USB 2.0, 1 x on the front (can be deactivated via software), 1 x PS/2 keyboard/mouse	
Wireless LAN	-
Intel® SCH US15W with integrated graphics 2x Ethernet (10/100/1000 MBit), RJ45 24 V DC +/- 20%	
338 mm 261 mm 62 mm	
IP65 -20 °C ... 55 °C 10% ... 85% (no condensation) Depends on the configuration DIN EN 60068-2-6 DIN EN 60068-2-27	

Ordering data

Type	Order No.	Pcs. / Pkt.
VMT 3012[1])	**2913959**	1
VMT 3012 EXP SUN[1])	**2700878**	1

Accessories

MC 1,5/ 4-STF-3,81 BD:PE-24VSO	**1771240**	50
VMT 301X EXT PS	**2913933**	1
VMT TISCHFUSS	**2900946**	1
VMT HALTEWINKEL LI/RE	**2900933**	1
VMT GALGENANSCHLUSSADAPTER	**2900962**	1
VMT HALTERUNG VESA	**2900959**	1

Technical data

38.1 cm/15" TFT active 1024 x 768 Pixel (XGA) LED
400 cd/m², typical (adjustable)
> 50000 h Resistive industrial touch screen
Atom™ 1.1 GHz Z510 Atom™ 1.6 GHz Z530
1 GB DDR2 RAM 2 GB DDR2 RAM
Flash SSD 1 GB Flash SSD 2 GB Flash SSD 4 GB Flash SSD 8 GB 2.5" SSD 8 GB 2.5" SSD 16 GB 2.5" SSD 32 GB 2.5" HDD, min. 80 GB, 24 x 7 Automotive
COM 1 (RS-232), 3 x USB 2.0, 1 x on the front (can be deactivated via software), 1 x PS/2 keyboard/mouse
Wireless LAN
Intel® SCH US15W with integrated graphics 2x Ethernet (10/100/1000 MBit), RJ45 24 V DC +/- 20%
400 mm 305 mm 65 mm
IP65 -20 °C ... 55 °C 10% ... 85% (no condensation) Depends on the configuration DIN EN 60068-2-6 DIN EN 60068-2-27

Ordering data

Type	Order No.	Pcs. / Pkt.
VMT 3015[1])	**2913674**	1

Accessories

Tablet PCs

Benefit from the advantages of modern networks and work with your portable industrial PC directly on site. The robust tablet PCs from Phoenix Contact are the ideal solution for performing mobile tasks and processes professionally, from both inside and outside the factory.

Your advantages:

- High system availability, thanks to a fanless design which is suitable for industrial applications and the absence of moving parts
- Energy-efficient Intel® ATOM™ or dual core processors
- Large-scale compatibility, thanks to open IT standards and numerous interfaces
- User-friendly handling thanks to the attractive and practical industrial design
- All-round protection against dust and splash water provided by IP54 housing with IP65 front
- Wireless connection via WLAN or Bluetooth
- Independence from the mains thanks to battery operation
- Comprehensive range of accessories

Tablet PC with 33.8 cm (13.3") display and Windows 7

Technical data

Display data	
Display	33.8 cm/13.3" TFT active
Monitor resolution	1280 x 800 Pixel (WXGA)
Display lighting type	CCFL
Brightness	400 cd/m², typical (adjustable)
Display backlight MTBF	> 50000 h
Touch screen	Resistive industrial touch screen
Computer data	
Operating systems	Windows 7 32-bit Ultimate (multi-language)
Processor	Atom™ 1.6 GHz Z530P
Main memory	2 GB DDR2 RAM
Data memory	2.5" HDD, min. 160 Gbyte (PATA)
Interfaces	2x USB 2.0, 1x USB 2.0 recessed, WLAN 802.11 a/b/g, Bluetooth 2.0 Class 1 or Class 2
Network	1 x Ethernet (10/100/1000 Mbit), RJ45
Power supply unit	115/230 V AC/20 V DC external power supply unit
General data	
Degree of protection	IP65 (front), IP54 (back)
Ambient temperature (operation)	0 °C ... 40 °C
Permissible humidity (operation)	10% ... 85% (no condensation)
Mounting type	Mobile application

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Mobile tablet PC with touch screen, enclosed housing - Atom 1.6 GHz - 1.2 GHz dual core	**TPC 6013**	**2700740**	1

Accessories

Hand strap for tablet PC	**TPC 6013 HAND STRAP**	**2700613**	1
3-point belt for tablet PC	**TPC 6013 THREE-POINT BELT**	**2700614**	1
Mechanical docking station for tablet PC	**TPC 6013 MECHANICAL DOCKING**	**2700615**	1
Replacement battery for TPC 6013	**TPC 6013 SPARE RECHARGEABLE BA**	**2700744**	1
Touch pens for tablet PC	**TPC 6013 TOUCH PENS**	**2700616**	1
Docking station for tablet PC	**PORT REPLICATOR**	**2701343**	1
ODU to V.24 (RS-232) cable for tablet PC			

N

Tablet PC with 33.8 cm (13.3") display and Windows Embedded Standard 7

Tablet PC with 33.8 cm (13.3") display and Windows XP

Technical data

33.8 cm/13.3" TFT active
1280 x 800 Pixel (WXGA)
CCFL
400 cd/m², typical (adjustable)
> 50000 h
Resistive industrial touch screen
Windows Embedded Standard 7
Atom™ 1.6 GHz Z530P
2 GB DDR2 RAM
2.5" SSD, 16 Gbytes, minimum
2x USB 2.0, 1x USB 2.0 recessed, WLAN 802.11 a/b/g, Bluetooth 2.0 Class 1 or Class 2
1 x Ethernet (10/100/1000 Mbit), RJ45
20 V/3.5 A external
IP65 (front), IP54 (back)
0 °C ... 40 °C
10% ... 85% (no condensation)
Mobile application

Ordering data

Type	Order No.	Pcs. / Pkt.
TPC 6013 S W7E	**2701316**	1

Accessories

TPC 6013 HAND STRAP	**2700613**	1
TPC 6013 THREE-POINT BELT	**2700614**	1
TPC 6013 MECHANICAL DOCKING	**2700615**	1
TPC 6013 SPARE RECHARGEABLE BA	**2700744**	1
TPC 6013 TOUCH PENS	**2700616**	1
PORT REPLICATOR	**2701343**	1

Technical data

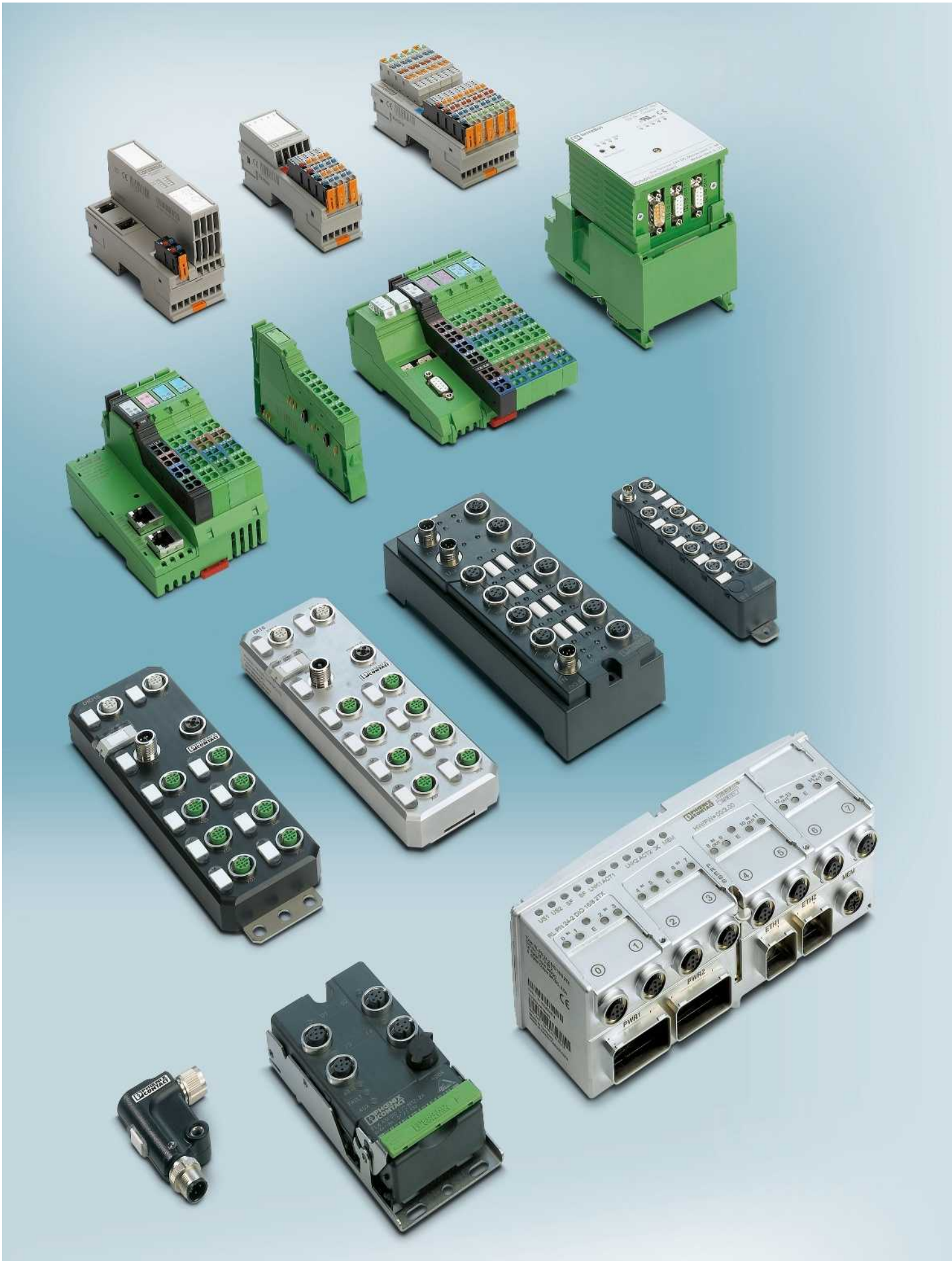
33.8 cm/13.3" TFT active
1280 x 800 Pixel (WXGA)
CCFL
400 cd/m², typical (adjustable)
> 50000 h
Resistive industrial touch screen
Windows XP-Multi
Dual Core™ 1.2 GHz
2 GB DDR2 RAM
2.5" HDD, min. 120 Gbyte (SATA)
2x USB 2.0, 1x USB 2.0 recessed, RS-232 to ODU plug, WLAN 802.11 a/b/g, Bluetooth 2.0 Class 1 or Class 2, 1x headphone out, 1x MIC IN, 2-megapixel autofocus camera
1x Ethernet (10/100 Mbps), RJ45
115/230 V AC/20 V DC external power supply unit
IP65 (front), IP54 (back)
0 °C ... 40 °C
10% ... 85% (no condensation)
Mobile application

Ordering data

Type	Order No.	Pcs. / Pkt.
TPC 6013 P	**2700611**	1

Accessories

TPC 6013 HAND STRAP	**2700613**	1
TPC 6013 THREE-POINT BELT	**2700614**	1
TPC 6013 MECHANICAL DOCKING	**2700615**	1
TPC 6013 SPARE RECHARGEABLE BA	**2700744**	1
TPC 6013 TOUCH PENS	**2700616**	1
TPC 6013 CABLE ODU TO RS232	**2700619**	1



I/O systems

I/O systems from Phoenix Contact are the perfect solution for control cabinet engineering or field installation.

Axioline F

Axioline F is Phoenix Contact's I/O system for the control cabinet of the Ethernet generation.

Open to all Ethernet-based communication protocols and PROFIBUS, Axioline F enables the shortest response times, fast installation, and is characterized by its particularly robust design and easy handling.

Inline

Inline, our I/O automation kit, can be used to connect sensors and actuators with a maximum range of functions.

These I/Os can also be found in safety applications or potentially explosive areas.

INTERBUS Smart Terminals

INTERBUS Smart Terminals are perfect for connecting medium to high numbers of sensors and actuators to INTERBUS.

Axioline E

Axioline E is Phoenix Contact's I/O system for field installation of the Ethernet generation.

The I/O system features a fast response time, robust design, and easy handling.

The comprehensive portfolio with optional plastic or zinc die-cast housing enables use in a wide range of environments.

Fieldline

The devices in the Fieldline product range with IP65/IP67 protection are optimized for use in machine building and systems manufacturing directly in the field.

AS-Interface

The digital I/O devices in the Fieldline Extension AS-Interface product range offer significant installation advantages thanks to their innovative connection technology.

Ruggedline

With fiber optic technology and zinc die-cast housing with IP65/IP67 protection, the robust devices support installation in particularly harsh industrial environments.

For the control cabinet (IP20)

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For field installation (IP67)

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Product overview

Bus couplers

EtherCAT	EtherNet/IP	Modbus/TCP (UDP)	PROFINET	sercos the automation bus	PROFIBUS
148	149	149	150	151	152

Input and output terminals

Digital input			Digital output	
16 channels	32 channels	64 channels	16 channels	32 channels
155	155	155	157	157

Analog input	Analog output	Incremental encoder input
8 channels	8 channels	2 channels
158	159	163

Open and closed-loop control

Temperature recording		Counter
8 channels (RTD)	8 channels (UTH)	2 channels
160	161	163

Communication modules

Serial communication module
RS-485/422 or RS-232 input and output channel
162

Acquisition modules

Position detection module
1 SSI interface, 1 analog output
164

General accessories

STARTUP+

Software for starting up and diagnosing Axioline stations

AXL SHIELD SET

Axioline shield connection set

VIP-CAB-FLK14/AXIO/0,14...

Relay adapter cable

...-CABLE-...

Corresponding cables and plugs can be found in our online catalog

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ZB 20,3 AXL UNPRINTED

Zack marker strip (device labeling) unprinted

ZBF 10/5,8 AXL UNPRINTED

Zack strip, flat, (plug/slot labeling) unprinted

EMT (35x...)R

Marking label rolls, unprinted

Page	www.phoenixcontact.net/products

General technical data

Ambient conditions	
Temperature range (operation)	-25°C ... +60°C
Relative humidity (operation)	5% < RH < 95% (no condensation)
Relative humidity (storage)	5% to 95% (no condensation)
Vibration	5g according to EN 60068-2-6
Shock	25g according to EN 60068-2-27
Continuous shock	10g according to EN 60068-2-29
Degree of protection	IP20
Electromagnetic compatibility	
Noise emission	Class B according to EN 61000-6-3
Noise immunity	According to EN 61000-4
Supply voltage	
Nominal value	24 V DC
Ripple	±5% according to EN 61131-2
Permissible range	19.2 V ... 30.0 V
System times	
System bus cycle time	2 µs
Offset per module	1 µs

Bus coupler

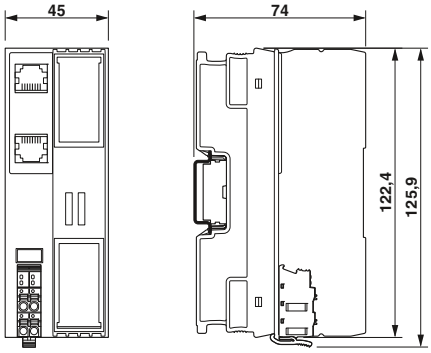
N

The Axioline bus coupler is the link between the Axioline system and the higher-level EtherCAT® network.

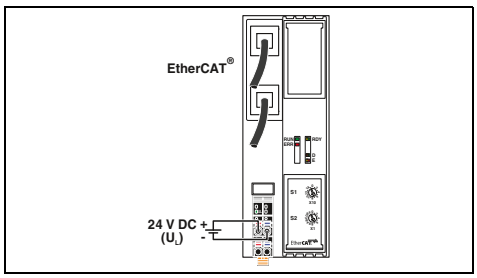
For startup tests, the Axioline station can be started up independently of the higher-level network via an Ethernet port on the bus coupler using the Startup+ software.

Features:

- Minimum cycle time of EtherCAT is 50 µs
- 2 RJ45 connections (with integrated switch)
- Supported mailbox protocols CoE, FoE
- Up to 63 additional Axioline devices can be connected
- Typical cycle time of the Axioline system bus is around 10 µs
- Runtime in bus coupler is negligible (almost 0 µs)
- Firmware can be updated
- Diagnostic and status indicators
- Automatic and manual addressing



EtherCAT® bus coupler



Technical data

Interface	
Fieldbus system	EtherCAT®
Connection method	RJ45 socket, auto negotiation and autocrossing
Number	2
Transmission speed	100 Mbps (full duplex)
Transmission length	max. 100 m
Local bus interface	
Name	Axio bus
Connection method	Connection for bus base module
Transmission speed	100 Mbps
Number of supported devices	max. 63 (per station)
Power supply for module electronics	
Supply of communications power U_L	24 V DC
Maximum permissible voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_{bus}	5 V DC (via bus base module)
Current supply at U_{bus}	2 A
Protective circuit	Surge protection of the supply voltage Polarity reversal protection of the supply voltage
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	177 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline bus coupler			
- For EtherCAT®	**AXL F BK EC**	**2688899**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS BK**	**2701422**	5

Bus coupler

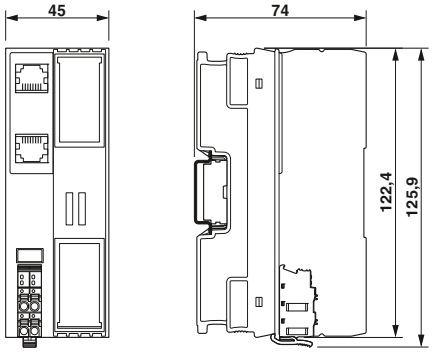
N

The Axioline bus coupler is the link between the Axioline system and the higher-level Ethernet network.

For startup tests, the Axioline station can be started up independently of the higher-level network via an Ethernet port on the bus coupler using the Startup+ software.

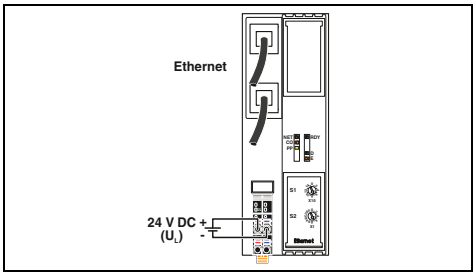
Features:

- Supports Modbus/TCP, Modbus/UDP
- Two rotary coding switches for address assignment
- 2 RJ45 connections (with integrated switch)
- Up to 63 additional Axioline devices can be connected
- Typical cycle time of the Axioline system bus is around 10 µs
- Runtime in bus coupler is negligible (almost 0 µs)
- Software interfaces for access via TCP/IP:
  - Device Driver Interface (DDI)
  - High-Level Language Fieldbus Interface (HFI)
- Firmware can be updated
- Diagnostic and status indicators



Modbus/TCP (UDP)

Ethernet bus coupler



Technical data

Interface	
Fieldbus system	Ethernet
Connection method	RJ45 socket, auto negotiation and autocrossing
Number	2
Transmission speed	100 Mbps (full duplex)
Transmission length	max. 100 m
Local bus interface	
Name	Axio bus
Connection method	Connection for bus base module
Transmission speed	100 Mbps
Number of supported devices	max. 63 (per station)
Power supply for module electronics	
Supply of communications power U_L	24 V DC
Maximum permissible voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_{bus}	5 V DC (via bus base module)
Current supply at U_{bus}	2 A
Protective circuit	Surge protection of the supply voltage Polarity reversal protection of the supply voltage
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	177 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline bus coupler			
- For Ethernet	**AXL F BK ETH**	**2688459**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS BK**	**2701422**	5

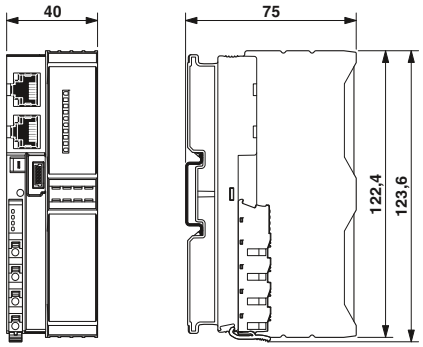
Bus coupler

The Axioline bus coupler is the link between the Axioline system and the higher-level Ethernet system.

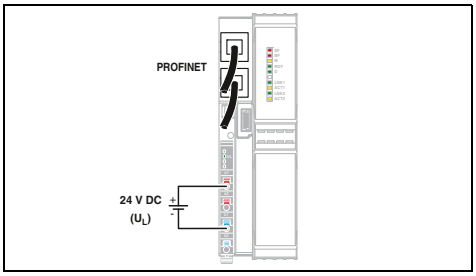
For startup tests, the Axioline station can be started up independently of the higher-level network via an Ethernet port on the bus coupler using the Startup+ software.

PROFINET bus coupler features:

- PROFINET RT
- Minimum cycle time of PROFINET for RT is 250 µs
- MRP implemented
- Module replacement without software
- 2 RJ45 connections (with integrated switch)
- Up to 63 additional Axioline devices can be connected
- Typical cycle time of the Axioline system bus is around 10 µs
- Runtime in bus coupler is negligible (almost 0 µs)
- Firmware can be updated
- Diagnostic and status indicators



PROFINET bus coupler



Technical data

Interface	
Fieldbus system	PROFINET
Connection method	RJ45 socket, auto negotiation and autocrossing
Number	2
Transmission speed	100 Mbps (full duplex)
Transmission length	max. 100 m
PROFINET IO	
Device function	PROFINET IO device
Update rate	250 µs
Local bus interface	
Name	Axio bus
Connection method	Connection for bus base module
Transmission speed	100 Mbps
Number of supported devices	max. 63 (per station)
Power supply for module electronics	
Supply of communications power U_L	24 V DC
Maximum permissible voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_{bus}	5 V DC (via bus base module)
Current supply at U_{bus}	2 A
Protective circuit	Surge protection of the supply voltage Polarity reversal protection of the supply voltage
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	173 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline bus coupler - For PROFINET IO	**AXL BK PN**	**2688019**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS BK**	**2701422**	5

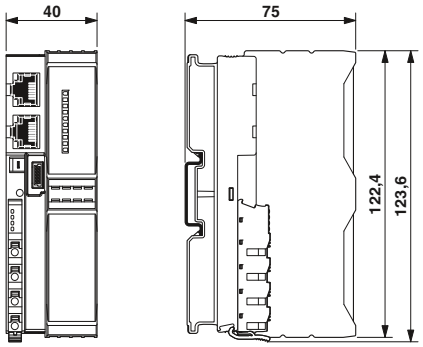
Bus coupler

The Axioline bus coupler is the link between the Axioline system and the higher-level sercos network.

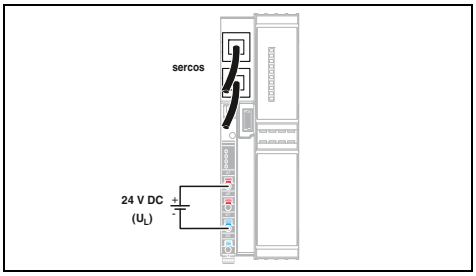
For startup tests, the Axioline station can be started up independently of the higher-level network via an Ethernet port on the bus coupler using the Startup+ software.

Features:

- sercos specification V1.3
- Minimum sercos cycle time of 31.25 µs
- 2 RJ45 connections (with integrated switch)
- Up to 63 additional Axioline devices can be connected
- Typical cycle time of the Axioline system bus is around 10 µs
- Runtime in bus coupler is negligible (almost 0 µs)
- Firmware can be updated
- Diagnostic and status indicators



sercos III bus coupler



Technical data

Interface	
Fieldbus system	sercos
Connection method	RJ45 socket, auto negotiation
Number	2
Transmission speed	100 Mbps (full duplex)
Transmission length	max. 100 m
sercos	
Device profile	FSP_IO
Equipment type	sercos slave
Update rate	31.25 µs
Local bus interface	
Name	Axio bus
Connection method	Connection for bus base module
Transmission speed	100 Mbps
Number of supported devices	max. 63 (per station)
Power supply for module electronics	
Supply of communications power U_L	24 V DC
Maximum permissible voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_{bus}	5 V DC (via bus base module)
Current supply at U_{bus}	2 A
Protective circuit	Surge protection of the supply voltage Polarity reversal protection of the supply voltage
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	174 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline bus coupler - For sercos	**AXL BK S3**	**2688116**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS BK**	**2701422**	5

Bus coupler

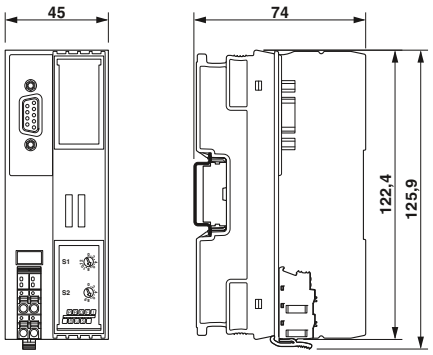
N

The Axioline bus coupler is the link between the Axioline system and the higher-level PROFIBUS network.

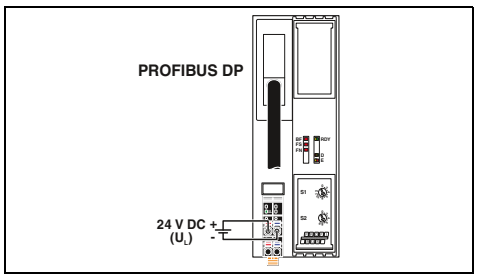
The address can be easily set using two rotary coding switches and the fieldbus is connected via a 9-pos. D-SUB socket.

Features:

- 9-pos. D-SUB socket connection
- Up to 63 additional Axioline devices can be connected
- Typical cycle time of the Axioline system bus is around 10 µs
- Runtime in bus coupler is negligible (almost 0 µs)
- I&M functions
- Diagnostic and status indicators



PROFIBUS bus coupler



Technical data

Interface	
Fieldbus system	PROFIBUS DP
Connection method	9-pos. D-SUB (socket)
Number	1
Transmission speed	9.6 kbps ... 12 Mbps
Local bus interface	
Name	Axio bus
Connection method	Connection for bus base module
Transmission speed	100 Mbps
Number of supported devices	max. 63 (per station)
Power supply for module electronics	
Supply of communications power U_L	24 V DC
Maximum permissible voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_{bus}	5 V DC (via bus base module)
Current supply at U_{bus}	2 A
Protective circuit	Surge protection of the supply voltage Polarity reversal protection of the supply voltage
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	175 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline bus coupler - For PROFIBUS	**AXL BK PB**	**2688530**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS BK**	**2701422**	5

Digital input modules

These modules are designed for use within an Axioline station.

The digital input modules are used to connect 24 V DC sensors. Sensors with up to four wires can be connected.

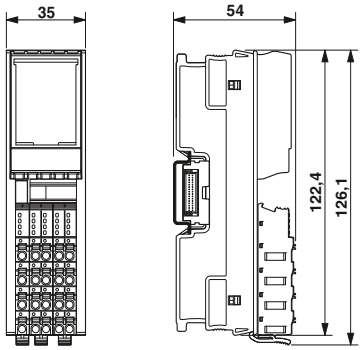
The filter times can be adjusted on the module.

Features:

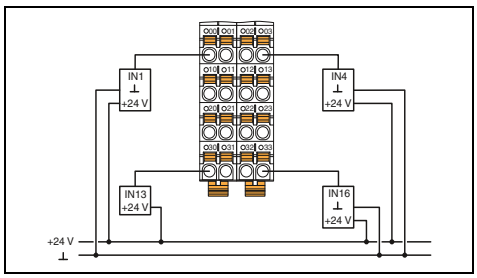
– 16 digital inputs according to EN 61131-2 type 1 and type 3
– 24 V DC/2.4 mA
– Connection of sensors in single, 2, 3, and 4-wire technology
– Minimum update time < 100 µs, bus synchronous
– Filter times can be set in three increments:
  < 100 µs, 1000 µs or 3000 µs
– Maximum input frequency: 5 kHz
– Stored device rating plate
– Diagnostic and status indicators

AXL DI 16/1 HS features:

– Minimum update time of 5 µs, bus-synchronous



16 inputs



Technical data

	AXL DI 16/1	AXL DI 16/1 HS
Local bus interface		
Name	Axio bus	
Connection method	Bus base module	
Power supply for module electronics		
Communications power U_{bus}	5 V DC (via bus base module)	
Current consumption from U_{bus}	max. 120 mA	
I/O supply		
Supply of digital input modules U_I	24 V DC	
Supply voltage range U_I	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Current consumption from U_I	20 mA	
Protective circuit	Surge protection of the supply voltage Polarity reversal protection of the supply voltage	
Digital inputs		
Connection technology	1-wire	
Maximum number of inputs	16	
Description of the inputs	EN 61131-2 types 1 and 3	
Nominal input voltage U_{IN}	24 V DC	
Nominal input current at U_{IN}	2.4 mA	2.3 mA
Input filter time	< 100 µs 1000 µs 3000 µs (default)	< 5 µs (no filter, default) 1000 µs 3000 µs
Protective circuit	Polarity reversal protection of the inputs	
General data		
Connection method	Spring-cage connection with direct plug-in method	
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
Weight	133 g	
Width	35 mm	
Height	126.1 mm	
Depth	54 mm	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline digital input module, complete with accessories (bus base module)			
- 16 inputs	**AXL DI 16/1**	**2688310**	1
- 16 inputs	**AXL DI 16/1 HS**	**2701722**	1
- 32 inputs			
- 64 inputs			

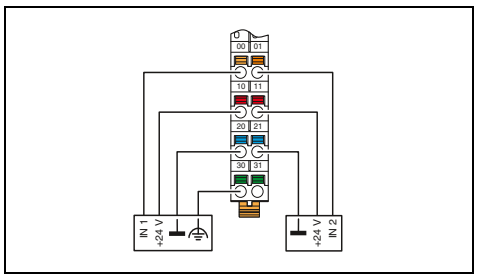
Accessories

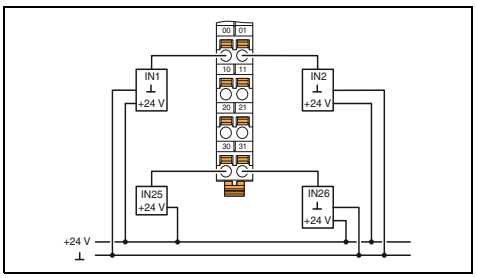
Axioline bus base module (replacement part)	**AXL BS S**	**2700992**	5

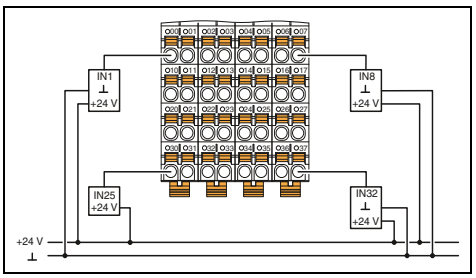
16 inputs

32 inputs

64 inputs







Technical data

Axio bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 4 A (2 A or each group of 8 inputs)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
2, 3, 4-wire	
16	
EN 61131-2 types 1 and 3	
24 V DC	
2.4 mA	
500 µs (default)	
< 100 µs	
Polarity reversal protection of the inputs	
Spring-cage connection with direct plug-in method	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
231 g	
53.6 mm	
129.9 mm	
54 mm	

Technical data

Axio bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 50 mA	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
1-wire	
32	
EN 61131-2 types 1 and 3	
24 V DC	
2.4 mA	
3000 µs (default)	
1000 µs	
< 100 µs	
Polarity reversal protection of the inputs	
Spring-cage connection with direct plug-in method	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
167 g	
53.6 mm	
126.1 mm	
54 mm	

Technical data

Axio bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
60 mA	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
1-wire	
64	
EN 61131-2 types 1 and 3	
24 V DC	
2.4 mA	
3000 µs (default)	
1000 µs	
< 100 µs	
Polarity reversal protection of the inputs	
Spring-cage connection with direct plug-in method	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
231 g	
53.6 mm	
129.9 mm	
54 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL DI 16/4	**2688022**	1

Accessories

AXL BS	**2688129**	5

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL DI 32/1	**2688035**	1

Accessories

AXL BS	**2688129**	5

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL DI 64/1	**2701450**	1

Accessories

AXL BS	**2688129**	5

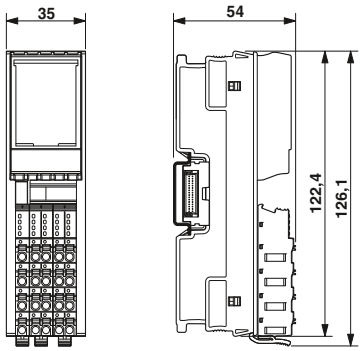
Digital output modules

These modules are designed for use within an Axioline station.

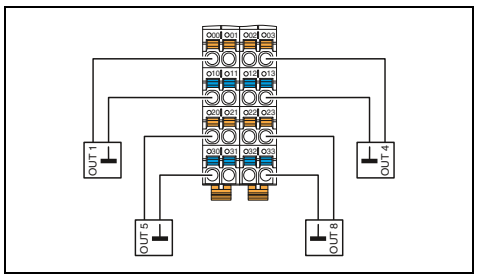
The digital output modules are used to output digital 24 V DC signals. Actuators with up to 3 wires can be connected.

Features:

– Short-circuit-proof outputs
– Local single-channel diagnostics
– Output behavior can be adjusted for when local bus communication is aborted



8 outputs, 2 A



Technical data

Local bus interface	
Name	Axio bus
Connection method	Bus base module
Power supply for module electronics	
Communications power U_{bus}	5 V DC (via bus base module)
Current consumption from U_{bus}	max. 150 mA
I/O supply	
Supply of digital output modules U_O	24 V DC
Supply voltage range U_O	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption from U_O	16 A (external fuse)
Protective circuit	Surge protection of the supply voltage Polarity reversal protection of the supply voltage
Digital outputs	
Connection technology	2-wire
Maximum number of outputs	8
Output voltage	24 V
Maximum output current per channel	2 A
Maximum output current per module	16 A (external fuse)
Behavior with overload	Shutdown with automatic restart
Protective circuit	Short-circuit protection, overload protection of the outputs
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	136 g
Width	35 mm
Height	126.1 mm
Depth	54 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline digital output module, complete with accessories (bus base module) - 8 outputs - 16 outputs - 32 outputs	**AXL DO 8/2-2A**	**2688381**	1

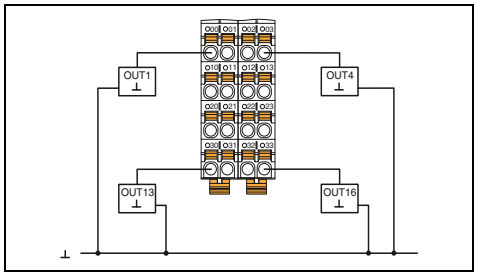
Accessories

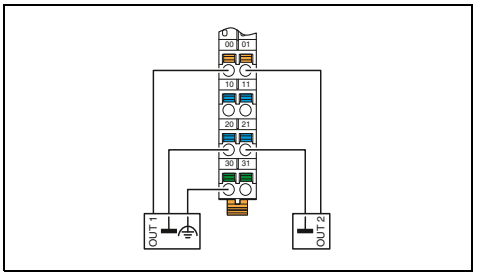
Axioline bus base module (replacement part)	**AXL BS S**	**2700992**	5

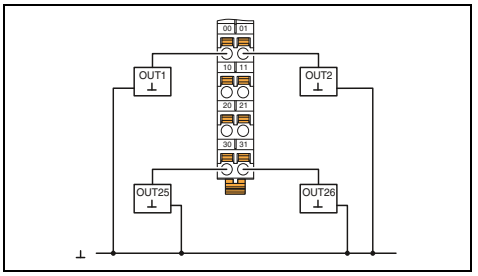
16 outputs

16 outputs

32 outputs







Technical data

Axio bus	
Bus base module	
5 V DC (via bus base module)	
max. 180 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
8 A (external fuse)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
1-wire	2, 3-wire
16	16
24 V	24 V
500 mA	500 mA
8 A (external fuse)	8 A (external fuse)
Shutdown with automatic restart	Shutdown with automatic restart
Short-circuit protection, overload protection of the outputs	Short-circuit protection, overload protection of the outputs
Spring-cage connection with direct plug-in method	Spring-cage connection with direct plug-in method
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
134 g	234 g
35 mm	53.6 mm
126.1 mm	129.9 mm
54 mm	54 mm

Technical data

Axio bus	
Bus base module	
5 V DC (via bus base module)	
max. 120 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
8 A (external fuse)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
2, 3-wire	
16	
24 V	
500 mA	
8 A (external fuse)	
Shutdown with automatic restart	
Short-circuit protection, overload protection of the outputs	
Spring-cage connection with direct plug-in method	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
234 g	
53.6 mm	
129.9 mm	
54 mm	

Technical data

Axio bus	
Bus base module	
5 V DC (via bus base module)	
max. 180 mA	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
8 A (external fuse)	
Surge protection of the supply voltage	
Polarity reversal protection of the supply voltage	
1-wire	
32	
24 V	
500 mA	
8 A (external fuse)	
Shutdown with automatic restart	
Short-circuit protection, overload protection of the outputs	
Spring-cage connection with direct plug-in method	
0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
191 g	
53.6 mm	
126.1 mm	
54 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL DO 16/1	**2688349**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL DO 16/3	**2688048**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL DO 32/1	**2688051**	1

Accessories

AXL BS S	**2700992**	5

Accessories

AXL BS	**2688129**	5

Accessories

AXL BS	**2688129**	5

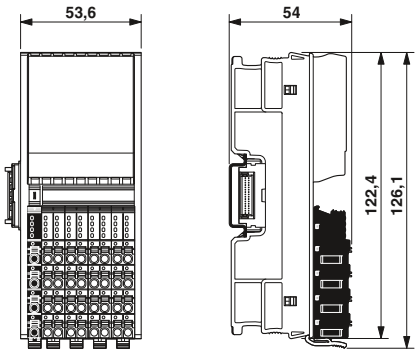
Analog input modules

These modules are designed for use within an Axioline station.

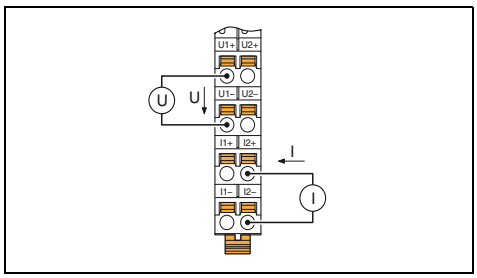
They are used to acquire standard analog current and voltage signals. Connection is via 2-wire technology and a shield connection.

Features:

– 8 analog differential signal inputs
– Current and voltage measuring ranges
– Input filter selection
– Minimum update time of 250 µs, bus synchronous
– 16-bit measured value representation
– Stored device rating plate
– Integrated sensor supply



8 inputs



Technical data

Local bus interface	
Name	Axio bus
Connection method	Bus base module
Power supply for module electronics	
Communications power U_{bus}	5 V DC (via bus base module)
Current consumption from U_{bus}	max. 130 mA
I/O supply	
Supply of analog modules U_A	24 V DC
Protective circuit	Surge protection Protection against polarity reversal Transient protection
Analog inputs	
Connection technology	2-wire (shielded, twisted pair)
Number of inputs	max. 8 (differential inputs, voltage or current can be chosen separately)
Voltage input signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Characteristics	
Measured value representation	16 bits (15 bits + sign bit)
Input filter	30 Hz, 12 kHz, and mean-value generation (can be parameterized)
Precision	0.1% (of measuring range final value for active mean-value generation and 30 Hz filter)
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	204 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline analog input module, complete with accessories (bus base module)			
- 8 inputs	**AXL AI 8**	**2688064**	1

Accessories

Axioline analog input module, complete with accessories (bus base module)	**AXL AI 8**	**2688064**	1
Axioline shield connection set	**AXL SHIELD SET**	**2700518**	1

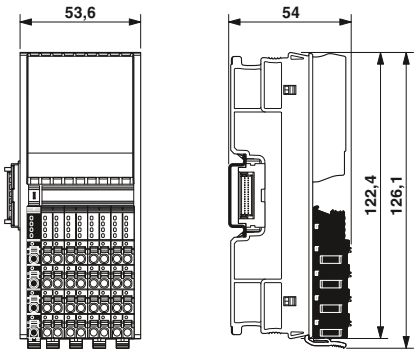
Analog output modules

These modules are designed for use within an Axioline station.

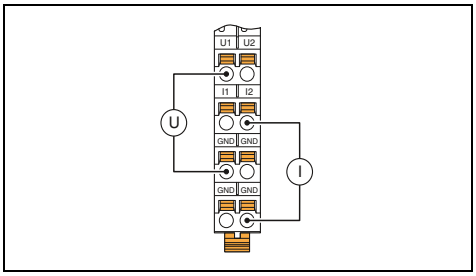
They are used to output standard analog current and voltage signals. Connection is via 2-wire technology and a shield connection.

Features:

– 8 analog bipolar outputs
– Current and voltage ranges
– Minimum update time of 250 µs, bus synchronous
– 16-bit output value
– Overload and short-circuit protected
– Stored device rating plate



8 outputs



Technical data

Local bus interface	
Name	Axio bus
Connection method	Bus base module
Power supply for module electronics	
Communications power U_{bus}	5 V DC (via bus base module)
Current consumption from U_{bus}	max. 130 mA
I/O supply	
Supply of analog modules U_A	24 V DC
Analog outputs	
Connection technology	2-wire (shielded, twisted pair)
Number of outputs	8
Voltage output signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current output signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Load/output load current output	to 500 Ω
Protective circuit	Short-circuit and overload protection Transient protection
Characteristics	
Representation of output values	16 bits (15 bits + sign)
Precision	Typ. 0.1% (of output range final value)
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	260 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline analog output module, complete with accessories (bus base module) - 8 outputs	**AXL AO 8**	**2688080**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS**	**2688129**	5
Axioline shield connection set	**AXL SHIELD SET**	**2700518**	1

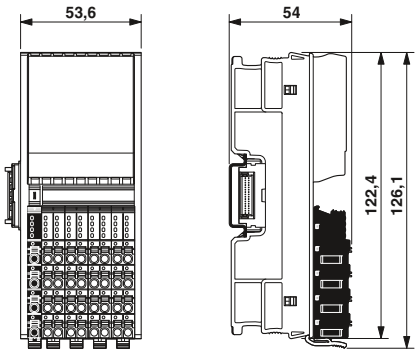
Temperature recording modules

This module is designed for use within an Axioline station.

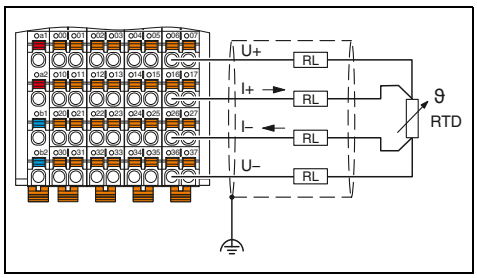
It is used to record resistive temperature sensors. Connection is via 2, 3 or 4-wire technology and a shield connection.

RTD features:

– 8 inputs for temperature shunts
– 500 Ω and 5 kΩ linear inputs
– Programmable filters
– Short-circuit-proof inputs
– Stored device rating plate



8 RTD inputs



Technical data

Local bus interface	
Name	Axio bus
Connection method	Bus base module
Power supply for module electronics	
Communications power U_{bus}	5 V DC (via bus base module)
Current consumption from U_{bus}	max. 180 mA
I/O supply	
Supply of analog modules U_A	24 V DC
Protective circuit	Surge protection Protection against polarity reversal Transient protection
Analog inputs	
Connection technology	2, 3, 4-wire (shielded)
Number of inputs	8 (for resistance temperature detectors)
Protective circuit	Short-circuit protection, overload protection of the inputs Transient protection of inputs Transient protection of sensor supplies
Sensor types (RTD) that can be used	Pt, Ni, KTY, Cu sensors
Linear resistance measuring range	0 Ω ... 500 Ω / 0 kΩ ... 5 kΩ
Characteristics	
Measured value representation	16 bits (15 bits + sign bit)
Input filter time	40 ms / 60 ms / 100 ms / 120 ms (adjustable)
Accuracy	Typ. ± 0.1 K (Pt100 with 3-wire termination)
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	197 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline analog input module, complete with accessories (bus base module) - 8 inputs for connecting temperature shunts	**AXL RTD 8**	**2688077**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS**	**2688129**	5
Axioline shield connection set	**AXL SHIELD SET**	**2700518**	1

Temperature recording modules

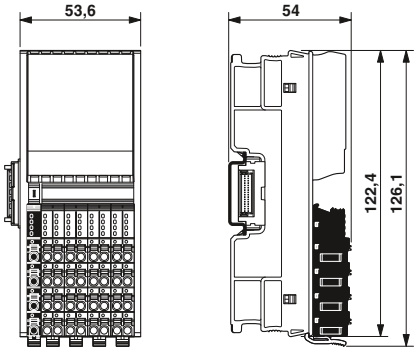
N

This module is designed for use within an Axioline station.

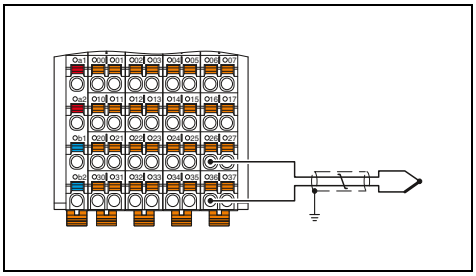
It is used to acquire data from thermocouples. Connection is via 2-wire technology and a shield connection.

Features of UTH:

– 8 inputs for thermocouples
– Linear voltages from -100 mV to +100 mV
– 1 input from -5 V to +5 V
– 4 Pt 100 inputs (external cold junction)
– Configurable cold junction type
– Stored device rating plate



8 UTH inputs



Technical data

Local bus interface	
Name	Axio bus
Connection technology	Bus base module
Power supply for module electronics	
Communications power U_{bus}	5 V DC (via bus base module)
Current consumption from U_{bus}	max. 180 mA
I/O supply	
Supply of analog modules U_A	24 V DC
Protective circuit	Surge protection of the supply voltage Polarity reversal protection of the supply voltage
Analog inputs	
Connection technology	2-wire (shielded)
Number of inputs	8 +1 (8 inputs for thermocouples or linear voltage, plus 1 input -5 V to +5 V)
Protective circuit	Short-circuit protection, overload protection of the inputs Transient protection of inputs
Sensor types (RTD) that can be used	Pt 100 (4 external cold junctions, can also be used as a sensor input)
Linear voltage range	-100 mV ... 100 mV
Characteristics	
Measured value representation	16 bits (15 bits + sign bit)
Input filter time	40 ms / 60 ms / 100 ms / 120 ms (adjustable)
Accuracy	Typ. ± 0.19 K (thermocouple type K, plus tolerance of cold junction)
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	203 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline analog input module, complete with accessories (bus base module) - 8 inputs for connection of thermocouple sensors	**AXL UTH 8**	**2688417**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS**	**2688129**	5
Axioline shield connection set	**AXL SHIELD SET**	**2700518**	1

Serial communication module

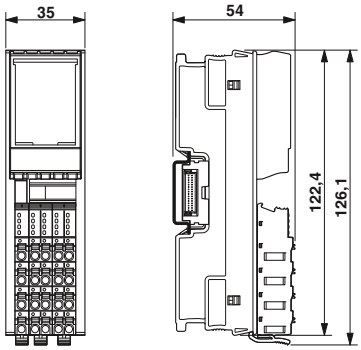
N

This module is designed for use within an Axioline station.

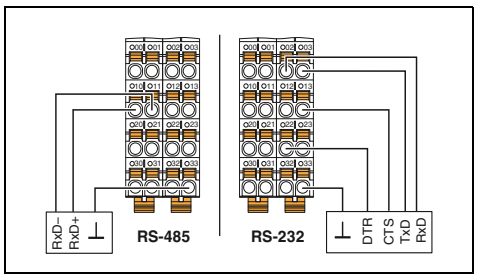
It is used to connect devices with a serial interface, e.g., barcode scanners.

Features:

– Baud rates of up to 250 kbaud
– Communication via acyclic services or process data
– Support of various protocols (e.g., end-to-end protocol)
– 5 RS-232 hardware handshake signals with status indication via LEDs
– Integrated RS-485/RS-422 termination resistor



1 serial input and output channel as RS-485/422 or RS-232 version



Technical data

Local bus interface	
Name	Axio bus
Connection method	Bus base module
Serial port	
Interface	RS-232, RS-485, RS-422
Connection method	Spring-cage connection with direct plug-in method
Power supply for module electronics	
Communications power U_{bus}	5 V DC (via bus base module)
Current consumption from U_{bus}	Typ. 200 mA
Serial input/output channel	
Input buffer	4 kbyte
Output buffer	1 kbyte
Transmission speed	110 bit/s ... 250000 bit/s (configurable)
Data bits	5 … 8
Stop bits	1 or 2
Parity	Even, odd or no parity
Transmission type	Transparent mode, end-to-end mode, XON/XOFF, Modbus RTU
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	135 g
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline communication module, complete with accessories (bus base module) - 1 serial input and output channel as RS-485/RS-422 or RS-232 version	**AXL F RS UNI 1H**	**2688666**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS S**	**2700992**	5
Axioline shield connection set	**AXL SHIELD SET**	**2700518**	1

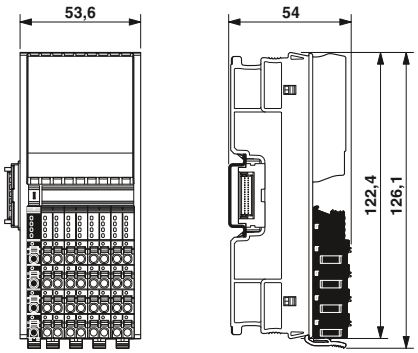
Special function module

This module is designed for use within an Axioline station.

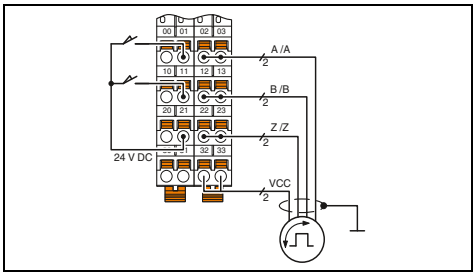
It is used for counting pulses and for position detection using incremental encoders.

Features:

- Two counter inputs (32-bit)
- Two incremental encoder interfaces (32-bit)
- Symmetrical or asymmetrical encoders can be connected
- Maximum frequency of 300 kHz
- Eight digital inputs (gate, direction signal, latch, home position switch)
- Two digital outputs
- 5 V and 24 V sensor/encoder supply
- Encoder monitoring
- Rotary axis function
- Ten homing methods



**2 counter inputs,
2 incremental encoder interfaces**



Technical data

Local bus interface	
Name	Axio bus
Connection method	Bus base module
Power supply for module electronics	
Communications power U_{bus}	5 V DC (via bus base module)
Current consumption from U_{bus}	Typ. 100 mA
I/O supply	
Supply of digital input modules U_I	24 V DC
Supply voltage range U_I	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Protective circuit	Surge protection Polarity reversal protection of the supply voltage
Counter input	
Number of inputs	2 (S1, S2)
Input frequency	max. 300 kHz /150 kHz (depending on the input voltage)
Input voltage	24 V DC
Encoder inputs	
Number of inputs	2 (A1, /A1, B1, /B1, Z1, /Z1 ; A2, /A2, B2, /B2, Z2, /Z2)
Encoder signals	Symmetrical and asymmetrical encoders
Input frequency	max. 300 kHz /150 kHz (depending on the input voltage)
Digital inputs	
Connection technology	1-wire (optionally 2, 3-wire)
Number of inputs	8 (CNT: G1, G2, Dir1, Dir2 ; INC: Ref1, Ref2, L1, L2)
Description of the inputs	EN 61131-2, type 3
Nominal input voltage U_{IN}	24 V DC
Nominal input current at U_{IN}	2.5 mA (per channel)
Digital outputs	
Number of outputs	2 (Out1, Out2)
Output voltage	24 V DC
Maximum output current per channel	500 mA
Protective circuit	Short-circuit protection, overload protection of the outputs
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	205 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline special function module - 2 counter inputs, 2 incremental encoder inputs	**AXL CNT 2/INC 2**	**2688093**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS**	**2688129**	5
Axioline shield connection set	**AXL SHIELD SET**	**2700518**	1

Axioline position detection module

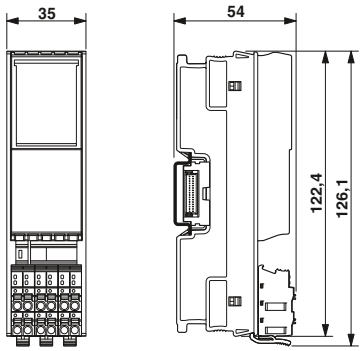
This module is designed for use within an Axioline station.

It is used to detect positions using an absolute encoder with an SSI interface.

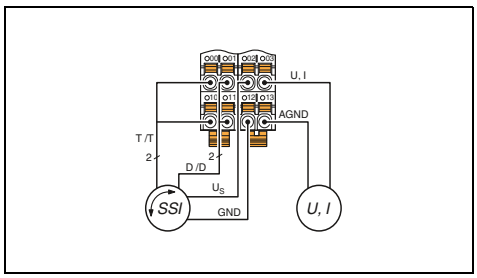
At the same time, an analog output can be used for defining the setpoint of a drive controller, for example.

Features:

- Position detection using absolute encoders with SSI interface
- Encoder resolution up to 56 bits
- Transmission frequency of up to 2 MHz
- Gray or binary code
- Reversal of direction of rotation
- Synchronized transmission of encoder values
- Detailed encoder diagnostics
- Current and voltage measuring ranges
- 16-bit resolution of the analog output value
- D/A conversion time typically 5 µs



1 SSI interface for absolute encoder, 1 analog output



Technical data

Local bus interface	
Name	Axio bus
Connection method	Bus base module
Power supply for module electronics	
Communications power U_{bus}	5 V DC (via bus base module)
Current consumption from U_{bus}	max. 140 mA
I/O supply	
Supply U_I	24 V DC 19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Protective circuit	Surge protection Protection against polarity reversal Transient protection
Encoder inputs	
Input name	SSI interface
Number of inputs	1
Transmission frequency	2 MHz
Adjustable resolution	8 ... 56
Analog outputs	
Connection technology	2-wire (shielded, twisted pair)
Number of outputs	1
Voltage output signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current output signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Load/output load current output	max. 500 Ω
Protective circuit	Surge protection Short-circuit and overload protection Transient protection
Precision	Typ. 0.1% (of output range final value)
Characteristics	
Representation of output values	16 bits (15 bits + sign)
General data	
Connection method	Spring-cage connection with direct plug-in method
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	135 g
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axioline special function module - 1 SSI interface for absolute encoder, 1 analog output	**AXL SSI 1/AO 1**	**2688433**	1

Accessories

Axioline bus base module (replacement part)	**AXL BS S**	**2700992**	5
Axioline shield connection set	**AXL SHIELD SET**	**2700518**	1

Product overview

Bus couplers

EtherNet/IP	Modbus/TCP (UDP)	PROFINET	sercos the automation bus	CANopen	DeviceNet	INTERBUS	MECHATROLINK	Modbus/RTU	PROFIBUS	MUX
168	170	172	174	178	180	182	192	169	188	193

Power, segment, and accessory terminals

Power terminals			Boost terminals	Segment terminals	Potential distributor terminals	
24 V DC	120 V AC	230 V AC		24 V DC	24 V DC	GND
194	195	195	196	198	199	199

Input and output terminals

Digital input

1 channel	2 channels	4 channels	8 channels	16 channels	32 channels
204	200	200	201	200	201

Digital output

1 channel	2 channels	4 channels	8 channels	16 channels	32 channels
210	206	206	206	206	207

Analog input			Strain gauge	Analog output		
2 channels	4 channels	8 channels	2 channels	1 channel	2 channels	8 channels
212	214	213	216	220	220	221

Temperature measurement terminals

1 channel (TC)	2 channels (UTH/RTD)	4/8 channels (RTD)
219	218	219

Machine Edition (ME)

Digital input	Digital output	Analog input	Analog output
4/16 channels	4/16 channels	2 channels	2 channels
222	222	223	223

Building automation

DALI terminals	EnOcean wireless receiver
224	225

Branch terminals

Remote bus branch, Fieldline extension, line skipping
226

Communication terminals

Serial communication terminals		Master terminals			
RS-232	RS-485	INTERFACE system bus	CAN	IO-Link	PROFIBUS
228	229	230	231	232	233

Measurement terminals

Position detection terminals
238

Open and closed-loop control

Temperature controller terminals		Function terminals		Positioning control terminals	
RTD sensors	UTH sensors	Counter terminal	Pulse width terminal	INC	SSI
www.phoenixcontact.net/products		234	235	237	237

Power-level terminals

Servo amplifier EC motors	Direct starter	Reversing load starter
240	242	242

Intrinsically safe terminals (Ex-i)

PWR	DIO	AIO	TEMP
24 V	4/4 channels	4/4 channels	4 channels (RTD/TC)
490	491	492	493

PC Worx programmable terminals – Inline controllers

Performance class		
100	200	300
532	www.phoenixcontact.net/products	538

Safety terminals

Logic modules	Safety-related I/Os	
8 channels	8 channels	4 channels
105	108	107

General accessories

IB IL FIELD ...
Marking fields

ESL 62X...
Labeling sheets

ZBF 6-...
Zack marker strip labeling

IL CP
Coding profile

CLIPFIX 35-5
Standard end clamp

CLIPFIX 35
End clamp for CANopen® and DeviceNet™ bus couplers

E/AL-NS 35
End clamp for use in the event of vibrations

www.phoenixcontact.net/products

FLKM 14-PA-INLINE/...
VARIOFACE front adapters

PSM-SET-FSMA/4-...
F-SMA plugs for INTERBUS FO

IBS DSUB 9/...
D-SUB 9 plug-in connectors

SUBCON ...
SUBCON plug-in connectors

I-L ATP GN
End cover plate

...-CABLE-...

PROJECT+
Software for planning the I/O configuration

www.phoenixcontact.net/products 514

General technical data

Ambient conditions	
Operating temperature range	-25°C ... +55°C
Storage temperature	-25°C ... +85°C
Relative humidity (operation)	5% to 95% (no condensation)
Relative humidity (storage)	5% to 95% (no condensation)
Vibration	5g, 2 hours in each space direction according to IEC 60068-2-6
Shock	25g, over 11 ms according to IEC 60068-2-6
Degree of protection	IP20 (according to IEC 60529)

Electromagnetic compatibility	
Noise emission	EN 61000-6-3
Noise emission of housing	EN 55011 Class A
Noise immunity	EN 61000-6-2

Supply voltage	
Nominal value	24 V DC
Ripple	±5%
Permissible range	19.2 V ... 30.0 V

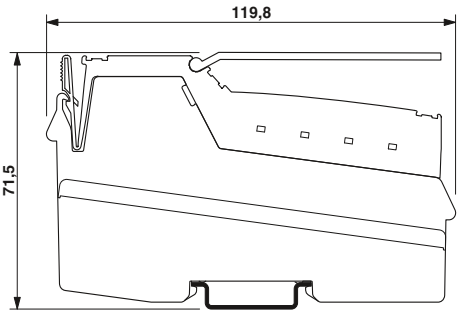
EtherNet/IP™ bus coupler

The EtherNet/IP™ bus coupler offers the following special features:

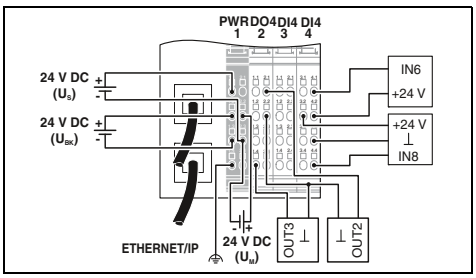
– EtherNet/IP™, Version 1.2
– 2 RJ45 connections
– 8 digital inputs, 4 digital outputs onboard
– Automatic speed detection of the system bus
– Up to 61 terminals (16 PCP devices) can be connected
– Web-based management
– Design width of 80 mm

Notes:

1) EMC: Class A product, see page 553



2-port copper connection, 8 digital inputs and 4 digital outputs



Technical data

Interface	
Fieldbus system	EtherNet/IP™
Connection method	RJ45 socket, auto negotiation
Number	2
Transmission speed	10/100 Mbps
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption	max. 0.98 A (from U_{BK})
Power supply at U_L	max. 0.8 A DC
Power supply at U_{ANA}	max. 0.5 A DC
Digital inputs	
Connection technology	2, 3-wire
Maximum number of inputs	8
Typical response time	Approx. 500 µs
Protective circuit	Protection against polarity reversal
Digital outputs	
Connection technology	2, 3-wire
Maximum number of outputs	4
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
INTERBUS data	
Number of local bus devices that can be connected	61 (on board I/Os are two devices)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	320 g
Width	80 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ethernet bus coupler, EtherNet/IP™-capable, complete with accessories (connector and marking field)	**IL EIP BK DI8 DO4 2TX-PAC**[1])	**2897758**	1

Accessories

Connector set for bus coupler	**IL BKDIO-PLSET**	**2878599**	1

Modbus/RTU (ASCII) bus coupler

The bus coupler for Modbus/RTU (ASCII) can insert an Inline station at any point in the Modbus/RTU network.

The address can be easily set using two rotary coding switches and the fieldbus is connected via a 9-pos. D-SUB socket.

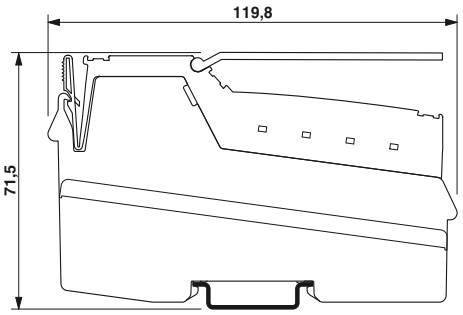
The bus coupler automatically detects 500 kbaud or 2 Mbaud terminals. Including the integration of up to 8 PCP devices, the maximum configuration for this bus coupler is 61 devices.

Features:

– 8 inputs, 24 V DC
– 4 outputs, 24 V DC, 500 mA
– Maximum of 61 devices (including 8 PCP)
– Shipbuilding and UL approvals
– Design width of 80 mm

Notes:

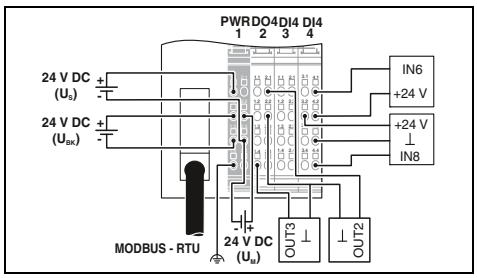
1) EMC: Class A product, see page 553



Modbus/RTU

**D-SUB connection,
8 digital inputs and 4 digital outputs**

Ex:



Technical data

Interface	
Fieldbus system	Modbus RTU
Connection method	D-SUB-9 socket
Transmission speed	1.2 kbps ... 115.2 kbps
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption	max. 0.98 A (from U_{BK})
Power supply at U_L	max. 0.8 A DC
Power supply at U_{ANA}	max. 0.5 A DC
Digital inputs	
Connection technology	2, 3-wire
Maximum number of inputs	8
Typical response time	Approx. 500 µs
Protective circuit	Polarity reversal
Digital outputs	
Connection technology	2, 3-wire
Maximum number of outputs	4
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
INTERBUS data	
Number of local bus devices that can be connected	61 (on board I/Os are two devices)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	320 g
Width	80 mm
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Modbus/RTU(ASCII) bus coupler, complete with accessories (connector and marking field)	**IL MOD BK DI8 DO4-PAC**[1]	**2878696**	1

Accessories

Connector set for bus coupler	**IL BKDIO-PLSET**	**2878599**	1
D-SUB plug, 9-pos with two cable infeeds, **for Inline Modular-Modbus RTU/ASCII bus couplers** (termination resistance can be connected via slide switch)	**SUBCON-PLUS-Modbus/IL/BK**	**2310808**	1

Ethernet (Modbus/TCP (UDP)) bus coupler

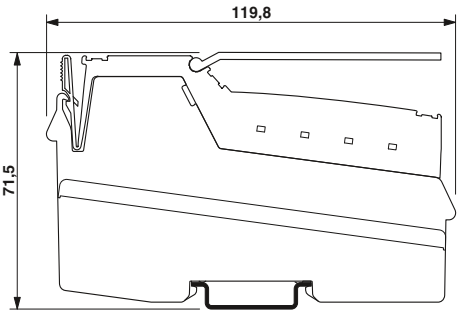
The Modbus/TCP (UDP) bus coupler can insert an Inline station at any point in the Modbus/TCP (UDP) network.

Features:

- 2 RJ45 connections
- 8 digital inputs, 4 digital outputs onboard
- Automatic speed detection of the system bus
- Up to 61 terminals (16 PCP devices) can be connected
- Web-based management
- Software interfaces for access via TCP/IP:
  - Device Driver Interface (DDI)
  - High-Level Language Fieldbus Interface (HFI)
- Can be programmed with C, C++, C#, Visual Basic or other high-level languages
- Data exchange via OPC server supported
- Design width of 80 mm

Notes:

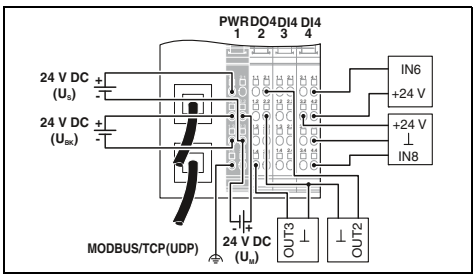
1) EMC: Class A product, see page 553



Modbus/TCP (UDP)

2-port copper connection, 8 digital inputs and 4 digital outputs

Ex:



Technical data

Interface	
Fieldbus system	Modbus/TCP (UDP)
Connection method	RJ45 socket, auto negotiation
Number	2
Transmission speed	10/100 Mbps
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption	max. 0.98 A (from U_{BK})
Power supply at U_L	max. 0.8 A DC
Power supply at U_{ANA}	max. 0.5 A DC
Digital inputs	
Connection technology	2, 3-wire
Maximum number of inputs	8
Typical response time	Approx. 500 µs
Protective circuit	Protection against polarity reversal
Digital outputs	
Connection technology	2, 3-wire
Maximum number of outputs	4
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
INTERBUS data	
Number of local bus devices that can be connected	61 (on board I/Os are two devices)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	375 g
Width	80 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Modbus/TCP(UDP) bus coupler - Complete with accessories (connector and marking field)	**IL ETH BK DI8 DO4 2TX-PAC**[1]	**2703981**	1

Accessories

Connector set for bus coupler	**IL BKDIO-PLSET**	**2878599**	1

Ethernet (Modbus/TCP) Block IO

This Inline Block IO module can be operated directly in an Ethernet network.

Thanks to the integrated switch, it is possible to connect an additional module and thereby implement a linear structure.

Features:

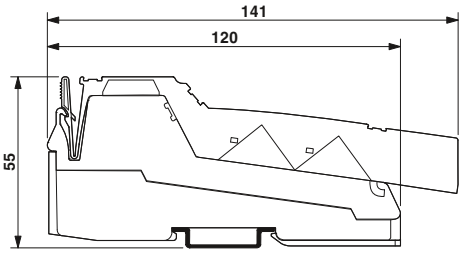
– 2 RJ45 sockets angled 45°
– 16/32 inputs, 24 V DC
– 16 outputs, 24 V DC, 500 mA

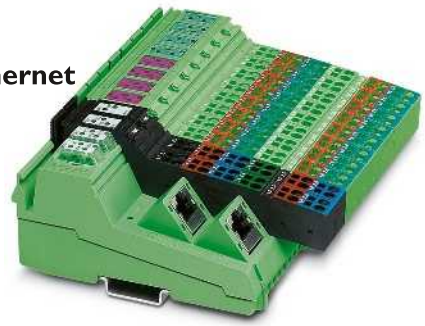
Supported network/application protocols:

– BootP
– http (Web server)
– SNMP
– Modbus/TCP
– DDI

Notes:

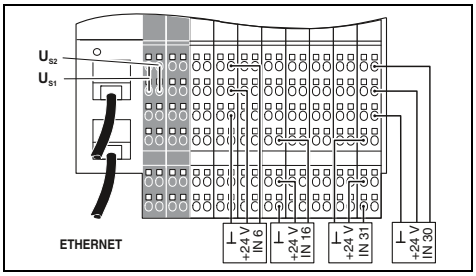
1) EMC: Class A product, see page 553





16 inputs and 16 selectable channels (input or output)

Ex:



Technical data

Interface	
Fieldbus system	Modbus TCP/IP
Connection method	RJ45 socket
Number	2
Transmission speed	10/100 Mbps (with autonegotiation)
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Supply current	60 mA
Digital inputs	
Connection technology	2, 3-wire
Number of inputs	32
Description of the input	16 fixed and 16 freely selectable
Typical response time	Approx. 500 µs
Protective circuit	Short-circuit protection, overload protection of the sensor supply
Digital outputs	
Connection technology	2-wire
Number of outputs	16
Output description	Freely selectable
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	500 g
Degree of protection	IP20
Width	156 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O digital input/output module			
- 16 fixed inputs, 16 freely selectable inputs/outputs	**ILB ETH 24 DI16 DIO16-2TX[1])**	**2832962**	1

PROFINET bus coupler

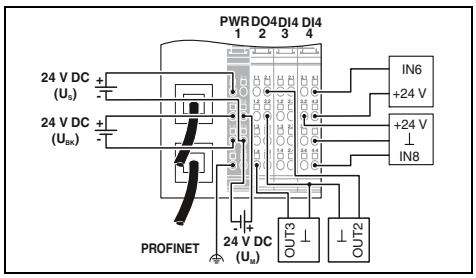
PROFINET bus couplers offers the following special features:
– 2 RJ45 or 2 SCRJ connections
– 8 digital inputs, 4 digital outputs onboard
– Automatic speed detection of the system bus
– Up to 61 terminals (16 PCP devices) can be connected
– Approved for PROFIsafe applications
– Design width of 80 mm

Notes:

1) EMC: Class A product, see page 553

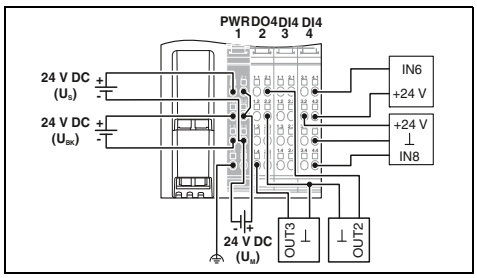
2-port copper connection, 8 digital inputs and 4 digital outputs

PROFIBUS
Ex:



2-port SCRJ connection, 8 digital inputs and 4 digital outputs

PROFIBUS
Ex:



Technical data

Interface		
Fieldbus system	PROFINET	PROFINET
Connection method	RJ45 socket, auto negotiation	SCRJ socket
Number	2	2
Transmission speed	100 Mbps (acc. to PROFINET standard)	100 Mbps (acc. to PROFINET standard)
PROFINET IO		
Device function	PROFINET IO device	PROFINET IO device
Update rate	min. 1 ms (depending on the size of the bus system)	min. 1 ms (depending on the size of the bus system)
Local bus interface		
Connection method	Inline data jumper	Inline data jumper
Power supply for module electronics		
Supply voltage	24 V DC (via Inline connector)	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption	Typ. 138 mA (from U_{BK})	max. 0.83 A DC (from U_{BK})
Power supply at U_L	max. 0.8 A DC	max. 0.8 A DC
Power supply at U_{ANA}	max. 0.5 A DC	max. 0.5 A DC
Digital inputs		
Connection technology	2, 3-wire	2, 3-wire
Maximum number of inputs	8	8
Typical response time	Approx. 500 µs	Approx. 500 µs
Protective circuit	Protection against polarity reversal	Protection against polarity reversal
Digital outputs		
Connection technology	2, 3-wire	2, 3-wire
Maximum number of outputs	4	4
Maximum output current per channel	500 mA	500 mA
Protective circuit	Short-circuit and overload protection	Short-circuit and overload protection
INTERBUS data		
Number of local bus devices that can be connected	61 (on board I/Os are two devices)	61 (on board I/Os are two devices)
General data		
Connection method	Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	375 g	280 g
Ambient temperature (operation)	-25 °C ... 55 °C (observe derating)	-25 °C ... 55 °C (observe derating)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PROFINET bus coupler, complete with accessories (connector and marking field) - RJ45 connection	**IL PN BK DI8 DO4 2TX-PAC**	**2703994**	1
- SCRJ connection	**IL PN BK DI8 DO4 2SCRJ-PAC[1])**	**2878379**	1

Accessories

Connector set for bus coupler	**IL BKDIO-PLSET**	**2878599**	1

PROFINET Block IO

This Inline Block IO module can be operated directly in a PROFINET network.

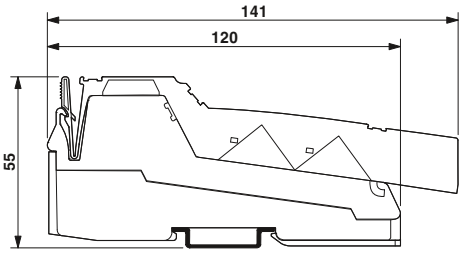
Thanks to the integrated switch, it is possible to connect an additional module and thereby implement a linear structure.

Features:

– 2 RJ45 sockets angled 45°
– 16/32 inputs, 24 V DC
– 16 outputs, 24 V DC, 500 mA

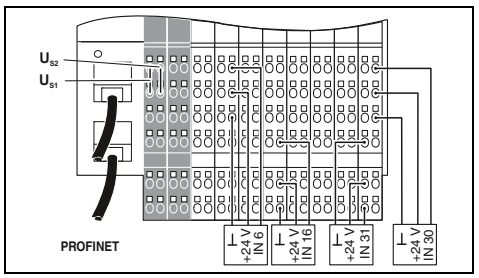
Notes:

1) EMC: Class A product, see page 553



16 inputs and 16 selectable channels (input or output)

Ex:



Technical data

Interface	
Fieldbus system	PROFINET
Connection method	RJ45 socket
Number	2
Transmission speed	10/100 Mbps (with autonegotiation)
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Supply current	60 mA
Digital inputs	
Connection technology	2, 3-wire
Number of inputs	32
Description of the input	16 fixed and 16 freely selectable
Typical response time	Approx. 500 µs
Protective circuit	Short-circuit protection, overload protection of the sensor supply
Digital outputs	
Connection technology	2-wire
Number of outputs	16
Output description	Freely selectable
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	500 g
Degree of protection	IP20
Width	156 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O digital input/output module for PROFINET - 16 fixed inputs, 16 freely selectable inputs/outputs	**ILB PN 24 DI16 DIO16-2TX**[1])	**2878146**	1

For the control cabinet (IP20) — Inline

sercos bus couplers

The sercos bus coupler enables the integration of the flexible Inline automation kit in sercos networks. This means that I/Os in motion control applications whose drives are networked via sercos can be integrated without having to use an additional bus system for the I/Os.

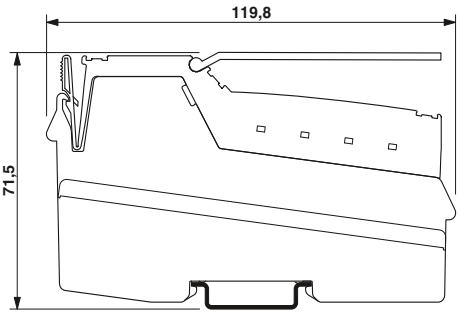
The input and output data is mapped to the input and output data containers defined in the FSP IO (function-specific profile IO).

Features:

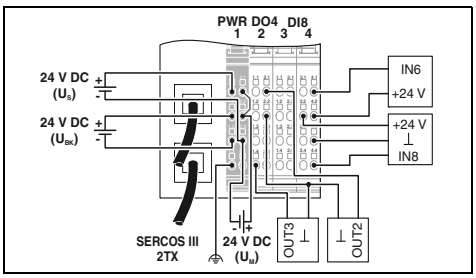
- sercos specification V1.1.2
- sercos LED
- 2 RJ45 connections
- Minimum sercos cycle time of 250 µs
- Maximum of 6 realtime connections
- 8 digital inputs, 4 digital outputs onboard
- Automatic speed detection of the system bus
- Up to 61 Inline terminals (16 PCP devices) can be connected

Notes:

1) EMC: Class A product, see page 553



2-port copper connection



Technical data

Interface	
Fieldbus system	sercos
Connection method	RJ45 socket, auto negotiation
Number	2
Transmission speed	100 Mbps
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption	max. 1.05 A (from U_{BK})
Power supply at U_L	max. 0.8 A DC
Power supply at U_{ANA}	max. 0.5 A DC
Digital inputs	
Connection technology	2, 3-wire
Maximum number of inputs	8
Typical response time	Approx. 500 µs
Protective circuit	Protection against polarity reversal
Digital outputs	
Connection technology	2, 3-wire
Maximum number of outputs	4
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
INTERBUS data	
Number of local bus devices that can be connected	61 (on board I/Os are two devices)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	375 g
Width	80 mm
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
sercos bus coupler, complete with accessories (connector and marking field) - sercos	**IL S3 BK DI8 DO4 2TX-PAC**[1])	**2692380**	1

Accessories

Inline connector	**IB IL SCN-8-CP**	**2727608**	10

sercos Block IO

The Inline Block IO module can be operated directly in a sercos network as a sercos slave.

The module is used to acquire and output analog signals.

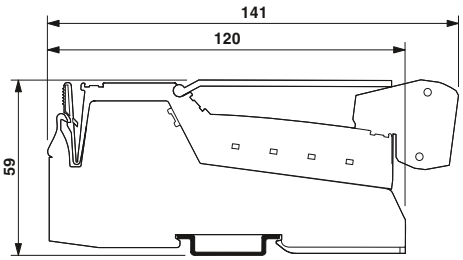
The compact unit enables quick and easy integration of I/Os into the sercos solution.

Features:

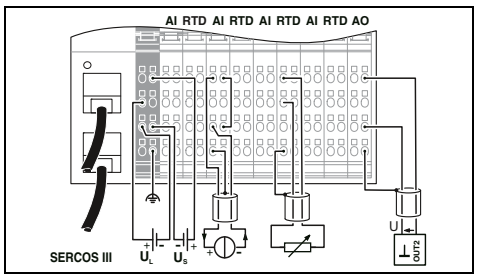
- 4 shielded differential analog signal inputs or 4 universal RTD inputs
- 4 voltage measuring ranges and 3 current measuring ranges
- Connection of sensors in 2, 3, and 4-wire technology
- Sensor supply with channel-specific integrated short-circuit and overload protection
- Adjustable filter times
- 2 shielded analog signal outputs with 4 voltage and 3 current ranges
- Connection of actuators in 2-wire technology
- Short-circuit-proof outputs

Notes:

1) EMC: Class A product, see page 553



4 analog inputs and 2 analog outputs



Technical data

Interface	
Fieldbus system	sercos
Connection method	RJ45 socket, shielded
Transmission speed	100 Mbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Supply current	-
Analog inputs	
Connection technology	2, 3, 4-wire (shielded)
Number of inputs	max. 4 (differential inputs, voltage or current can be chosen separately)
Voltage input signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Sensor types (RTD) that can be used	Pt100, Pt500, Pt1000, Ni100, Ni1000, Ni1000 L&G
Linear resistance measuring range	0 Ω ... 3200 Ω / 0 Ω ... 9500 Ω
Protective circuit for voltage input	Overload protection, short-circuit protection of sensor supply
Protective circuit for current input	Short-circuit protection for the sensor supply
Analog outputs	
Connection technology	2-wire (shielded)
Number of outputs	2
Voltage output signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current output signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Protective circuit	Short-circuit protection of outputs
Process data	
Measured value resolution	16 bits (15 bits + sign bit)
Input filter time	1.1 ms (or 4.5 ms per channel)
Data formats	-
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	465 g
Degree of protection	IP20
Width	156 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O analog input/output module			
- For sercos	**ILB S3 AI4 AO2-2TX[1])**	**2692076**	1

sercos Block IO

The Inline Block IO module can be operated directly in a sercos network as a sercos slave.

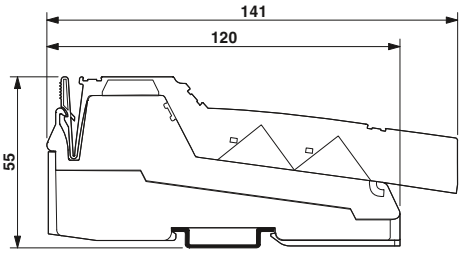
The module is used to acquire and output digital signals.

Features:

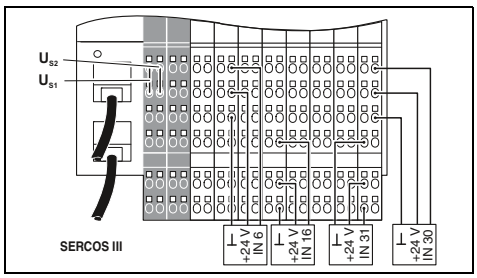
- 16 digital inputs
- 16 channels that can be used as digital I/Os
- The combined I/Os are configured by simply selecting the actuator or sensor connection ; no parameterization is required
- Connection of sensors in 2 and 3-wire technology
- Connection of actuators in 2-wire technology
- Very low delay times
- Short-circuit and overload protected outputs

Notes:

1) EMC: Class A product, see page 553



16 inputs and 16 selectable channels (input or output)



Technical data

Interface	
Fieldbus system	sercos
Connection method	RJ45 socket
Number	2
Transmission speed	100 Mbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC
Supply current	70 mA
Digital inputs	
Connection technology	2, 3-wire
Number of inputs	32
Description of the input	16 fixed and 16 freely selectable
Typical response time	50 µs
Protective circuit	Short-circuit protection, overload protection of the sensor supply
Digital outputs	
Connection technology	2-wire
Number of outputs	16
Output description	Freely selectable
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	500 g
Degree of protection	IP20
Width	156 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O digital input/output module			
- 16 fixed inputs, 16 freely selectable inputs/outputs	**ILB S3 24 DI16 DIO16-2TX[1])**	**2897570**	1

sercos Block IO

Positioning controller for two axes

The Inline Block IO module can be operated directly in a sercos network as a sercos slave.

The module handles the motion control of two drive axes and offers the following functions:

– Point-to-point positioning controller
– Position controller
– Speed controller
– Cam controller
– Homing
– Probe function

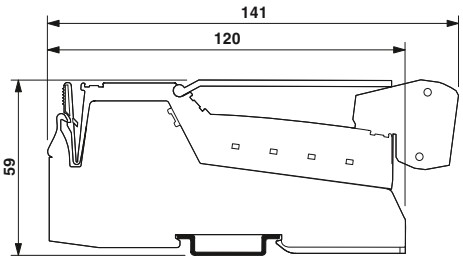
For each axis, one drive controller (using +/-10 V signal) and one position encoder (using incremental signal) can be connected to the digital I/Os for the limit and home position switches.

The module integrates motion functions in sercos systems where there are no control electronics with sercos interface, e.g.,:

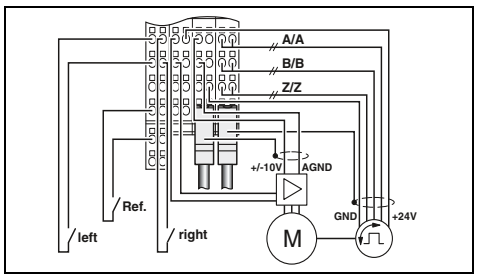
– Proportional valves for pneumatic or hydraulic cylinders
– Drive amplifier for electrical low-power motors
– Simple frequency inverter

Notes:

1) EMC: Class A product, see page 553



**8 digital inputs and 4 outputs,
2 analog outputs,
2 incremental encoder inputs**



Technical data

Interface	
Fieldbus system	sercos
Connection method	RJ45 socket
No. of channels	2
Transmission speed	100 Mbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Supply current	70 mA
Encoder inputs	
Input name	Encoder input, 2 square-wave signals with 90 degree offset
Description of the input	Position detection with incremental signal from rotary/linear encoder
Number of inputs	2
Input frequency	to 300 kHz
Digital inputs	
Connection method	2, 3-wire
Number of inputs	8
Nominal input voltage U_{IN}	24 V DC
Digital outputs	
Connection technology	2-wire
Number of outputs	4
Output voltage	24 V DC
Maximum output current per channel	500 mA
Analog outputs	
Connection technology	2-wire
Number of outputs	2
Voltage output signal	-10 V ... 10 V
D/A resolution	10 bit
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	405 g
Width	156 mm
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Block motion control for sercos			
- 2 axes, drive control via speed setpoint, position detection with incremental signal from rotary/linear encoder	**ILB S3 24 DI8 DO4 AO2 INC-IN2**[1]	**2700174**	1

CANopen® bus coupler

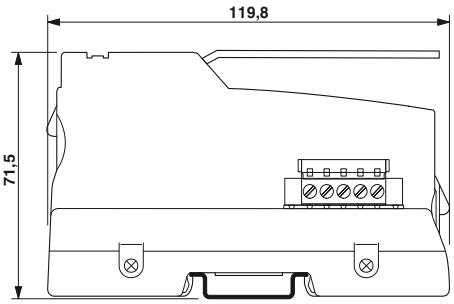
The CANopen® bus coupler enables the flexible Inline automation kit to be operated at any point within the CANopen® network.

Features:

- Slave function in CANopen® network
- Address can be set via DIP switches
- CANopen® connection via TWIN-COMBICON connector
- 63 terminals can be connected

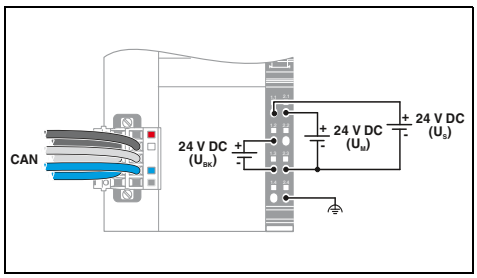
Notes:

1) EMC: Class A product, see page 553



MINI-COMBICON connection

Ex:



Technical data

Interface	
Fieldbus system	CANopen®
Connection method	2x 5-pos. TWIN-COMBICON connectors
Transmission speed	1 Mbaud, 500 kbaud, 250 kbaud, 125 kbaud, 50 kbaud, 20 kbaud, 10 kbaud (can be set via DIP switch or programmed)
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC
Max. current consumption	max. 1.25 A (from U_{BK})
Power supply at U_L	max. 2 A DC
Power supply at U_{ANA}	max. 0.5 A DC
INTERBUS data	
Number of local bus devices that can be connected	63
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	240 g
Width	85 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
CANopen® bus coupler, complete with accessories (connector and marking field)	**IL CAN BK-TC-PAC**[1]	**2718701**	1

Accessories

Inline connector	**IB IL SCN-8-CP**	**2727608**	10

CANopen® Block IO

This Inline Block IO module can be connected directly to the CANopen® network as a slave.

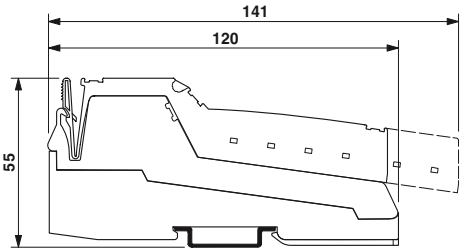
The bus address and the data transmission rate are easily set using the DIP switches on the module. Automatic detection of transmission speeds can also be set.

Features:

– D-SUB bus connection
– 16 inputs, 24 V DC
– 16 outputs, 24 V DC, 500 mA

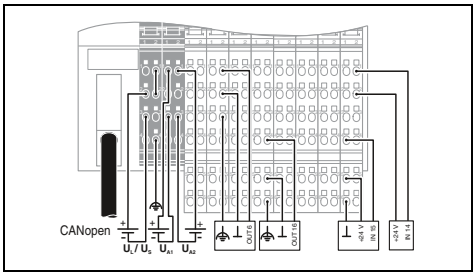
Notes:

1) EMC: Class A product, see page 553



16 digital inputs and 16 digital outputs

Ex:



Technical data

Interface	
Fieldbus system	CANopen®
Connection method	D-SUB-9 socket
Transmission speed	10 kbps ... 1 Mbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Supply current	25 mA
Digital inputs	
Connection technology	2, 3-wire
Number of inputs	16
Description of the input	EN 61131-2 type 1
Typical response time	Approx. 500 µs
Protective circuit	Short-circuit protection, overload protection of the sensor supply
Digital outputs	
Connection technology	2, 3-wire
Number of outputs	16
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	500 g
Degree of protection	IP20
Width	156 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O digital input/output module			
- 16 inputs, 16 outputs	**ILB CO 24 DI16 DO16[1])**	**2862592**	1

DeviceNet™ bus coupler

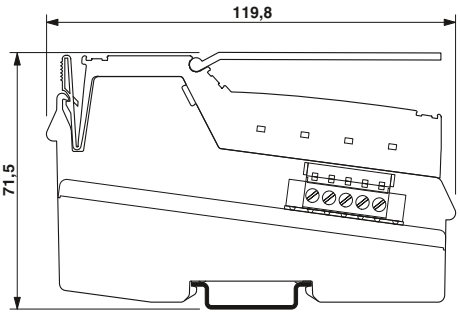
The DeviceNet™ bus coupler enables the flexible Inline automation kit to be operated at any point within the DeviceNet™ network.

Features:

- Slave function in DeviceNet™ network
- Address can be set via DIP switches or software
- DeviceNet™ connection via TWIN-COMBICON connector
- Automatic speed detection of the system bus
- 61 terminals can be connected

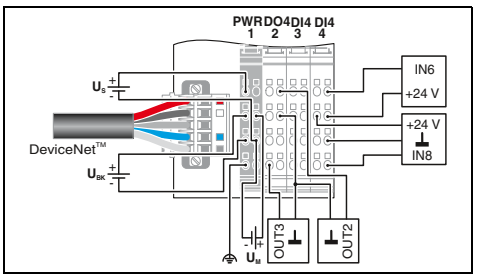
Notes:

1) EMC: Class A product, see page 553



MINI-COMBICON connection, 8 digital inputs and 4 digital outputs

Ex:



Technical data

Interface	
Fieldbus system	DeviceNet™
Connection method	2x 5-pos. TWIN-COMBICON connectors
Transmission speed	500 kbaud, 250 kbaud, 125 kbaud (can be set via DIP switch or programmed)
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption	max. 0.9 A (from U_{BK})
Power supply at U_L	max. 0.8 A DC
Power supply at U_{ANA}	max. 0.5 A DC
Digital inputs	
Connection technology	2, 3-wire
Maximum number of inputs	8
Typical response time	Approx. 500 µs
Protective circuit	Protection against polarity reversal
Digital outputs	
Connection technology	2, 3-wire
Maximum number of outputs	4
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
INTERBUS data	
Number of local bus devices that can be connected	61 (on board I/Os are two devices)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	320 g
Width	80 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
DeviceNet™ bus coupler, complete with accessories (connector and marking field)	**IL DN BK DI8 DO4-PAC**[1]	**2897211**	1

Accessories

Connector set for bus coupler	**IL BKDIO-PLSET**	**2878599**	1

DeviceNet™ Block IO

This Inline Block IO module can be connected directly to the DeviceNet™ fieldbus system as a slave.

In the case of DeviceNet™, the remote bus is connected via the TWIN-COMBICON connector provided.

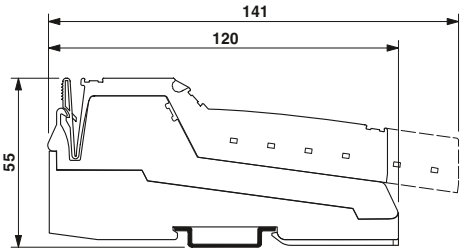
The bus address and the data transmission rate are easily set using the DIP switches on the module. Automatic detection of transmission speeds can also be set.

Features:

– 2 x 5-pos. TWIN-COMBICON connector
– 16 inputs, 24 V DC
– 16 outputs, 24 V DC, 500 mA

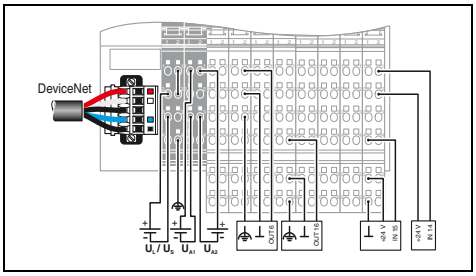
Notes:

1) EMC: Class A product, see page 553



16 digital inputs and 16 digital outputs

Ex:



Technical data

Interface	
Fieldbus system	DeviceNet™
Connection method	2x 5-pos. TWIN-COMBICON connectors
Transmission speed	125 kbps ... 500 kbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Supply current	70 mA
Digital inputs	
Connection technology	2, 3-wire
Number of inputs	16
Description of the input	EN 61131-2 type 1
Typical response time	Approx. 500 µs
Protective circuit	Short-circuit protection, overload protection of the sensor supply
Digital outputs	
Connection technology	2, 3-wire
Number of outputs	16
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	500 g
Degree of protection	IP20
Width	156 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O digital input/output module			
- 16 inputs, 16 outputs	**ILB DN 24 DI16 DO16[1])**	**2862602**	1

INTERBUS bus coupler for copper cables

The INTERBUS bus coupler connects the terminals of an Inline station with the INTERBUS network.

Various bus couplers can be selected to connect to the INTERBUS remote branch via a copper connection. Inline or D-SUB connectors are used accordingly to establish the connection.

The bus coupler performs the following functions within an Inline station:

– Refreshing the INTERBUS remote bus signals
– Decoupling the outgoing remote bus or the connected I/O terminals via software commands
– Supplying the connected I/O modules by means of an integrated power supply unit (IBS IL 24 BK-T/U-PAC)

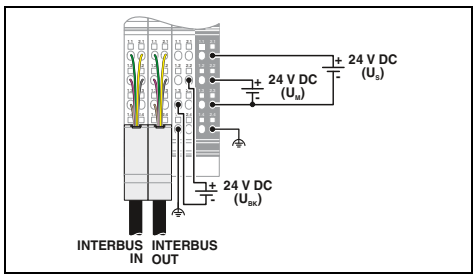
Notes:

1) EMC: Class A product, see page 553

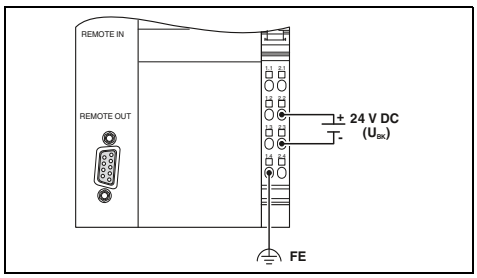
Inline shield connector connection

D-SUB connection

Ex:



Ex:



Technical data

Interface	
Name	INTERBUS remote bus
Connection method	2x 6-pos. Inline shield connectors
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Typical current consumption	Typ. 100 mA (without connected Inline I/O terminals)
Power supply at U_L	max. 2 A DC (observe derating)
Power supply at U_{ANA}	max. 0.5 A DC (observe derating)
INTERBUS data	
Number of local bus devices that can be connected	63
Maximum distance to the next remote bus device	400 m
Programmable functions	
	Local bus branch disable Local bus reset Local bus disable Remote bus disable Remote bus reset
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	214 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Technical data

Interface	
Name	INTERBUS remote bus
Connection method	D-SUB-9 socket/plug
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Typical current consumption	Typ. 100 mA (without connected Inline I/O terminals)
Power supply at U_L	max. 2 A DC (observe derating)
Power supply at U_{ANA}	max. 0.5 A DC (observe derating)
INTERBUS data	
Number of local bus devices that can be connected	63
Maximum distance to the next remote bus device	400 m
Programmable functions	
	Local bus branch disable Local bus reset Local bus disable Remote bus disable Remote bus reset
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	210 g
Width	85 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
INTERBUS bus coupler, complete with accessories (connector and marking field) - Inline shield connector connection - D-SUB connection	**IBS IL 24 BK-T/U-PAC[1])**	**2861580**	1

Accessories

Connector set for bus terminal, copper, color-coded	**IB IL BK-PLSET/CP**	**2860374**	1
Inline connector			

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS IL 24 BK-DSUB-PAC[1])	**2861593**	1

Accessories

IB IL SCN-8-CP	**2727608**	10

INTERBUS bus coupler for fiber-optic cable

The INTERBUS bus coupler connects the terminals of an Inline station with the INTERBUS network.

Various bus couplers can be selected for the FO connection to the INTERBUS remote bus. The connection is always made using an Inline F-SMA connector (optical fiber).

The IBS IL 24 BK-LK/45 has a 45° angled INTERBUS fiber optic connection. The angled design means that the bus coupler and Inline station can also be mounted in very shallow terminal boxes without violating the required minimum bending radii for fiber optic cables.

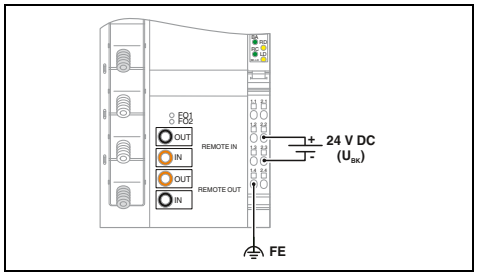
The IBS IL 24 BK RB-LK bus coupler offers the additional option of connecting a (fiber optic) remote bus branch.

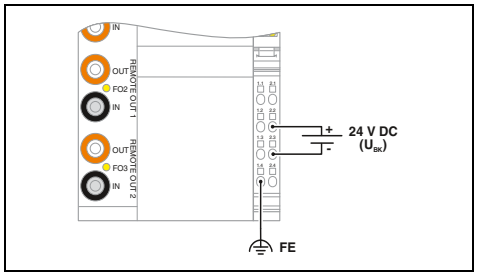
Notes:

1) EMC: Class A product, see page 553

45° angled fiber optic connection

90° FO connection and FO remote bus branch





Technical data

Interface	
Name	INTERBUS remote bus
Connection method	4x F-SMA angled connectors
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Typical current consumption	Typ. 90 mA (without connected Inline I/O terminals)
Power supply at U_L	max. 2 A DC (observe derating)
Power supply at U_{ANA}	max. 0.5 A DC (observe derating)
INTERBUS data	
Number of local bus devices that can be connected	63
Maximum distance to the next remote bus device	400 m
Programmable functions	
	Local bus branch disable Local bus reset Local bus disable Remote bus disable Remote bus reset
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	210 g
Width	85 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
INTERBUS bus coupler, complete with accessories (connector and marking field) - 45° angled fiber optic connection - FO connection and FO remote bus branch	**IBS IL 24 BK-LK/45-PAC**[1])	**2862165**	1

Accessories

Inline connector	**IB IL SCN-8-CP**	**2727608**	10

Technical data

Interface	
Name	INTERBUS remote bus
Connection method	6x F-SMA connectors
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Typical current consumption	Typ. 120 mA (without connected Inline I/O terminals)
Power supply at U_L	max. 2 A DC (observe derating)
Power supply at U_{ANA}	max. 0.5 A DC (observe derating)
INTERBUS data	
Number of local bus devices that can be connected	63
Maximum distance to the next remote bus device	400 m
Programmable functions	
	Local bus branch disable Local bus reset Local bus disable Remote bus disable Remote bus reset
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	235 g
Width	85 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS IL 24 BK RB-LK-PAC[1])	**2861506**	1

Accessories

IB IL SCN-8-CP	**2727608**	10

INTERBUS Block IO

This Inline Block IO module can be connected to the INTERBUS fieldbus system.

In order to prevent the adverse effects of interference due to compensating currents, the inputs are galvanically decoupled and have adjustable filter times. The current inputs are overload-protected in these devices and the integrated sensor supply provides short-circuit protection.

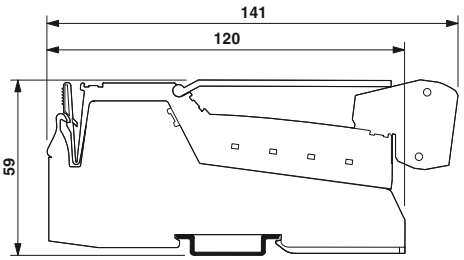
The output behavior can be set for a bus reset and thereby provides safety for the machine. In addition, all channels are equipped with shield connections as standard. This directly increases the immunity to EMI in the system.

Features:

– 4 analog inputs (shielded)
– Difference measurement or resistance thermometer (RTD)
– 2 analog outputs (shielded)

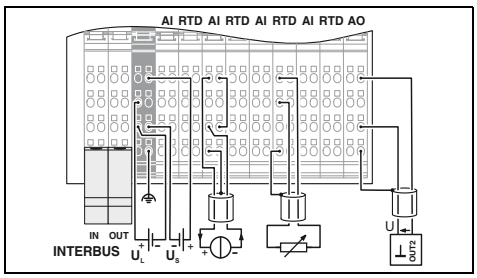
Notes:

1) EMC: Class A product, see page 553



4 analog inputs and 2 analog outputs

INTERBUS CLUB



Technical data

Interface	
Fieldbus system	INTERBUS
Connection method	Inline connectors
Transmission speed	500 kbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption	Typ. 95 mA
Analog inputs	
Connection technology	2, 3, 4-wire (shielded)
Number of inputs	max. 4 (differential inputs, voltage or current can be chosen separately)
Description of the input	Differential input, incl. sensor supply (24 V DC)
Voltage input signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Sensor types (RTD) that can be used	Pt100, Pt500, Pt1000, Ni100, Ni1000, Ni1000 L&G
Linear resistance measuring range	0 Ω ... 3200 Ω / 0 Ω ... 9500 Ω
Protective circuit for voltage input	Electronic short-circuit protection
Protective circuit for current input	Electronic short-circuit protection
Analog outputs	
Connection technology	2-wire (shielded)
Number of outputs	2
Voltage output signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current output signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Protective circuit	Short-circuit protection of outputs, electronic
Process data	
Measured value resolution	16 bits (15 bits + sign bit)
Input filter time	1.1 ms (Or 4.5 ms per channel)
Data formats	IB IL, IB ST, IB RT, standardized representation, S7 compatible
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	465 g
Degree of protection	IP20
Width	156 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O analog input/output module			
- For INTERBUS	**ILB IB AI4 AO2[1])**	**2878777**	1

INTERBUS Block IO

These Inline Block IO modules can be connected to the INTERBUS fieldbus system.

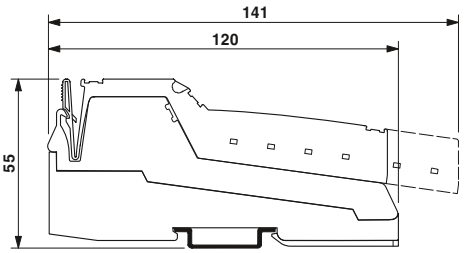
Depending on the module version, they offer various combinations of inputs and outputs.

Features:

– Inline or D-SUB bus connection
– 8 ... 32 inputs, 24 V DC
– 8 ... 32 outputs, 24 V DC, 500 mA

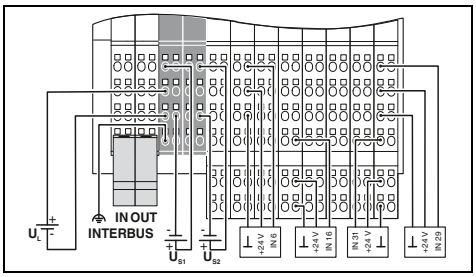
Notes:

1) EMC: Class A product, see page 553



16/32 digital inputs

INTERBUS CLUB
Ex:



Technical data

	ILB IB 24 DI16[1])	ILB IB 24 DI32[1])
Interface		
Fieldbus system	INTERBUS	
Connection method	Inline connectors	
Transmission speed	500 kbps	
Power supply for module electronics		
Supply voltage	24 V DC	
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Supply current	80 mA	60 mA
Digital inputs		
Connection technology	2, 3-wire	
Number of inputs	16	32
Description of the input	EN 61131-2 type 1	
Typical response time	Approx. 500 µs	
Protective circuit	Short-circuit protection, overload protection of the sensor supply	
Digital outputs		
Connection technology	-	
Number of outputs	-	
Maximum output current per channel	-	
Protective circuit	-	
General data		
Connection method	Spring-cage connection	
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight	300 g	405 g
Degree of protection	IP20	
Width	95 mm	156 mm

Ordering data

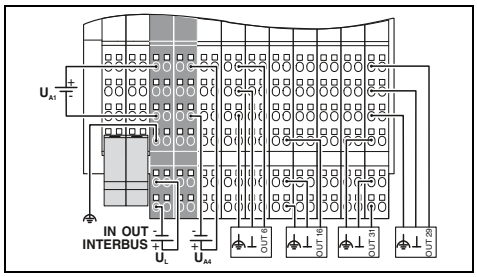
Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O digital input module			
- 16 inputs	**ILB IB 24 DI16[1])**	**2862330**	1
- 32 inputs	**ILB IB 24 DI32[1])**	**2862343**	1
Inline Block I/O digital output module			
- 16 outputs			
- 32 outputs			
Inline Block I/O digital input/output module			
- 8 inputs, 8 outputs			
- 16 inputs, 16 outputs			
- 16 inputs, 16 outputs, D-SUB bus connection			

16/32 digital outputs

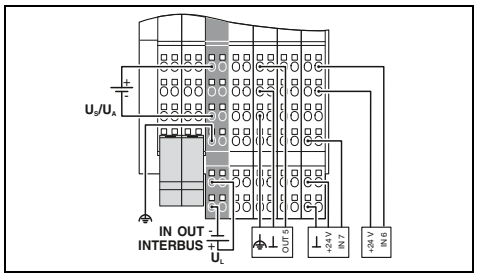
8 digital inputs and 8 digital outputs

16 digital inputs and 16 digital outputs

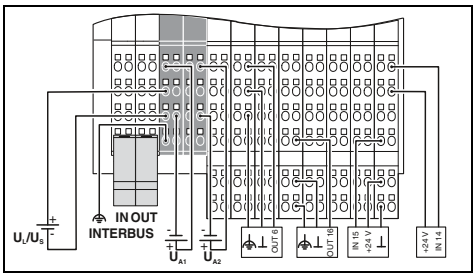
INTERBUS CLUB
Ex:



INTERBUS CLUB
Ex:



INTERBUS CLUB
Ex:



Technical data

ILB IB 24 DO16[1])	ILB IB 24 DO32[1])
INTERBUS	
Inline connectors	
500 kbps	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
80 mA	85 mA
-	
-	
-	
-	
-	
2, 3-wire	
16	32
500 mA	
Short-circuit and overload protection	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
300 g	510 g
IP20	
95 mm	156 mm

Technical data

INTERBUS
Inline connectors
500 kbps
24 V DC
19.2 V DC ... 30 V DC (including all tolerances, including ripple)
60 mA
2, 3-wire
8
EN 61131-2 type 1
Approx. 500 µs
Short-circuit protection, overload protection of the sensor supply
2, 3-wire
8
500 mA
Short-circuit and overload protection
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
350 g
IP20
95 mm

Technical data

INTERBUS
Inline connectors
500 kbps
24 V DC
19.2 V DC ... 30 V DC (including all tolerances, including ripple)
80 mA
2, 3-wire
16
EN 61131-2 type 1
Approx. 500 µs
Short-circuit protection, overload protection of the sensor supply
2, 3-wire
16
500 mA
Short-circuit and overload protection
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
500 g
IP20
156 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
ILB IB 24 DO16[1])	**2862356**	1
ILB IB 24 DO32[1])	**2862369**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
ILB IB 24 DI 8 DO 8[1])	**2862372**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
ILB IB 24 DI16 DO16[1])	**2862385**	1
ILB IB 24 DI16 DO16-DSUB	**2878625**	1

PROFIBUS bus coupler

The bus couplers for PROFIBUS DP can insert an Inline station at any point in the PROFIBUS DP network.

The address can be easily set using two rotary coding switches or via DIP switches. The fieldbus is connected via a 9-pos. D-SUB socket.

The bus couplers can be used in many applications with their UL approvals and the additional Ex Zone 2 manufacturer's declaration.

D-SUB connection

D-SUB connection,
8 digital inputs and 4 digital outputs

IL PB BK DI8 DO4/EF-PAC

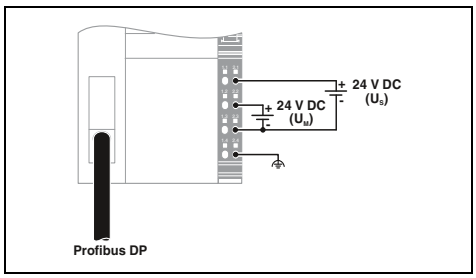
– 8 inputs, 24 V DC
– 4 outputs, 24 V DC, 500 mA
– Operation of PROFIsafe devices
– IO-Link calls supported

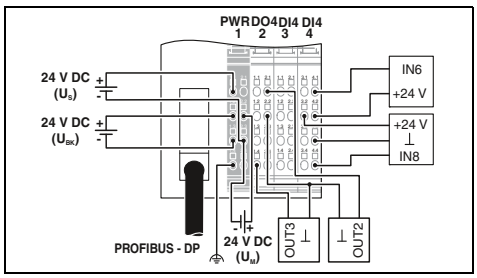
Notes:

1) EMC: Class A product, see page 553

Ex:

PROFIBUS





	Technical data	Technical data
Interface		
Fieldbus system	PROFIBUS DP	PROFIBUS DP
Connection method	D-SUB-9 socket	D-SUB-9 socket
Transmission speed	9.6 kbps ... 12 Mbps	9.6 kbps ... 12 Mbps
Local bus interface		
Connection method	Inline data jumper	Inline data jumper
Power supply for module electronics		
Supply voltage	24 V DC (via Inline connector)	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption	max. 1.25 A	max. 0.98 A (from U_{BK})
Power supply at U_L	max. 2 A DC	max. 0.8 A DC
Power supply at U_{ANA}	max. 0.5 A DC	max. 0.5 A DC
Digital inputs		
Connection technology	-	2, 3-wire
Maximum number of inputs	-	8
Protective circuit	-	Protection against polarity reversal
Digital outputs		
Connection technology	-	2, 3-wire
Maximum number of outputs	-	4
Maximum output current per channel	-	500 mA
Protective circuit	-	Short-circuit and overload protection
INTERBUS data		
Number of local bus devices that can be connected	63	61 (on board I/Os are two devices)
General data		
Connection method	Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	240 g	320 g
Width	85 mm	80 mm
Ambient temperature (operation)	0 °C ... 55 °C	-25 °C ... 55 °C
Permissible humidity (operation)	85% (no condensation)	10% ... 95% (according to DIN EN 61131-2)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PROFIBUS bus coupler, DP/V1, complete with accessories (connector and marking field)			
- With advanced functions, PROFIsafe	**IL PB BK DP/V1-PAC**[1])	**2862246**	1

Accessories

Connector set for bus coupler	**IL BKDIO-PLSET**	**2878599**	1
PROFIBUS connector (D-SUB)	**SUBCON-PLUS-PROFIB**	**2744348**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IL PB BK DI8 DO4/EF-PAC[1])	**2692322**	1

Accessories

IL BKDIO-PLSET	**2878599**	1
SUBCON-PLUS-PROFIB	**2744348**	1

PROFIBUS Block IO

This Inline Block IO module can be connected to the PROFIBUS fieldbus system as a slave.

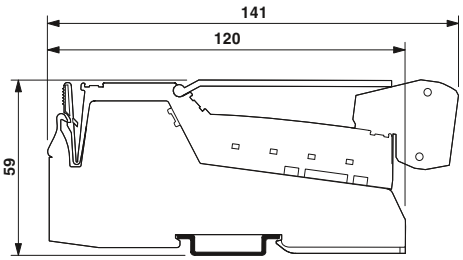
The bus address is set using rotary coding switches on the module.

In order to prevent the adverse effects of interference due to compensating currents, the inputs are galvanically decoupled and have adjustable filter times. The current inputs are overload-protected in these devices and the integrated sensor supply provides short-circuit protection.

The output behavior can be set for a bus reset and thereby provides safety for the machine. In addition, all channels are equipped with shield connections as standard. This directly increases the immunity to EMI in the system.

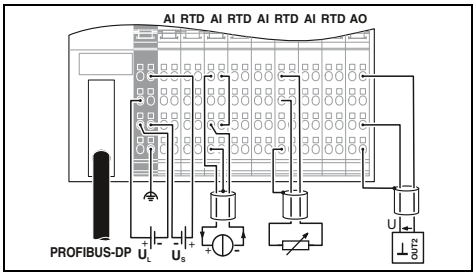
Features:

– 4 analog inputs (shielded)
– Difference measurement or resistance thermometer (RTD)
– 2 analog outputs (shielded)



4 analog inputs and 2 analog outputs

c UL us PROFIBUS



Notes:

1) EMC: Class A product, see page 553

Technical data

Interface	
Fieldbus system	PROFIBUS DP
Connection method	D-SUB-9 socket
Transmission speed	,,6 kbps ... 12 Mbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption	Typ. 95 mA
Analog inputs	
Connection technology	2, 3, 4-wire (shielded)
Number of inputs	max. 4 (differential inputs, voltage or current can be chosen separately)
Description of the input	Differential input, incl. sensor supply (24 V DC)
Voltage input signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Sensor types (RTD) that can be used	Pt100, Pt500, Pt1000, Ni100, Ni1000, Ni1000 L&G
Linear resistance measuring range	0 Ω ... 3200 Ω / 0 Ω ... 9500 Ω
Protective circuit for voltage input	Overload protection, short-circuit protection of sensor supply
Protective circuit for current input	Electronic short-circuit protection
Analog outputs	
Connection technology	2-wire (shielded)
Number of outputs	2
Voltage output signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current output signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Protective circuit	Short-circuit protection of outputs
Process data	
Measured value resolution	16 bits (15 bits + sign bit)
Input filter time	1.1 ms (Or 4.5 ms per channel)
Data formats	IB IL
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	465 g
Degree of protection	IP20
Width	156 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O analog input/output module			
For PROFIBUS	**ILB PB AI4 AO2[1])**	**2878874**	1

PROFIBUS Block IO

These Inline Block IO modules can be connected directly to the PROFIBUS field-bus system as slaves.

The bus address is set using rotary coding switches on the module.

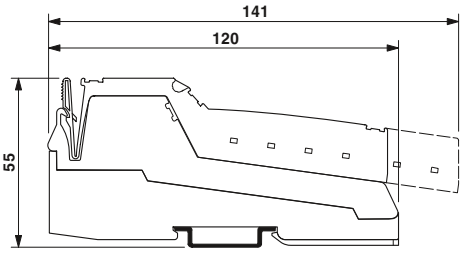
Depending on the module version, they offer various combinations of inputs and outputs.

Features:

– D-SUB bus connection
– 8 ... 32 inputs, 24 V DC
– 8 ... 32 outputs, 24 V DC, 500 mA

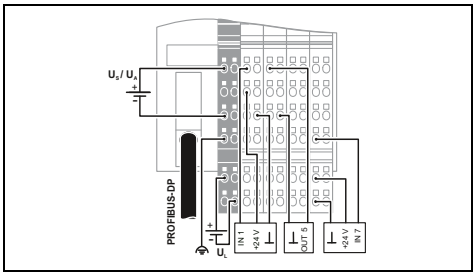
Notes:

1) EMC: Class A product, see page 553



**8 inputs and
8 selectable channels (input or output)**

PROFIBUS



Technical data

Interface	
Fieldbus system	PROFIBUS DP
Connection method	D-SUB-9 socket
Transmission speed	9.6 kbps ... 12 Mbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Supply current	60 mA
Digital inputs	
Connection method	2, 3-wire
Number of inputs	16
Description of the input	8 fixed and 8 freely selectable
Typical response time	Approx. 500 µs
Protective circuit	Short-circuit protection, overload protection of the sensor supply
Digital outputs	
Connection method	2, 3-wire
Number of outputs	8
Output description	Freely selectable
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	350 g
Degree of protection	IP20
Width	95 mm

Ordering data

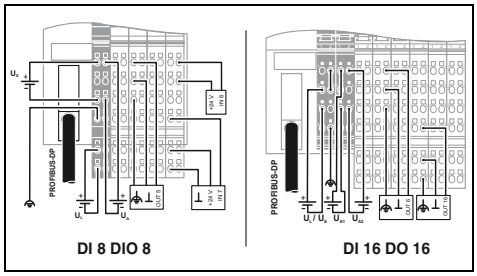
Description	Type	Order No.	Pcs. / Pkt.
Inline Block I/O digital input/output module - Eight inputs, eight inputs or outputs - 16 inputs, 16 outputs	**ILB PB 24 DI 8 DIO8[1])**	**2863562**	1
Inline Block I/O digital input module - 32 inputs			
Inline Block I/O digital output module - 32 outputs			

16 digital inputs and 16 digital outputs

32 digital inputs

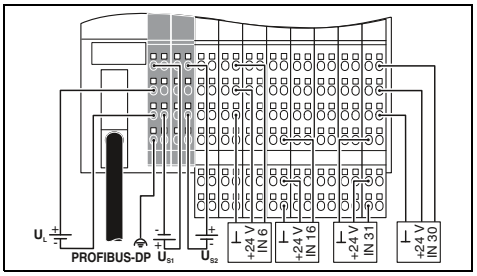
32 digital outputs

PROFIBUS
Ex:

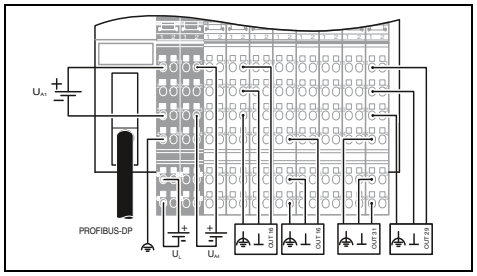


DI 8 DIO 8 **DI 16 DO 16**

PROFIBUS
Ex:



PROFIBUS
Ex:



Technical data

PROFIBUS DP D-SUB-9 socket 9.6 kbps ... 12 Mbps	PROFIBUS DP D-SUB-9 socket 9.6 kbps ... 12 Mbps
24 V DC 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	24 V DC 19.2 V DC ... 30 V DC (including all tolerances, including ripple)
70 mA	50 mA
2, 3-wire 16 EN 61131-2 type 1	2, 3-wire 32 EN 61131-2 type 1
Approx. 500 µs Short-circuit protection, overload protection of the sensor supply	Approx. 500 µs Short-circuit protection, overload protection of the sensor supply
2, 3-wire 16 - 500 mA Short-circuit and overload protection	- - - - -
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 500 g IP20 156 mm	Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 510 g IP20 156 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
ILB PB 24 DI16 DO16[1])	**2862411**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
ILB PB 24 DI32[1])	**2862398**	1

Technical data

PROFIBUS DP D-SUB-9 socket 9.6 kbps ... 12 Mbps
24 V DC 19.2 V DC ... 30 V DC (including all tolerances, including ripple)
70 mA
- - -
- -
2, 3-wire 32 - 500 mA Short-circuit and overload protection
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 510 g IP20 156 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
ILB PB 24 DO32[1])	**2862408**	1

Mechatrolink bus coupler

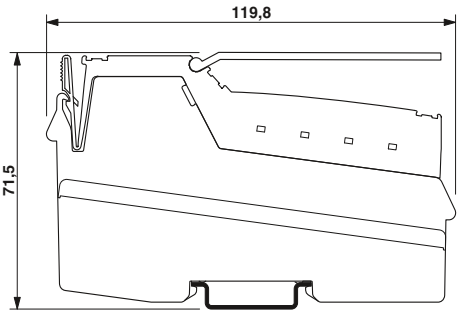
The Mechatrolink bus coupler is the link between the Mechatrolink network and the extensive Inline Modular product range.

Features:

- Mechatrolink network connection
- Data transmission speed: 10 Mbps (MII) and 4 Mbps (MI)
- Slave address, baud rate, and Mechatrolink data width can be set via DIP switches
- Meets Mechatrolink II intelligent I/O specification
- Supports high-speed I/O scanner

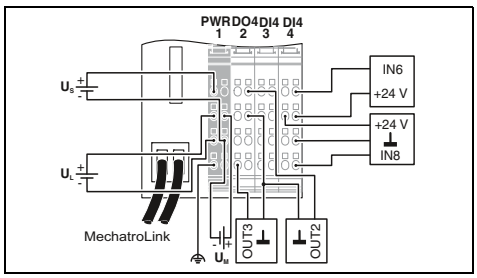
Notes:

1) EMC: Class A product, see page 553



**USB connection,
8 digital inputs and 4 digital outputs**

Ex:



Technical data

Interface	
Fieldbus system	Mechatrolink
Connection method	USB type A, socket
Number	2
Transmission speed	max. 10 Mbps
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via Inline connector)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption	max. 0.9 A (from U_{BK})
Power supply at U_L	max. 0.8 A DC
Power supply at U_{ANA}	max. 0.5 A DC
Digital inputs	
Connection method	2, 3-wire
Maximum number of inputs	8
Typical response time	Approx. 500 µs
Protective circuit	Protection against polarity reversal
Digital outputs	
Connection method	2, 3-wire
Maximum number of outputs	4
Maximum output current per channel	500 mA
Protective circuit	Short-circuit and overload protection
INTERBUS data	
Number of local bus devices that can be connected	61 (on board I/Os are two devices)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	320 g
Width	80 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Mechatrolink bus coupler, complete with accessories (connector and marking field)	**IL MII BK DI8 DO4-PAC**[1])	**2884619**	1

Accessories

Connector set for bus coupler	**IL BKDIO-PLSET**	**2878599**	1

Field multiplexer

The simple field multiplexer principle:
– Sensors and actuators in the field
– Wired with Inline I/O terminals
– Connect the I/O terminals to the field multiplexer
– Connect the field multiplexer to the remote station (up to 12 km away) using a 2-wire cable. Alternatively, transmission is also possible via fiber optics, a telephone line or wirelessly using electrical optical interface converters.
– Apply 24 V and you're done!

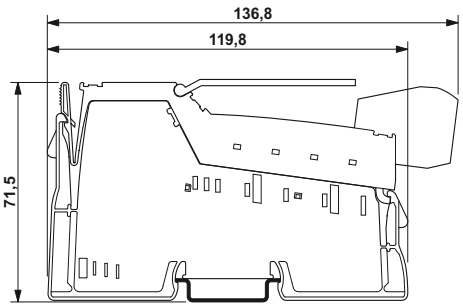
The field multiplexer, together with the connected I/O terminals forms one station. The system consists of two such stations. It must be designed in such a way that one particular output terminal at the other end is assigned to each input terminal and vice versa. There is one output per input and one input per output.

In terms of the system configuration, all that is required is the complementary arrangement of the I/O terminals in the station and remote station. Configuration software is not required.

Features:
– Up to 63 I/O terminals can be connected
– Up to 512 digital or 32 analog I/Os (or a mixture) can be connected
– Data transmission time:
t_{Cu} = n x 6.8 ms/byte + 78 ms
t_{FO} = n x 1.37 ms/byte + 10 ms
n = 1 ... 64 bytes

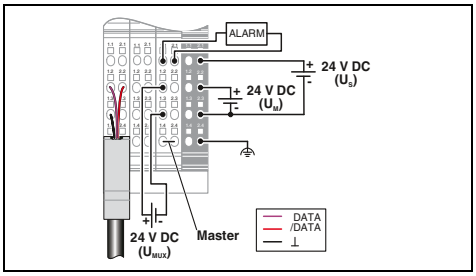
Notes:
1) EMC: Class A product, see page 553

Digital and analog Inline I/O terminals that can be used on the field multiplexer are indicated in this catalog by the adjacent logo.



Copper connection

Ex:



Technical data

Interfaces	
Fieldbus system	Inline remote bus
Connection method	Inline shield connector
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including ripple)
Typical current consumption	< 60 mA (without connected I/O terminal blocks (24 V DC supply)) 1.25 A (with max. number of connected I/O terminal blocks (24 V DC supply)) 8 A (If this value is exceeded, further power or segment terminals must be used!)
Field multiplexer system data	
Remote bus	
Remote bus length	Max. 12 km via 2-wire copper cable (depending on the type of cable and the environmental conditions with regard to EMC) ; max. 3.8 km via optical fiber converter with fiberglass cable
Interface	RS-485, modified
Transmission protocol	Special telecontrol protocol
Local bus	
Maximum number of inputs and outputs	512 digital or 32 analog I/Os, can be mixed
Number of INTERBUS Inline I/O terminals that can be connected	32
Update time of all input and output data	1 s
Transmission protocol	INTERBUS
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	212 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline field multiplexer, complete with accessories (connector and marking field)	**IB IL 24 MUX MA-PAC**[1]	**2861205**	1

Accessories

Connector set for Inline field multiplexer	**IB IL MUX-PLSET**	**2836036**	1
Adapter cable, Inline field multiplexer on PSI-MOS module	**IB IL MUX-CAB PSI**	**2878476**	1

Power terminals

Inline power terminals are used to supply, protect, and diagnose the individual voltage routing within an Inline station.

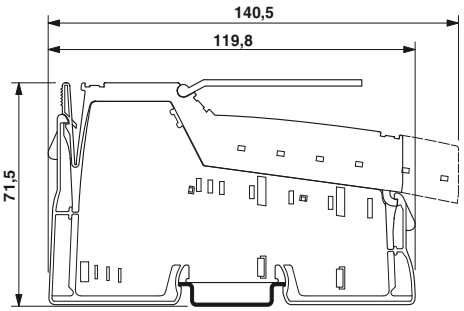
Depending on the terminal type, various functions can be implemented.

Supply of:

– Main circuit (U_M) up to 8 A
– Segment circuit (U_S) for the I/O supply up to 8 A

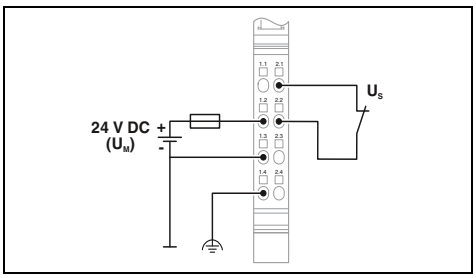
Notes:

1) EMC: Class A product, see page 553



24 V

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Connection method	-
I/O voltage	24 V DC
I/O voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Main circuit supply U_M	24 V DC
Power supply at U_M	8 A
Communications power U_L	7.5 V DC ±5% (via voltage jumper)
Power supply at U_L	-
Current consumption from U_L	-
I/O supply voltage U_{ANA}	-
Power supply at U_{ANA}	-
Segment supply voltage U_S	24 V DC
Power supply at U_S	8 A
Fuse	-
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Protective circuit	Polarity protection, surge protection
Weight	59 g
Width	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline power terminal, complete with accessories (connector and marking field)			
- With fuse	**IB IL 24 PWR IN-PAC**[1])	**2861331**	1
- With fuse and diagnostics			
- With fuse and fuse diagnostics			
- 120 V AC			
- 230 V AC			
- 230 V AC, with fuse and diagnostics			

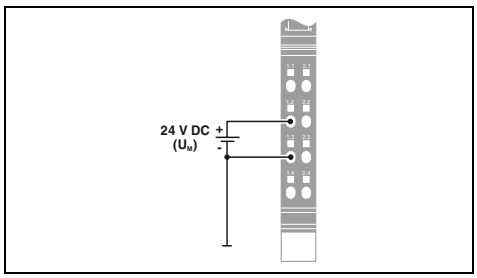
Accessories

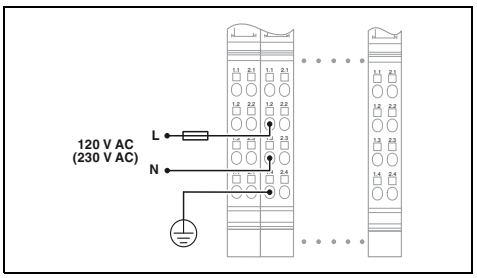
Inline distance terminal			

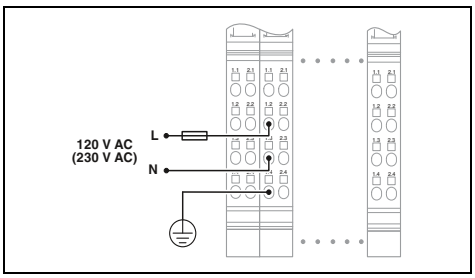
24 V with fuse and diagnostics

120 V

230 V with/without diagnostics







Technical data

IB IL 24 PWR IN/2-F-PAC[1])	IB IL 24 PWR IN/2-F-D-PAC[1])
Inline data jumper	
8-pos. Inline power plug	
24 V DC	
19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
24 V DC	
6 A	4 A
7.5 V DC ±5% (via voltage jumper)	
-	
0 A DC	25 mA
-	
-	
24 V DC	
6 A	4 A
SI 5 x 20 6, 300 AT (in scope of delivery)	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Polarity protection, surge protection	
59 g	44 g
12.2 mm	
-25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 PWR IN/2-F-PAC[1])	**2862136**	1
IB IL 24 PWR IN/2-F-D-PAC[1])	**2862152**	1
IB IL 24 PWR IN/2F-DF-PAC[1])	**2863779**	1

Accessories

Technical data

IB IL 120 PWR IN-PAC[1])
Inline data jumper
8-pos. Inline power plug
120 V AC
108 V AC ... 135 V AC (including all tolerances, including ripple)
120 V AC
8 A
-
-
-
-
-
-
-
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Surge protection
80 g
36.6 mm
-25 °C ... 55 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 120 PWR IN-PAC[1])	**2861454**	1

Accessories

IB IL DOR LV-SET-PAC[1])	**2861645**	1

Technical data

IB IL 230 PWR IN-PAC[1])	IB IL 230 PWR IN/F-D-PAC[1])
Inline data jumper	
8-pos. Inline power plug	
230 V AC	
207 V AC ... 253 V AC (including all tolerances, including ripple)	
230 V AC	
8 A	
-	7.5 V DC (via voltage jumper)
-	
-	25 mA
-	
-	
-	
-	
-	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Surge protection	-
80 g	
36.6 mm	
-25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 230 PWR IN-PAC[1])	**2861535**	1
IB IL 230 PWR IN/F-D-PAC[1])	**2878971**	1

Accessories

IB IL DOR LV-SET-PAC[1])	**2861645**	1

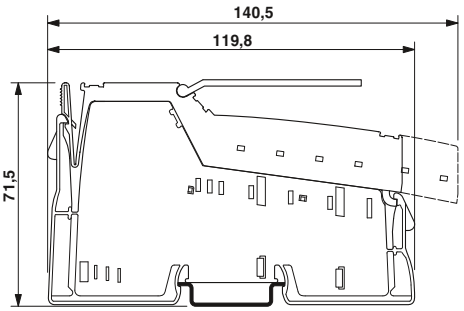
Boost terminal

The IB IL 24 PWR IN/R-PAC Inline boost terminal is used to boost the following voltages:

– Main circuit (U_M) up to 8 A
– Segment circuit (U_S) for the I/O supply up to 8 A
– Analog supply (U_{ANA}) up to 0.5 A
– Communications power (U_L) up to 2 A

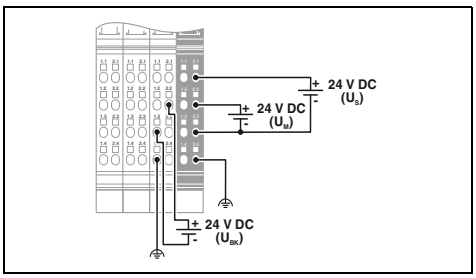
Notes:

1) EMC: Class A product, see page 553



U_M, U_S, U_L, U_{ANA}

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O voltage	24 V DC
I/O voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Main circuit supply U_M	24 V DC
Power supply at U_M	8 A
Communications power U_L	7.5 V DC ±5% (via voltage jumper)
Power supply at U_L	max. 2 A DC
I/O supply voltage U_{ANA}	24 V DC
Power supply at U_{ANA}	0.5 A DC
Segment supply voltage U_S	24 V DC
Power supply at U_S	8 A DC
Fuse	(electrical/thermal overload protection, included in scope of delivery)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Protective circuit	Surge protection (segment supply, main supply, 24 V supply) input protective diodes (can be destroyed by permanent overload) pulse loads up to 1500 W are short circuited by the input protective diode.
Weight	192 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline power terminal or **boost terminal**, complete with accessories (connector and marking field)	**IB IL 24 PWR IN/R-PAC**[1])	**2861674**	1

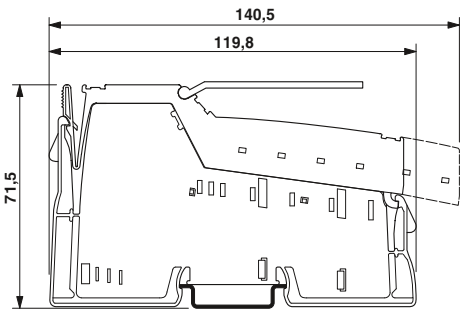
Accessories

Connector set, for power terminal, color-coded	**IB IL PWR IN/R-PLSET**	**2860620**	1

Boost terminal

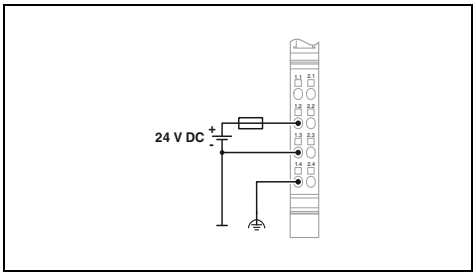
The IB IL 24 PWR IN/R/L-0.8A-PAC Inline boost terminal is used to boost the following voltage:
– Communications power (U_L) up to 0.8 A

Notes:
1) EMC: Class A product, see page 553



U_L

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O voltage	24 V DC
I/O voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_L	7.5 V DC ±5% (via voltage jumper)
Power supply at U_L	max. 0.8 A DC
Fuse	(electrical/thermal overload protection, included in scope of delivery)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Protective circuit	Surge protection input protective diodes (can be destroyed by permanent overload) pulse loads up to 1500 W are short circuited by the input protective diode.
Weight	65 g
Width	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline boost terminal, complete with accessories (connector and marking field) - For the communications power U_L of 0.8 A	**IB IL 24 PWR IN/R/L-0.8A-PAC[1])**	**2693020**	1

Accessories

Connector for power and segment terminals	**IB IL SCN-PWR IN-CP**	**2727637**	10

Segment terminals

Inline segment terminals can be used to create several segment circuits (U_S) within the main circuit (U_M). The signal and initiator voltages for digital I/Os are always tapped from the segment circuit U_S.

Depending on the terminal type, various functions can be implemented:

– Segmentation without fuse
– Segmentation with fine fuse
– Segmentation with fine fuse and diagnostics
– Segmentation with electronic fuse and diagnostics

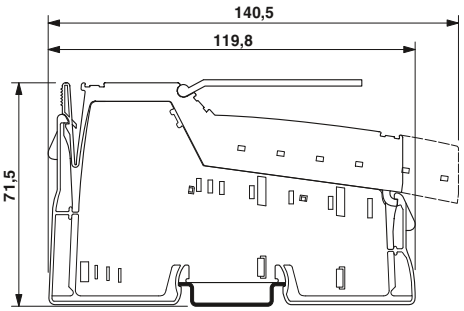
When combined with the IB IL PD 24V-PAC potential distributor terminal, 24 V supplies with electronic fuse protection and remote diagnostics can be provided in the field, for example. However, the potential distributor terminals are also suitable for the economical return wiring of sensor and actuator cables when using digital Inline terminals with single-conductor connection technology.

The IB IL DOR LV-SET-PAC distance terminal set creates the specified creepage distance when using AC terminals (gray housing). For example, when using IB IL 24/230 DOR 4/W-PAC relay terminals, the two end terminals interrupt all 24 V circuits as well as GND and functional earth ground.

AC power terminals for 120 V AC or 230 V AC already include distance terminals.

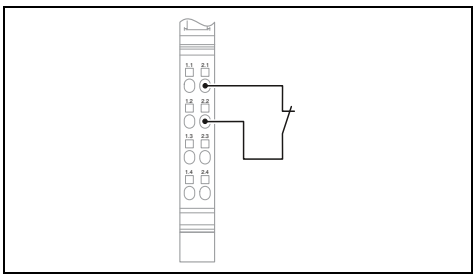
Notes:

1) EMC: Class A product, see page 553



24 V

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Connection method	Inline potential distributor
Communications power U_L	-
Current consumption from U_L	-
Segment supply voltage U_S	24 V DC
Power supply at U_S	8 A
Fuse	-
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Protective circuit	Overload protection fuse
Weight	42 g
Width	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline segment terminal, complete with accessories (connector and marking field) - With fuse - With fuse and diagnostics	**IB IL 24 SEG-PAC**[1]**)**	**2861344**	1
Inline potential distributor terminal, complete with accessories (connector and marking field) - 24 V - GND			

24 V with fuse and diagnostics

24 V with electronic fuse

Potential distributor

Ex:

U_M and U_S connected internally via fuse

Technical data

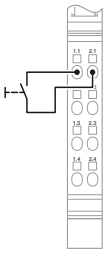
Inline data jumper	
Inline potential distributor	
-	
-	
24 V DC	
6 A	
SI 5 x 20 6, 300 AT (in scope of delivery)	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Overload protection fuse	
59 g	
12.2 mm	
-25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 SEG/F-PAC[1])	**2861373**	1
IB IL 24 SEG/F-D-PAC[1])	**2861904**	1

Ex:

Button for resetting the fuse



U_M and U_S connected internally via fuse

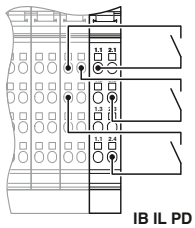
Technical data

Inline data jumper	
Inline potential distributor	
7.5 V DC (via voltage jumper)	
30 mA	
24 V DC	
2.5 A	
2.5 A (electronic)	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Overload protection	
44 g	
12.2 mm	
-25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 SEG-ELF-PAC[1])	**2861409**	1

e.g. for single wire connection with IB IL 24 DI 32/HD



IB IL PD 24V-PAC

Technical data

	IB IL PD 24V-PAC[1])	IB IL PD GND-PAC[1])
Inline data jumper		
Inline potential distributor		
-	-	
-	-	
24 V DC	24 V DC	-
-	-	
-	-	
Spring-cage connection		
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16		
-		
44 g		
12.2 mm		
-25 °C ... 55 °C		

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL PD 24V-PAC[1])	**2862987**	1
IB IL PD GND-PAC[1])	**2862990**	1

Digital input terminals

Digital Inline input terminals are designed to connect digital signals, such as those supplied by buttons, limit switches or proximity switches.

Features, depending on the selected device:

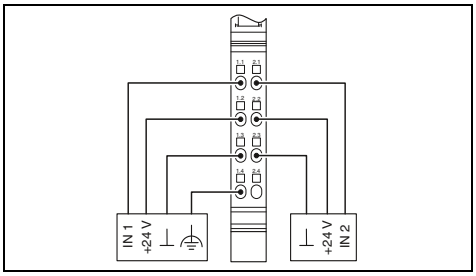
– 2 to 32-channel
– According to EN 61131-2 Type 1 or 3
– 1, 2, 3 or 4-wire connection technology
– Maximum permissible load current per sensor: 250 mA

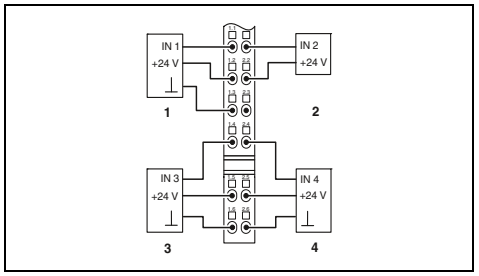
Notes:

1) EMC: Class A product, see page 553

2 inputs

4 inputs





Technical data

Local bus interface		
Connection method	Inline data jumper	Inline data jumper
Power supply for module electronics		
Supply voltage	24 V DC (via voltage jumper)	24 V DC (via voltage jumper)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption from U_L	max. 35 mA	max. 40 mA
Digital inputs		
Connection method	Spring-cage connection	Spring-cage connection
Connection technology	2, 3, 4-wire	2, 3-wire
Maximum number of inputs	2	4
Description of the inputs	EN 61131-2 type 1	EN 61131-2 type 1
Typical response time	< 1 ms	< 1 ms
General data		
Connection method	Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	38 g	66 g
Width	12.2 mm	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline digital input terminal, complete with accessories (connector and marking field)			
- 2 inputs	**IB IL 24 DI 2-PAC**[1])	**2861221**	1
- 8 inputs	**IB IL 24 DI 4-PAC**[1])	**2861234**	1

Accessories

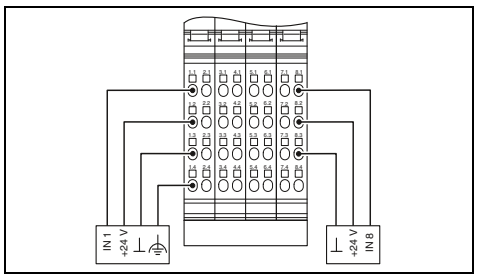
Connector set for IB IL DI/DO 8			
Connector set for IB IL DI 16, color-coded			
Inline connector	**IB IL SCN-8-CP**	**2727608**	10
	IB IL SCN-12-ICP	**2727611**	10

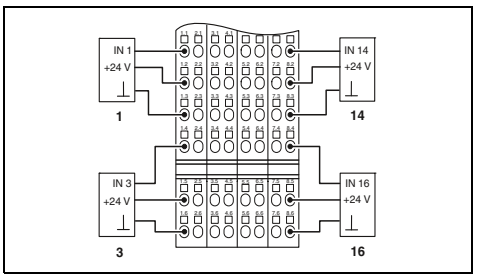
8 inputs

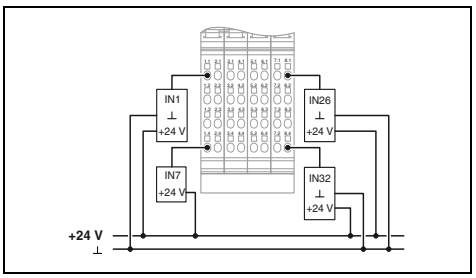
16 inputs

32 inputs

Ex:







Technical data

IB IL 24 DI 8-PAC[1])	IB IL 24 DI8/HD-PAC[1])
Inline data jumper	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 50 mA	max. 30 mA DC
Spring-cage connection	
2, 3, 4-wire	1-wire
8	
EN 61131-2 type 1	EN 61131-2 types 1 and 3
< 1 ms	1 ms
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
118 g	60 g
48.8 mm	12.2 mm
-25 °C ... 55 °C	

Technical data

Inline data jumper
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)
max. 60 mA
Spring-cage connection
2, 3-wire
16
EN 61131-2 type 1
< 1 ms
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
210 g
48.8 mm
-25 °C ... 55 °C

Technical data

Inline data jumper
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)
max. 90 mA
Spring-cage connection
1-wire
32
EN 61131-2 type 1
2 ms
Spring-cage connection
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
185 g
48.8 mm
-25 °C ... 55 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DI 8-PAC[1])	**2861247**	1
IB IL 24 DI8/HD-PAC[1])	**2700173**	1

Accessories

IB IL DI/DO 8-PLSET/CP	**2860963**	1
IB IL SCN-8	**2726337**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DI 16-PAC[1])	**2861250**	1

Accessories

IB IL DI16-PLSET/ICP	**2860989**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DI 32/HD-PAC[1])	**2862835**	1

Accessories

IB IL DI/DO 8-PLSET	**2860950**	1

Digital input terminals

The digital Inline input terminals are used to acquire digital input signals. They are designed for use within an Inline station.

NPN terminal features:
– 2 to 32-channel

T2 terminal features:
– According to EN 61131-2 Type 2

S0 terminal features:
– Connection of S0 pulse encoders
– 32-bit counter range

Pulse counter:
– Maximum counting frequency of up to 150 Hz

Operating hours counter:
– 1 s resolution
– Counter enabled on active or inactive input (configurable)

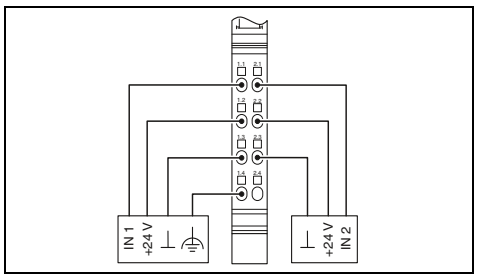
Notes:

1) EMC: Class A product, see page 553

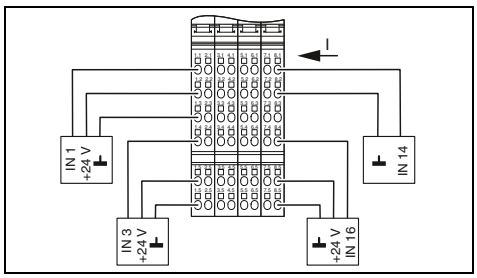
2 inputs, NPN-wired

16 inputs, NPN-wired

Ex:



Ex:



Technical data

Local bus interface		
Connection method	Inline data jumper	Inline data jumper
Power supply for module electronics		
Supply voltage	24 V DC (via voltage jumper)	24 V DC (via voltage jumper)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption from U_L	max. 35 mA	max. 60 mA
Digital inputs		
Connection method	Spring-cage connection	Spring-cage connection
Connection technology	2, 3, 4-wire	2, 3-wire
Maximum number of inputs	2	16
Description of the inputs	EN 61131-2 type 1	EN 61131-2 type 1
Typical response time	< 1 ms	< 1 ms
General data		
Connection method	Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	41 g	122 g
Width	12.2 mm	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline digital input terminal, complete with accessories (connector and marking field) - NPN-wired - Input in acc. with EN 61131-2/Type 2 - S0 counter	**IB IL 24 DI 2-NPN-PAC**[1]	**2861483**	1

Accessories

Connector set for IB IL DI/DO 8			
Inline connector	**IB IL SCN-8-CP**	**2727608**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DI 16-NPN-PAC[1]	**2863520**	1

Accessories

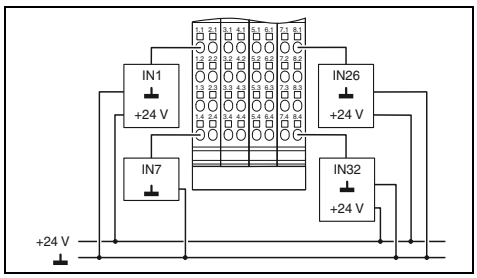
IB IL SCN-12-ICP	**2727611**	10

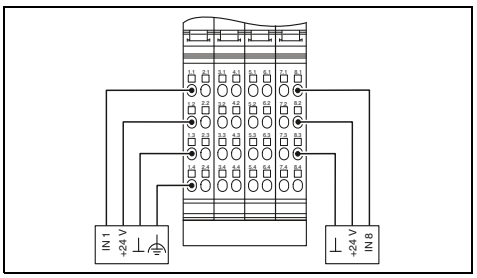
32 inputs, NPN-wired

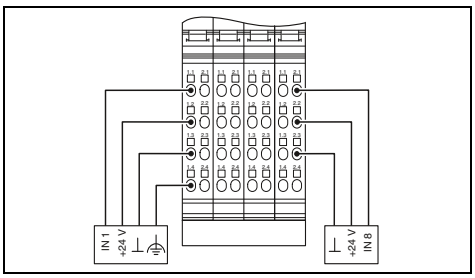
8 inputs, EN 61131-2/Type 2

8 S_0 counter inputs

Ex:







Technical data

Inline data jumper	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 90 mA	
Spring-cage connection 1-wire 32 EN 61131-2 type 1 < 1 ms	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 125 g 48.8 mm -25 °C ... 55 °C	

Technical data

Inline data jumper	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 50 mA	
Spring-cage connection 2, 3, 4-wire 8 EN 61131-2 type 2 < 1 ms	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 118 g 48.8 mm -25 °C ... 55 °C	

Technical data

Inline data jumper	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC	
max. 50 mA	
Spring-cage connection 2, 3, 4-wire 8 According to DIN 43864 -	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 118 g 48.8 mm -25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DI 32/HD-NPN-PAC[1])	**2878243**	1

Accessories

IB IL DI/DO 8-PLSET	**2860950**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DI 8/T2-PAC[1])	**2862204**	1

Accessories

IB IL DI/DO 8-PLSET/CP	**2860963**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL DI 8/S0-PAC[1])	**2897020**	1

Accessories

IB IL SCN-8-CP	**2727608**	10

Digital input terminals

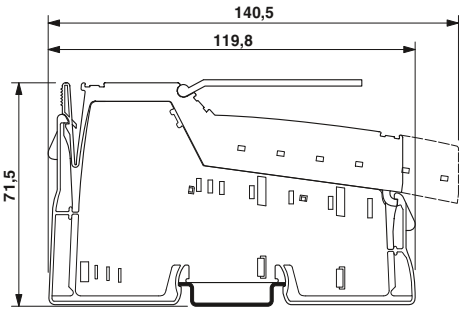
The terminals are designed for use within an Inline station. They are used to acquire digital input signals in the 120 V AC or 230 V AC voltage range.

Features:

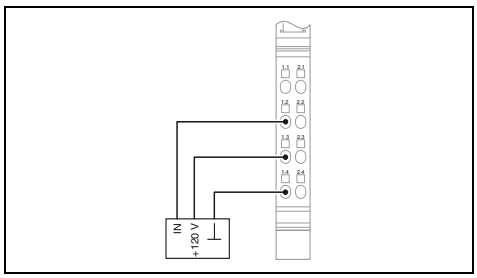
– Connections for one digital sensor
– Maximum permissible load current: 500 mA

Notes:

1) EMC: Class A product, see page 553



1 input, 120 V



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	120 V AC (via voltage jumper)
Supply voltage range	108 V AC ... 135 V AC
Current consumption from U_L	max. 30 mA
Digital inputs	
Connection method	Spring-cage connection
Connection technology	2, 3-wire
Maximum number of inputs	1
Description of the inputs	EN 61131-2 type 1
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	39 g
Width	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C

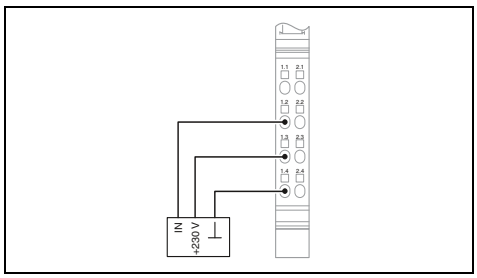
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline digital input terminal, complete with accessories (connector and marking field) - 120 V AC - 230 V AC	**IB IL 120 DI 1-PAC**[1]**)**	**2861917**	1

Accessories

Inline distance terminal	**IB IL DOR LV-SET-PAC**[1]**)**	**2861645**	1
Connector for Inline input terminals with AC voltage, color-coded	**IB IL SCN-8-AC-ICP**	**2740261**	10

1 input, 230 V



Technical data

Inline data jumper	
230 V AC (via voltage jumper) 12 V AC ... 253 V AC max. 30 mA	
Spring-cage connection 2, 3-wire 1 EN 61131-2 type 1	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 39 g 12.2 mm -25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 230 DI 1-PAC[1])	**2861548**	1

Accessories

IB IL DOR LV-SET-PAC[1])	**2861645**	1
IB IL SCN-8-AC-ICP	**2740261**	10

Digital output terminals

Digital Inline output terminals are designed for the connection of digital actuators, such as electromagnetic valves, contactors or visual indicators.

Features, depending on the selected device:

– 2 to 32-channel
– Connection of actuators in single, 2, 3, and 4-wire technology
– Nominal current per output: 500 mA
– Short-circuit and overload protected outputs

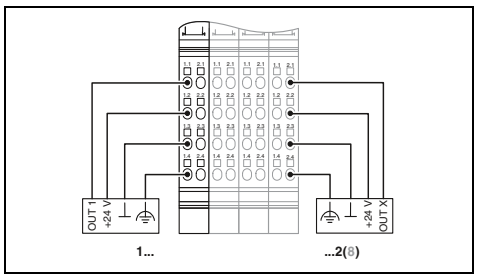
Notes:

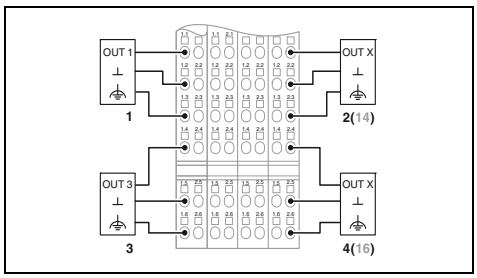
1) EMC: Class A product, see page 553

2 outputs

4 outputs

Ex:





Technical data

Local bus interface		
Connection method	Inline data jumper	Inline data jumper
Power supply for module electronics		
Supply voltage	24 V DC (via voltage jumper)	24 V DC (via voltage jumper)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption from U_L	max. 33 mA	max. 44 mA
Digital outputs		
Connection method	2, 3, 4-wire	2, 3-wire
Maximum number of outputs	2	4
Maximum output current per channel	500 mA	500 mA
Protective circuit	Overload protection, short-circuit protection of outputs	Overload protection, short-circuit protection of outputs
General data		
Connection technology	Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	41 g	66 g
Width	12.2 mm	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline digital output terminal, complete with accessories (connector and marking field)			
- Single-conductor connection technology	**IB IL 24 DO 2-PAC**[1])	**2861470**	1

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline digital output terminal, complete with accessories (connector and marking field)			
- Single-conductor connection technology	**IB IL 24 DO 4-PAC**[1])	**2861276**	1

Accessories

Description	Type	Order No.	Pcs. / Pkt.
Connector set for IB IL DI/DO 8			
Inline connector	**IB IL SCN-8-CP**	**2727608**	10

Accessories

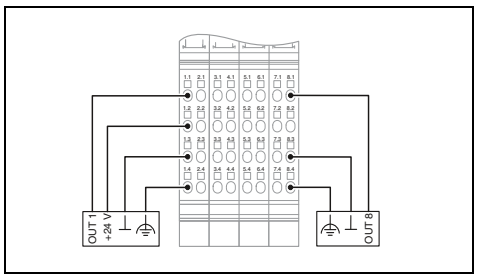
Description	Type	Order No.	Pcs. / Pkt.
Connector set for IB IL DI/DO 8			
Inline connector	**IB IL SCN-12-OCP**	**2727624**	10

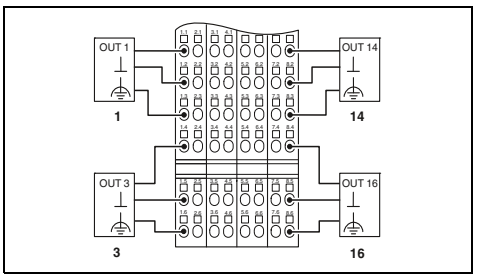
8 outputs

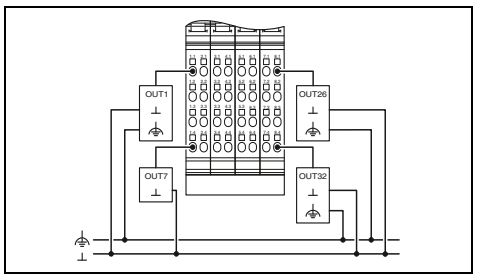
16 outputs

32 outputs

Ex:







Technical data

	IB IL 24 DO 8-PAC[1])	IB IL 24 DO8/HD-PAC[1])
	Inline data jumper	
	24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
	max. 60 mA	max. 45 mA
	2, 3, 4-wire	1-wire
	8	
	500 mA	
	Overload protection, short-circuit protection of outputs	
	Spring-cage connection	
	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
	130 g	60 g
	48.8 mm	12.2 mm
	-25 °C ... 55 °C	

Technical data

	Inline data jumper
	24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)
	max. 90 mA
	2, 3-wire
	16
	500 mA
	Overload protection, short-circuit protection of outputs
	Spring-cage connection
	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
	218 g
	48.8 mm
	-25 °C ... 55 °C

Technical data

	Inline data jumper
	24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)
	max. 140 mA
	1-wire
	32
	500 mA
	Overload protection, short-circuit protection of outputs
	Spring-cage connection
	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
	195 g
	48.8 mm
	-25 °C ... 55 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DO 8-PAC[1])	**2861289**	1
IB IL 24 DO8/HD-PAC[1])	**2700172**	1

Accessories

IB IL DI/DO 8-PLSET/CP	**2860963**	1
IB IL SCN-8	**2726337**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DO 16-PAC[1])	**2861292**	1

Accessories

IB IL DO16-PLSET/OCP	**2860992**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DO 32/HD-PAC[1])	**2862822**	1

Accessories

IB IL DI/DO 8-PLSET	**2860950**	1

Digital output terminals

The terminals are designed for use within an Inline station. They are used to output digital signals.

NPN terminal features:
- NPN-wired
- 2 to 32-channel
- Connection of sensors in 1, 2, 3, and 4-wire technology
- Maximum permissible load current per actuator: 500 mA
- Short-circuit and overload protected outputs

2 A module features:
- 2 to 8-channel
- Connection of sensors in 2, 3, and 4-wire technology
- Maximum permissible load current per actuator: 2 A
- Short-circuit and overload protected outputs

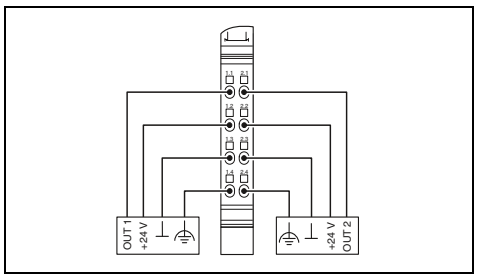
Notes:

1) EMC: Class A product, see page 553

2 outputs, NPN-wired

8 outputs, NPN-wired

Ex:



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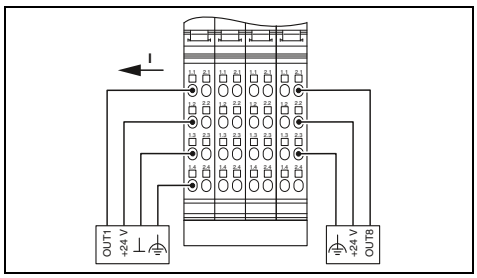


Technical data

Local bus interface		
Connection method	Inline data jumper	Inline data jumper
Power supply for module electronics		
Supply voltage	24 V DC (via voltage jumper)	24 V DC (via voltage jumper)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Current consumption from U_L	max. 32 mA	max. 60 mA
Digital outputs		
Connection technology	2, 3, 4-wire	2, 3, 4-wire
Maximum number of outputs	2	8
Maximum output current per channel	500 mA	1 A
Protective circuit	Overload protection, short-circuit protection of outputs	Overload protection, short-circuit protection of outputs
General data		
Connection method	Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	42 g	130 g
Width	12.2 mm	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline digital output terminal, complete with accessories (connector and marking field)			
- NPN-wired - Outputs 2 A	**IB IL 24 DO 2-NPN-PAC**[1])	**2861496**	1

Accessories

Connector set for IB IL DI/DO 8			
Inline connector	**IB IL SCN-8-CP**	**2727608**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DO 8-NPN-PAC[1])	**2863546**	1

Accessories

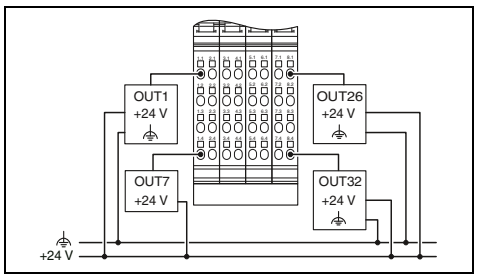
IB IL DI/DO 8-PLSET/CP	**2860963**	1

32 outputs, NPN-wired

2 outputs, 2 A

8 outputs, 2 A

Ex:



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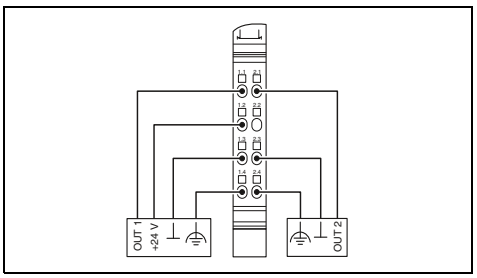
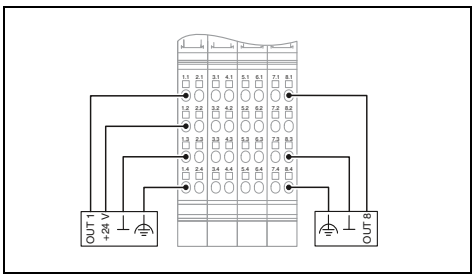




Technical data

Inline data jumper	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 140 mA	
1-wire 32 500 mA Overload protection, short-circuit protection of outputs	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 135 g 48.8 mm -25 °C ... 55 °C	

Technical data

Inline data jumper	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 35 mA	
2, 3, 4-wire 2 2 A Overload protection, short-circuit protection of outputs	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 46 g 12.2 mm -25 °C ... 55 °C	

Technical data

Inline data jumper	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 60 mA	
2, 3, 4-wire 8 2 A Overload protection, short-circuit protection of outputs	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 130 g 48.8 mm -25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DO 32/HD-NPN-PAC[1])	**2878340**	1

Accessories

IB IL DI/DO 8-PLSET	**2860950**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DO 2-2A-PAC[1])	**2861263**	1

Accessories

IB IL SCN-8-CP	**2727608**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 DO 8-2A-PAC[1])	**2861603**	1

Accessories

IB IL DI/DO 8-PLSET/CP	**2860963**	1

Digital output terminals

Digital Inline output terminals are designed for the connection of digital actuators, such as electromagnetic valves, contactors or visual indicators.

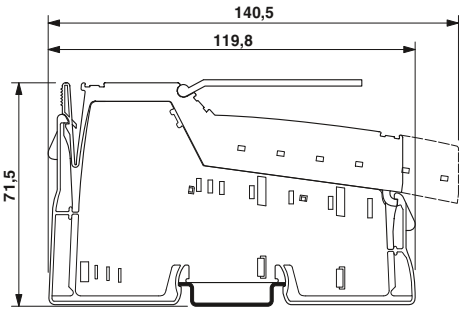
Inline relay terminals make it possible to switch any I/O voltage up to a maximum of 230 V AC.

Differing relay contact materials ensure low contact resistance for small loads and lamp loads in the ...W versions, while the ...W/PC versions are designed for capacitive loads.

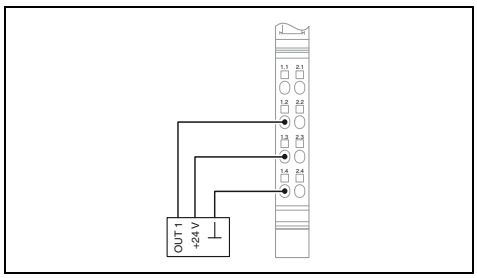
The IB IL 24/48 DOR 2/W-PAC module is a relay module for small signals.

Notes:

1) EMC: Class A product, see page 553



1/4 outputs, 12 - 253 V AC



Technical data

	IB IL DO 1 AC-PAC[1])	IB IL DO 4 AC-1A-PAC[1])
Local bus interface		
Connection method	Inline data jumper	
Power supply for module electronics		
Supply voltage	24 V DC (nominal value)	
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Current consumption from U_L	max. 35 mA	max. 45 mA
Digital outputs		
Connection method	Spring-cage connection	
Connection technology	3-wire	
Maximum number of outputs	1	4
Maximum output current per channel	500 mA	1 A
General data		
Connection method	Spring-cage connection	
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight	45 g	130 g
Width	12.2 mm	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline digital output terminal, complete with accessories (connector and marking field)			
- 1 output	**IB IL DO 1 AC-PAC[1])**	**2861920**	1
- 4 outputs 1 A	**IB IL DO 4 AC-1A-PAC[1])**	**2861658**	1
- 1 SPDT relay contact			
- 2 SPDT relay contacts,			
- 4 SPDT relay contacts			
- 4 SPDT relay contacts, 10 A, high inrush current			

Accessories

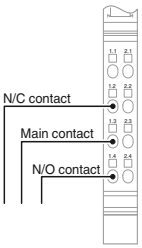
Inline distance terminal	**IB IL DOR LV-SET-PAC[1])**	**2861645**	1
Connector for digital Inline output terminals, color-coded	**IB IL SCN-8-AC-OCP**	**2740274**	10
Connector for digital Inline terminals with AC voltage			

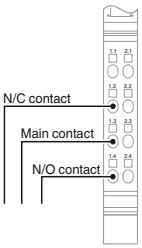
1/4 relay outputs, 5 - 253 V AC, gold contacts

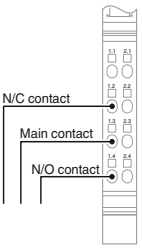
1/4 relay outputs, 5 - 253 V AC

2 relay outputs, 5 - 50 V AC, 5 - 120 V DC

Ex:







Technical data

IB IL 24/230 DOR1/W-PAC[1])	IB IL 24/230 DOR4/W-PAC[1])
Inline data jumper	
24 V DC (nominal value) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 60 mA	max. 187 mA
Spring-cage connection Floating SPDT relay contact	
1	4
3 A	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
46 g	138 g
12.2 mm	48.8 mm
-25 °C ... 55 °C	

Technical data

IB IL 24/230 DOR1/W-PC-PAC[1])	IB IL 24/230 DOR4/W-PC-PAC[1])
Inline data jumper	Via data marshalling
24 V DC (nominal value) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
max. 60 mA	max. 187 mA
Spring-cage connection Floating SPDT relay contact	
1	4
2.6 A	3 A
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
46 g	138 g
12.2 mm	48.8 mm
-25 °C ... 55 °C	

Technical data

Inline data jumper
24 V DC (nominal value) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)
max. 30 mA
Spring-cage connection Floating SPDT relay contact
2
2 A
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
63 g
12.2 mm
-25 °C ... 55 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24/230 DOR1/W-PAC[1])	**2861881**	1
IB IL 24/230 DOR4/W-PAC[1])	**2861878**	1
IB IL 24/230 DOR4/HC-PAC[1])	**2897716**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24/230 DOR1/W-PC-PAC[1])	**2862178**	1
IB IL 24/230 DOR4/W-PC-PAC[1])	**2862181**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24/48 DOR 2/W-PAC[1])	**2863119**	1

Accessories

IB IL DOR LV-SET-PAC[1])	**2861645**	1
IB IL SCN-8-AC-REL	**2740290**	10

Accessories

IB IL DOR LV-SET-PAC[1])	**2861645**	1
IB IL SCN-8-AC-REL	**2740290**	10

Accessories

Analog input terminals

Inline Analog input terminals are suitable for connecting standard sensors for acquiring current and voltage signals.

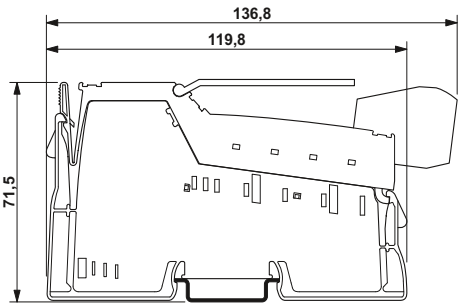
Terminals with 2, 4 or 8 channels are available.

Features:

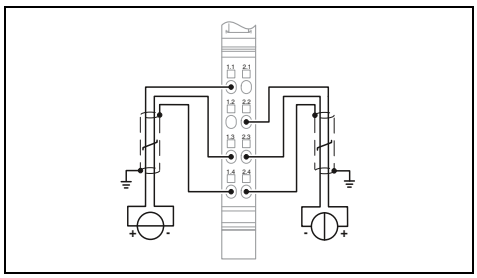
- Single-ended and differential inputs
- Connection of sensors in 2 or 3-wire technology
- Measured value acquisition with 13 or 16-bit resolution
- High level of measuring accuracy
- Excellent interference and common mode suppression
- Overload-protected current inputs
- Integrated short-circuit-proof sensor supply

Notes:

1) EMC: Class A product, see page 553



2 inputs



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O supply voltage U_{ANA}	24 V DC
Current consumption from U_{ANA}	max. 18 mA
Communications power U_L	7.5 V DC (via voltage jumper)
Current consumption from U_L	max. 60 mA
Analog inputs	
Connection technology	2-wire (shielded)
Number of inputs	max. 2 (single ended)
Voltage input signal	0 V ... 10 V / -10 V ... 10 V
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Process data	
Measured value resolution	16 bits (15 bits + sign bit)
Process data update	Typ. 1.5 ms
Data formats	IL, IB ST, IB RT, standardized display
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	69 g
Width	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline analog input terminal, complete with accessories (connector and marking field) - 2 inputs	**IB IL AI 2/SF-PAC**[1])	**2861302**	1
- 8 inputs, initiator with supply outputs			

Accessories

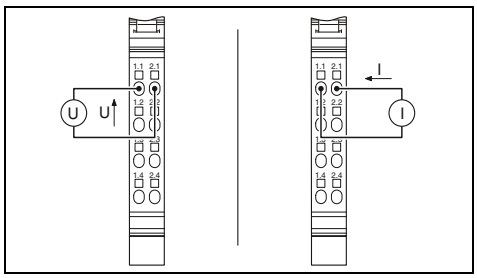
Shield connector	**IB IL SCN 6-SHIELD-TWIN**	**2740245**	5

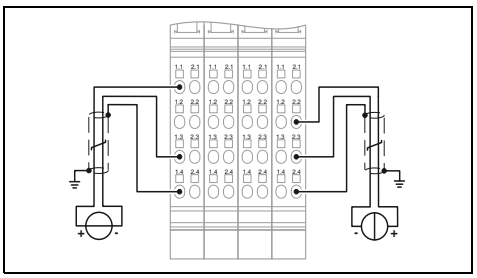
N

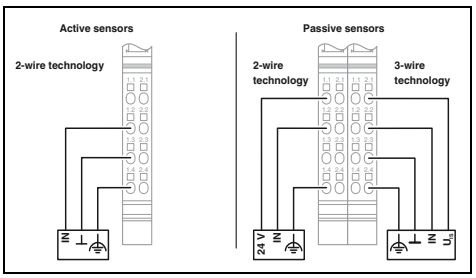
4 inputs

8 inputs

8 inputs, with initiator supply







Technical data

IB IL AI 4/U-PAC[1])	IB IL AI 4/I-PAC[1])
Inline data jumper	
24 V DC Typ. 30 mA 7.5 V DC (via voltage jumper) Typ. 55 mA	
2-wire	
4 (differential inputs, voltage)	4 (differential inputs, current)
0 V ... 10 V (default) / -10 V ... 10 V	-
-	0 mA ... 20 mA (default) / 4 mA ... 20 mA
12 bits (11 bits + sign bit)	13 bits (12 bits + sign bit)
Typ. 250 µs (all channels) IB IL, S7-compatible	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 66 g 12.2 mm -25 °C ... 55 °C	

Technical data

Inline data jumper
24 V DC max. 35 mA 7.5 V DC (via voltage jumper) max. 55 mA
2-wire (shielded) max. 8 (single ended)
0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
16 bits (15 bits + sign bit) Typ. 1 ms (bus-synchronous) IL, IB ST, IB RT, standardized representation, PIO format
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 213 g 48.8 mm -25 °C ... 55 °C

Technical data

Inline data jumper
24 V DC max. 40 mA 7.5 V DC (via voltage jumper) max. 65 mA
2-wire (shielded) max. 8 (single ended)
-
0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
16 bits (15 bits + sign bit) Typ. 1 ms (bus-synchronous) IBS IL, IBS ST, IBS RT, standardized representation, PIO format
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 125 g 48.8 mm -25 °C ... 55 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL AI 4/U-PAC[1])	**2700459**	1
IB IL AI 4/I-PAC[1])	**2700458**	1

Accessories

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL AI 8/SF-PAC[1])	**2861412**	1

Accessories

IB IL SCN 6-SHIELD-TWIN	**2740245**	5

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL AI 8/IS-PAC[1])	**2861661**	1

Accessories

IB IL SCN 6-SHIELD-TWIN	**2740245**	5

Analog input terminals

The IB IL AI 4/EF (EF…Extended Functions) analog Inline terminal is suitable for connecting standard sensors for acquiring current and voltage signals.

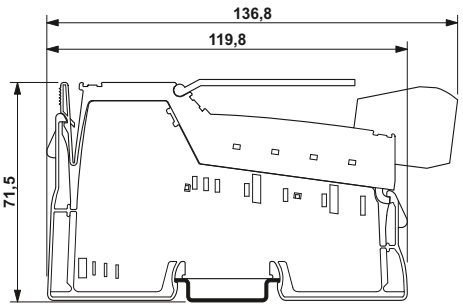
Features:

- 4 differential signal inputs
- Connection of sensors in 2, 3, and 4-wire technology
- Measured value acquisition with 16-bit resolution
- Sensor supply with channel-specific integrated short-circuit and overload protection
- Short update time of < 1 ms, maximum for all channels
- Bus-synchronous provision of input values with very low jitter (< 10 µs)

Notes:

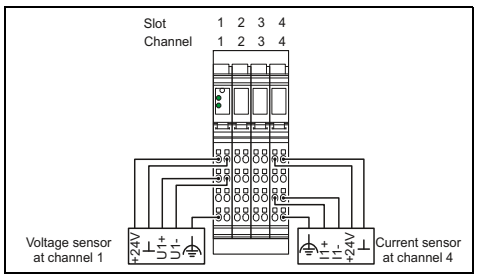
The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553



4 inputs, with extended functions

Ex: c UL us



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O supply voltage U_{ANA}	24 V DC
Current consumption from U_{ANA}	max. 20 mA
Communications power U_L	7.5 V DC (via voltage jumper)
Current consumption from U_L	max. 100 mA
Analog inputs	
Connection technology	2, 3-wire
Number of inputs	max. 4 (differential inputs, voltage or current can be chosen separately)
Description of the input	Differential input, including sensor supply (24 V DC)
Voltage input signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Process data	
Measured value resolution	16 bits (15 bits + sign bit)
Process data update	Typ. 1 ms (bus-synchronous)
Data formats	IL, IB ST, standardized display, S7 compatible
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	210 g
Width	48.8 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline analog input terminal, complete with accessories (connector and marking field)	**IB IL AI 4/EF-PAC**[1]	**2878447**	1

Accessories

Shield connector	**IB IL SCN 6-SHIELD-TWIN**	**2740245**	5

Analog input terminal with HART functionality

The Inline terminal offers the option of communicating with intelligent field devices using the standardized HART communication protocol.

It enables both analog and digital communication. The analog signal transmits the process information ; the digital modulated signal also permits
bidirectional communication with the HART-compatible sensor.

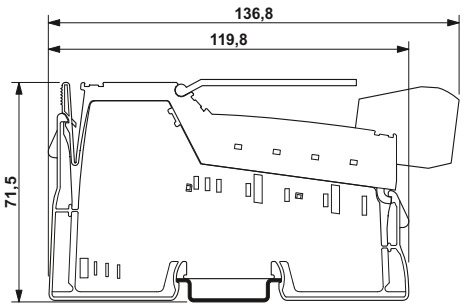
Features:

- Two differential signal inputs for current sensors
- Sensor connection with 2-wire connection technology
- Measured value acquisition with 16-bit resolution
- Point-to-point and multi-drop connections possible
- Polling and burst modes
- A maximum of 5 HART devices can be connected per channel
- A hand-held operator panel can be connected
- FDT/DTM support

Notes:

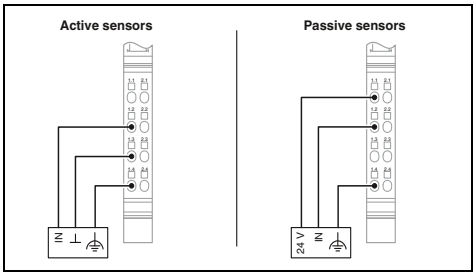
The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553



2 HART inputs

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O supply voltage U_{ANA}	24 V DC
Current consumption from U_{ANA}	max. 150 mA
Communications power U_L	7.5 V DC
Current consumption from U_L	max. 110 mA
Analog inputs	
Connection technology	2-wire (shielded)
Number of inputs	max. 2 (differential inputs, current)
Current input signal	0 mA ... 25 mA / 4 mA ... 20 mA
Process data	
Measured value resolution	16 bits (15 bits + sign bit)
Process data update	Typ. 1 ms (bus-synchronous)
Data formats	IL, standardized display
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	134 g
Width	48.8 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline analog input terminal, complete with accessories (connector and marking field) - HART functionality	**IB IL AI 2-HART-PAC**[1])	**2862149**	1

Accessories

Shield connector	**IB IL SCN 6-SHIELD-TWIN**	**2740245**	5

Strain gauge measurement terminals

Inline strain gauge measurement terminals enable the connection of load cells, force transducers, mass force transducers, and similar instruments, based on strain gauges.

IB IL SGI 2/F-PAC features:

– 2 fast inputs for strain gauge
– Bus-synchronous process data update with ≥ 1 ms (depending on the local bus cycle time)
– Typical deviation of the measuring range final value of ±0.1% (unipolar) or ±0.2% (bipolar)
– Optional: 16-sample mean-value generation

IB IL SGI 2/P-PAC features:

– 2 high-precision inputs for strain gauge
– Typical deviation of the measuring range final value of ±0.01%
– Serial interface for external weight displays
– Zero point, tare, and standstill display
– Optional: 4, 16, and 32-sample mean-value generation

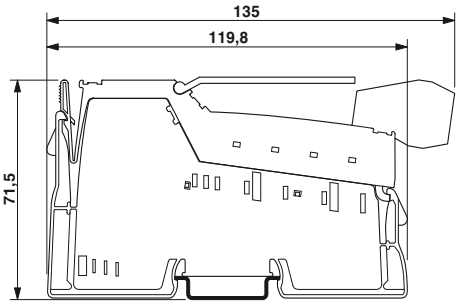
IB IL SGI 1/CAL features:

– 1 input for strain gauge
– Can be verified by EC type approval according to standards EN 45501 and OIML R76
– Electronic evaluating device to set up non-automatic weighing instruments (NAWI)
– Up to 3000 division counts
– Serial interface for external weight displays
– Zero point, tare, and standstill display
– Alibi memory for up to 65,536 measurement protocols
– Parameterization and calibration using FDT/DTM technology
– Various filter settings
– Calibration set for calibration required (Order No. 2700165)

Notes:

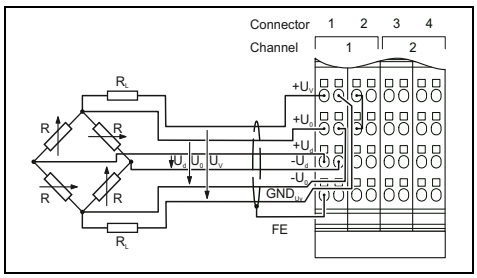
The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553



2 fast inputs

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O supply voltage U_{ANA}	24 V DC
Current consumption from U_{ANA}	Typ. 32 mA (With maximum load 60 Ω at U_V = 5 V)
Communications power U_L	7.5 V DC
Current consumption from U_L	max. 85 mA
Analog inputs	
Connection technology	6 or 4-wire, twisted pair shielded cable
Number of inputs	2
Description of the inputs	Input channels for strain gauge
Bridge difference U_d	Measuring range specified by selecting the characteristic and the bridge voltage
Bridge voltage U_0	3.3 V / 5 V
Analog outputs	
Description of the outputs	Voltage output
Number of outputs	2
Impedance	> 59 Ω (typical)
Maximum output current	max. 85 mA (with U_V = 5 V)
Characteristics	
Unipolar	+1 mV/V, +2 mV/V, +3 mV/V, +4 mV/V
Bipolar	±1 mV/V, ±2 mV/V, ±3 mV/V, ±4 mV/V
Measured value representation	15 bit + sign bit
Process data update	1 x per local bus cycle
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	190 g
Width	48.8 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline analog strain gauge input terminal, complete with accessories (connector and marking field) - Fast inputs - Precise inputs - Can be verified, precise input	**IB IL SGI 2/F-PAC**[1]	**2878638**	1

Accessories

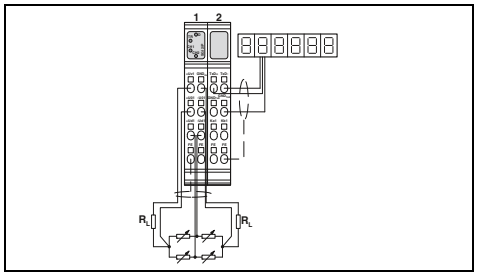
Calibration set, approval-related			
Shield connector	**IB IL SCN 6-SHIELD-TWIN**	**2740245**	5

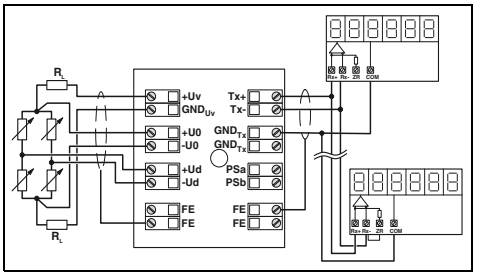
2 precise inputs

1 input that can be verified

Ex:

PTB-BG





Technical data

Inline data jumper	
24 V DC max. 100 mA	24 V DC max. 50 mA
7.5 V DC max. 100 mA	7.5 V DC Typ. 80 mA
6 or 4-wire, twisted pair shielded cable	6-wire, twisted pair shielded cable
2 Input channels for strain gauge Measuring range specified by selecting the characteristic	1 Input channel for strain gauge Measuring range specified by selecting the characteristic
5 V	5 V
Voltage output 2 > 55 Ω (per channel) max. 90 mA (per channel)	Voltage output 1 > 55 Ω max. 90 mA
- ±1 mV/V, ±2 mV/V, ±3 mV/V, ±3.33 mV/V, ±4 mV/V, ±5 mV/V	- ±1 mV/V, ±2 mV/V, ±3 mV/V, ±3.33 mV/V, ±4 mV/V, ±5 mV/V
15 bits + sign bit (process data) ; 15 bits + sign bit and measured display value in the ASCII character set (PCP)	Process data: status bits and measured value including decimal places of the gross/net display
Typ. 100 ms (12.5 ms, depends on the configuration)	Typ. 100 ms
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 220 g 48.8 mm	Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 160 g 48.8 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL SGI 2/P-PAC[1])	**2884907**	1

Accessories

IB IL SCN 6-SHIELD-TWIN	**2740245**	5

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL SGI 1/CAL[1])	**2700064**	1

Accessories

IB IL SGI EU CALSET	**2700165**	1
IB IL SCN-6 SHIELD	**2726353**	5

Temperature measurement terminals

These Inline terminals can be used to connect thermocouples (UTH) and resistive temperature sensors (RTD).

Features of UTH inputs:

– Connection of thermocouples according to DIN EN 60584-1 and DIN 43710
– Absolute and differential temperature measurement (configurable)
– Measured value acquisition with 16-bit resolution
– -15 mV to +85 mV linear input
– Internal and external cold junction

Features of RTD inputs:

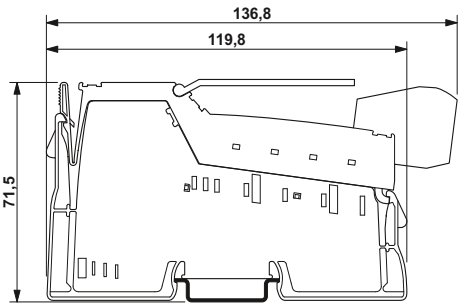
– Pt, Ni, Cu, KTY sensor types according to DIN and SAMA
– Connection of sensors in 2, 3, and 4-wire technology
– Measured value acquisition with 16-bit resolution
– Channel scout for optical channel identification

The IB IL 24 TC Inline thermistor terminal is used for the evaluation of PTC thermistors. It makes it possible to monitor the temperature of motors and can be used in conjunction with Inline motor starters.

Notes:

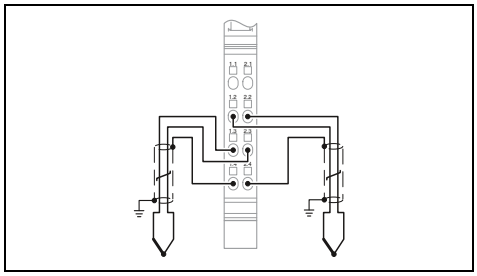
The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553



2 UTH inputs

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O supply voltage U_{ANA}	24 V DC
Current consumption from U_{ANA}	max. 18 mA
Communications power U_L	7.5 V DC (via voltage jumper)
Current consumption from U_L	max. 60 mA
Analog inputs	
Connection technology	2-wire (shielded)
Number of inputs	2
Precision	Typ. ± 0.6 °C
Description of the input	Inputs for thermocouples or linear voltage
Linear resistance measuring range	-
Sensor types (RTD) that can be used	-
Sensor types that can be used (TC)	U, T, L, J, E, K, N, S, R, B, C, W, HK
Measuring principle	Successive approximation
Process data update	30 ms (for both channels)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	67 g
Width	12.2 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline analog input terminal, complete with accessories (connector and marking field) - With extended functions	**IB IL TEMP 2 UTH-PAC**[1]	**2861386**	1

Accessories

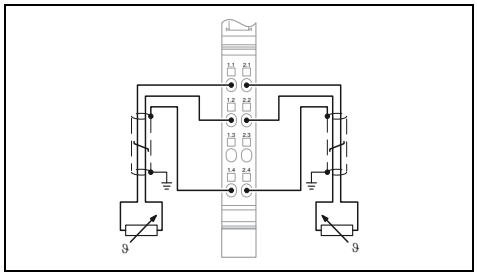
Shield connector	**IB IL SCN 6-SHIELD-TWIN**	**2740245**	5

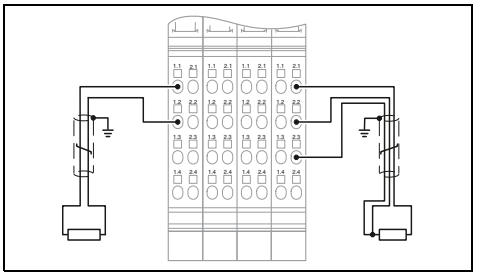
2 RTD inputs

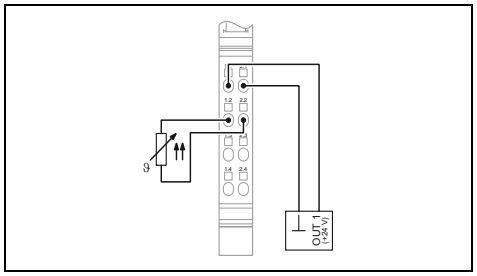
4 or 8 RTD inputs

1 thermistor input

Ex:







Technical data

Inline data jumper	
24 V DC	
max. 18 mA	
7.5 V DC (via voltage jumper)	
max. 60 mA	
2, 3-wire	
2	
Typ. ± 0.26 °C	
Input for resistive temperature sensors	
0 Ω ... 400 Ω / 0 Ω ... 4 kΩ	
Pt, Ni, KTY, Cu sensors, linear resistors	
-	
Successive approximation	
30 ms	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
67 g	
12.2 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL TEMP 2 RTD-PAC[1])	**2861328**	1

Accessories

IB IL SCN 6-SHIELD-TWIN	**2740245**	5

Technical data

	IB IL TEMP 4/8 RTD-PAC[1])	IB IL TEMP 4/8 RTD/EF-PAC[1])
Inline data jumper		
24 V DC		
	Typ. 28 mA	Typ. 6 mA
7.5 V DC (via voltage jumper)		
	Typ. 75 mA	Typ. 95 mA
	2, 3-wire	4-wire
8		
	Typ. ± 0.5 °C	Typ. ± 0.05 °C
Input for resistive temperature sensors		
	0 Ω ... 400 Ω / 0 Ω ... 20 kΩ	0 Ω ... 500 Ω / 0 Ω ... 5 kΩ
	Pt, Ni, KTY, Cu sensors, linear resistors	Pt, Ni, KTY sensors, linear resistors
-		
	Successive approximation	Sigma/Delta process
	6 ms (up to 230 ms possible depending on operating mode)	1.8 s (up to 3.3 s possible depending on operating mode)
Spring-cage connection		
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16		
190 g		
48.8 mm		

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL TEMP 4/8 RTD-PAC[1])	**2863915**	1
IB IL TEMP 4/8 RTD/EF-PAC[1])	**2897402**	1

Accessories

IB IL SCN 6-SHIELD-TWIN	**2740245**	5

Technical data

Inline data jumper	
24 V DC	
0 A DC	
7.5 V DC (via voltage jumper)	
max. 60 mA	
2-wire	
1	
-	
Input for PTC thermistor	
2.7 kΩ ... 3.5 kΩ (shutdown range, total resistance) / 50 Ω ... 2.25 kΩ (operating range, total resistance)	
PTC thermistor according to DIN 44081 or DIN 44082	
-	
-	
-	
Spring-cage connection	
0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
50 g	
12.2 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 TC-PAC[1])	**2861360**	1

Accessories

IB IL SCN-6 SHIELD	**2726353**	5

Analog output terminals

These Inline terminals are used in applications in which analog actuators are to be controlled.

With these terminals, common current and voltage output ranges can be configured individually and channel-specifically.

Features:

- Connection of sensors in 2-wire technology
- Measured value output with 16-bit resolution
- Load of up to 500 Ω
- Bipolar outputs
- Short-circuit-proof current outputs
- Short update time of < 1 ms

Notes:

The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

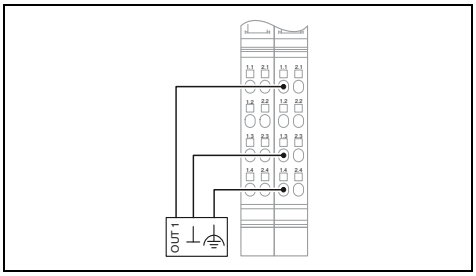
1) EMC: Class A product, see page 553

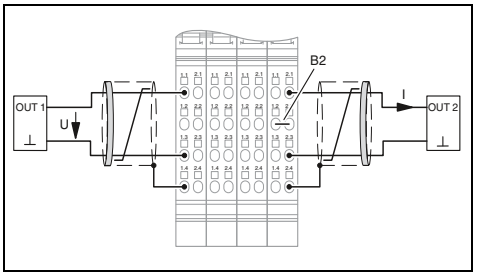
1 output

2 outputs

Ex:

Ex:





	Technical data	Technical data
Local bus interface		
Connection method	Inline data jumper	Inline data jumper
Power supply for module electronics		
I/O supply voltage U_{ANA}	24 V DC	24 V DC
Current consumption from U_{ANA}	max. 65 mA	max. 95 mA
Communications power U_L	7.5 V DC (via voltage jumper)	7.5 V DC (via voltage jumper)
Current consumption from U_L	max. 40 mA	max. 45 mA
Analog outputs		
Connection technology	2-wire (shielded)	2-wire (shielded)
Number of outputs	1	2
Voltage output signal	0 V ... 10 V	0 V ... 10 V
Load/output load voltage output	> 2 kΩ 0.05%	> 2 kΩ 0.03%
Current output signal	0 mA ... 20 mA / 4 mA ... 20 mA	0 mA ... 20 mA / 4 mA ... 20 mA
Load/output load current output	> 500 Ω	> 500 Ω
Protective circuit	Transient protection of outputs	Short-circuit protection of outputs
Characteristics		
Representation of output values	16 bits (15 bits + sign)	16 bits (15 bits + sign)
Process data update	< 1 ms	< 1 ms
General data		
Connection method	Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	126 g	125 g
Width	24.4 mm	48.8 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline analog output terminal, complete with accessories (connector and marking field)	**IB IL AO 1/SF-PAC**[1]	**2861315**	1

Accessories

Connector set	**IB IL AO/CNT-PLSET**	**2732664**	1
Shield connector for analog Inline terminals			
Connectors			

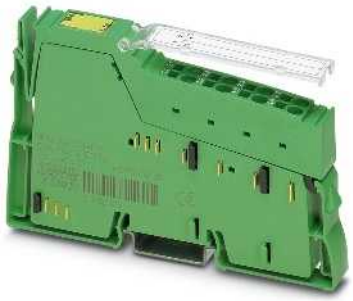
Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL AO 2/SF-PAC[1]	**2863083**	1

Accessories

IB IL SCN-6 SHIELD	**2726353**	5

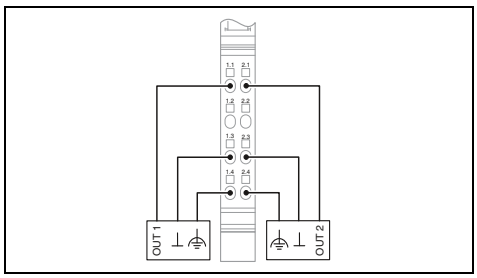
2 outputs, bipolar

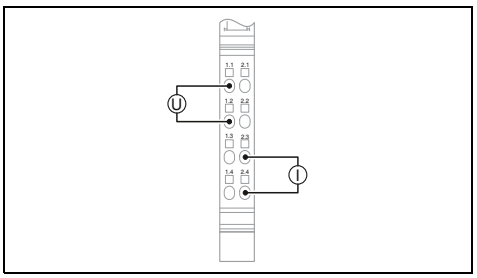


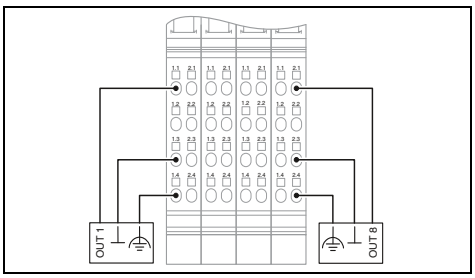
2 outputs, multifunctional

4/8 outputs, bipolar

Ex:







Technical data

Inline data jumper	
24 V DC max. 35 mA 7.5 V DC (via voltage jumper) max. 40 mA	
2-wire (shielded) 2 0 V ... 10 V / -10 V ... 10 V > 2 kΩ 0.05% - - Transient protection of outputs	
16 bits (15 bits + sign) < 2 ms	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 48 g 12.2 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL AO 2/U/BP-PAC[1]	**2861467**	1

Accessories

IB IL SCN 6-SHIELD-TWIN	**2740245**	5

Technical data

Inline data jumper	
24 V DC Typ. 24 mA (idling) 7.5 V DC (via voltage jumper) Typ. 55 mA	
2-wire (shielded, twisted pair) 2 0 V ... 10 V / -10 V ... 10 V > 1 kΩ 0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA ≤ 450 Ω Short-circuit and overload protection Transient protection	
12 bits (11 bits + sign bit) (bus-synchronous)	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 66 g 12.2 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL AO 2/UI-PAC[1]	**2700775**	1

Accessories

Technical data

Inline data jumper	
24 V DC Typ. 72 mA 7.5 V DC (via voltage jumper) Typ. 80 mA	
2, 3-wire 8 0 V ... 10 V / -10 V ... 10 V / 0 V ... 5 V / -5 V ... 5 V > 2 kΩ 0.05% - - Transient protection of outputs	
16 bits (15 bits + sign) < 2 ms (depends on operating mode)	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 215 g 48.8 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL AO 4/8/U/BP-PAC[1]	**2878036**	1

Accessories

IB IL SCN-8	**2726337**	10

Machine Edition (ME)

The Inline ME versions (Machine Edition) are designed to be used in a space-saving and inexpensive way, for example with machine applications, if minimum connection technology is possible.

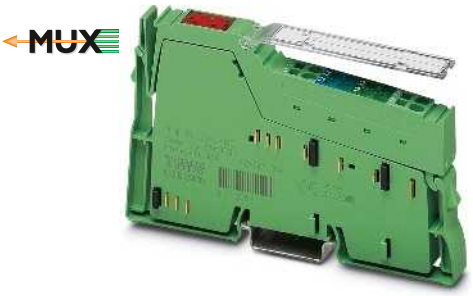
The digital Inline input terminal is designed for the connection of digital signals, such as those that are emitted from control switches, limit switches or proximity switches, and the digital Inline output terminals are designed for the connection of digital actuators, such as electromagnetic valves, contactors or visual indicators.

The digital ME variants are only available in packages of 4.

Notes:

1) EMC: Class A product, see page 553

4/16 digital inputs



4/16 digital outputs

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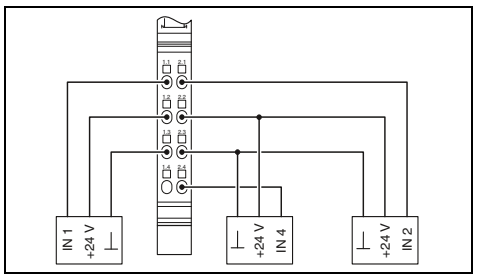

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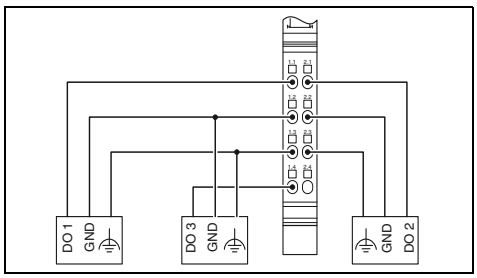


Technical data

	IB IL 24 DI 4-ME[1])	IB IL 24 DI 16-ME[1])
Local bus interface		
Connection method	Inline data jumper	
Power supply for module electronics		
Supply voltage	24 V DC (via voltage jumper)	
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Supply current	40 mA	
Digital inputs		
Connection method	Spring-cage connection	
Connection technology	2, 3-wire	
Maximum number of inputs	4	16
Description of the inputs	EN 61131-2 type 1	
Typical response time	< 1 ms	
Digital outputs		
Connection method	-	
Connection technology	-	
Maximum number of outputs	-	
Maximum output current per channel	-	
General data		
Connection method	Spring-cage connection	
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight	44 g	122 g
Width	12.2 mm	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C	

Technical data

	IB IL 24 DO 4-ME[1])	IB IL 24 DO 16-ME[1])
Local bus interface		
Connection method	Inline data jumper	
Power supply for module electronics		
Supply voltage	24 V DC (nominal value)	
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
Supply current	44 mA	90 mA
Digital inputs		
Connection method	-	
Connection technology	-	
Maximum number of inputs	-	
Description of the inputs	-	
Typical response time	-	
Digital outputs		
Connection method	Spring-cage connection	
Connection technology	2, 3-wire	
Maximum number of outputs	4	16
Maximum output current per channel	500 mA	
General data		
Connection method	Spring-cage connection	
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight	44 g	130 g
Width	12.2 mm	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline digital input terminal, Machine Edition variant, complete with accessories (connector plug and marking field)			
- 4 inputs	**IB IL 24 DI 4-ME[1])**	**2863928**	4
- 16 inputs	**IB IL 24 DI 16-ME[1])**	**2897156**	4
Inline digital output terminal, Machine Edition variant, complete with accessories (connector plug and marking field)			
- 4 outputs	**IB IL 24 DO 4-ME[1])**	**2863931**	4
- 16 outputs	**IB IL 24 DO 16-ME[1])**	**2897253**	4

Machine Edition (ME)

The IB IL AI 2/SF-ME analog Inline terminal is suitable for connecting standard sensors for acquiring current and voltage signals.

The IB IL AO 2/U/BP-ME analog Inline terminal supplies the typical voltage signals 0 ... 10 V and ±10 V as manipulated variables.

Both terminals can be used to implement cost-optimized applications.

Features:

- Connection of sensors in 2 or 3-wire technology
- Measured value acquisition with 12-bit resolution

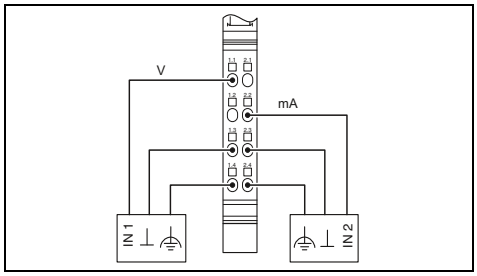
Notes:

1) EMC: Class A product, see page 553

2 analog inputs

2 analog outputs

Ex:



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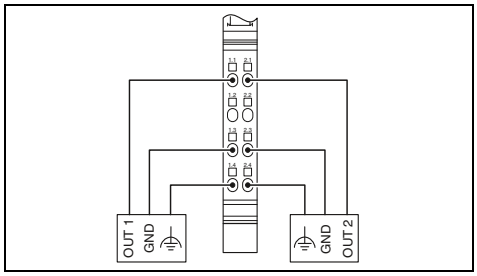


Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O supply voltage U_{ANA}	24 V DC
Current consumption from U_{ANA}	max. 18 mA
Analog inputs	
Connection technology	2, 3-wire
Number of inputs	max. 2 (single ended)
Voltage input signal	0 V ... 10 V / -10 V ... 10 V
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA
Measured value resolution	13 bits (12 bits + sign bit)
Process data update	Typ. 1.5 ms
Data formats	IL, IB ST, IB RT, standardized display
Analog outputs	
Connection method	-
Number of outputs	-
Voltage output signal	-
Current output signal	-
Representation of output values	-
Process data update	-
Data formats	-
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	47 g
Width	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O supply voltage U_{ANA}	24 V DC
Current consumption from U_{ANA}	max. 35 mA
Analog inputs	
Connection technology	-
Number of inputs	-
Voltage input signal	-
Current input signal	-
Measured value resolution	-
Process data update	-
Data formats	-
Analog outputs	
Connection method	2-wire
Number of outputs	2
Voltage output signal	0 V ... 10 V / -10 V ... 10 V
Current output signal	-
Representation of output values	13 bits (12 bits + sign)
Process data update	< 1 ms
Data formats	IL, IB ST
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	48 g
Width	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline analog input terminal, Machine Edition variant, complete with accessories (connector plug and marking field)	**IB IL AI 2/SF-ME[1])**	**2863944**	1
Inline analog output terminal, Machine Edition variant, complete with accessories (connector plug and marking field)	**IB IL AO 2/U/BP-ME[1])**	**2863957**	1

DALI terminals

Up to 64 DALI devices can be connected via the DALI master.

The IB IL DALI/PWR-PAC terminal is a DALI master, which in addition to DALI communication also provides the DALI bus supply, without having to connect an external DALI power supply unit. This terminal can be easily extended with up to three IB IL DALI-PAC devices, each of which represents another DALI master.

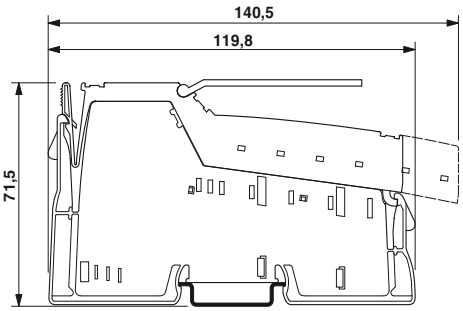
Features:

– Up to 64 DALI devices per master terminal
– Safe electrical isolation of the DALI bus
– Protection of the DALI bus against accidental connection of the mains voltage (up to 250 V AC)
– Diagnosis, transmitting and receiving display
– Function blocks for PC Worx are available

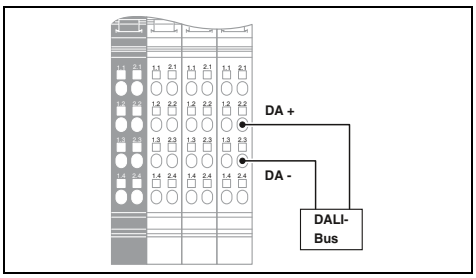
EnOcean wireless receiver

The SRC-RS485 EVC EnOcean wireless receiver is used to connect EnOcean sensors to the controller.

An Inline RS-485 communication terminal (IB IL RS485/422-PRO-PAC) is used to connect to the I/O station.



DALI master



Technical data

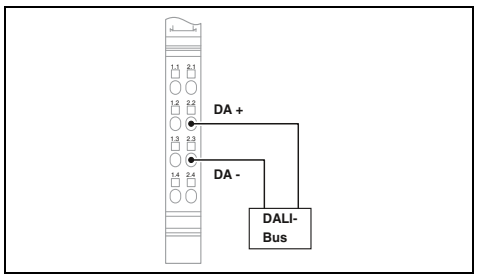
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (nominal value)
Supply voltage range	19.2 V DC ... 30 V DC
Current consumption from U_L	≤ 38 mA
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	194 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
1-channel DALI-master, complete with accessories (connection plug and marking field) - Integrated DALI power supply unit - Extension for IB IL DALI/PWR-PAC	**IB IL DALI/PWR-PAC**	**2897813**	1
EnOcean wireless receiver for connection with IB IL RS 485/422-PRO-PAC			

Extension for DALI master

EnOcean wireless receiver



Technical data	
Inline data jumper	-
24 V DC (nominal value) 19.2 V DC ... 30 V DC ≤ 38 mA	24 V DC (nominal value) 15 V DC ... 24 V DC -
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 57 g 12.2 mm -25 °C ... 55 °C	Screw connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 - 70 mm -20 °C ... 60 °C

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
IB IL DALI-PAC	**2897910**	1

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
SRC-RS485 EVC	**2897237**	1

Branch terminals

The IBS IL 24 RB-T-PAC and IBS IL 24 RB-LK-PAC branch terminals make it possible to add more system levels to an INTERBUS network. A total of up to 15 levels can be operated in the network.

The IBS IL 24 RB-T terminal uses a copper cable as the transmission medium. The IBS IL 24 RB-LK terminal uses fiber optics as the outgoing remote bus interface.

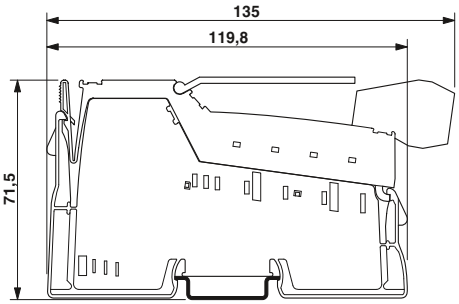
The IB IL 24 FLM-PAC Inline branch terminal enables the direct connection of Fieldline Modular M8 and M12 local bus devices to an Inline Modular station.

When combined with the IB IL 24 LSKIP-PAC local bus extension terminal, it is possible to jump between two rows within an Inline station. This means that the Inline station can extend onto another DIN rail without having to use a new bus coupler.

In contrast to the IB IL 24 FLM-PAC, the IB IL 24 FLM MUL-TI-PAC branch terminal enables the integration of several Fieldline Modular M8 local buses in an Inline station.

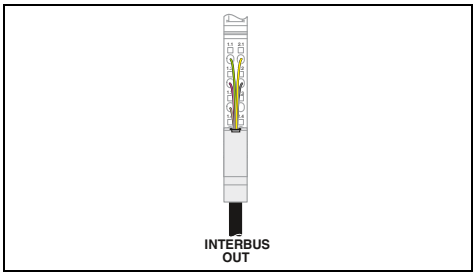
Notes:

1) EMC: Class A product, see page 553



Remote bus branch

Ex: cULus



Technical data

Interface	
Connection method	Inline shield connector
Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply voltage	24 V DC (via voltage jumper)
Supply voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Max. current consumption	-
Current consumption from U_L	-
Current consumption from U_{ANA}	Typ. 29 mA
Power supply at U_L	-
Power supply at U_{ANA}	-
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	67 g
Width	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline branch terminal, complete with accessories (connector and marking field)	**IBS IL 24 RB-T-PAC[1])**	**2861441**	1

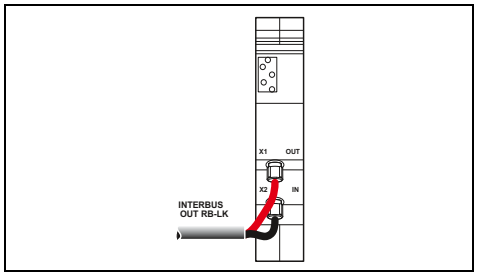
Accessories

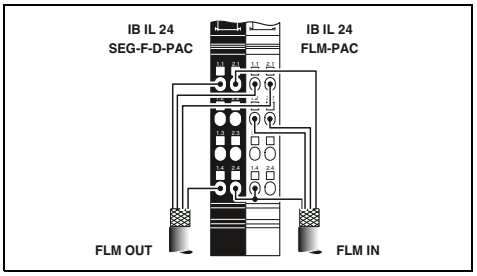
Inline segment terminal, complete with accessories (connector and marking field)			
Shield connector for analog Inline terminals	**IB IL SCN-6 SHIELD**	**2726353**	5

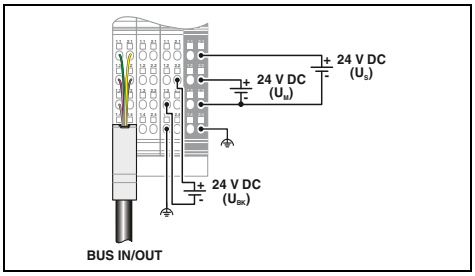
Fiber optic remote bus branch

Fieldline Modular extension

Local bus extension terminal







Technical data

FSMA plugs	
Inline data jumper	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple)	
-	
-	
Typ. 42 mA	
-	
-	
FSMA plugs - ... - / - ... - / - 89 g 24.4 mm -25 °C ... 55 °C	

Technical data

	IB IL 24 FLM-PAC[1])	IB IL 24 FLM MULTI-PAC[1])
Inline shield connector		
Inline data jumper		
110 mA		50 mA
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 43 g 12.2 mm -25 °C ... 55 °C		

Technical data

Inline shield connector
Inline data jumper
24 V DC 19.2 V DC ... 30 V DC
max. 1.25 A (with max. number of connected I/O terminals)
-
-
max. 2 A DC (observe derating)
max. 0.5 A DC (observe derating)
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 207 g 48.8 mm -25 °C ... 55 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS IL 24 RB-LK[1])	**2878117**	1

Accessories

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 FLM-PAC[1])	**2736903**	1
IB IL 24 FLM MULTI-PAC[1])	**2737009**	1

Accessories

IB IL 24 SEG/F-PAC[1])	**2861373**	1
IB IL SCN-6 SHIELD	**2726353**	5

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 LSKIP-PAC	**2897457**	1

Accessories

Serial communication terminals

Inline communication terminals can be used to connect devices with a serial interface (e.g., barcode scanners).

Features:

– V.24 (RS-232) or RS-485/RS-422 interface depending on the version
– Support of various protocols (e.g., end-to-end protocol)
– Baud rates of up to 250 kbaud
– Communication via acyclic services (PCP) or process data (PRO versions)

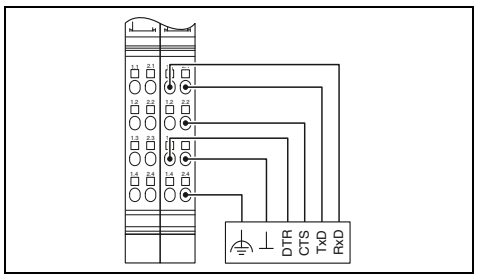
Notes:

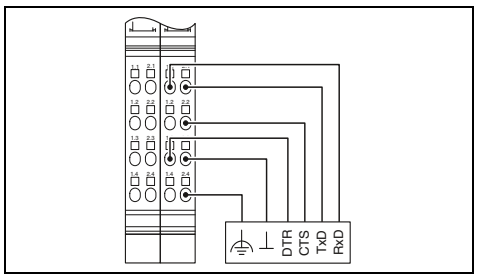
The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553

1 serial V.24 (RS-232) interface, PCP communication

1 serial V.24 (RS-232) interface, process data communication





Technical data

Local bus interface		
Connection method	Inline data jumper	Inline data jumper
Serial port		
Interface	V.24 (RS-232)	V.24 (RS-232)
Connection method	Spring-cage connection	Spring-cage connection
Power supply for module electronics		
I/O voltage	24 V DC (via voltage jumper)	24 V DC (via voltage jumper)
I/O voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_L	7.5 V (via voltage jumper)	7.5 V (via voltage jumper)
Current consumption from U_L	Typ. 155 mA	Typ. 155 mA
Serial input/output channel		
Input buffer	4 kbyte	4 kbyte
Output buffer	1 kbyte	1 kbyte
Transmission speed	110 bit/s ... 38400 bit/s (configurable)	110 bit/s ... 38400 bit/s (configurable)
Data bits	7 or 8	7 or 8
Stop bits	1 or 2	1 or 2
Parity	Even, odd or no parity	Even, odd or no parity
Transmission type	Transparent mode, end-end mode, dual buffer mode, 3964R, XON/XOFF	Transparent mode, end-end mode, dual buffer mode, 3964R, XON/XOFF
General data		
Connection method	Spring-cage connection	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	135 g	135 g
Width	24.4 mm	24.4 mm
Ambient temperature (operation)	-25 °C ... 55 °C	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline communication channel,, complete with accessories (connector and marking field) - 1 serial input and output channel as RS-485/RS-422 or RS-232 version	**IB IL RS 232-PAC**[1]**)**	**2861357**	1

Accessories

Connector set	**IB IL AO/CNT-PLSET**	**2732664**	1

Ordering data

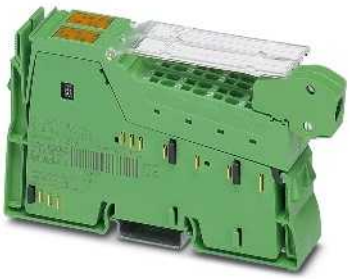
Description	Type	Order No.	Pcs. / Pkt.
Inline communication channel,, complete with accessories (connector and marking field) - 1 serial input and output channel as RS-485/RS-422 or RS-232 version	**IB IL RS 232-PRO-PAC**[1]**)**	**2878722**	1

Accessories

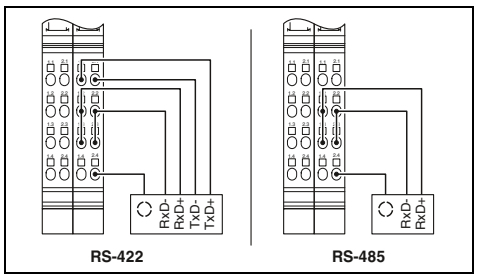
Connector set	**IB IL AO/CNT-PLSET**	**2732664**	1

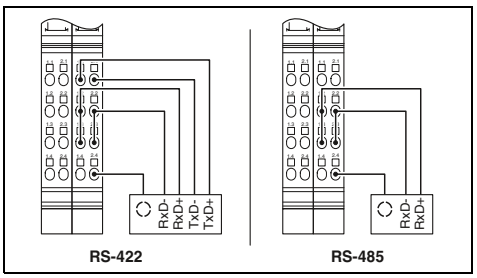
1 serial RS-485/RS-422 interface, PCP communication

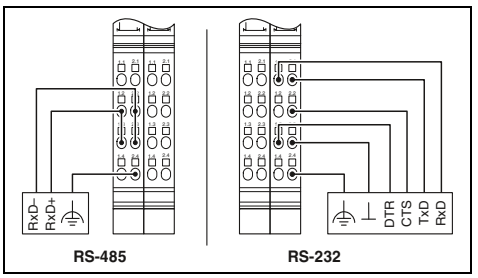
1 serial RS-485/RS-422 interface, process data communication



1 serial RS-485/422 or RS-232 interface, process data communication







Technical data

Inline data jumper	
RS-422/485 Spring-cage connection	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple) 7.5 V (via voltage jumper) Typ. 170 mA	
4 kbyte 1 kbyte 110 bit/s ... 38400 bit/s (configurable) 7 or 8 1 or 2 Even, odd or no parity Transparent mode, end-end mode, dual buffer mode, 3964R, XON/XOFF, Modbus RTU / ASCII	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 135 g 24.4 mm -25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL RS 485/422-PAC	**2861933**	1

Accessories

IB IL AO/CNT-PLSET	**2732664**	1

Technical data

Inline data jumper	
RS-422/485 Spring-cage connection	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple) 7.5 V (via voltage jumper) Typ. 170 mA	
4 kbyte 1 kbyte 110 bit/s ... 38400 bit/s (configurable) 7 or 8 1 or 2 Even, odd or no parity Transparent mode, end-end mode, dual buffer mode, 3964R, XON/XOFF, MOVILINK protocol	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 135 g 24.4 mm -25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL RS 485/422-PRO-PAC	**2863627**	1

Accessories

IB IL AO/CNT-PLSET	**2732664**	1

Technical data

Inline data jumper	
RS-232, RS-485, RS-422 Spring-cage connection	
24 V DC (via voltage jumper) 19.2 V DC ... 30 V DC (including all tolerances, including ripple) 7.5 V (via voltage jumper) Typ. 78 mA	
4 kbyte 1 kbyte 110 bit/s ... 250000 bit/s (configurable) 5 … 8 1 or 2 Even, odd or no parity Transparent mode, end-to-end mode, XON/XOFF	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 135 g 24.4 mm -25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL RS UNI-PAC[1])	**2700893**	1

Accessories

IB IL AO/CNT-PLSET	**2732664**	1

INTERFACE system bus master terminal

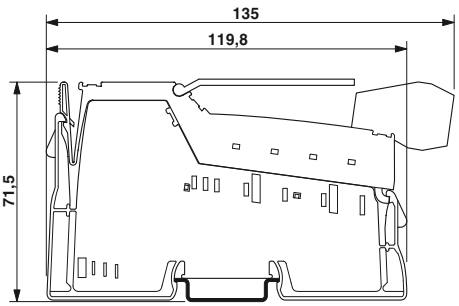
The Inline terminal can be used to connect INTERFACE modules to the Inline station and thereby the higher-level bus system via the INTERFACE system bus.

Features:

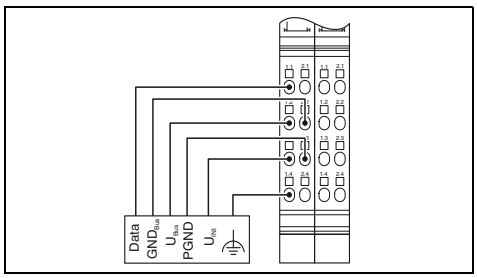
- Easy integration of up to 8 INTERFACE EMM and EEM modules with firmware 1.03 or later
- User-friendly parameterization, configuration, and diagnostics using DTMs (Device Type Managers)
- Serial interface (S port) including a memory stick for saving the configuration
- Acquisition and output of up to 31 measured values and 16 manipulated variables
- Application: motor and energy data management

Notes:

1) EMC: Class A product, see page 553



INTERFACE system bus master



Technical data

Local bus interface	
Connection method	Inline data jumper
Communication interface	
Interface	INTERFACE system bus
Connection method	Inline shield connector
Programming interface	
Interface	Programming interface (S port)
Connection method	IFS-USB-PROG-ADAPTER
Power supply for module electronics	
Communications power U_L	7.5 V (via voltage jumper)
Current consumption from U_L	Typ. 66 mA
Supply of the connected INTERFACE modules	
9 V supply	
Voltage range	8.1 V ... 9.9 V
Type of protection	Short-circuit protection, electronic
Max. current carrying capacity	300 mA
24 V supply (EEM, EMM)	
Voltage range	19.2 V ... 30 V (including ripple)
Type of protection	Short-circuit protection, electronic and thermal
Max. current carrying capacity	4 A
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	130 g
Width	24.4 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Modular communication terminal, complete with accessories (connector plug and marking field)			
- For connecting the INTERFACE system bus	**IB IL IFS-MA-PAC**[1]**)**	**2692720**	1

Accessories

Connector set	**IB IL AO/CNT-PLSET**	**2732664**	1
Programming adapter with USB interface	**IFS-USB-PROG-ADAPTER**[1]**)**	**2811271**	1
Multi-functional memory block for the INTERFACE system	**IFS-CONFSTICK**[1]**)**	**2986122**	1
Assembled connecting cable, IL-IFS, 2 m in length	**IMC 1,5/ 5-ST-3,81SET IL IFS 2M**	**1784729**	1

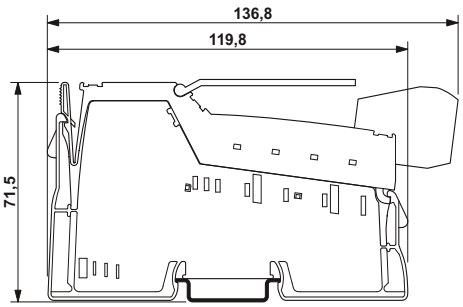
CAN master terminal

The Inline terminal can be used to connect a lower-level CAN network. Within the Inline station, the terminal acts as a CAN master for the CAN system.

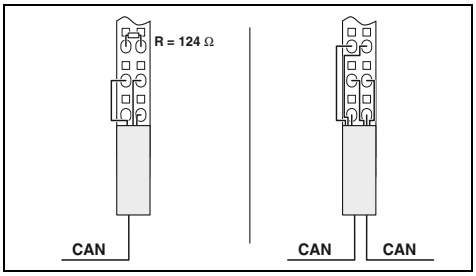
Any CAN frames with 11-bit or 29-bit identifier can be transmitted via the terminal by the PLC to all types of CAN devices, regardless of the CAN protocol present there.

Features:

- Transparent mode
- CAN 2.0A (11-bit identifier ; standard frame)
- CAN 2.0B (29-bit identifier ; extended frame)
- Transmission speed of 10 kbps to 1 Mbps
- Maximum data width:
  126 bytes + 2-byte command/status word
- User-friendly controller-independent software tool for configuring the CAN network
- Serial interface (S port) including a memory stick for saving the configuration



CAN master



Notes:

The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553

Technical data

Local bus interface	
Connection method	Inline data jumper
Communication interface	
Interface	CAN bus
Connection method	Inline shield connector
Programming interface	
Interface	CAN bus
Connection method	Inline shield connector
Power supply for module electronics	
Communications power U_L	7.5 V (via voltage jumper)
Current consumption from U_L	Typ. 110 mA
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	75 g
Width	12.2 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline Modular communication terminal, complete with accessories (connector and marking field)			
- For connecting a CAN bus system	**IB IL CAN-MA-PAC**[1]**)**	**2700196**	1

Accessories

Shield connector	**IB IL SCN 6-SHIELD-TWIN**	**2740245**	5
Multi-functional memory block for the INTERFACE system	**IFS-CONFSTICK**[1]**)**	**2986122**	1
Configuration cable for IB IL CAN-MA-PAC	**IB IL CAN-MA CONF-CAB**	**2700620**	1

IO-Link master terminal

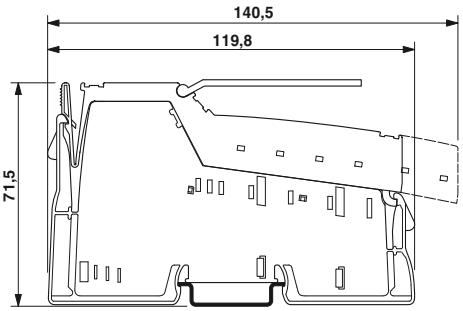
The Inline IO-Link master enables the connection of IO-Link-compatible sensors and actuators (IO-Link devices).

Features:

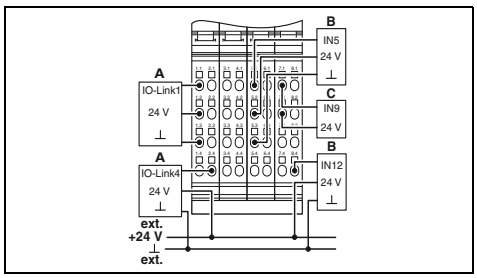
– 4 type A IO-Link ports
– Transmission speeds
  COM1: 4.8 kbaud
  COM2: 38.4 kbaud
  COM3: 230.4 kbaud
– Optional use of the IO-Link ports in SIO mode as standard inputs or standard outputs
– Connections for 12 digital sensors

Notes:

1) EMC: Class A product, see page 553



4 IO-Link ports, 12 digital inputs



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Communications power U_L	7.5 V (via voltage jumper)
Current consumption from U_L	max. 100 mA
Digital inputs	
Connection technology	2, 3-wire
Maximum number of inputs	12
IO-Link ports	
Connection technology	2, 3-wire
Number of ports	4
IO-Link port supply	
I/O supply voltage	min. U_S - 1 V
Nominal current for every IO-Link port	max. 200 mA
Nominal current per device	max. 800 mA
Digital inputs in the SIO mode	
Number of inputs	max. 4
Input voltage	24 V DC
Input voltage range	0 V DC ... 30 V DC
Nominal input current	5.5 mA (at 24 V DC)
Current flow	linear in the range of 0 V ... 7 V, constant in the range of 7 V ... 30 V
Signal delay	3 ms
Digital outputs in the SIO mode	
Number of outputs	max. 4
Nominal output voltage	U_S - 3 V (U_{OUT} at $I_{CQ} \leq 200$ mA)
Nominal current per channel	max. 200 mA ($I_{Nominal}$)
Maximum total current consumption	max. 800 mA
Protective circuit	Short-circuit protection integrated per channel
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	200 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline IO-Link master, complete with accessories (connector plug and marking field)	**IB IL 24 IOL 4 DI 12-PAC**[1])	**2692717**	1

PROFIBUS terminal

The PROFIBUS terminal enables connection of PROFIBUS modules to a PC Worx controller via INTERBUS or PROFINET.

Likewise, a PC Worx controller can be integrated into an existing PROFIBUS system.

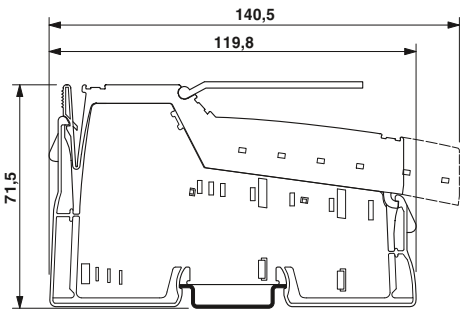
The terminal supports both the master and slave functions.

Features:

- PROFIBUS DP V0 master for a maximum of ten PROFIBUS slaves with up to 48 data words of input and output data.
- PROFIBUS DP V0 master for a maximum of three PROFIBUS slaves with up to 56 data words of input and output data.
- PROFIBUS DP slave with a maximum of 56 data words
- user-friendly parameterization via PC Worx
- local plug-in memory for backing up the configuration

Notes:

1) EMC: Class A product, see page 553



PROFIBUS master/slave

Technical data

Local bus interface	
Connection method	Inline data jumper
Communication interface	
Interface	PROFIBUS DP V0 master/slave
Connection method	9-pos. D-SUB socket
Power supply for module electronics	
Communications power U_L	7.5 V (via voltage jumper)
Current consumption from U_L	Typ. 98 mA
General data	
Connection method	9-pos. D-SUB socket
Weight	200 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline PROFIBUS master, complete with accessories (connector plug and marking field)	**IB IL PB MA-PAC**[1])	**2700630**	1

Accessories

PROFIBUS connector plug (D-SUB)	**SUBCON-PLUS-PROFIB**	**2744348**	1

Counter terminal

The Inline counter terminal detects and processes fast pulse sequences from sensors.

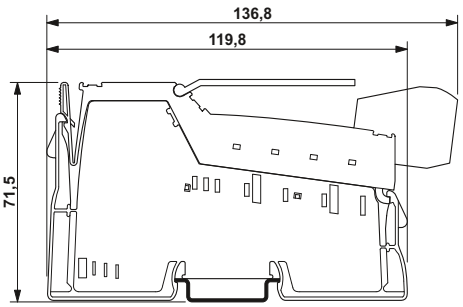
Features:

- 1 counter
- 24 V sensor supply including monitoring
- Processing of 5 V or 24 V signals
- Input frequency of up to 100 kHz
- Gate input
- Four operating modes:
  Event counting, time or state-controlled frequency measurement, time measurement (period or pulse length), and pulse generator
- 24-bit counter value for event counting and frequency measurement
- 16-bit counter value for time measurement
- Time measurement resolutions:
  2 µs, 1 ms, and 10 ms
- Frequency measurement resolution of up to 0.1 Hz
- 24 V onboard output switches when relation condition is met
- Start and final value can be modified during counting

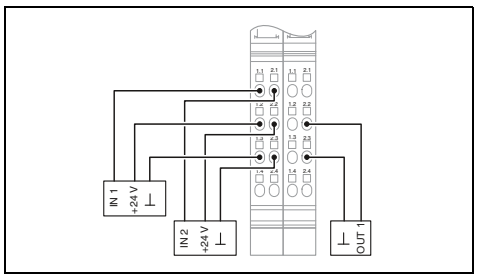
Notes:

The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553



1 counter input



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O voltage	24 V DC (via voltage jumper)
I/O voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_L	7.5 V DC
Current consumption from U_L	max. 50 mA
Counter input	
Operating modes	Event counting, frequency/time measurement, pulse generator
Input frequency	max. 100 kHz
Input voltage	24 V DC / 5 V DC
Input current	5 mA (typical)
Control input	
Connection method	2, 3-wire
Input voltage	24 V DC / 5 V DC
Input current	5 mA (typical)
Digital outputs	
Number of outputs	1
Connection method	2-wire
Output voltage	24 V
Output current	500 mA
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	130 g
Width	24.4 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline counter terminal, complete with accessories (connector and marking field)	**IB IL CNT-PAC**[1])	**2861852**	1

Accessories

Connector set	**IB IL AO/CNT-PLSET**	**2732664**	1

Pulse width terminal

The Inline PWM terminal outputs signals ; depending on the operating mode, either the pulse length, period length or frequency can be set.

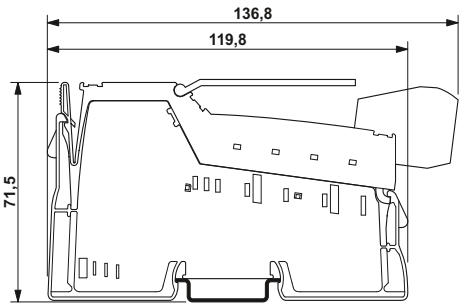
Features:

– 2 independent channels
– Output of 5 V or 24 V signals
– Maximum frequency of 50 kHz
– Pulse width modulation (period length can be set in increments from 100 µs to 10 s, duty factor in 0.39% increments)
– Frequency output (frequency can be set between 0 and 50 kHz)
– Single pulse output (pulse length of 10 µs to 25.5 s can be set)
– Pulse/direction signal output without integrated ramp function to control step motor power sections

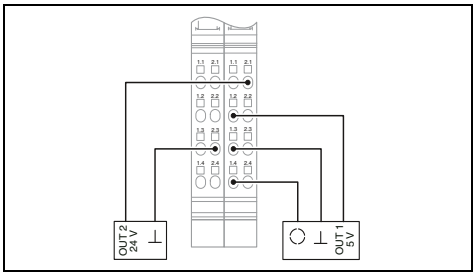
Notes:

The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553



Pulse width modulation, frequency generator or step motor control



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
I/O voltage	24 V DC (via voltage jumper)
I/O voltage range	19.2 V DC ... 30 V DC (including all tolerances, including ripple)
Communications power U_L	7.5 V (via voltage jumper)
Current consumption from U_L	max. 130 mA
Digital outputs	
Number of outputs	2
Connection method	2-wire (shielded)
Output voltage	24 V / 5 V
Output current	10 mA (5 V) ; 500 mA (24 V)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	130 g
Width	24.4 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline function terminal, complete with accessories (connector and marking field)	**IB IL PWM/2-PAC**[1]**)**	**2861632**	1

Accessories

Connectors	**IB IL SCN-8**	**2726337**	10
Shield connector	**IB IL SCN 6-SHIELD-TWIN**	**2740245**	5

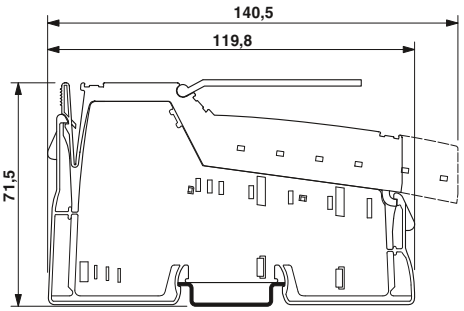
Power measurement terminal

This module is designed for use within an Inline station.

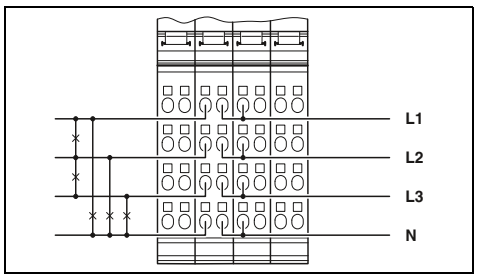
The power measurement terminal enables you to analyze AC power grids and is used in applications where conventional analog meters in distribution systems no longer meet growing requirements. This is particularly true in cases where it is important to analyze distortions and harmonics as well as measuring current, voltage, and power.

Features:

- 3 phases plus neutral conductor, connectable
- Direct current detection, 1 A or 5 A
- Line-to-line voltage up to 690 V AC (L-L)
- Specification according to EN 61010−1:2001:
  - Measurement category 3 (300 V AC (L-N))
  - Measurement category 2 (400 V AC (L-N))
- Network variables:
  - Phase currents and neutral conductor current
  - Phase and phase conductor voltages
  - Real, reactive, and apparent powers
  - Power factors of phases
  - Power flow directions
  - Frequency
- Operating modes:
  - Basic measured values
  - Scanning measured values (64 scans/full wave)
- Synchronization
- Triggers for measurement intervals can be freely defined
- Harmonic analysis up to 31st harmonic
- Determination of maximum value
- Operating hours counter
- Power meter
- Bimetal filtering



Analysis of AC power grids



Technical data

Local bus interface	
Name	Inline local bus
Connection method	Inline data jumper
Power supply for module electronics	
Communications power U_L	7.5 V (via voltage jumper)
Current consumption from U_L	Typ. 130 mA
Current measuring input	
Nominal current I_N	5 A AC (1 A AC, depending on parameterization)
Overload	140% continuous ; 150 A for 10 ms
Precision	0.25% (of the nominal value)
Scanning rate	22.4 k samples/50 Hz
Voltage measuring input	
Nominal voltage U_N	400 V AC (Nominal phase voltage)
Nominal voltage U_N	0 V AC ... 690 V AC (phase conductor voltage)
Overload	120% of the nominal value
Precision	0.25% (of the nominal value)
Scanning rate	22.4 k samples/50 Hz
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Weight	200 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline power measurement terminal, complete with accessories (connector plug and marking field)	**IB IL PM 3P/N/EF-PAC**	**2700965**	1

Accessories

Marking field, width: 12.2 mm	**IB IL FIELD 2**	**2727501**	10
Marking field, width: 48.8 mm	**IB IL FIELD 8**	**2727515**	10

Positioning control terminal

The Inline positioning control system is suitable for point-to-point positioning of binary-controlled drives, e.g., pole-changing AC motors, in accordance with the rapid motion/creeping motion principle and supports the positioning of rotary and linear axes.

It can be used to perform simple positioning tasks, such as positioning:
– Transportation equipment
– Format adjustments (adjustable axes)
– Tools

It is not necessary to set control parameters here. After specifying a target position, the terminal automatically, and therefore independently of the bus, assumes control of the drive by specifying both the traversing rate (rapid motion/creeping motion) and the traversing direction via four binary outputs and signaling when the target point has been reached.

IB IL INC-PAC:
– Position detection via symmetrical or asymmetrical incremental encoder with or without Z trace

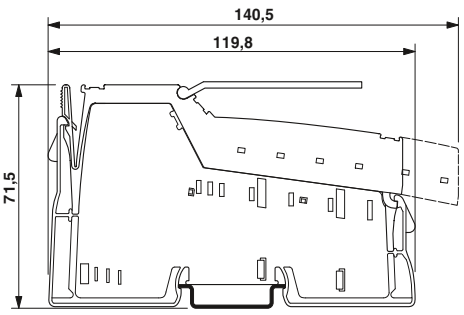
IB IL SSI-PAC:
– Position detection using absolute encoders with SSI interface

Features:
– 5 V and 24 V encoder supply including monitoring
– 24 V sensor supply including monitoring
– 3 digital inputs
– 4 digital outputs
– Software limit switch
– Integrated monitoring functions
– Gear ratio can be parameterized
– Backlash and friction compensation
– Startup using hand-held operator panel mode

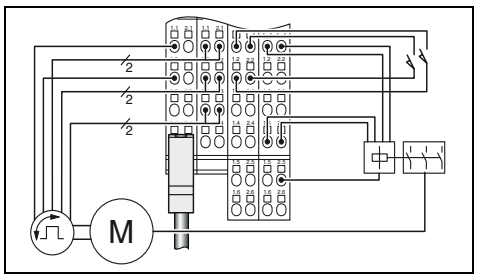
Notes:

The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553



With incremental encoder interface or SSI interface for absolute encoders



Technical data

	IB IL INC-PAC[1])	IB IL SSI-PAC[1])
Local bus interface		
Connection method	Inline data jumper	
Power supply for module electronics		
Communications power U_L	7.5 V (via voltage jumper)	
Current consumption from U_L	max. 110 mA	max. 60 mA
Encoder supply voltage	5 V DC (sym. / asym.) / 24 V DC (Only asymmetrical encoders)	5 V DC / 24 V DC
Encoder supply current	500 mA	
Drawing encoder supply voltage	Main circuit U_M	
Drawing initiator supply	Main circuit U_M	
Incremental encoder input		
Number of inputs	1	-
Description of the input	Symmetrical (RS-422) or asymmetrical (4.5 V - 30 V)	-
Input frequency (24 V)	0 Hz ... 50 kHz (asymmetrical)	-
Input frequency (5 V)	0 kHz ... 500 kHz (symmetrical)	-
Absolute position encoder input		
Number of inputs	-	1
Transmission frequency	-	400 kHz
Adjustable resolution		26 bit (maximum)
Digital inputs		
Number of inputs	3	
Input voltage range “0” signal	-30 V DC ... 5 V DC	
Input voltage range “1” signal	13 V DC ... 30 V DC	
Digital outputs		
Number of outputs	4	
Connection method	-	
Output voltage	24 V DC	-
Output current	2 A	-
General data		
Connection method	Spring-cage connection	
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16	
Weight	210 g	
Width	48.8 mm	
Ambient temperature (operation)	-25 °C ... 55 °C	

Ordering data

Inline positioning terminal, complete with accessories (connector plug and marking field)			
- Incremental encoder input	**IB IL INC-PAC[1])**	**2861849**	1
- Absolute encoder input	**IB IL SSI-PAC[1])**	**2861865**	1

Accessories

Connecting plug	**IB IL SCN-12-ICP**	**2727611**	10
Shield connector for analog Inline terminals	**IB IL SCN-6 SHIELD**	**2726353**	5

Position measurement terminals

Inline position detection terminals can be used to detect the position with incremental encoders, absolute encoders with SSI interface or magnetostrictive encoders with start/stop interface.

IB IL INC-IN-PAC features:

– Symmetrical and asymmetrical incremental encoders with or without Z trace can be connected
– Shield connection
– Maximum input frequency of 300 kHz
– Single, double or quadruple evaluation
– 25-bit actual position value
– 5 V and 24 V encoder supply including monitoring
– 3 digital inputs to connect two limit switches and one home position switch
– 5 homing functions
– Direction of rotation indicator via LED
– Open circuit detection

IB IL SSI-IN-PAC features:

– 1 single or multi-turn encoder with up to 25-bit resolution can be connected
– Transmission frequency of up to 1 MHz
– 5 V encoder supply including monitoring
– Gray or binary code
– Parity monitoring
– Reversal of direction of rotation
– Shield connection

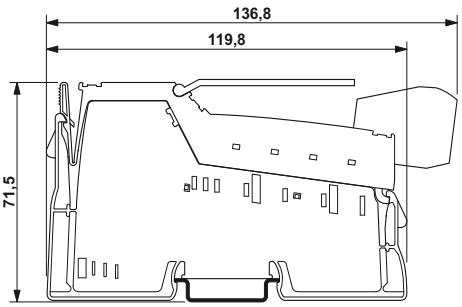
IB IL IMPULSE-IN-PAC features:

– 1 magnetostrictive encoder can be connected
– Evaluation of the position of a magnet
– Length measuring range of up to 3.85 m
– Position resolution of 5 µm
– Ultrasonic encoder speed of 2500 m/s to 2999.99 m/s
– 24 V encoder supply including monitoring
– Shield connection

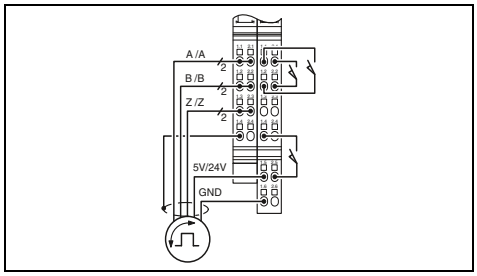
Notes:

The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553



Input for incremental encoder with square-wave signal (symmetrical or asymmetrical)



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Communications power U_L	7.5 V (via voltage jumper)
Current consumption from U_L	max. 70 mA
Encoder supply voltage	5 V DC / 24 V DC
Encoder supply current	max. 250 mA
Drawing encoder supply voltage	Main circuit U_M
Drawing initiator supply	Main circuit U_M
Incremental encoder input	
Number of inputs	1
Description of the input	Symmetrical (RS-422) or asymmetrical (3.5 V to -27 V)
Input frequency (24 V)	0 Hz ... 300 kHz
Absolute position encoder input	
Number of inputs	-
Transmission frequency	-
Adjustable resolution	-
Input for magnetostrictive encoders	
Length measuring range	-
Ultra-sound speed (gradient)	-
Digital inputs	
Number of inputs	3
Input voltage range “0” signal	-30 V DC ... 5 V DC
Input voltage range “1” signal	15 V DC ... 30 V DC
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	143 g
Width	24.4 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

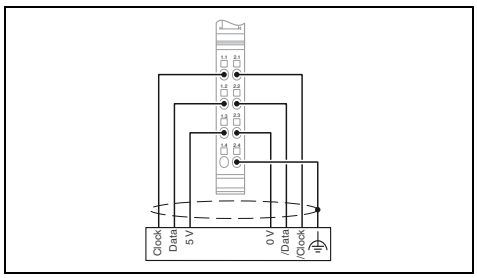
Inline position measurement terminal, complete with accessories (connector plug and marking field)		
IB IL INC-IN-PAC	**2861755**	1

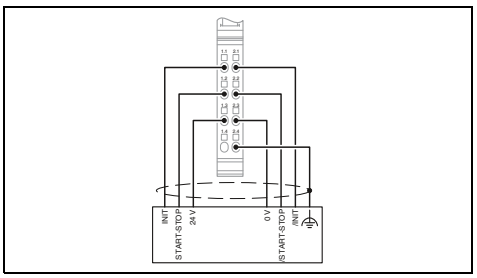
Accessories

Connecting plug		
IB IL SCN-12-ICP	**2727611**	10
Shield connector for analog Inline terminals		
IB IL SCN-6 SHIELD	**2726353**	5

Input for absolute rotation or travel measuring systems with SSI interface

Input for magnetostrictive encoder with start/stop interface





Technical data	
Inline data jumper	
7.5 V (via voltage jumper) max. 28 mA 5 V DC max. 250 mA Main circuit U_M -	
- -	
-	
1 100 kHz / 200 kHz / 400 kHz / 800 kHz / 1 MHz 25 bit (maximum)	
- -	
- - -	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 71 g 12.2 mm -25 °C ... 55 °C	

Technical data	
Inline data jumper	
7.5 V max. 70 mA 24 V max. 250 mA Main circuit U_M -	
- -	
-	
- - -	
> 0 mm ... 3850 mm (resolution: 5 µm) 2500.00 m/s ... 2999.99 m/s (Firmware 1.22 and higher) 2750.00 m/s ... 2898.00 m/s (Firmware 1.21 and higher)	
- - -	
Spring-cage connection 0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16 71 g 12.2 mm -25 °C ... 55 °C	

Ordering data		
IB IL SSI-IN-PAC[1])	**2819574**	1

Accessories		
IB IL SCN-6 SHIELD	**2726353**	5

Ordering data		
IB IL IMPULSE-IN-PAC[1])	**2861768**	1

Accessories		
IB IL SCN-6 SHIELD	**2726353**	5

Servo controller for EC motors

The IB IL EC AR 48/10A Inline servo controller is a universal power output module with a 4 quadrant function for permanently excited DC motors with brushgears or electronically commutated DC motors (EC motors) with up to 450 W power output.

Features:

- Variable frequency drive with positioning function
- Electronic commutation with Hall sensors
- Point-to-point positioning function
- Speed profile: trapezoid or S curve
- Position, speed, and torque control
- Position detection with incremental encoder
- Homing
- Max. 48 V/10 A
- 97.6 mm design width
- Software tool for operation and startup including oscilloscope function
- Cycle time of the position controller: 1 ms
- For single and multi-axis applications

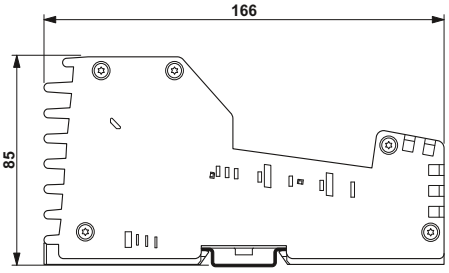
Applications:

- Handling machines in the semiconductor industry, in small parts protection, in the electronics industry, and in test engineering
- Assembly machines in small appliance production
- Bearing and conveying technology for small loads
- Format adjustment in processing machines and packaging machines
- Laboratory technology

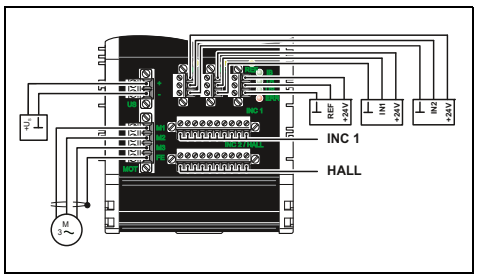
Notes:

The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553



Servo controller for 24 V motors with positioning and homing function



Technical data

Interface	
Inline local bus	Inline data jumper
Startup and diagnostics	RS-232
Power supply for module electronics	
Communications power U_L	7.5 V DC (via voltage jumper)
Current consumption from U_L	Typ. 30 mA
Power supply	
Connection method	2-pos. COMBICON connector
Supply voltage range	12 V DC ... 48 V DC ±15% (surge voltage shutdown U_S > 60 V DC)
Motor output	
Output name	1 permanently excited DC motor with or without brushgear
Connection method	4-pos. COMBICON plug with shield connection clamp
Nominal current range	max. 10 A (starting/continuous current)
Nominal motor power	450 W (power consumption)
Function	4 quadrant servo controller
Incremental encoder input	
Symmetrical incremental encoders	
Input frequency (5 V)	max. 1 MHz
Asymmetrical incremental encoders	
Input frequency (5 V) / Input frequency (24 V)	max. 500 kHz (at 4 V voltage level) / max. 100 kHz (at 20 V voltage level)
Digital inputs	
Number of inputs	3
Connection method	MINI COMBICON
Connection technology	3-wire (signal, Us, GND)
General data	
Connection method	Screw connection
Connection data solid/stranded/AWG Front MSTB	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12
Connection data solid/stranded/AWG Front MC	0.14 ... 2.5 mm² / 0.2 ... 2.5 mm² / 28 - 16
Weight	880 g
Width	97.6 mm
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline variable frequency drive, including connector plug			
- For DC motors with brushgear and EC motors (without brushgear)	**IB IL EC AR 48/10A-PAC**[1]**)**	**2819587**	1

Accessories

Startup and diagnostic software, including cable for connecting to the RS-232 interface of a PC	**EC AR CAB SW TOOL**	**2819545**	1
Connector set, including shield connection clamps	**IB IL ECAR-PLSET**	**2819561**	1

Power-level terminals

The single-channel power-level terminals for direct and reversing starters and the electromechanical version with electronic motor protection enable a three-phase asynchronous motor to be switched, protected, and monitored via a bus system.

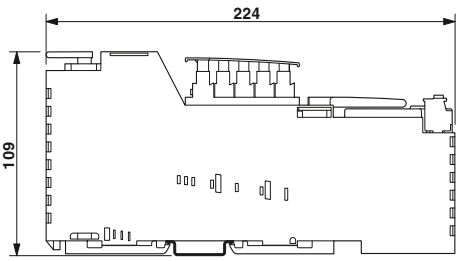
The power-level terminals are designed for use within the 24 V area of an Inline station.

Features:

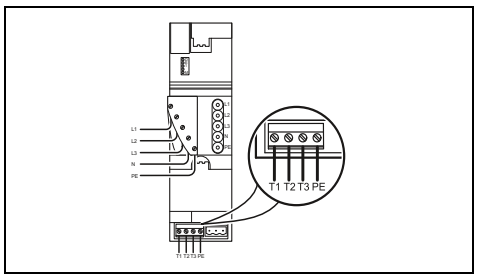
- Integrated electronic motor protection in accordance with IEC 60947-4
- Connection option for an external passive brake module
- Manual local operation
- Safe isolation between mains voltage and 24 V supply voltage according to EN 50178
- Diagnostic and status indicators
- Motor current monitoring
- Motor control via OUT process data

Notes:

1) EMC: Class A product, see page 553



Electronic direct or reversing load starter, up to 1.5 kW/400 V AC



Technical data

Interface	
Inline local bus	Inline data jumper
Power supply for module electronics	
Communications power U_L	7.5 V
Current consumption from U_L	max. 45 mA
Motor starter, output	
Connection method	(3-phase), via COMBICON
Output voltage range	200 V AC ... 400 V AC (50 Hz ... 60 Hz)
Nominal current range	0.2 A ... 3.6 A
Power factor	0.3
Switching rate	Max. 30 per minute (observe derating)
Motor monitoring	
Tripping class	Based on class 10 A of IEC 60947-4: 1990
Overspeed tripping	≥ 20 A (after 0.3 seconds)
Output	
Maximum switching voltage	-
Max. switching current	-
Switch-off delay	-
Switch-on delay	-
General data	
Connection method	Screw connection
Connection data solid/stranded/AWG motor circuit connector	0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16
Width	63 mm

Ordering data

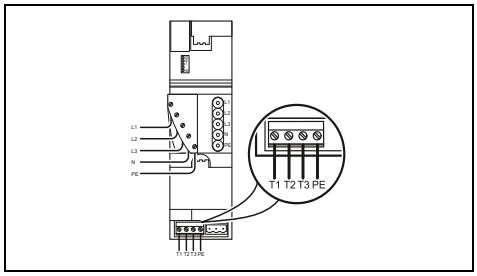
Description	Type	Order No.	Pcs. / Pkt.
Inline power-level terminals, incl. motor circuit connector plug			
- Electronic direct starter	**IB IL 400 ELR 1-3A[1])**	**2727352**	1
- Electronic reversing load starter	**IB IL 400 ELR R-3A[1])**	**2727378**	1
- Electromechanical direct starter			
Inline brake module, for brake control in connection with Inline power-level terminals			
- For 24 V DC brakes			
- For 440 V AC/DC brakes			

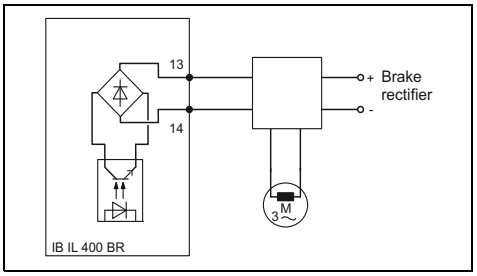
Accessories

Inline thermistor terminal, complete with accessories (connector plug and marking field)	**IB IL 24 TC-PAC[1])**	**2861360**	1
Hand-held operator panel, for motor starters and variable frequency drives	**IBS HVO**	**2836052**	1
Power plug for Inline power-level terminals	**IB IL 400 CN-PWR-IN**	**2836078**	1
Power bridge, for Inline power-level terminals	**IB IL 400 CN-BRG**	**2836081**	1
Motor-circuit connector for Inline power-level terminals	**GMVSTBW 2,5 HV/ 4-ST-7,62 NZIL**	**1893957**	10

Electronic direct starter, up to 3.7 kW/400 V AC

Extension module, for brake control of power-level terminals





Technical data

Inline data jumper	-
7.5 V	-
max. 45 mA	-
(3-phase), via COMBICON	-
200 V AC ... 600 V AC (50 Hz ... 60 Hz)	-
0.2 A ... 8 A	-
0.3	-
Max. 5 cycles per minute	-
Based on class 10 A of IEC 60947-4: 1990	-
≥ 40 A (after 0.3 seconds)	-
-	31 V DC
-	3 A DC
-	< 15 ms
-	< 2 ms
Screw connection 0.2 ... 1.5 mm² / 0.2 ... 1.5 mm² / 24 - 16	
63 mm	55 mm

Technical data

IB IL 24 BR/DC[1])	IB IL 400 BR[1])
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
-	-
31 V DC	440 V AC/DC
3 A DC	300 mA AC/DC
< 15 ms	< 1 ms
< 2 ms	< 4 ms
55 mm	55 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 400 MLR 1-8A[1])	**2727365**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB IL 24 BR/DC[1])	**2742036**	1
IB IL 400 BR[1])	**2727394**	1

Accessories

IB IL 24 TC-PAC[1])	**2861360**	1
IBS HVO	**2836052**	1
IB IL 400 CN-PWR-IN	**2836078**	1
IB IL 400 CN-BRG	**2836081**	1
GMVSTBW 2,5 HV/ 4-ST-7,62 NZIL	**1893957**	10

Accessories

For the control cabinet (IP20) — INTERBUS Smart Terminals

Product overview

Bus terminals

PROFINET	INTERBUS
246	247

Input and output modules

Digital input		Digital output			Digital input/output
16 channels	32 channels	8 channels	16 channels	32 channels	8/8 channels
248	248	249	249	249	249

Analog input			Analog output	
2 channels	4 channels	8 channels	4 channels	8 channels
250	250	251	251	251

Special function modules

Counter	Communication
4 channels	RS-232/RS-485/RS-422

www.phoenixcontact.net/products

Accessories

Corresponding cables and plugs can be found in our online catalog.

www.phoenixcontact.net/products

General technical data

Ambient conditions	
Ambient temperature (operation) Ambient temperature (storage)	0°C to +55°C -25°C to +75°C
Relative humidity (operation) Relative humidity (storage)	30% to 75% (no condensation) 30% to 95% (no condensation)
Degree of protection	IP20 according to IEC 60529
Vibration according to IEC 60068-2-6 Shock according to IEC 60068-2-27	2g 15g
Air and creepage distances	IEC 60664/IEC 60664A/ DIN VDE 0110:1989-01, and DIN VDE 0160:1988-05
Electromagnetic compatibility	
Noise emission	DIN EN 55022 Class A (industrial applications)
Supply voltage	
Nominal value Permissible range	24 V DC 18.5 V DC to 30.5 V DC (ripple included)

INTERBUS bus terminal modules

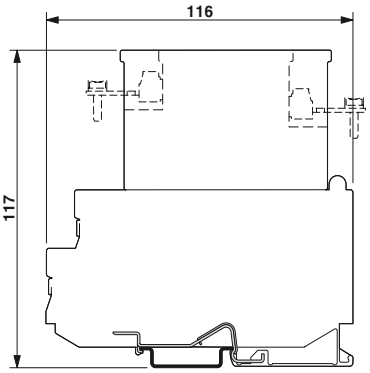
INTERBUS bus terminal modules connect the I/O modules of an ST station to the INTERBUS network.

Features:

– Copper or fiber optic connection
– Up to 4 or 8 I/O modules can be connected
– Additional remote/local bus branches
– Additional I/Os onboard

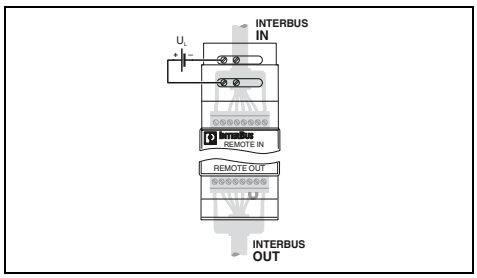
Notes:

1) EMC: Class A product, see page 553



Basic function

INTERBUS CLUB



Technical data

	IBS ST 24 BKM-T[1])	IBS ST 24 BKM-LK-OPC[1])
Interface		
Name	INTERBUS remote bus	
Connection method	8-pos. mini Combicon plug	F-SMA plug
Power supply for module electronics		
Supply voltage	24 V DC	
Supply voltage range	20 V DC ... 30 V DC (including ripple)	
Digital inputs		
Connection method	Screw connection	
Maximum number of inputs	-	
Protective circuit	-	
Digital outputs		
Connection method	-	
Maximum number of outputs	-	
Maximum output current per channel	-	
Maximum output current per module / terminal block	-	
Protective circuit	-	
General data		
Connection method	MINI COMBICON	Screw connection
Connection data solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Weight	200 g	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
INTERBUS-ST bus terminal module, consisting of: terminal part with screw connection and module electronics - MINI-COMBICON plug, 8-pos. - 9-pos. D-SUB plug - Additional remote bus branch, D-SUB plug - Additional local bus branch	**IBS ST 24 BKM-T[1])**	**2750154**	1
INTERBUS-ST bus terminal module, consisting of: terminal part with screw connection and module electronics - Fiber optics F-SMA plug, optical path diagnostics	**IBS ST 24 BKM-LK-OPC[1])**	**2728665**	1

Accessories

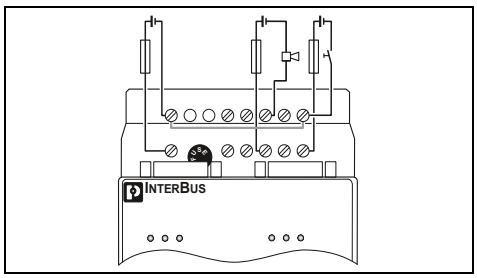
Replacement shield point, for INTERBUS-ST BKM-... bus terminal block	**IBS RB-SHIELD**	**2722742**	1
Replacement remote bus connector set, for INTERBUS-ST BKM-... bus terminal block	**IBS RB PLSET/MC 1,5/8**	**2722755**	1
Replacement local bus cable	**IB ST LBC**	**2836492**	10
Insertion bridges, divisible, insulated spine, blue, 84-pos.	**EB 84 IB ST BU**	**2836269**	5
Insertion bridges, divisible, insulated spine, red, 84-pos.	**EB 84 IB ST RD**	**2836272**	5

Standard function

With bus branch

With integrated I/Os

INTERBUS CLUB



Technical data

INTERBUS remote bus	9-pos. D-SUB plug/socket
24 V DC	18.5 V DC ... 30.5 V DC (including ripple)
Screw connection	
-	
-	
-	
-	
-	
-	
-	
-	
-	
Screw connection	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
470 g	

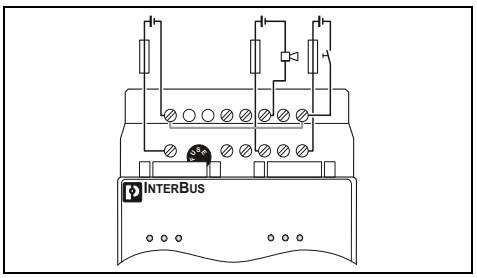
Ordering data

Type	Order No.	Pcs. / Pkt.
IBS ST 24 BK-T[1])	**2754341**	1

Accessories

IB ST LBC	**2836492**	10
EB 84 IB ST BU	**2836269**	5
EB 84 IB ST RD	**2836272**	5

INTERBUS CLUB



Technical data

INTERBUS remote bus	9-pos. D-SUB plug/socket
24 V DC	20 V DC ... 30 V DC (including ripple)
Screw connection	
-	
-	
-	
-	
-	
-	
-	
-	
-	
Screw connection	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
470 g	

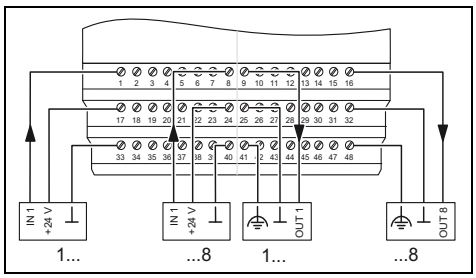
Ordering data

Type	Order No.	Pcs. / Pkt.
IBS ST 24 BK RB-T[1])	**2753504**	1
IBS ST 24 BK LB-T[1])	**2753232**	1

Accessories

IB ST LBC	**2836492**	10
EB 84 IB ST BU	**2836269**	5
EB 84 IB ST RD	**2836272**	5

INTERBUS CLUB



Technical data

INTERBUS remote bus	9-pos. D-SUB plug/socket
24 V DC	18.5 V DC ... 30.5 V DC (including ripple)
3-wire	
8	
Overload protection	
3-wire	
8	
500 mA	
4 A	
Short-circuit protection	
Overload protection	
Screw connection	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
690 g	

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS ST 24 BK DIO 8/8/3-T[1])	**2752411**	1

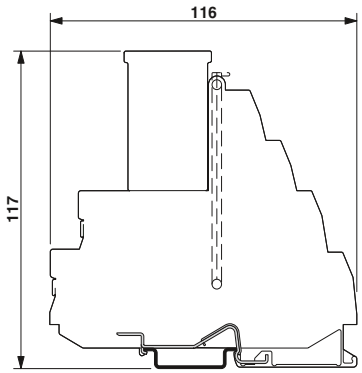
Accessories

IB ST LBC	**2836492**	10
EB 84 IB ST BU	**2836269**	5
EB 84 IB ST RD	**2836272**	5

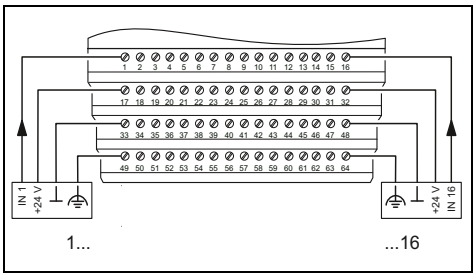
Digital input and output modules

The digital ST I/O modules are available in various versions:
– Digital inputs with basic functions (BDI)
– Digital inputs with extended functions (DI)
– Digital outputs with basic functions (BDO)
– Digital outputs with extended functions (DO)
– Relay outputs (DO..R)
– Digital I/O modules (inputs and outputs)

Notes:
1) EMC: Class A product, see page 553



16/32 inputs



Technical data

	IB ST 24 BDI 16/4[1])	IB ST 24 DI32/2[1])
Local bus interface		
Name	ST local bus	
Connection method	ST local bus plug	
Power supply for module electronics		
Supply voltage	24 V DC	
Supply voltage range	20 V DC ... 30 V DC (including ripple)	
Digital inputs		
Connection technology	4-wire	2-wire
Maximum number of inputs	16	32
Typical response time	50 µs	3 ms (typical)
Protective circuit	-	
Digital outputs		
Connection technology	-	
Maximum number of outputs	-	
Maximum output current per channel	-	
Maximum output current per module / terminal block	-	
Protective circuit	-	
General data		
Connection method	Screw connection	
Connection data solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Weight	755 g	740 g
Width	118 mm	

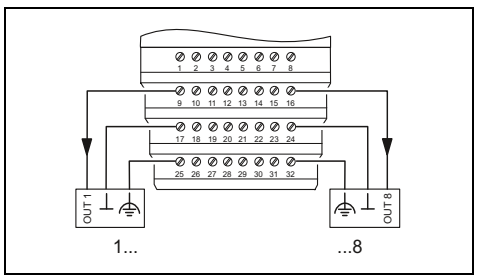
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
INTERBUS-ST digital input module, consisting of: terminal part with screw connection and module electronics			
- 16 inputs, basic function	**IB ST 24 BDI 16/4[1])**	**2750170**	1
- 16 inputs	**IB ST 24 DI 16/4[1])**	**2754338**	1
- 32 inputs	**IB ST 24 DI32/2[1])**	**2754927**	1
INTERBUS-ST digital output module, consisting of: terminal part with screw connection and module electronics			
- Eight outputs, 2 A			
- 16 outputs, 500 mA			
- 32 outputs			
- 32 outputs			
- 16 relay N/O contact outputs			
INTERBUS-ST digital input/output module, consisting of: terminal part with screw connection and module electronics			
- Eight inputs, eight relay PDT outputs			
- Eight inputs, eight outputs, 2 A			

8/16 outputs

16/32 outputs

8 inputs and 8 outputs

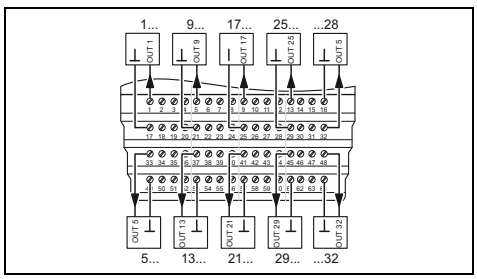


Technical data

IB ST 24 DO 8/3-2A[1])	IB ST 24 DO16/3[1])
ST local bus ST local bus plug	
24 V DC 20 V DC ... 30 V DC (including ripple)	
- - - -	
3-wire	
8	16
2 A	500 mA
10 A	8 A
Short-circuit protection	
Screw connection 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
770 g	760 g
118 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB ST 24 DO 8/3-2A[1])	**2754891**	1
IB ST 24 DO16/3[1])	**2754914**	1

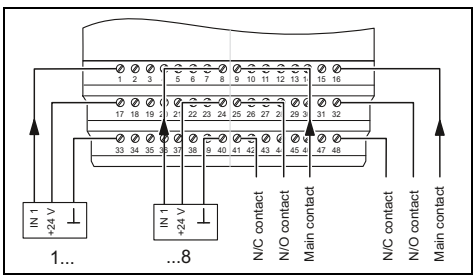


Technical data

IB ST 24 BDO 32/2[1])	IB ST 24 DO16R/S[1])
ST local bus ST local bus plug	
24 V DC 20 V DC ... 30 V DC (including ripple)	
- - - -	
2-wire	3-wire
32	16
500 mA	3 A
16 A	-
Short-circuit protection Current limit for 8 channels	Short-circuit protection
Screw connection 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
770 g	
118 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB ST 24 BDO 32/2[1])	**2750824**	1
IB ST 24 DO32/2[1])	**2754325**	1
IB ST 24 DO16R/S[1])	**2721112**	1



Technical data

IB ST 24 DIO 8/8R/3[1])	IB ST 24 DIO 8/8/3-2A[1])
ST local bus ST local bus plug	
24 V DC 20 V DC ... 30 V DC (including ripple)	
3-wire 8 3 ms (typ.) Overload protection Short-circuit protection	Overload protection
3-wire 8	
3 A	2 A
-	16 A
Short-circuit protection	Short-circuit protection Overload protection
Screw connection 0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
770 g	
118 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB ST 24 DIO 8/8R/3[1])	**2751849**	1
IB ST 24 DIO 8/8/3-2A[1])	**2753708**	1

Analog input and output modules

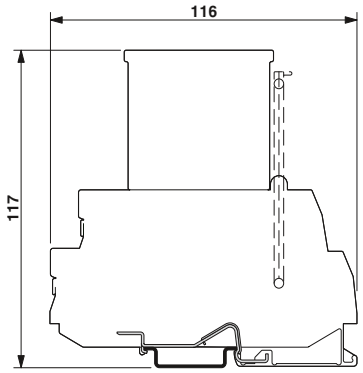
The analog I/O modules offer different functions depending on the module type.

Features:

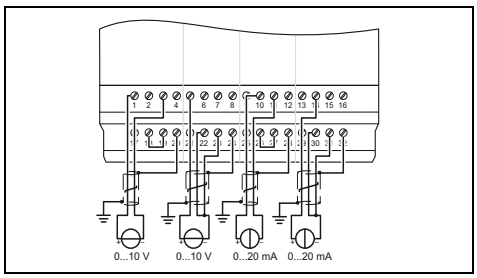
– 2, 4 or 8 channels
– Standard signal types (voltage and current)
– Temperature measurement modules

Notes:

1) EMC: Class A product, see page 553



2/4 inputs



Technical data

	IB ST 24 BAI 2/SF[1])	IB ST 24 AI 4/SF[1])
Interface		
Name	ST local bus	
Connection method	ST local bus plug	
Power supply for module electronics		
Supply voltage	± 24 V DC 5% (ripple)	
Supply voltage range	20 V DC ... 30 V DC	
Analog inputs		
Connection technology	2, 3-wire	2, 3, 4-wire
Number of inputs	2	4
Description of the inputs	-	
Analog outputs		
Connection technology	-	
Number of outputs	-	
General data		
Connection method	Screw connection	
Connection data solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
Weight	370 g	600 g
Width	81 mm	118 mm

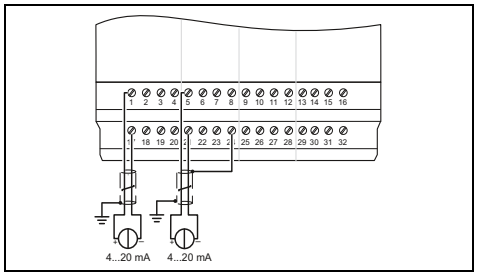
Ordering data

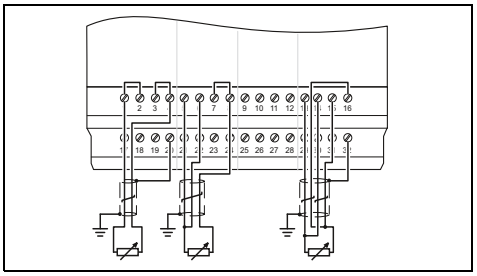
Description	Type	Order No.	Pcs. / Pkt.
INTERBUS-ST analog input module, consisting of: terminal part with screw connection and module electronics			
- Two inputs, 0 - 20 mA, 4 - 20 mA, 0 - 10 V	**IB ST 24 BAI 2/SF[1])**	**2722771**	1
- Four inputs, 0 - 20 mA, 0 - 10 V	**IB ST 24 AI 4/SF[1])**	**2754309**	1
- Four inputs, 4 - 20 mA, 0 - 10 V	**IB ST 24 AI 4/SF4[1])**	**2750565**	1
- Four inputs, 4 - 20 mA, ±10 V	**IB ST 24 AI 4/BP[1])**	**2751564**	1
- Four inputs, 0 - 20 mA, 4 - 20 mA, 0 - 10 V			
- Eight inputs, 0 -5 V, 0 -10 V, 0 -25 V, 0 -50 V			
- Eight inputs, 0 - 20 mA, 4 - 20 mA, 0 - 40 mA, 0 - 60 mA			
INTERBUS-ST analog input module for temperature and resistance measurement, consisting of: terminal part with screw connection and module electronics			
- Four inputs, RTD			
INTERBUS-ST analog output module, consisting of: terminal part with screw connection and module electronics			
- Four outputs, 0 - 20 mA, 0 - 10 V			
- Four outputs, 4 - 20 mA, 0 - 10 V			
- Four outputs, 0 - 10 V			
- Eight outputs, 0 - 10 V, ±10 V, ±12 V			

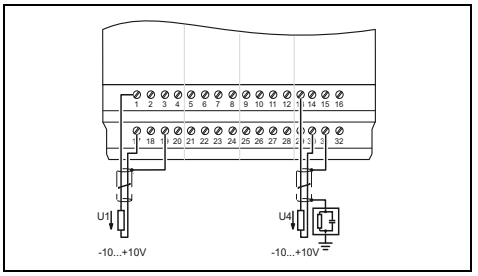
4/8 inputs

4 RTD inputs

4/8 outputs







Technical data

IB ST 24 AI 4/I[1])	IB ST 24 BAI 8/U[1])
ST local bus	
ST local bus plug	
± 24 V DC 5% (ripple)	
18.5 V DC ... 30.2 V DC	
2-wire	
4	8
Differential input	-
-	
-	
Screw connection	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
465 g	600 g
118 mm	

Technical data

ST local bus
ST local bus plug
24 V DC
18.5 V DC ... 30.2 V DC
2, 3, 4-wire
4
-
-
-
Screw connection
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12
540 g
118 mm

Technical data

IB ST 24 AO 4/SF[1])	IB ST 24 BAO 8/U[1])
ST local bus	
ST local bus plug	
24 V DC	± 24 V DC 5% (ripple)
18.5 V DC ... 30.5 V DC	18.5 V DC ... 30.2 V DC
-	
-	
-	
2-wire	
4	8
Screw connection	
0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 12	
600 g	
118 mm	

Ordering data

Type	Order No.	Pcs. / Pkt.
IB ST 24 AI 4/I[1])	**2719629**	1
IB ST 24 BAI 8/U[1])	**2721015**	1
IB ST 24 BAI 8/I[1])	**2721028**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB ST 24 PT100 4/4[1])	**2752767**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IB ST 24 AO 4/SF[1])	**2754312**	1
IB ST 24 AO 4/SF4[1])	**2750578**	1
IB ST 24 AO 4/BP[1])	**2752521**	1
IB ST 24 BAO 8/U[1])	**2721044**	1

Product overview

Axioline I/O modules, metal, M12

Digital input	Digital input/output			IO-Link
16 channels	16 configurable channels	8/8 channels	8/4 channels	8 ports
EtherCAT	Page 254	Page 255		
EtherNet/IP	Page 258	Page 259		
Modbus/TCP (UDP)	Page 262	Page 263		
PROFINET	Page 266	Page 267		
sercos the automation bus	Page 270	Page 271		
PROFIBUS	Page 274	Page 275		

Axioline I/O modules, plastic, M12

Digital input	Digital input/output			IO-Link
16 channels	16 configurable channels	8/8 channels	8/4 channels	8 ports
EtherCAT	Page 256	Page 257		
EtherNet/IP	Page 260	Page 261		
Modbus/TCP (UDP)	Page 264	Page 265		
PROFINET	Page 268	Page 269		
sercos the automation bus	Page 272	Page 273		
PROFIBUS	Page 276	Page 277		

Axioline I/O M12 link devices

IO-Link

Analog input		Analog output		Temperature recording
1 channel Current input	1 channel Voltage input	1 channel Current output	1 channel Voltage output	1 channel RTD
Page 278		Page 279		

Axioline I/O M12 link devices

IO-Link

Analog input		Analog output		Temperature recording
1 channel Current input	1 channel Voltage input	1 channel Current output	1 channel Voltage output	1 channel RTD
Page 280		Page 281		

EtherCAT®
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Rugged metal housing
- Seamless connection via M12 connectors
- SPEEDCON rapid interlock system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

Additional features
IO-Link master:

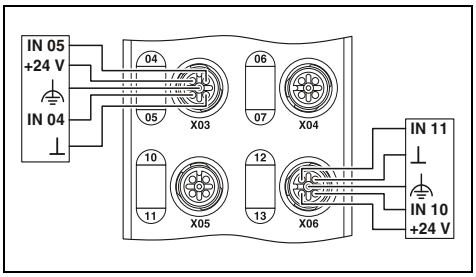
- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

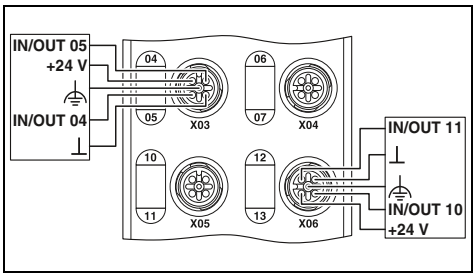
N

16 digital inputs

N

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	EtherCAT®	EtherCAT®
Connection method	M12, D-coded	M12, D-coded
Transmission speed	100 Mbps	100 Mbps
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection technology	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection technology	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection technology	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	750 g	750 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	185 mm	185 mm
Depth	37.8 mm	37.8 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E EC DI16 M12 6M**	**2701526**	1	**AXL E EC DIO16 M12 6M**	**2701528**	1

N

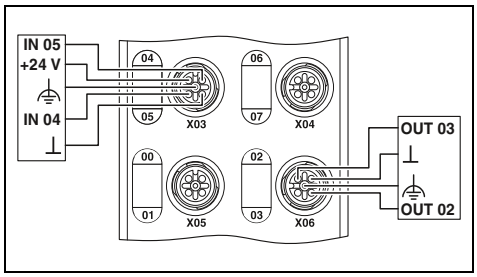
8 digital inputs and 8 digital outputs

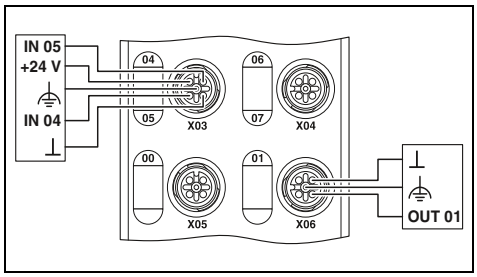
N

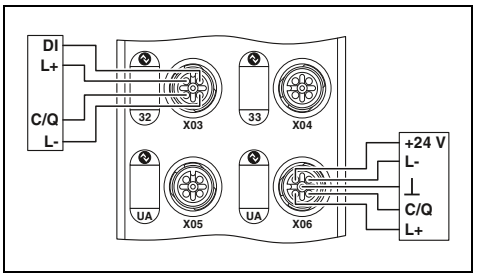
8 digital inputs and 4 digital outputs

N

8 IO-Link ports, 4 digital inputs







Technical data

EtherCAT®	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, double occupancy	
2, 3-wire	
8	
500 mA	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
-	
-	
750 g	
198.5 mm	
59.8 mm	
185 mm	
37.8 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EC DI8 DO8 M12 6M	**2701525**	1

Technical data

EtherCAT®	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, (A-coded)	
2, 3-wire	
4	
2 A	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
-	
-	
750 g	
198.5 mm	
59.8 mm	
185 mm	
37.8 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EC DI8 DO4 2A M12 6M	**2701529**	1

Technical data

EtherCAT®	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
4	
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
-	
-	
-	
-	
-	
M12 plug-in connector	
3, 5-wire	
8	
24 V DC	
200 mA	
Overload protection, electronic in the device	
750 g	
198.5 mm	
59.8 mm	
185 mm	
37.8 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E IOL8 DI4 M12 6M	**2701531**	1

EtherCAT®
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Maximum current carrying capacity of the supply 12 A
– Diagnostic and status indicators
– Short-circuit and overload protection

Additional features
IO-Link master:

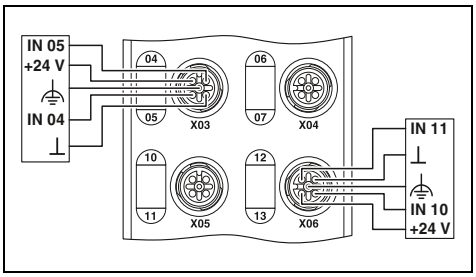
– According to specification 1.1
– 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

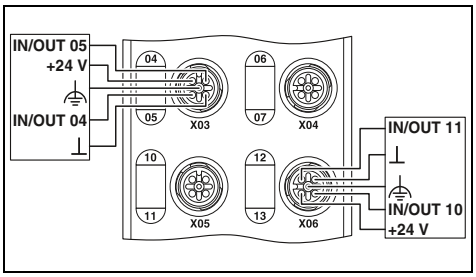
N

16 digital inputs

N

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	EtherCAT®	EtherCAT®
Connection method	M12, D-coded	M12, D-coded
Transmission speed	100 Mbps	100 Mbps
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	480 g	480 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	204.6 mm	204.6 mm
Depth	31.3 mm	31.3 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E EC DI16 M12 6P**	**2701521**	1	**AXL E EC DIO16 M12 6P**	**2701522**	1

N

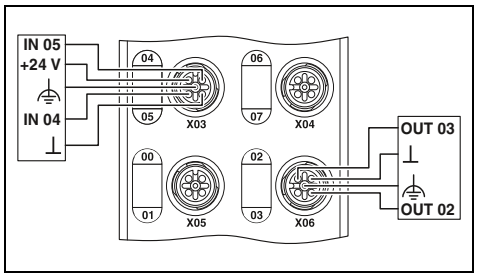
8 digital inputs and 8 digital outputs

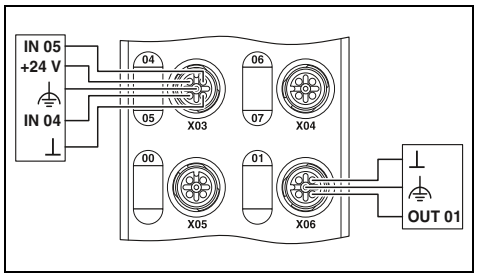
N

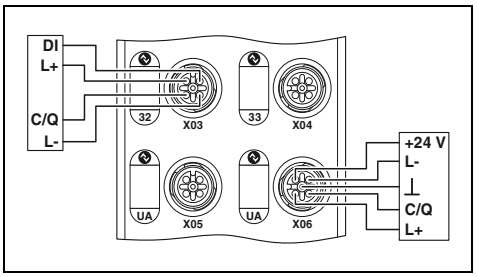
8 digital inputs and 4 digital outputs

N

8 IO-Link ports, 4 digital inputs







Technical data

EtherCAT®	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, double occupancy	
2, 3-wire	
8	
500 mA	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
-	
-	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EC DI8 DO8 M12 6P	**2701520**	1

Technical data

EtherCAT®	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, (A-coded)	
2, 3-wire	
4	
2 A	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
-	
-	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EC DI8 DO4 2A M12 6P	**2701523**	1

Technical data

EtherCAT®	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
4	
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
-	
-	
-	
-	
-	
M12 plug-in connector	
3, 5-wire	
8	
24 V DC	
200 mA	
Overload protection, electronics in the device	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E IOL8 DI4 M12 6P	**2701524**	1

EtherNet/IP™ Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Rugged metal housing
- Seamless connection via M12 connectors
- SPEEDCON rapid interlock system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

Additional features

IO-Link master:

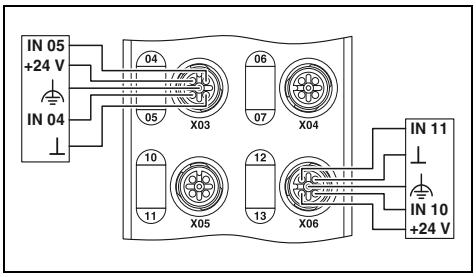
- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

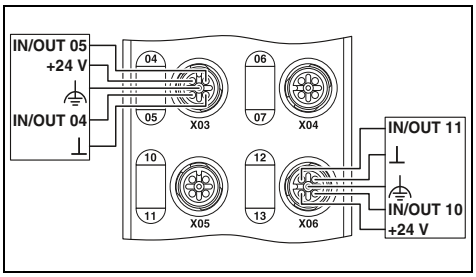
N

16 digital inputs

N

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	EtherNet/IP™	EtherNet/IP™
Connection method	M12 plug-in connectors, D-coded	M12 plug-in connectors, D-coded
Transmission speed	10/100 Mbps, autonegotiation	10/100 Mbps, autonegotiation
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	750 g	750 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	185 mm	185 mm
Depth	37.8 mm	37.8 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E EIP DI16 M12 6M**	**2701488**	1	**AXL E EIP DIO16 M12 6M**	**2701489**	1

N

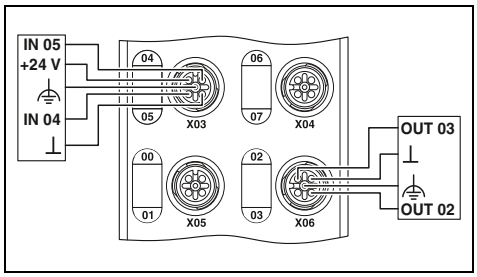
8 digital inputs and 8 digital outputs

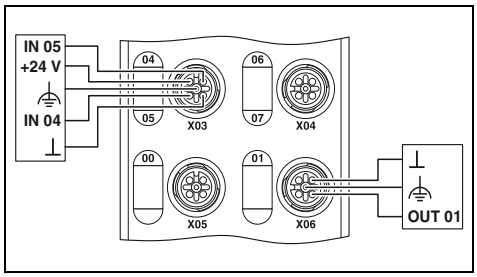
N

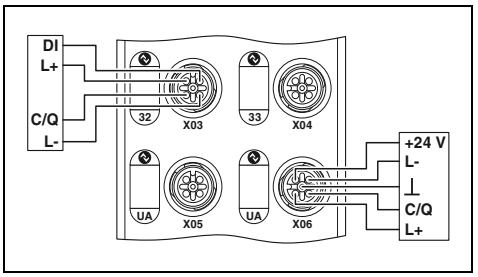
8 digital inputs and 4 digital outputs

N

8 IO-Link ports, 4 digital inputs







Technical data

EtherNet/IP™	
M12 plug-in connectors, D-coded	
10/100 Mbps, autonegotiation	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, double occupancy	M12 plug-in connector, (A-coded)
2, 3-wire	2, 3-wire
8	4
500 mA	2 A
Overload protection, short-circuit protection of outputs	Overload protection, short-circuit protection of outputs
-	-
-	-
-	-
-	-
-	-
-	-
750 g	750 g
198.5 mm	198.5 mm
59.8 mm	59.8 mm
185 mm	185 mm
37.8 mm	37.8 mm
IP65/67	IP65/67
-25 °C ... 60 °C	-25 °C ... 60 °C

Technical data

EtherNet/IP™
M12 plug-in connectors, D-coded
10/100 Mbps, autonegotiation
24 V DC
M12 plug-in connector (T-coded)
18 V DC ... 31.2 V DC (including all tolerances, including ripple)
M12 plug-in connector, double occupancy
2, 3, 4-wire
4
3 ms
IEC 61131-2 type 1
Protection against polarity reversal
-
-
-
-
-
M12 plug-in connector
3, 5-wire
8
24 V DC
200 mA
Overload protection, electronics in the device
750 g
198.5 mm
59.8 mm
185 mm
37.8 mm
IP65/67
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EIP DI8 DO8 M12 6M	**2701487**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EIP DI8 DO4 2A M12 6M	**2701490**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EIP IOL8 DI4 M12 6M	**2701491**	1

EtherNet/IP™
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Maximum current carrying capacity of the supply 12 A
– Diagnostic and status indicators
– Short-circuit and overload protection

Additional features
IO-Link master:

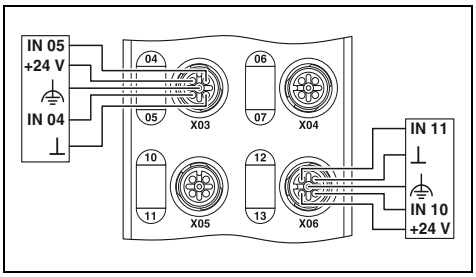
– According to specification 1.1
– 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

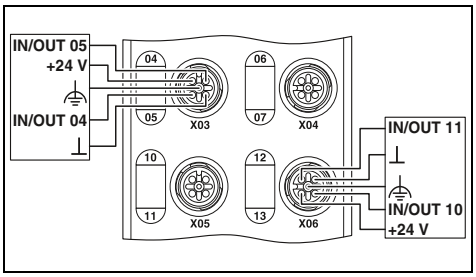
N

16 digital inputs

N

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	EtherNet/IP™	EtherNet/IP™
Connection method	M12 plug-in connectors, D-coded	M12 plug-in connectors, D-coded
Transmission speed	10/100 Mbps, autonegotiation	10/100 Mbps, autonegotiation
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	480 g	480 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	204.6 mm	204.6 mm
Depth	31.3 mm	31.3 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E EIP DI16 M12 6P**	**2701493**	1	**AXL E EIP DIO16 M12 6P**	**2701494**	1

N

EtherNet/IP

8 digital inputs and 8 digital outputs

N

EtherNet/IP

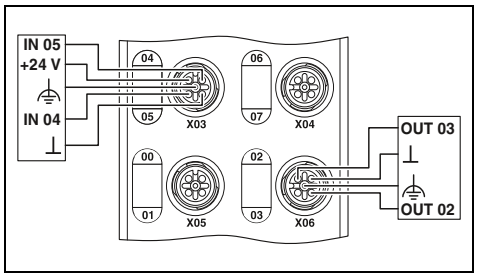
8 digital inputs and 4 digital outputs

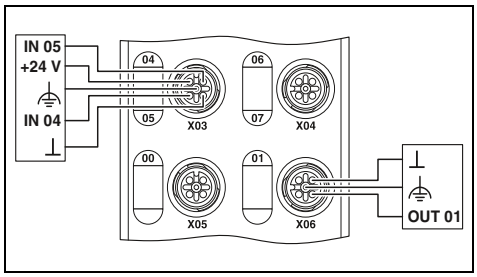
N

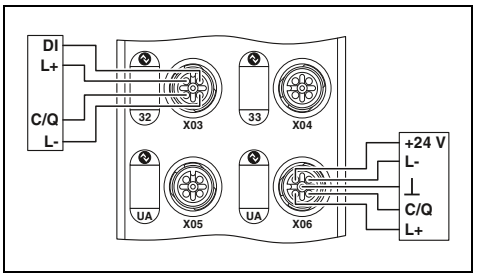
EtherNet/IP

IO-Link

8 IO-Link ports, 4 digital inputs







Technical data

EtherNet/IP™	
M12 plug-in connectors, D-coded	
10/100 Mbps, autonegotiation	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, double occupancy	M12 plug-in connector, (A-coded)
2, 3-wire	2, 3-wire
8	4
500 mA	2 A
Overload protection, short-circuit protection of outputs	Overload protection, short-circuit protection of outputs
-	-
-	-
-	-
-	-
-	-
-	-
480 g	480 g
198.5 mm	198.5 mm
59.8 mm	59.8 mm
204.6 mm	204.6 mm
31.3 mm	31.3 mm
IP65/67	IP65/67
-25 °C ... 60 °C	-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EIP DI8 DO8 M12 6P	**2701492**	1

Technical data

EtherNet/IP™	
M12 plug-in connectors, D-coded	
10/100 Mbps, autonegotiation	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, double occupancy	
2, 3-wire	
8	
500 mA	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
-	
-	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EIP DI8 DO4 2A M12 6P	**2701495**	1

Technical data

EtherNet/IP™	
M12 plug-in connectors, D-coded	
10/100 Mbps, autonegotiation	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
4	
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
-	
-	
-	
-	
-	
M12 plug-in connector	
3, 5-wire	
8	
24 V DC	
200 mA	
Overload protection, electronic in the device	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E EIP IOL8 DI4 M12 6P	**2701496**	1

Modbus TCP
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Rugged metal housing
- Seamless connection via M12 connectors
- SPEEDCON rapid interlock system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

Additional features
IO-Link master:

- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

N

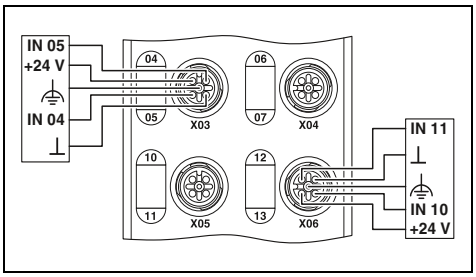
Modbus/TCP (UDP)

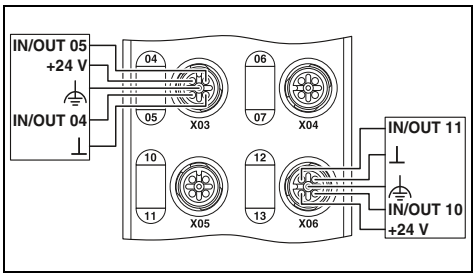
16 digital inputs

N

Modbus/TCP (UDP)

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	Ethernet	Ethernet
Connection method	M12, D-coded	M12, D-coded
Transmission speed	100 Mbps	100 Mbps
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	750 g	750 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	185 mm	185 mm
Depth	37.8 mm	37.8 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E ETH DI16 M12 6M**	**2701538**	1	**AXL E ETH DIO16 M12 6M**	**2701539**	1

N

Modbus/TCP (UDP)

8 digital inputs and 8 digital outputs

N

Modbus/TCP (UDP)

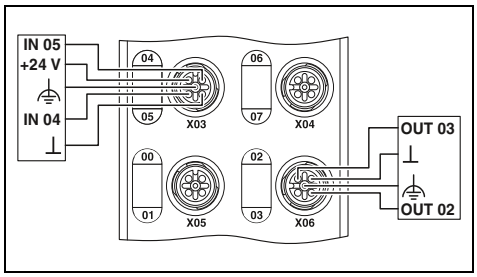
8 digital inputs and 4 digital outputs

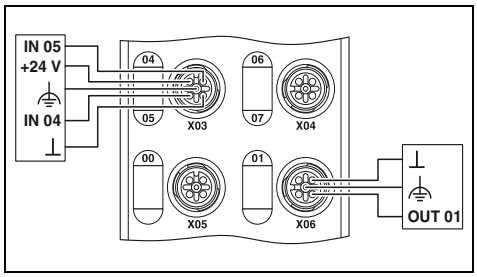
N

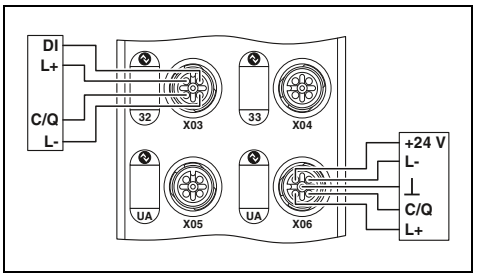
Modbus/TCP (UDP)

IO-Link

8 IO-Link ports, 4 digital inputs







Technical data	Technical data	Technical data
Ethernet	Ethernet	Ethernet
M12, D-coded	M12, D-coded	M12, D-coded
100 Mbps	100 Mbps	100 Mbps
24 V DC	24 V DC	24 V DC
M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
2, 3, 4-wire	2, 3, 4-wire	2, 3, 4-wire
8	8	4
1 ms	1 ms	3 ms
IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1
Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply	Protection against polarity reversal
M12 plug-in connector, double occupancy	M12 plug-in connector, (A-coded)	-
2, 3-wire	2, 3-wire	-
8	4	-
500 mA	2 A	-
Overload protection, short-circuit protection of outputs	Overload protection, short-circuit protection of outputs	-
-	-	M12 plug-in connector
-	-	3, 5-wire
-	-	8
-	-	24 V DC
-	-	200 mA
-	-	Overload protection, electronics in the device
750 g	750 g	750 g
198.5 mm	198.5 mm	198.5 mm
59.8 mm	59.8 mm	59.8 mm
185 mm	185 mm	185 mm
37.8 mm	37.8 mm	37.8 mm
IP65/67	IP65/67	IP65/67
-25 °C ... 60 °C	-25 °C ... 60 °C	-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E ETH DI8 DO8 M12 6M	**2701537**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E ETH DI8 DO4 2A M12 6M	**2701540**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E ETH IOL8 DI4 M12 6M	**2701541**	1

Modbus TCP
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Seamless connection via M12 connectors
- SPEEDCON rapid interlock system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

Additional features
IO-Link master:

- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

N

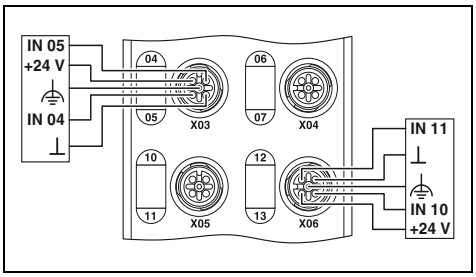
Modbus/TCP (UDP)

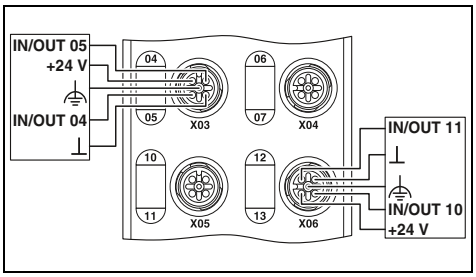
16 digital inputs

N

Modbus/TCP (UDP)

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	Ethernet	Ethernet
Connection method	M12, D-coded	M12, D-coded
Transmission speed	100 Mbps	100 Mbps
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	480 g	480 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	204.6 mm	204.6 mm
Depth	31.3 mm	31.3 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

Description	Ordering data: Type	Order No.	Pcs. / Pkt.	Ordering data: Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E ETH DI16 M12 6P**	**2701533**	1	**AXL E ETH DIO16 M12 6P**	**2701534**	1

N

Modbus/TCP (UDP)

8 digital inputs and 8 digital outputs

N

Modbus/TCP (UDP)

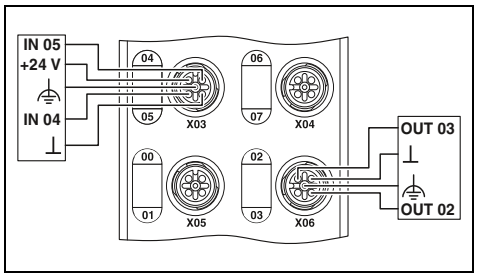
8 digital inputs and 4 digital outputs

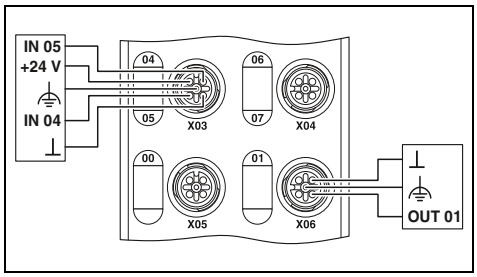
N

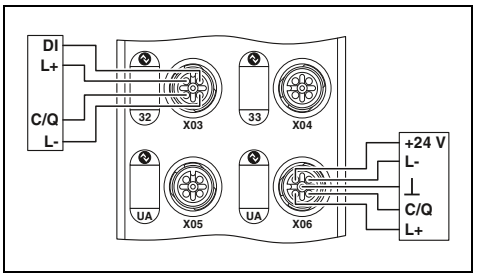
Modbus/TCP (UDP)

IO-Link

8 IO-Link ports, 4 digital inputs







Technical data	
Ethernet	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, double occupancy	
2, 3-wire	
8	
500 mA	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
-	
-	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
AXL E ETH DI8 DO8 M12 6P	**2701532**	1

Technical data	
Ethernet	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, (A-coded)	
2, 3-wire	
4	
2 A	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
-	
-	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
AXL E ETH DI8 DO4 2A M12 6P	**2701535**	1

Technical data	
Ethernet	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
4	
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
-	
-	
-	
-	
-	
M12 plug-in connector	
3, 5-wire	
8	
24 V DC	
200 mA	
Overload protection, electronics in the device	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
AXL E ETH IOL8 DI4 M12 6P	**2701536**	1

PROFINET
Digital I/O devices – Stand-Alone

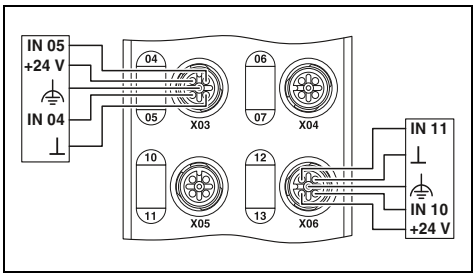
The I/O devices with a block design are used to acquire and output various signals.

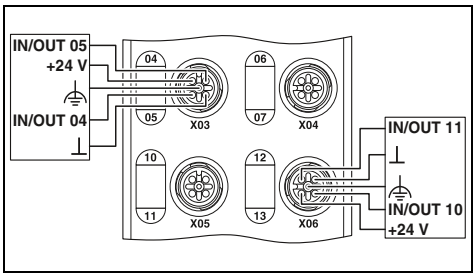
Features:
- Rugged metal housing
- Seamless connection via M12 connectors
- SPEEDCON rapid interlock system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

Additional features
IO-Link master:
- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

16 digital inputs

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	PROFINET	PROFINET
Connection method	M12, D-coded	M12, D-coded
Transmission speed	100 Mbps	100 Mbps
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	750 g	750 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	185 mm	185 mm
Depth	37.8 mm	37.8 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E PN DI16 M12 6M**	**2701516**	1	**AXL E PN DIO16 M12 6M**	**2701517**	1

N

8 digital inputs and 8 digital outputs

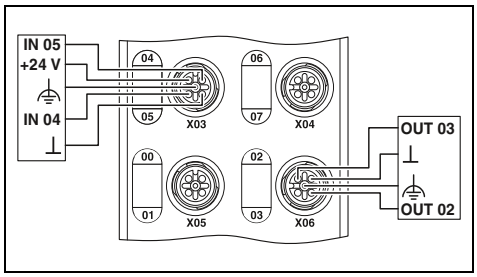
N

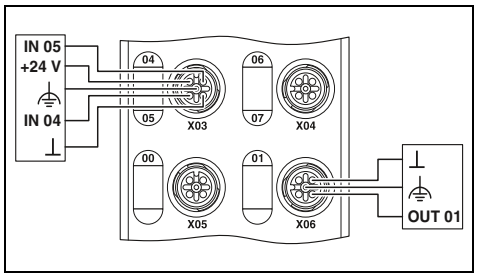
8 digital inputs and 4 digital outputs

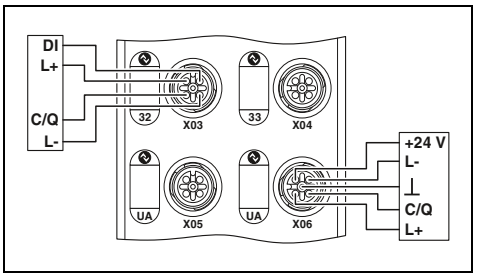
N

IO-Link

8 IO-Link ports, 4 digital inputs







Technical data	Technical data	Technical data
PROFINET	PROFINET	PROFINET
M12, D-coded	M12, D-coded	M12, D-coded
100 Mbps	100 Mbps	100 Mbps
24 V DC	24 V DC	24 V DC
M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
2, 3, 4-wire	2, 3, 4-wire	2, 3, 4-wire
8	8	4
1 ms	1 ms	3 ms
IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1
Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply	Protection against polarity reversal
M12 plug-in connector, double occupancy	M12 plug-in connector, (A-coded)	-
2, 3-wire	2, 3-wire	-
8	8	-
500 mA	2 A	-
Overload protection, short-circuit protection of outputs	Overload protection, short-circuit protection of outputs	-
-	-	M12 plug-in connector
-	-	3, 5-wire
-	-	8
-	-	24 V DC
-	-	200 mA
-	-	Overload protection, electronics in the device
750 g	750 g	750 g
198.5 mm	198.5 mm	198.5 mm
59.8 mm	59.8 mm	59.8 mm
185 mm	185 mm	185 mm
37.8 mm	37.8 mm	37.8 mm
IP65/67	IP65/67	IP65/67
-25 °C ... 60 °C	-25 °C ... 60 °C	-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E PN DI8 DO8 M12 6M	2701515	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E PN DI8 DO4 2A M12 6M	2701518	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E PN IOL8 DI4 M12 6M	2701519	1

PROFINET
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Maximum current carrying capacity of the supply 12 A
– Diagnostic and status indicators
– Short-circuit and overload protection

Additional features
IO-Link master:

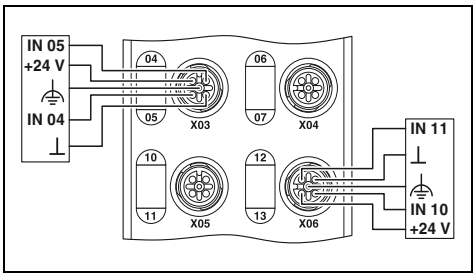
– According to specification 1.1
– 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

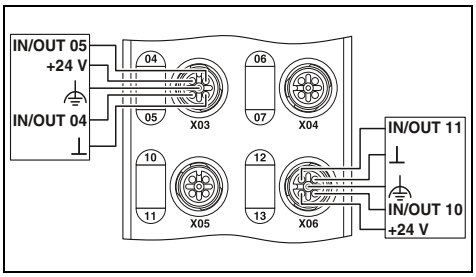
N

16 digital inputs

N

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	PROFINET	PROFINET
Connection method	M12, D-coded	M12, D-coded
Transmission speed	100 Mbps	100 Mbps
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	480 g	480 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	204.6 mm	204.6 mm
Depth	31.3 mm	31.3 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

Description	Ordering data: Type	Order No.	Pcs. / Pkt.	Ordering data: Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E PN DI16 M12 6P**	**2701510**	1	**AXL E PN DIO16 M12 6P**	**2701511**	1

N

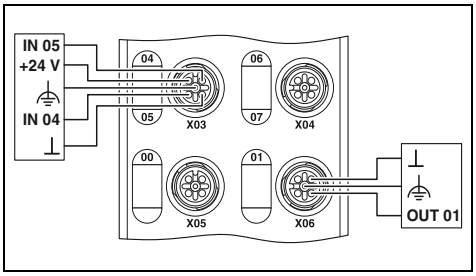
8 digital inputs and 8 digital outputs

Technical data	
PROFINET	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, double occupancy	
2, 3-wire	
8	
500 mA	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
-	
-	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data		
Type	Order No.	Pcs. / Pkt.
AXL E PN DI8 DO8 M12 6P	2701509	1

N

8 digital inputs and 4 digital outputs

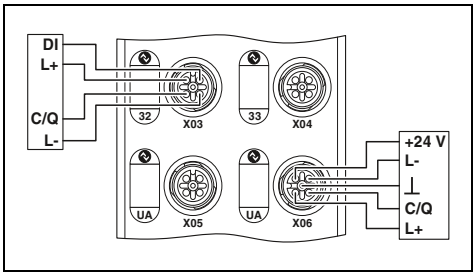


Technical data	
PROFINET	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
1 ms	
IEC 61131-2 type 1 and type 3	
Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, (A-coded)	
2, 3-wire	
4	
2 A	
Overload protection, short-circuit protection of outputs	
-	
-	
-	
-	
-	
-	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data		
Type	Order No.	Pcs. / Pkt.
AXL E PN DI8 DO4 2A M12 6P	2701512	1

N

8 IO-Link ports, 4 digital inputs



Technical data	
PROFINET	
M12, D-coded	
100 Mbps	
24 V DC	
M12 plug-in connector (T-coded)	
18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
4	
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
-	
-	
-	
-	
-	
M12 plug-in connector	
3, 5-wire	
8	
24 V DC	
200 mA	
Overload protection, electronics in the device	
480 g	
198.5 mm	
59.8 mm	
204.6 mm	
31.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data		
Type	Order No.	Pcs. / Pkt.
AXL E PN IOL8 DI4 M12 6P	2701513	1

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Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Rugged metal housing
- Seamless connection via M12 connectors
- SPEEDCON rapid interlock system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

Additional features
IO-Link master:

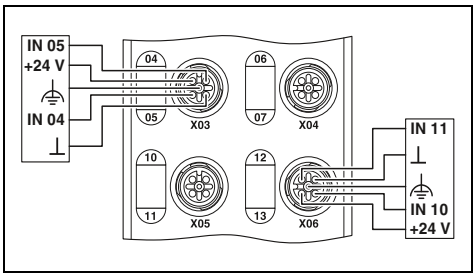
- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

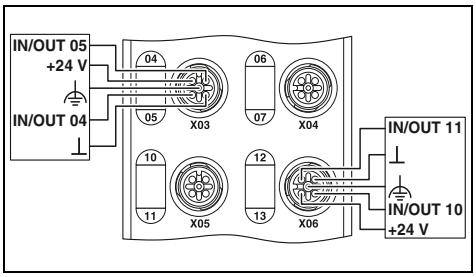
N

16 digital inputs

N

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	sercos	sercos
Connection method	M12, D-coded	M12, D-coded
Transmission speed	100 Mbps	100 Mbps
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	-
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	750 g	750 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	185 mm	185 mm
Depth	37.8 mm	37.8 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E S3 DI16 M12 6M**	**2701549**	1	**AXL E S3 DIO16 M12 6M**	**2701550**	1

N

sercos
the automation bus

8 digital inputs and 8 digital outputs

N

sercos
the automation bus

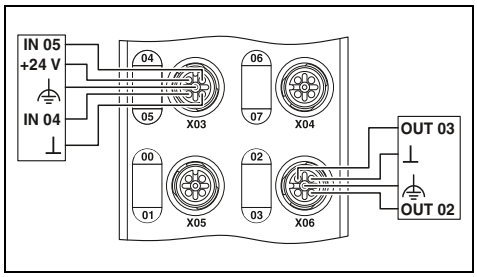
8 digital inputs and 4 digital outputs

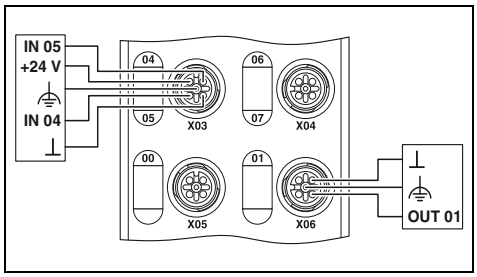
N

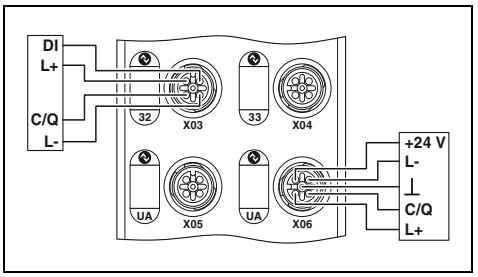
sercos
the automation bus

IO-Link

8 IO-Link ports, 4 digital inputs







Technical data

sercos M12, D-coded 100 Mbps	
24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy 2, 3, 4-wire 8 1 ms IEC 61131-2 type 1 and type 3 Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, double occupancy 2, 3-wire - 500 mA Overload protection, short-circuit protection of outputs	
- - -	
- - -	
750 g 198.5 mm 59.8 mm 185 mm 37.8 mm IP65/67 -25 °C ... 60 °C	

Technical data

sercos M12, D-coded 100 Mbps	
24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy 2, 3, 4-wire 8 1 ms IEC 61131-2 type 1 and type 3 Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, (A-coded) 2, 3-wire - 2 A Overload protection, short-circuit protection of outputs	
- - -	
- - -	
750 g 198.5 mm 59.8 mm 185 mm 37.8 mm IP65/67 -25 °C ... 60 °C	

Technical data

sercos M12, D-coded 100 Mbps	
24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy 2, 3, 4-wire 4 3 ms IEC 61131-2 type 1 Protection against polarity reversal	
- - - - -	
M12 plug-in connector 3, 5-wire 8	
24 V DC 200 mA Overload protection, electronics in the device	
750 g 198.5 mm 59.8 mm 185 mm 37.8 mm IP65/67 -25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E S3 DI8 DO8 M12 6M	**2701548**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E S3 DI8 DO4 2A M12 6M	**2701551**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E S3 IOL8 DI4 M12 6M	**2701552**	1

sercos
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Seamless connection via M12 connectors
- SPEEDCON rapid interlock system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

Additional features
IO-Link master:

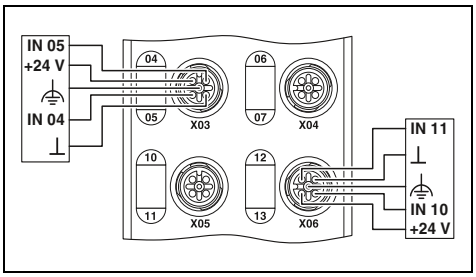
- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

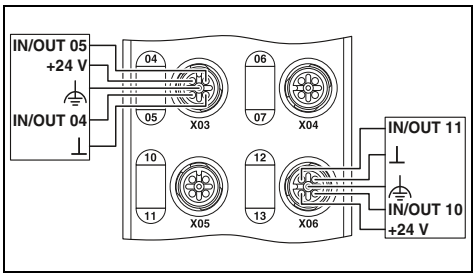
N

16 digital inputs

N

16 configurable inputs or outputs





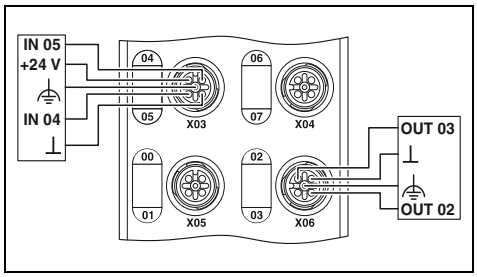
	Technical data	Technical data
Interface		
Fieldbus system	sercos	sercos
Connection method	M12, D-coded	M12, D-coded
Transmission speed	100 Mbps	100 Mbps
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	480 g	480 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	204.6 mm	204.6 mm
Depth	31.3 mm	31.3 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

Description	Ordering data: Type	Order No.	Pcs. / Pkt.	Ordering data: Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E S3 DI16 M12 6P**	**2701544**	1	**AXL E S3 DIO16 M12 6P**	**2701545**	1

N

sercos
the automation bus

8 digital inputs and 8 digital outputs



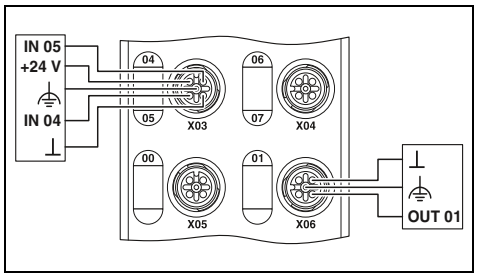
Technical data	
sercos M12, D-coded 100 Mbps	
24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy 2, 3, 4-wire 8 1 ms IEC 61131-2 type 1 and type 3 Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, double occupancy 2, 3-wire 8 500 mA Overload protection, short-circuit protection of outputs	
- - -	
- - -	
480 g 198.5 mm 59.8 mm 204.6 mm 31.3 mm IP65/67 -25 °C ... 60 °C	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
AXL E S3 DI8 DO8 M12 6P	**2701542**	1

N

sercos
the automation bus

8 digital inputs and 4 digital outputs



Technical data	
sercos M12, D-coded 100 Mbps	
24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy 2, 3, 4-wire 8 1 ms IEC 61131-2 type 1 and type 3 Overload protection, short-circuit protection of sensor supply	
M12 plug-in connector, (A-coded) 2, 3-wire 4 2 A Overload protection, short-circuit protection of outputs	
- - -	
- - -	
480 g 198.5 mm 59.8 mm 204.6 mm 31.3 mm IP65/67 -25 °C ... 60 °C	

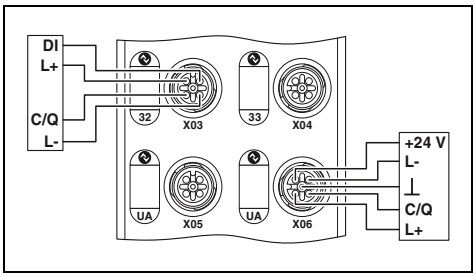
Ordering data		
Type	**Order No.**	Pcs. / Pkt.
AXL E S3 DI8 DO4 2A M12 6P	**2701546**	1

N

sercos
the automation bus

IO-Link

8 IO-Link ports, 4 digital inputs



Technical data	
sercos M12, D-coded 100 Mbps	
24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)	
M12 plug-in connector, double occupancy 2, 3, 4-wire 4 3 ms IEC 61131-2 type 1 Protection against polarity reversal	
- - - - -	
M12 plug-in connector 3, 5-wire 8	
24 V DC 200 mA Overload protection, electronics in the device	
480 g 198.5 mm 59.8 mm 204.6 mm 31.3 mm IP65/67 -25 °C ... 60 °C	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
AXL E S3 IOL8 DI4 M12 6P	**2701547**	1

PROFIBUS DP
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

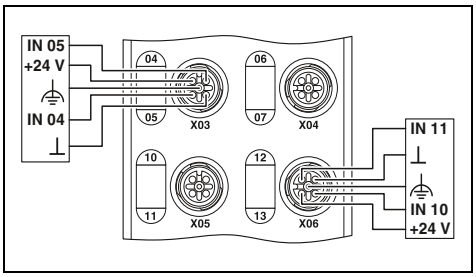
- Rugged metal housing
- Seamless connection via M12 connectors
- SPEEDCON rapid interlock system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

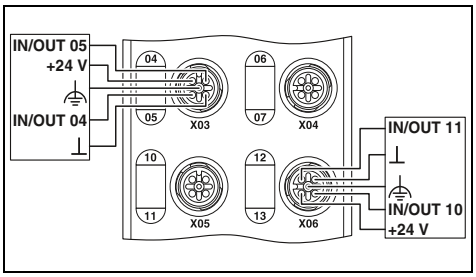
Additional features
IO-Link master:

- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

16 digital inputs

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	PROFIBUS DP	PROFIBUS DP
Connection method	2x M12 plug-in connectors, B-coded	2x M12 plug-in connectors, B-coded
Transmission speed	9.64 kbaud to 12 Mbaud automatic detection	9.64 kbaud to 12 Mbaud automatic detection
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	750 g	750 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	185 mm	185 mm
Depth	37.8 mm	37.8 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E PB DI16 M12 6M**	**2701505**	1	**AXL E PB DIO16 M12 6M**	**2701506**	1

N

8 digital inputs and 8 digital outputs

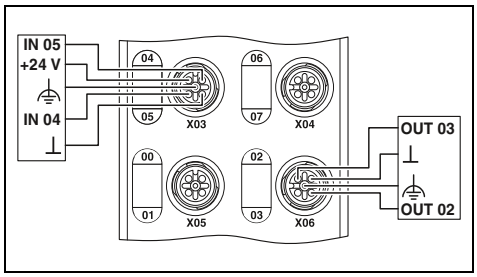
N

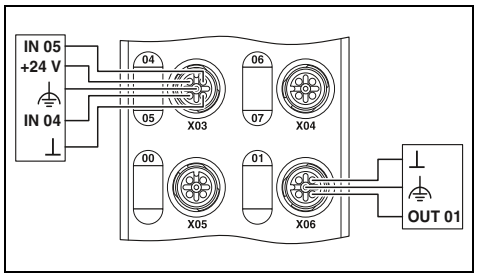
8 digital inputs and 4 digital outputs

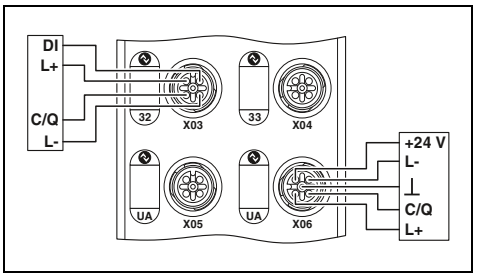
N

IO-Link

8 IO-Link ports, 4 digital inputs







Technical data

	PROFIBUS DP 2x M12 plug-in connectors, B-coded 9.64 kbaud to 12 Mbaud automatic detection
	24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)
	M12 plug-in connector, double occupancy 2, 3, 4-wire 8 1 ms IEC 61131-2 type 1 and type 3 Overload protection, short-circuit protection of sensor supply
	M12 plug-in connector, double occupancy 2, 3-wire 8 500 mA Overload protection, short-circuit protection of outputs
	- - -
	- - -
	750 g 198.5 mm 59.8 mm 185 mm 37.8 mm IP65/67 -25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E PB DI8 DO8 M12 6M	2701504	1

Technical data

	PROFIBUS DP 2x M12 plug-in connectors, B-coded 9.64 kbaud to 12 Mbaud automatic detection
	24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)
	M12 plug-in connector, double occupancy 2, 3, 4-wire 8 1 ms IEC 61131-2 type 1 and type 3 Overload protection, short-circuit protection of sensor supply
	M12 plug-in connector, (A-coded) 2, 3-wire 4 2 A Overload protection, short-circuit protection of outputs
	- - -
	- - -
	750 g 198.5 mm 59.8 mm 185 mm 37.8 mm IP65/67 -25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E PB DI8 DO4 2A M12 6M	2701507	1

Technical data

	PROFIBUS DP 2x M12 plug-in connectors, B-coded 9.64 kbaud to 12 Mbaud automatic detection
	24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)
	M12 plug-in connector, double occupancy 2, 3, 4-wire 4 3 ms IEC 61131-2 type 1 Protection against polarity reversal
	- - - - -
	M12 plug-in connector 3, 5-wire 8
	24 V DC 200 mA Overload protection, electronics in the device
	750 g 198.5 mm 59.8 mm 185 mm 37.8 mm IP65/67 -25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E PB IOL8 DI4 M12 6M	2701508	1

PROFIBUS DP
Digital I/O devices – Stand-Alone

The I/O devices with a block design are used to acquire and output various signals.

Features:

- Seamless connection via M12 connectors
- SPEEDCON rapid interlock system
- Maximum current carrying capacity of the supply 12 A
- Diagnostic and status indicators
- Short-circuit and overload protection

Additional features
IO-Link master:

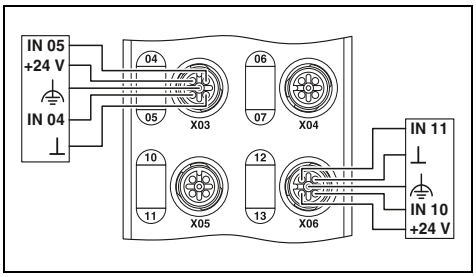
- According to specification 1.1
- 4 digital inputs, 4 IO-Link ports Class A, 4 IO-Link ports Class B on one device

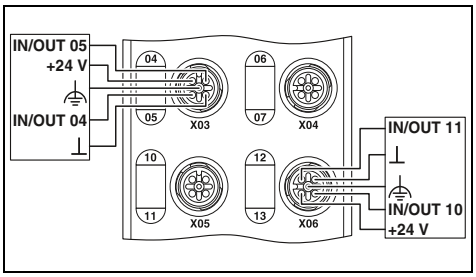
N

16 digital inputs

N

16 configurable inputs or outputs





	Technical data	Technical data
Interface		
Fieldbus system	PROFIBUS DP	PROFIBUS DP
Connection method	2x M12 plug-in connectors, B-coded	2x M12 plug-in connectors, B-coded
Transmission speed	9.64 kbaud to 12 Mbaud automatic detection	9.64 kbaud to 12 Mbaud automatic detection
Power supply for module electronics		
Supply voltage	24 V DC	24 V DC
Connection method	M12 plug-in connector (T-coded)	M12 plug-in connector (T-coded)
Supply voltage range	18 V DC ... 31.2 V DC (including all tolerances, including ripple)	18 V DC ... 31.2 V DC (including all tolerances, including ripple)
Digital inputs		
Connection method	M12 plug-in connector, double occupancy	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	2, 3, 4-wire
Maximum number of inputs	16	16
Filter time	1 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1 and type 3	IEC 61131-2 type 1 and type 3
Protective circuit	Overload protection, short-circuit protection of sensor supply	Overload protection, short-circuit protection of sensor supply
Digital outputs		
Connection method	-	M12 plug-in connector, double occupancy
Connection method	-	2, 3-wire
Maximum number of outputs	-	16
Maximum output current per channel	-	500 mA
Protective circuit	-	Overload protection, short-circuit protection of outputs
IO-Link ports		
Connection method	-	-
Connection method	-	-
Number of ports	-	-
IO-Link port supply		
I/O supply voltage	-	-
Nominal current for every IO-Link port	-	-
Protective circuit	-	-
General data		
Weight	480 g	480 g
Drill hole spacing	198.5 mm	198.5 mm
Width	59.8 mm	59.8 mm
Height	204.6 mm	204.6 mm
Depth	31.3 mm	31.3 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Axioline I/O device - Digital inputs - Digital inputs/outputs - IO-Link ports and digital inputs	**AXL E PB DI16 M12 6P**	**2701498**	1	**AXL E PB DIO16 M12 6P**	**2701499**	1

N

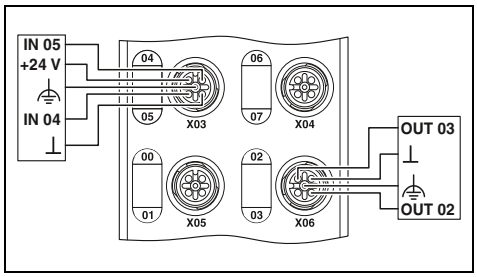
8 digital inputs and 8 digital outputs

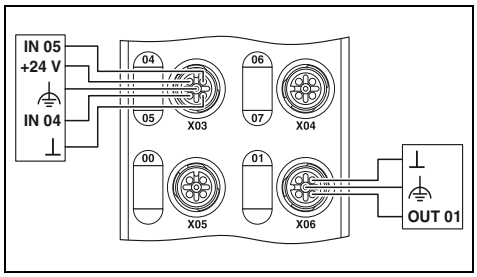
N

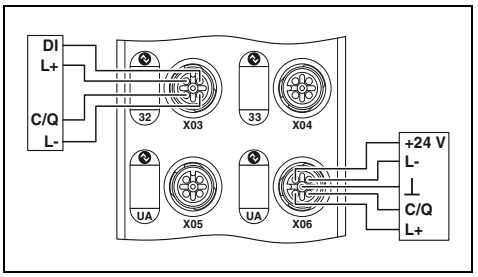
8 digital inputs and 4 digital outputs

N

8 IO-Link ports, 4 digital inputs







Technical data

	PROFIBUS DP 2x M12 plug-in connectors, B-coded 9.64 kbaud to 12 Mbaud automatic detection
	24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)
	M12 plug-in connector, double occupancy 2, 3, 4-wire 8 1 ms IEC 61131-2 type 1 and type 3 Overload protection, short-circuit protection of sensor supply
	M12 plug-in connector, double occupancy 2, 3-wire 8 500 mA Overload protection, short-circuit protection of outputs
	- - -
	- - -
	480 g 198.5 mm 59.8 mm 204.6 mm 31.3 mm IP65/67 -25 °C ... 60 °C

Technical data

	PROFIBUS DP 2x M12 plug-in connectors, B-coded 9.64 kbaud to 12 Mbaud automatic detection
	24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)
	M12 plug-in connector, double occupancy 2, 3, 4-wire 8 1 ms IEC 61131-2 type 1 and type 3 Overload protection, short-circuit protection of sensor supply
	M12 plug-in connector, (A-coded) 2, 3-wire 4 2 A Overload protection, short-circuit protection of outputs
	- - -
	- - -
	480 g 198.5 mm 59.8 mm 204.6 mm 31.3 mm IP65/67 -25 °C ... 60 °C

Technical data

	PROFIBUS DP 2x M12 plug-in connectors, B-coded 9.64 kbaud to 12 Mbaud automatic detection
	24 V DC M12 plug-in connector (T-coded) 18 V DC ... 31.2 V DC (including all tolerances, including ripple)
	M12 plug-in connector, double occupancy 2, 3, 4-wire 4 3 ms IEC 61131-2 type 1 Protection against polarity reversal
	- - - - -
	M12 plug-in connector 3, 5-wire 8
	24 V DC 200 mA Overload protection, electronics in the device
	480 g 198.5 mm 59.8 mm 204.6 mm 31.3 mm IP65/67 -25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E PB DI8 DO8 M12 6P	2701497	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E PB DI8 DO4 2A M12 6P	2701502	1

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E PB IOL8 DI4 M12 6P	2701503	1

IO-Link/analog converter

N

N

IO-Link/analog converters are used to convert analog input or output signals to the IO-Link interface. You can connect the converters directly in the field.

Features:

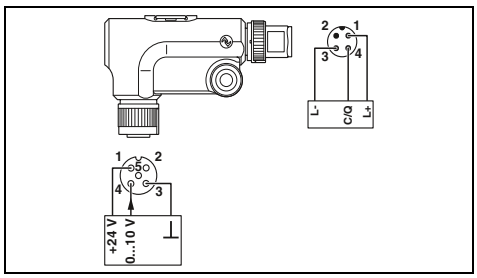
– Large variety of analog functions
– Tailored combination of analog functions
– High transmission reliability
– Reduced cabling

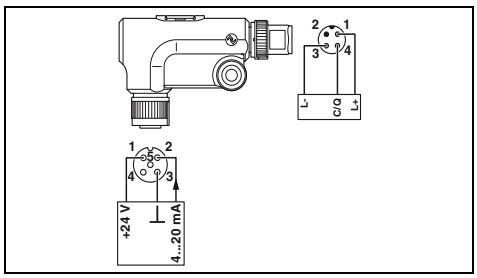
IO-Link

1 analog input (0 ... 10 V)

IO-Link

1 analog input (4 … 20 mA)





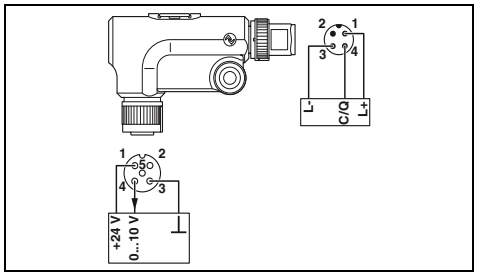
	Technical data	Technical data
IO-Link ports		
Connection method	M12 plug-in connector, A-coded	M12 plug-in connector, A-coded
Connection technology	3-wire	3-wire
Number of ports	1	1
IO-Link port supply		
I/O supply voltage	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)
Nominal current for every IO-Link port	max. 100 mA	max. 100 mA
Protective circuit	Protection against polarity reversal Short-circuit protection Overload protection	Protection against polarity reversal Short-circuit protection Overload protection
Analog inputs		
Connection method	M12 plug-in connector, A-coded	M12 plug-in connector, A-coded
Connection technology	3-wire	3-wire
Number of inputs	1 (voltage)	1 (current)
Voltage input signal	0 V ... 10 V	-
Current input signal	-	4 mA ... 20 mA
Analog outputs		
Connection method	-	-
Connection technology	-	-
Number of outputs	-	-
Voltage output signal	-	-
Current output signal	-	-
Temperature input		
Connection method	-	-
Connection technology	-	-
Number of inputs	-	-
Sensor types (RTD) that can be used	-	-
Linear resistance measuring range	-	-
General data		
Weight	34 g	34 g
Width	16.6 mm	16.6 mm
Height	42 mm	42 mm
Depth	66.5 mm	66.5 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
IO-Link/analog converter - Analog input - Analog output - RTD input	**AXL E IOL AI1 U M12 R**	**2700273**	1	**AXL E IOL AI1 I M12 R**	**2700275**	1

N

IO-Link

1 analog output (0 ... 10 V)



Technical data

	M12 plug-in connector, A-coded
	3-wire
	1
	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)
	max. 100 mA
	Protection against polarity reversal
	Short-circuit protection
	Overload protection
	-
	-
	-
	-
	-
	M12 plug-in connector, A-coded
	3-wire
	1 (voltage)
	0 V ... 10 V
	-
	-
	-
	-
	-
	-
	34 g
	16.6 mm
	42 mm
	66.5 mm
	IP65/67
	-25 °C ... 60 °C

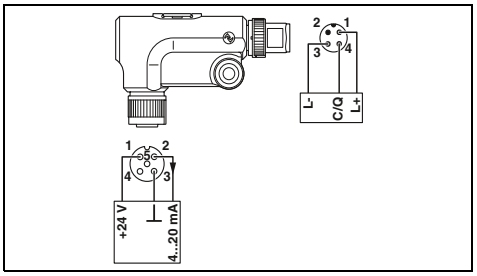
Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E IOL AO1 U M12 R	**2700278**	1

N

IO-Link

1 analog output (4 ... 20 mA)



Technical data

	M12 plug-in connector, A-coded
	3-wire
	1
	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)
	max. 100 mA
	Protection against polarity reversal
	Short-circuit protection
	Overload protection
	-
	-
	-
	-
	-
	M12 plug-in connector, A-coded
	3-wire
	1 (current)
	-
	4 mA ... 20 mA
	-
	-
	-
	-
	-
	34 g
	16.6 mm
	42 mm
	66.5 mm
	IP65/67
	-25 °C ... 60 °C

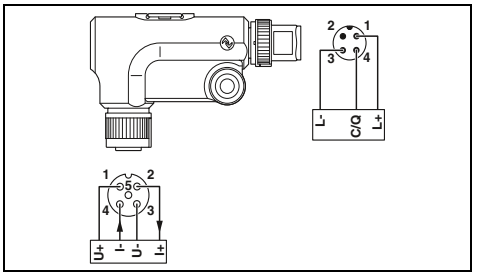
Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E IOL AO1 I M12 R	**2700282**	1

N

IO-Link

1 RTD input



Technical data

	M12 plug-in connector, A-coded
	3-wire
	1
	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)
	max. 100 mA
	Protection against polarity reversal
	Short-circuit protection
	Overload protection
	-
	-
	-
	-
	-
	-
	-
	-
	-
	-
	M12 plug-in connector, A-coded
	4-wire
	1 (for resistance temperature detectors)
	Pt 100, Pt 1000
	0 Ω ... 500 Ω / 0 Ω ... 5 kΩ
	34 g
	16.6 mm
	42 mm
	66.5 mm
	IP65/67
	-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E IOL RTD1 M12 R	**2700305**	1

IO-Link/analog converter

N

N

IO-Link/analog converters are used to convert analog input or output signals to the IO-Link interface. You can connect the converters directly in the field.

Features:

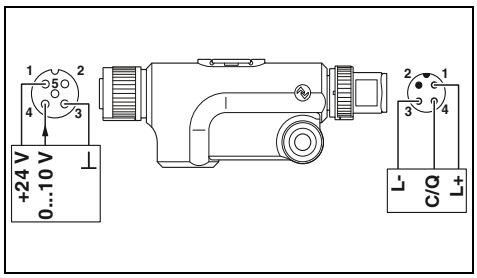
– Large variety of analog functions
– Tailored combination of analog functions
– High transmission reliability
– Reduced cabling

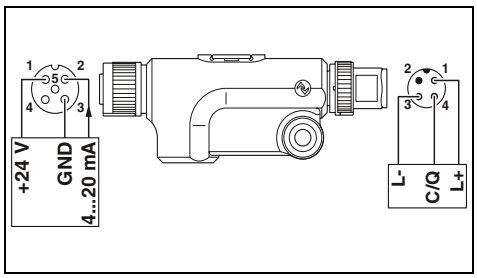
IO-Link

1 analog input (0 ... 10 V)

IO-Link

1 analog input (4 … 20 mA)





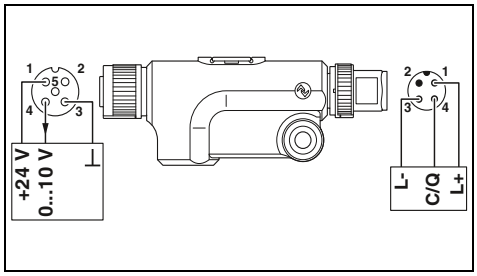
	Technical data	Technical data
IO-Link ports		
Connection method	M12 plug-in connector, A-coded	M12 plug-in connector, A-coded
Connection method	3-wire	3-wire
Number of ports	1	1
IO-Link port supply		
I/O supply voltage	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)
Nominal current for every IO-Link port	max. 100 mA	max. 100 mA
Protective circuit	Protection against polarity reversal Short-circuit protection Overload protection	Protection against polarity reversal Short-circuit protection Overload protection
Analog inputs		
Connection method	M12 plug-in connector, A-coded	M12 plug-in connector, A-coded
Connection technology	3-wire	3-wire
Number of inputs	1 (voltage)	1 (current)
Voltage input signal	0 V ... 10 V	-
Current input signal	-	4 mA ... 20 mA
Analog outputs		
Connection method	-	-
Connection technology	-	-
Number of outputs	-	-
Voltage output signal	-	-
Current output signal	-	-
Temperature input		
Connection method	-	-
Connection technology	-	-
Number of inputs	-	-
Sensor types (RTD) that can be used	-	-
Linear resistance measuring range	-	-
General data		
Weight	34 g	34 g
Width	16.6 mm	16.6 mm
Height	29 mm	29 mm
Depth	79.5 mm	79.5 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C	-25 °C ... 60 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
IO-Link/analog converter - Analog input - Analog output - RTD input	**AXL E IOL AI1 U M12 S**	**2700336**	1	**AXL E IOL AI1 I M12 S**	**2700338**	1

N

IO-Link

1 analog output (0 ... 10 V)



Technical data

	M12 plug-in connector, A-coded
	3-wire
	1
	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)
	max. 100 mA
	Protection against polarity reversal
	Short-circuit protection
	Overload protection
	-
	-
	-
	-
	-
	M12 plug-in connector, A-coded
	3-wire
	1 (voltage)
	0 V ... 10 V
	-
	-
	-
	-
	-
	-
	34 g
	16.6 mm
	29 mm
	79.5 mm
	IP65/67
	-25 °C ... 60 °C

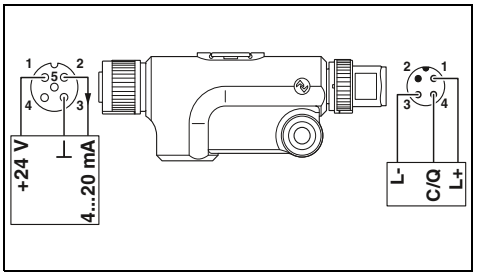
Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E IOL AO1 U M12 S	**2700350**	1

N

IO-Link

1 analog output (4 ... 20 mA)



Technical data

	M12 plug-in connector, A-coded
	3-wire
	1
	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)
	max. 100 mA
	Protection against polarity reversal
	Short-circuit protection
	Overload protection
	-
	-
	-
	-
	-
	M12 plug-in connector, A-coded
	3-wire
	1 (current)
	-
	4 mA ... 20 mA
	-
	-
	-
	-
	-
	34 g
	16.6 mm
	29 mm
	79.5 mm
	IP65/67
	-25 °C ... 60 °C

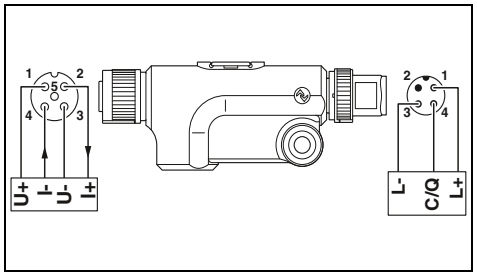
Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E IOL AO1 I M12 S	**2700351**	1

N

IO-Link

1 RTD input



Technical data

	M12 plug-in connector, A-coded
	3-wire
	1
	24 V DC (This supply voltage is provided via the IO-Link interface of the IO-Link master.)
	max. 100 mA
	Protection against polarity reversal
	Short-circuit protection
	Overload protection
	-
	-
	-
	-
	-
	-
	-
	-
	-
	-
	M12 plug-in connector, A-coded
	4-wire
	1 (for resistance temperature detectors)
	Pt 100, Pt 1000
	0 Ω ... 500 Ω / 0 Ω ... 5 kΩ
	34 g
	16.6 mm
	29 mm
	79.5 mm
	IP65/67
	-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
AXL E IOL RTD1 M12 S	**2700352**	1

Product overview

Digital I/O devices – stand-alone

INTERBUS	PROFIBUS	IO-Link	DeviceNet	CANopen
284	286	288	290	292

Bus couplers – modular

INTERBUS	PROFINET	PROFIBUS	DeviceNet	EtherNet/IP	Ethernet
294	295	295	296	297	297

M12 I/O devices – modular

Digital input		Digital input/output			Digital output
8 channels	16 channels	4/4 channels	8/8 channels	16/16 channels	8 channels
298	298	299	299	299	299

IO-Link master	Analog input	Analog output	Analog input
4 IO-Link ports	4 channels	4 channels	4 channels (RTD)
300	301	301	301

M8 I/O devices – modular

Digital input	Digital input/output	Digital output	
8 channels	8 channels	4 channels	8 channels
302	303	303	303

Accessories

FLM ADAP M12/M8

Fieldline Modular M12/M8 adapter

304

IB IL 24 FLM ...-PAC

Inline Modular branch terminal

304

SAC-...2XM12...

M12 bus system T-connector

305

SAC-5P-M12MS ... TR

Termination resistor, M12, PROFIBUS and DeviceNet™/CANopen®

305

SAC-3P-M12Y/2XM12FS PE

M12 Y-distributor/connector

305

FLM MP...

Mounting plates

304

PROT-M12 / M8 ...

Sealing caps

305

ZBF 12 ... / ZBF 8 ...

Marking material

305

...

Bus and power cable with M12 plug-in connector

306

SAC-4P-M ...

Bus and power cable with M8 plug-in connector

308

SACC-M12... / SACC-M8...

M12/M8 plug-in connectors that can be assembled

309

PROJECT+

Software for planning the I/O configuration

514

INTERBUS digital I/O devices – stand-alone

The compact I/O devices are used to acquire and output digital signals in an INTERBUS system.

Features:

– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

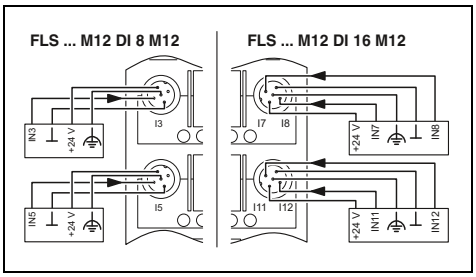
Notes:

A comprehensive range of installation materials for field installation can be found on page 304

1) EMC: Class A product, see page 553

8/16 digital inputs

INTERBUS CLUB
Ex:

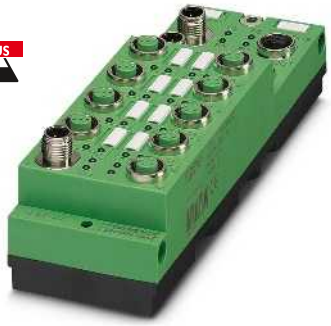


Technical data

	FLS IB M12 DI 8 M12[1]	FLS IB M12 DI 16 M12[1]
Interface		
Fieldbus system	INTERBUS	
Name	Remote bus	
Connection method	2x M12 plug-in connectors, B-coded	
Transmission speed	500 kbaud	
Power supply for module electronics		
Supply voltage	24 V DC	
Connection method	M12 plug-in connector, (A-coded)	
Supply voltage range	18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
Digital inputs		
Connection method	M12 plug-in connector	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	
Maximum number of inputs	8	16
Filter time	3 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1	
Protective circuit	Protection against polarity reversal	
Digital outputs		
Connection method	-	
Connection method	-	
Maximum number of outputs	-	
Maximum output current per channel	-	
Protective circuit	-	
General data		
Weight	310 g	
Drill hole spacing	151 mm	
Width	60 mm	
Height	161 mm	
Depth	44.5 mm	
Degree of protection	IP65/67	
Ambient temperature (operation)	-25 °C ... 60 °C	

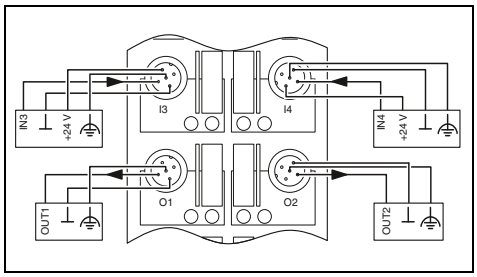
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Stand-Alone input device, INTERBUS M12			
- 8 inputs	**FLS IB M12 DI 8 M12[1]**	**2736013**	1
- 16 inputs	**FLS IB M12 DI 16 M12[1]**	**2736314**	1
Fieldline Stand-Alone I/O device, INTERBUS M12			
- 4 inputs, 4 outputs			
- 8 inputs, 8 outputs			
Fieldline Stand-Alone output device, INTERBUS M12			
- 8 outputs			



4 digital inputs and 4 digital outputs

INTERBUS CLUB
Ex:



Technical data

INTERBUS	
Remote bus	
2x M12 plug-in connectors, B-coded	
500 kbaud	
24 V DC	
M12 plug-in connector, (A-coded)	
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
M12 plug-in connector	
2, 3, 4-wire	
4	
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
M12 plug-in connector	
2, 3-wire	
4	
2 A	
Short-circuit protection	
340 g	
168 mm	
60 mm	
178 mm	
49.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS IB M12 DIO 4/4 M12-2A[1])	**2736026**	1

8 digital inputs and 8 digital outputs

INTERBUS CLUB
Ex:

Technical data

INTERBUS	
Remote bus	
2x M12 plug-in connectors, B-coded	
500 kbaud	
24 V DC	
M12 plug-in connector, (A-coded)	
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
M12 plug-in connector, double occupancy	
2, 3, 4-wire	
8	
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
M12 plug-in connector, double occupancy	
2, 3-wire	
8	
500 mA	
Short-circuit protection	
340 g	
168 mm	
60 mm	
178 mm	
49.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS IB M12 DIO 8/8 M12[1])	**2736385**	1

8 digital outputs

INTERBUS CLUB
Ex:

Technical data

INTERBUS	
Remote bus	
2 M12 plug-in connectors, B-coded	
500 kbaud	
24 V DC	
M12 plug-in connector, (A-coded)	
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
-	
-	
-	
-	
-	
-	
M12 plug-in connector	
2, 3-wire	
8	
2 A	
Short-circuit protection	
350 g	
168 mm	
60 mm	
178 mm	
49.3 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS IB M12 DO 8 M12-2A[1])	**2736039**	1

PROFIBUS digital I/O devices – stand-alone

The compact I/O devices are used to acquire and output digital signals in a PROFIBUS DP system.

Features:

– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Directly accessible address coding switch
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

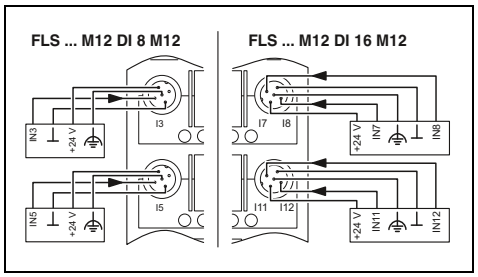
Notes:

A comprehensive range of installation materials for field installation can be found on page 304

1) EMC: Class A product, see page 553

8/16 digital inputs

PROFIBUS
Ex:



Technical data

	FLS PB M12 DI 8 M12[1]	FLS PB M12 DI 16 M12[1]
Interface		
Fieldbus system	PROFIBUS DP	
Name	PROFIBUS DP	
Connection method	2x M12 plug-in connectors, B-coded	
Transmission speed	9.64 kbaud to 12 Mbaud automatic detection	
Address area assignment	1 ... 99, can be set	
Power supply for module electronics		
Supply voltage	24 V DC	
Connection method	M12 plug-in connector, (A-coded)	
Supply voltage range	18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
Digital inputs		
Connection method	M12 plug-in connector	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	
Maximum number of inputs	8	16
Filter time	3 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1	
Protective circuit	Protection against polarity reversal	
Digital outputs		
Connection method	-	
Connection method	-	
Maximum number of outputs	-	
Maximum output current per channel	-	
Protective circuit	-	
General data		
Weight	310 g	
Drill hole spacing	151 mm	
Width	60 mm	
Height	161 mm	
Depth	44.5 mm	
Degree of protection	IP65/67	
Ambient temperature (operation)	-25 °C ... 60 °C	

Ordering data

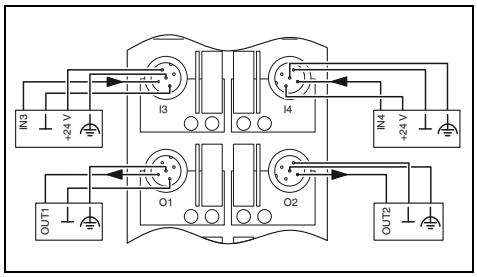
Description	Type	Order No.	Pcs. / Pkt.
Fieldline Stand-Alone input device, PROFIBUS M12			
- 8 inputs	**FLS PB M12 DI 8 M12[1]**	**2736123**	1
- 16 inputs	**FLS PB M12 DI 16 M12[1]**	**2736220**	1
Fieldline Stand-Alone I/O device, PROFIBUS M12			
- 4 inputs, 4 outputs			
- 8 inputs, 8 outputs			
Fieldline Stand-Alone output device, PROFIBUS M12			
- 8 outputs			

4 digital inputs and 4 digital outputs

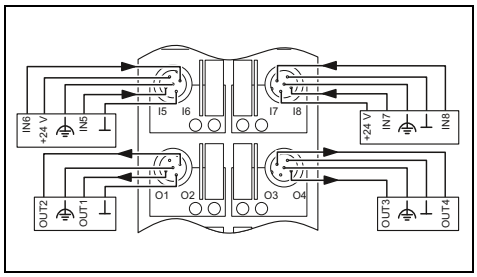
8 digital inputs and 8 digital outputs

8 digital outputs

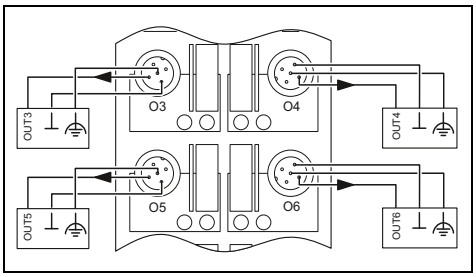
PROFIBUS
Ex:



PROFIBUS
Ex:



PROFIBUS
Ex:



Technical data

PROFIBUS DP	PROFIBUS DP
PROFIBUS DP	PROFIBUS DP
2x M12 plug-in connectors, B-coded	2x M12 plug-in connectors, B-coded
9.64 kbaud to 12 Mbaud automatic detection	9.64 kbaud to 12 Mbaud automatic detection
1 ... 99, can be set	1 ... 99, can be set
24 V DC	24 V DC
M12 plug-in connector, (A-coded)	M12 plug-in connector, (A-coded)
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	18 V DC ... 30 V DC IEC 61131-2 (including ripple)
M12 plug-in connector	M12 plug-in connector, double occupancy
2, 3, 4-wire	2, 3, 4-wire
4	8
3 ms	3 ms
IEC 61131-2 type 1	IEC 61131-2 type 1
Protection against polarity reversal	Protection against polarity reversal
M12 plug-in connector	M12 plug-in connector, double occupancy
2, 3-wire	2, 3-wire
4	8
2 A	500 mA
Short-circuit protection	Short-circuit protection
340 g	340 g
168 mm	168 mm
60 mm	60 mm
178 mm	178 mm
49.3 mm	49.3 mm
IP65/67	IP65/67
-25 °C ... 60 °C	-25 °C ... 60 °C

Technical data

PROFIBUS DP
PROFIBUS DP
2x M12 plug-in connectors, B-coded
9.64 kbaud to 12 Mbaud automatic detection
1 ... 99, can be set
24 V DC
M12 plug-in connector, (A-coded)
18 V DC ... 30 V DC IEC 61131-2 (including ripple)
-
-
-
-
-
-
M12 plug-in connector
2, 3-wire
8
2 A
Short-circuit protection
350 g
168 mm
60 mm
178 mm
49.3 mm
IP65/67
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS PB M12 DIO 4/4 M12-2A[1])	**2736107**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS PB M12 DIO 8/8 M12[1])	**2736372**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS PB M12 DO 8 M12-2A[1])	**2736110**	1

PROFIBUS IO-Link masters – stand-alone

IO-Link masters enable the easy integration of IO-Link devices in a PROFIBUS DP system.

Features:

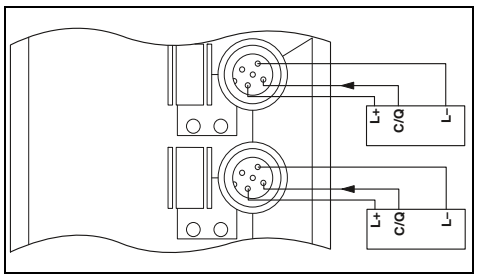
– Up to 8 IO-Link ports
– Support of PROFIBUS DP/V1 services
– Seamless connection via M12 connectors
– Directly accessible address coding switch
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

Notes:

A comprehensive range of installation materials for field installation can be found on page 304

1) EMC: Class A product, see page 553

4 IO-Link ports and 4 digital inputs



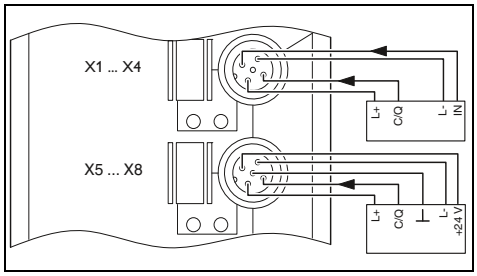
Technical data

Interface	
Name	PROFIBUS DP
Connection method	M12 plug-in connector, B-coded
Transmission speed	9.64 kbaud to 12 Mbaud automatic detection
Power supply for module electronics	
Supply voltage	24 V DC
Connection method	M12 plug-in connector
Supply voltage range	18 V DC ... 30 V DC IEC 61131-2 (including ripple)
Digital inputs	
Connection method	-
Connection method	3-wire
Maximum number of inputs	-
IO-Link ports	
Connection method	M12 plug-in connector
Connection method	3-wire
Number of ports	4
IO-Link port supply	
Sensor supply voltage	min. U_S - 1 V
Nominal current for every IO-Link port	200 mA
Nominal current per device	800 mA
Protective circuit	Overload protection, electronics in the device Short-circuit protection, electronics in the device
General data	
Weight	280 g
Drill hole spacing	168 mm
Width	70 mm
Height	178 mm
Depth	49.3 mm
Degree of protection	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline stand-alone device, PROFIBUS M12 - IO-Link master with four 4 IO-Link ports - IO-Link master with 8 IO-Link ports, 4 digital inputs, and separate actuator supply	**FLS PB M12 IOL 4 M12[1])**	**2736987**	1

8 IO-Link ports, 4 digital inputs, and separate power supply



Technical data

PROFIBUS DP
M12 plug-in connector, B-coded
9.64 kbaud to 12 Mbaud automatic detection

24 V DC
M12 plug-in connector
18 V DC ... 30 V DC IEC 61131-2 (including ripple)

M12 plug-in connector
2, 3-wire
4

M12 plug-in connector
3, 5-wire
8

min. U_S - 2 V
200 mA
4 A
Overload protection, electronics in the device
Short-circuit protection, electronics in the device

340 g
168 mm
60 mm
178 mm
49.3 mm
IP65/67
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS PB M12 IOL 8 DI 4 M12-B[1])	**2773380**	1

DeviceNet™ digital I/O devices – stand-alone

The compact I/O devices are used to acquire and output digital signals in a DeviceNet™ system.

Features:

– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Directly accessible address coding switch
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

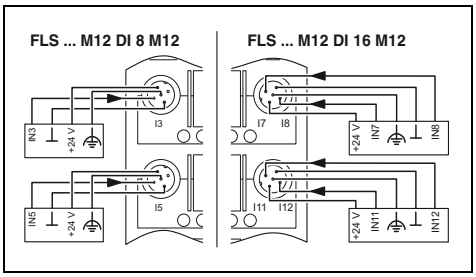
Notes:

A comprehensive range of installation materials for field installation can be found on page 304

1) EMC: Class A product, see page 553

8/16 digital inputs

Ex:



Technical data

	FLS DN M12 DI 8 M12[1]	FLS DN M12 DI 16 M12[1]
Interface		
Fieldbus system	DeviceNet™	
Connection method	2 M12 plug connectors, A-coded	
Transmission speed	125 kbaud, 250 kbaud, 500 kbaud automatic detection	
Address area assignment	0 ... 63, can be set	
Power supply for module electronics		
Supply voltage	24 V DC	
Connection method	M12 plug-in connector, (A-coded)	
Supply voltage range	11 V DC ... 30 V DC IEC 61131-2 (including ripple)	12 V DC ... 30 V DC IEC 61131-2 (including ripple)
Digital inputs		
Connection method	M12 plug-in connector	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	
Maximum number of inputs	8	16
Filter time	3 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1	
Protective circuit	Protection against polarity reversal	
Digital outputs		
Connection method	-	
Connection method	-	
Maximum number of outputs	-	
Maximum output current per channel	-	
Protective circuit	-	
General data		
Weight	310 g	
Drill hole spacing	151 mm	
Width	60 mm	
Height	161 mm	
Depth	44.5 mm	
Degree of protection	IP65/67	
Ambient temperature (operation)	-25 °C ... 60 °C	

Ordering data

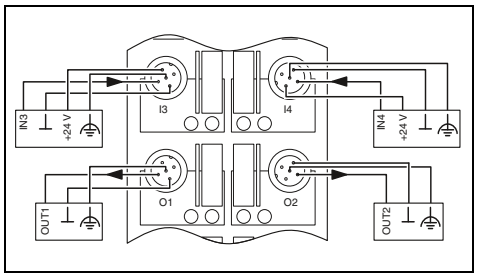
Description	Type	Order No.	Pcs. / Pkt.
Fieldline Stand-Alone input device, DeviceNet™ M12			
- 8 inputs	**FLS DN M12 DI 8 M12[1]**	**2736068**	1
- 16 inputs	**FLS DN M12 DI 16 M12[1]**	**2736327**	1
Fieldline Stand-Alone I/O device, DeviceNet™ M12			
- 4 inputs, 4 outputs			
- 8 inputs, 8 outputs			
Fieldline Stand-Alone output device, DeviceNet™ M12			
- 8 outputs			

4 digital inputs and 4 digital outputs

8 digital inputs and 8 digital outputs

8 digital outputs

Ex:



Technical data

DeviceNet™
2 M12 plug connectors, A-coded
125 kbaud, 250 kbaud, 500 kbaud automatic detection

0 ... 63, can be set

24 V DC
M12 plug-in connector, (A-coded)
12 V DC ... 30 V DC IEC 61131-2 (including ripple)

M12 plug-in connector

2, 3, 4-wire
4
3 ms
IEC 61131-2 type 1
Protection against polarity reversal

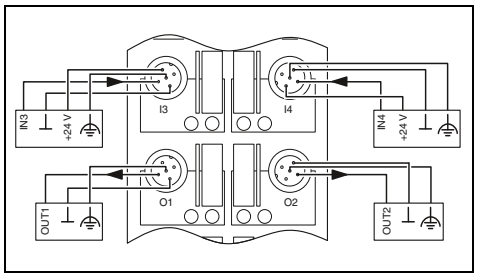
M12 plug-in connector
2, 3-wire
4
2 A
Short-circuit protection

340 g
168 mm
60 mm
178 mm
49.3 mm
IP65/67
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS DN M12 DIO 4/4 M12-2A[1])	**2736042**	1

Ex:



Technical data

DeviceNet™
2 M12 plug connectors, A-coded
125 kbaud, 250 kbaud, 500 kbaud automatic detection

0 ... 63, can be set

24 V DC
M12 plug-in connector, (A-coded)
12 V DC ... 30 V DC IEC 61131-2 (including ripple)

M12 plug-in connector, double occupancy

2, 3, 4-wire
8
3 ms
IEC 61131-2 type 1
Protection against polarity reversal

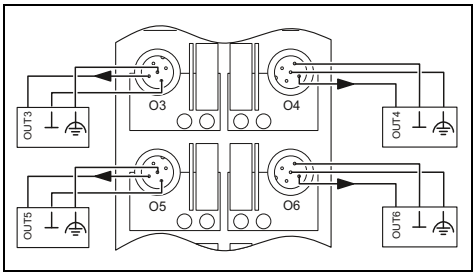
M12 plug-in connector, double occupancy
2, 3-wire
8
500 mA
Short-circuit protection

340 g
168 mm
60 mm
178 mm
49.3 mm
IP65/67
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS DN M12 DIO 8/8 M12[1])	**2736398**	1

Ex:



Technical data

DeviceNet™
2 M12 plug connectors, A-coded
125 kbaud, 250 kbaud, 500 kbaud automatic detection

0 ... 63, can be set

24 V DC
M12 plug-in connector, (A-coded)
12 V DC ... 30 V DC IEC 61131-2 (including ripple)

-

-
-
-
-
-

M12 plug-in connector
2, 3-wire
8
2 A
Short-circuit protection

350 g
168 mm
60 mm
178 mm
49.3 mm
IP65/67
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS DN M12 DO 8 M12-2A[1])	**2736055**	1

CANopen® digital I/O devices – stand-alone

The compact I/O devices are used to acquire and output digital signals in a CANopen® system.

Features:

– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Directly accessible address coding switch
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

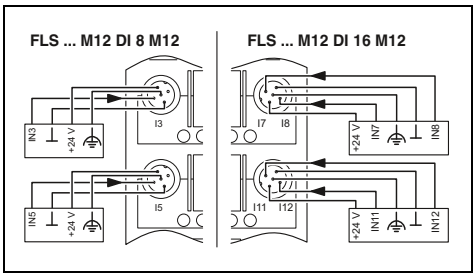
Notes:

A comprehensive range of installation materials for field installation can be found on page 304

1) EMC: Class A product, see page 553

8/16 digital inputs

Ex:



Technical data

	FLS CO M12 DI 8 M12[1]	FLS CO M12 DI 16 M12[1]
Interface		
Fieldbus system	CANopen®	
Connection method	2 M12 plug connectors, A-coded	
Transmission speed	Maximum 1 Mbaud automatic detection	
Address area assignment	1 ... 126, adjustable	
Power supply for module electronics		
Supply voltage	24 V DC	
Connection method	M12 plug-in connector, (A-coded)	
Supply voltage range	18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
Digital inputs		
Connection method	M12 plug-in connector	M12 plug-in connector, double occupancy
Connection method	2, 3, 4-wire	
Maximum number of inputs	8	16
Filter time	3 ms	1 ms
Input characteristic curve	IEC 61131-2 type 1	
Protective circuit	Protection against polarity reversal	
Digital outputs		
Connection method	-	
Connection method	-	
Maximum number of outputs	-	
Maximum output current per channel	-	
Protective circuit	-	
General data		
Weight	310 g	
Drill hole spacing	151 mm	
Width	60 mm	
Height	161 mm	
Depth	44.5 mm	
Degree of protection	IP65/67	
Ambient temperature (operation)	-25 °C ... 60 °C	

Ordering data

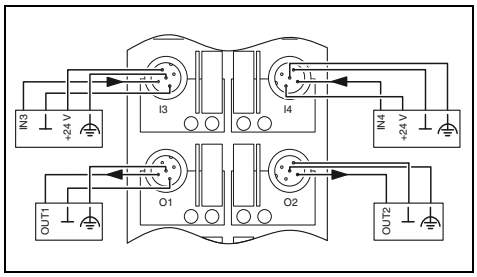
Description	Type	Order No.	Pcs. / Pkt.
Fieldline Stand-Alone input device, CANopen® M12			
- 8 inputs	**FLS CO M12 DI 8 M12[1]**	**2736097**	1
- 16 inputs	**FLS CO M12 DI 16 M12[1]**	**2736479**	1
Fieldline Stand-Alone I/O device, CANopen® M12			
- 4 inputs, 4 outputs			
- 8 inputs, 8 outputs			
Fieldline Stand-Alone output device, CANopen® M12			
- 8 outputs			

4 digital inputs and 4 digital outputs

8 digital inputs and 8 digital outputs

8 digital outputs

Ex:



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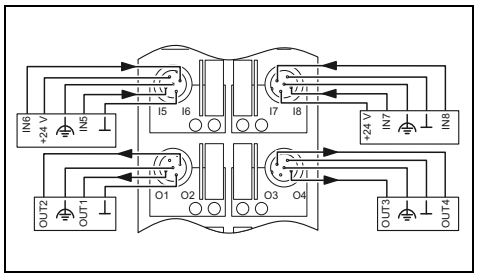

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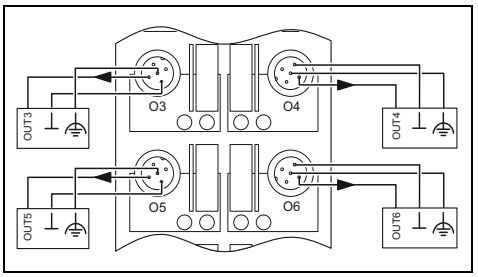


Technical data

CANopen®	CANopen®	CANopen®
2 M12 plug connectors, A-coded	2 M12 plug connectors, A-coded	2 M12 plug connectors, A-coded
Maximum 1 Mbaud automatic detection	Maximum 1 Mbaud automatic detection	Maximum 1 Mbaud automatic detection
1 ... 126, adjustable	1 ... 126, adjustable	1 ... 126, adjustable
24 V DC	24 V DC	24 V DC
M12 plug-in connector, (A-coded)	M12 plug-in connector, (A-coded)	M12 plug-in connector, (A-coded)
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	18 V DC ... 30 V DC IEC 61131-2 (including ripple)	18 V DC ... 30 V DC IEC 61131-2 (including ripple)
M12 plug-in connector	M12 plug-in connector, double occupancy	-
2, 3, 4-wire	2, 3, 4-wire	-
4	8	-
3 ms	3 ms	-
IEC 61131-2 type 1	IEC 61131-2 type 1	-
Protection against polarity reversal	Protection against polarity reversal	-
M12 plug-in connector	M12 plug-in connector, double occupancy	M12 plug-in connector
2, 3-wire	2, 3-wire	2, 3-wire
4	8	8
2 A	500 mA	2 A
Short-circuit protection	Short-circuit protection	Short-circuit protection
340 g	350 g	350 g
168 mm	168 mm	168 mm
60 mm	60 mm	60 mm
178 mm	178 mm	178 mm
49.3 mm	49.3 mm	49.3 mm
IP65/67	IP65/67	IP65/67
-25 °C ... 60 °C	-25 °C ... 60 °C	-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS CO M12 DIO 4/4 M12-2A[1])	**2736071**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS CO M12 DIO 8/8 M12[1])	**2736482**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLS CO M12 DO 8 M12-2A[1])	**2736084**	1

Bus couplers – modular

The bus couplers open a high-performance local bus with up to 16 devices.

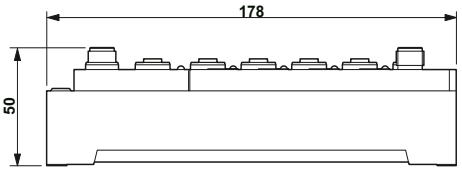
The following protocols are supported:

– INTERBUS
– PROFINET
– PROFIBUS
– DeviceNet™
– EtherNet/IP™
– Modbus TCP

Notes:

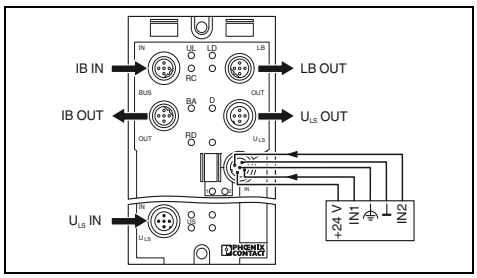
A comprehensive range of installation materials for field installation can be found on page 304

1) EMC: Class A product, see page 553



INTERBUS

Ex:



Technical data

Interface	
Fieldbus system	INTERBUS
Connection method	M12 plug-in connector, B-coded
Number of positions	5
Transmission speed	500 kbaud/2 Mbaud, can be selected
Address area assignment	-
Power supply for module electronics	
Supply voltage	24 V DC
Connection method	M12 plug-in connector
Supply voltage range	18 V DC ... 30 V DC IEC 61131-2 (including ripple)
Local bus gateway	
Transmission speed	500 kbaud/2 Mbaud, can be selected
Connection method	M12 plug-in connector, B-coded
Max. number of local bus devices	16
Max. length of local bus	20 m
Digital inputs	
Connection method	M12 plug-in connector
Connection method	2, 3, 4-wire
Maximum number of inputs	8
Filter time	3 ms
Input characteristic curve	IEC 61131-2 type 1
Protective circuit	Protection against polarity reversal
General data	
Weight	280 g
Drill hole spacing	168 mm
Width	70 mm
Degree of protection	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C

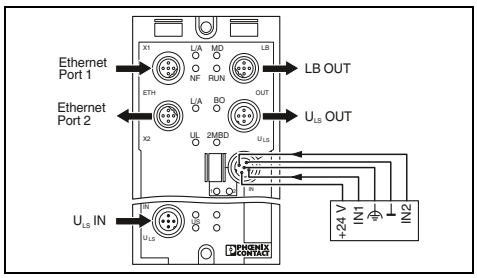
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Modular M12 bus coupler - INTERBUS M12 - PROFINET M12 - PROFIBUS M12	**FLM BK IB M12 DI 8 M12[1])**	**2736301**	1

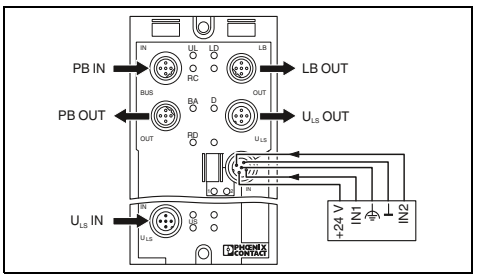
PROFINET

PROFIBUS

cULus



cULus PROFIBUS
Ex: cULus



Technical data

PROFINET	
M12 plug-in connectors, D-coded	
4	
100 Mbps, autonegotiation	
-	
24 V DC	
M12 plug-in connector	
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
500 kbaud/2 Mbaud, can be selected	
M12 plug-in connector, B-coded	
16	
20 m	
M12 plug-in connector	
2, 3, 4-wire	
8	
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
280 g	
168 mm	
70 mm	
IP65/67	
-25 °C ... 55 °C	

Technical data

PROFIBUS DP	
M12 plug-in connector, B-coded	
5	
9.64 kbaud to 12 Mbaud automatic detection	
1 ... 126, adjustable	
24 V DC	
M12 plug-in connector	
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
500 kbaud/2 Mbaud, can be selected	
M12 plug-in connector, B-coded	
16	
20 m	
M12 plug-in connector	
2, 3, 4-wire	
8	
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
280 g	
168 mm	
70 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM BK PN M12 DI 8 M12-2TX[1])	**2736741**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM BK PB M12 DI 8 M12[1])	**2736330**	1

Bus couplers – modular

The bus couplers open a high-performance local bus with up to 16 devices.

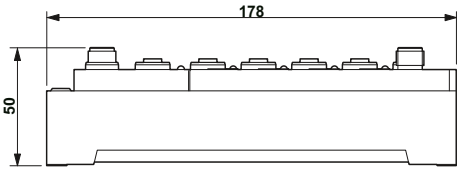
The following protocols are supported:

– INTERBUS
– PROFINET
– PROFIBUS
– DeviceNet™
– EtherNet/IP™
– Modbus TCP

Notes:

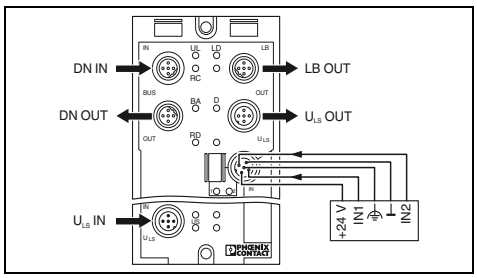
A comprehensive range of installation materials for field installation can be found on page 304

1) EMC: Class A product, see page 553



DeviceNet™

Ex:



Technical data

Interface	
Fieldbus system	DeviceNet™
Connection method	M12 plug-in connector, A-coded
Number of positions	5
Transmission speed	125 kbaud, 250 kbaud, 500 kbaud automatic detection
Address area assignment	0 ... 63, can be set
Power supply for module electronics	
Supply voltage	24 V DC
Connection method	M12 plug-in connector
Supply voltage range	18 V DC ... 30 V DC IEC 61131-2 (including ripple)
Local bus gateway	
Transmission speed	500 kbaud/2 Mbaud, can be selected
Connection method	M12 plug-in connector, B-coded
Max. number of local bus devices	16
Max. length of local bus	20 m
Digital inputs	
Connection method	M12 plug-in connector
Connection method	2, 3, 4-wire
Maximum number of inputs	8
Filter time	3 ms
Input characteristic curve	IEC 61131-2 type 1
Protective circuit	Protection against polarity reversal
General data	
Weight	280 g
Drill hole spacing	178 mm
Width	70 mm
Degree of protection	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Modular M12 bus coupler - DeviceNet™ M12 - EtherNet/IP™ M12 - Ethernet M12	**FLM BK DN M12 DI 8 M12[1])**	**2736343**	1

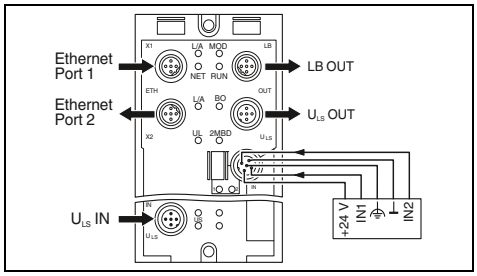
EtherNet/IP

EtherNet/IP™

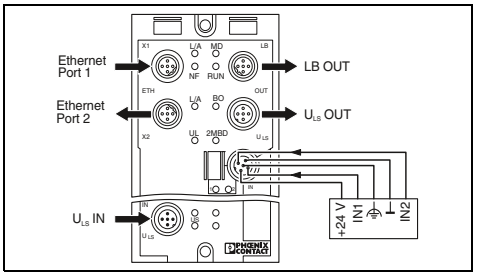
Ethernet

Modbus TCP

Ex:



Ex:



Technical data

EtherNet/IP™	Ethernet
M12 plug-in connectors, D-coded	M12 plug-in connectors, D-coded
4	4
10/100 Mbps, autonegotiation	10/100 Mbps, autonegotiation
-	-
24 V DC	24 V DC
M12 plug-in connector	M12 plug-in connector
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	18 V DC ... 30 V DC IEC 61131-2 (including ripple)
500 kbaud/2 Mbaud, can be selected	500 kbaud/2 Mbaud, can be selected
M12 plug-in connector, B-coded	M12 plug-in connector, B-coded
16	16
20 m	20 m
M12 plug-in connector	M12 plug-in connector
2, 3, 4-wire	2, 3, 4-wire
8	8
3 ms	3 ms
IEC 61131-2 type 1	IEC 61131-2 type 1
Protection against polarity reversal	Protection against polarity reversal
280 g	280 g
178 mm	178 mm
70 mm	70 mm
IP65/67	IP65/67
-25 °C ... 60 °C	-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM BK EIP M12 DI 8 M12-2TX	**2773322**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM BK ETH M12 DI 8 M12-2TX	**2736916**	1

Digital I/O devices M12 – modular

The local bus devices are used to acquire and output digital signals in a Fieldline Modular station.

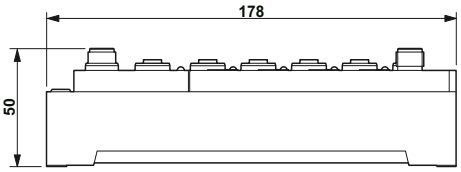
Features:

– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

Notes:

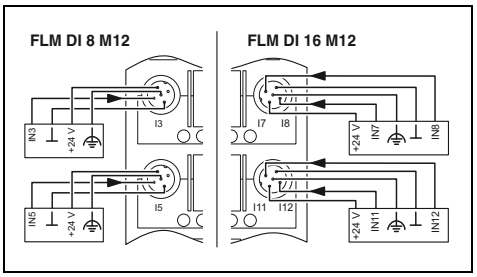
A comprehensive range of installation materials for field installation can be found on page 304

1) EMC: Class A product, see page 553



8/16 digital inputs

Ex:



Technical data

	FLM DI 8 M12[1])	FLM DI 16 M12
Interface		
Name	Local bus	
Connection method	M12 plug-in connector, B-coded	
Transmission speed	500 kbaud/2 Mbaud, can be selected	
Power supply for module electronics		
Supply voltage	24 V DC	
Connection method	M12 plug-in connector	
Supply voltage range	18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
Digital inputs		
Connection method	M12 plug-in connector	
Connection method	2, 3, 4-wire	
Maximum number of inputs	8	16
Filter time	3 ms	
Input characteristic curve	IEC 61131-2 type 1	
Protective circuit	Protection against polarity reversal	
Digital outputs		
Connection method	-	
Connection method	-	
Maximum number of outputs	-	
Maximum output current per channel	-	
Protective circuit	-	
General data		
Weight	290 g	310 g
Drill hole spacing	168 mm	
Width	70 mm	
Degree of protection	IP65/67	
Ambient temperature (operation)	-25 °C ... 60 °C	

Ordering data

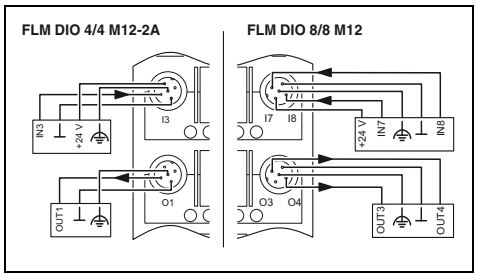
Description	Type	Order No.	Pcs. / Pkt.
Fieldline Modular M12 digital input device			
- 8 inputs	**FLM DI 8 M12[1])**	**2736288**	1
- 16 inputs	**FLM DI 16 M12**	**2736835**	1
Fieldline Modular M12 digital I/O device			
- 4 inputs, 4 outputs, 2 A			
- 8 inputs, 8 outputs			
- 16 inputs, 16 outputs			
Fieldline Modular M12 digital output device			
- 8 outputs			

4/8 digital inputs and 4/8 digital outputs

8 digital outputs

16 digital inputs, 16 digital outputs, and extended diagnostics

Ex:



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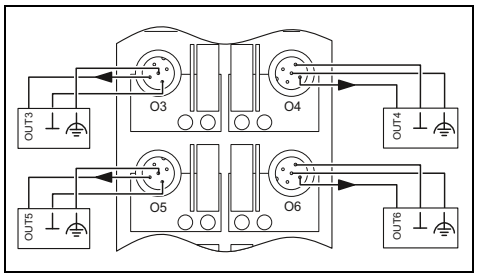
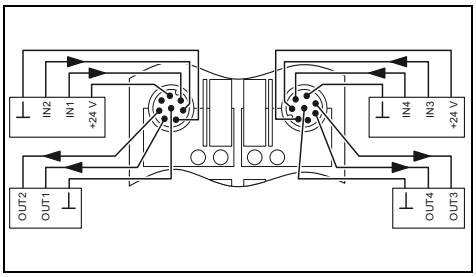




Technical data

FLM DIO 4/4 M12-2A[1])	FLM DIO 8/8 M12
Local bus	
M12 plug-in connector, B-coded	
500 kbaud/2 Mbaud, can be selected	
24 V DC	
M12 plug-in connector	
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
M12 plug-in connector	
2, 3, 4-wire	
4	8
3 ms	
IEC 61131-2 type 1	
Protection against polarity reversal	
M12 plug-in connector	
2, 3-wire	
4	8
2 A	500 mA
Short-circuit protection	
315 g	330 g
168 mm	
70 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM DIO 4/4 M12-2A[1])	**2736369**	1
FLM DIO 8/8 M12	**2736848**	1

Technical data

Local bus
M12 plug-in connector, B-coded
500 kbaud/2 Mbaud, can be selected
24 V DC
M12 plug-in connector
18 V DC ... 30 V DC IEC 61131-2 (including ripple)
-
-
-
-
-
M12 plug-in connector
2, 3-wire
8
500 mA
Short-circuit protection
310 g
168 mm
70 mm
IP65/67
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM DO 8 M12[1])	**2736291**	1

Technical data

Local bus
M12 plug-in connector, B-coded
500 kbaud/2 Mbaud, can be selected
24 V DC
M12 plug-in connector
18 V DC ... 30 V DC IEC 61131-2 (including ripple)
M12 plug-in connector, 8-pos.
2, 3-wire
16
3 ms
IEC 61131-2 type 1
Protection against polarity reversal
M12 plug-in connector, 8-pos.
2-wire
16
500 mA
Short-circuit protection, overload protection of the sensor supply
400 g
168 mm
70 mm
IP65/67
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM DIO 16/16 M12/8-DIAG[1])	**2736738**	1

M12 IO-Link master – modular

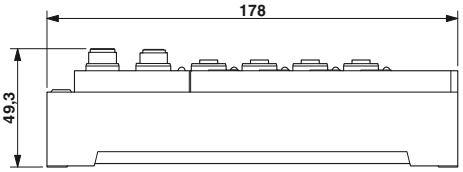
The IO-Link master enables the easy integration of IO-Link devices in a Fieldline Modular station.

Features:

– 4 IO-Link ports and 4 digital inputs
– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

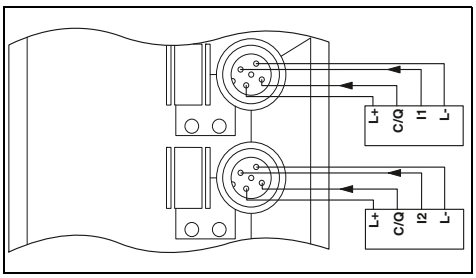
Notes:

A comprehensive range of installation materials for field installation can be found on page 304



IO-Link

4 IO-Link ports and 4 digital inputs



Technical data

Interface	
Name	Local bus
Connection method	M12 plug-in connector, B-coded
Transmission speed	500 kbaud/2 Mbaud, can be selected
Power supply for module electronics	
Supply voltage	24 V DC
Connection method	M12 plug-in connector
Supply voltage range	18 V DC ... 30 V DC IEC 61131-2 (including ripple)
IO-Link ports	
Connection method	M12 plug-in connector
Connection technology	3-wire
Number of ports	4
IO-Link port supply	
Sensor supply voltage	min. U_S - 1 V
Nominal current for every IO-Link port	max. 200 mA
Nominal current per device	800 mA
Protective circuit	Overload protection, electronics in the device Short-circuit protection, electronics in the device
Digital inputs	
Connection method	M12 plug connection
Connection technology	2, 3-wire
Number of inputs	4
Input filter time	Typ. 3 ms
Input characteristic curve	IEC 61131-2 type 1
Protective circuit	Protection against polarity reversal
General data	
Weight	280 g
Drill hole spacing	168 mm
Width	70 mm
Degree of protection	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Modular M12 I/O device - IO-Link master with four IO-Link ports and four digital inputs	**FLM IOL4 DI4 M12**	**2736990**	1

M12 analog I/O devices – modular

The local bus devices are used to acquire and output analog signals in a Fieldline Modular station.

Features:

– Seamless connection via M12 connectors
– SPEEDCON rapid interlock system
– Flexible power supply concept
– Diagnostic and status indicators
– Short-circuit and overload protection

Notes:

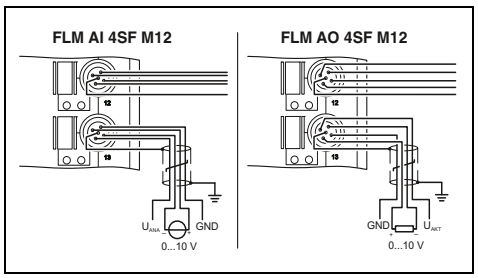
A comprehensive range of installation materials for field installation can be found on page 304

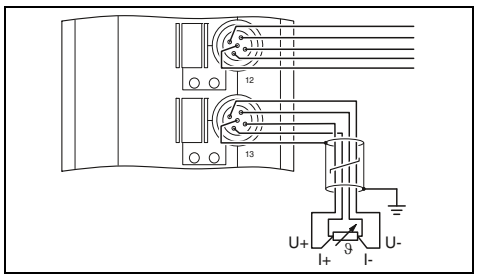
1) EMC: Class A product, see page 553

4 analog inputs/outputs

4 temperature inputs for resistive sensors

Ex: c UL us





Technical data

	FLM AI 4 SF M12[1])	FLM AO 4 SF M12[1])
Interface		
Name	Local bus	
Connection method	M12 plug-in connector, B-coded	
Transmission speed	500 kbps / 2Mbps	500 kbps / 2Mbaud switchable
Power supply for module electronics		
Supply voltage	24 V DC	
Supply voltage range	18 V DC ... 30 V DC (including ripple)	
Analog inputs		
Connection technology	2, 4-wire	-
Number of inputs	max. 4 (differential inputs, voltage or current)	-
Voltage input signal	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V	-
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA / -20 mA ... 20 mA	-
Protective circuit for voltage input	Protection against polarity reversal	-
Process data update	-	
Analog outputs		
Connection technology	-	2, 4-wire
Number of outputs	-	4
Voltage output signal	-	0 V ... 5 V / -5 V ... 5 V / 0 V ... 10 V / -10 V ... 10 V
Current output signal	-	0 mA ... 20 mA / 4 mA ... 20 mA
Protective circuit	-	Short-circuit protection
General data		
Connection method	M12 plug-in connector	
Weight	280 g	
Drill hole spacing	168 mm	
Width	70 mm	
Degree of protection	IP65/67	
Ambient temperature (operation)	-25 °C ... 60 °C	

Technical data

Local bus
M12 plug-in connector, B-coded
500 kbps / 2 Mbps
24 V DC
18 V DC ... 30 V DC (including ripple)
2, 3, 4-wire (shielded)
max. 4 (for resistance temperature detectors)
-
-
(Dependent on the connection method)
-
-
-
-
M12 plug-in connector
280 g
168 mm
70 mm
IP65/67
-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Modular M12 analog input device			
- 4 inputs	**FLM AI 4 SF M12[1])**	**2736453**	1
Fieldline Modular M12 analog output device			
- 4 outputs	**FLM AO 4 SF M12[1])**	**2736466**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM TEMP 4 RTD M12[1])	**2736819**	1

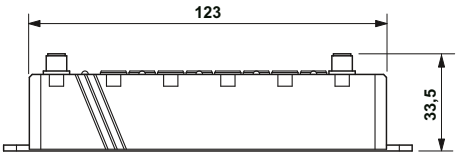
Digital I/O devices M8 – modular

The narrow local bus devices are particularly suitable for use on machines close to the process.

Features:

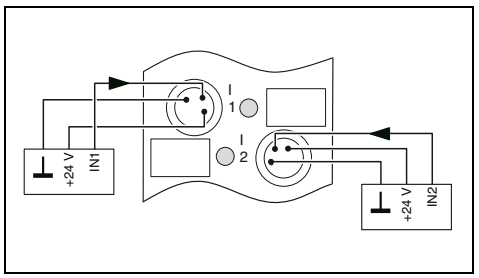
– Seamless connection via M8 connectors
– Optimized for 30 mm mounting profile
– Can also be connected to an Inline station
– Diagnostic and status indicators
– Short-circuit and overload protection

Notes:
A comprehensive range of installation materials for field installation can be found on page 304
1) EMC: Class A product, see page 553



8 digital inputs

Ex:



Technical data

Interface	
Name	Local bus
Connection method	M8 plug-in connector
Power supply for module electronics	
Supply voltage	24 V DC
Connection method	M8 plug-in connector
Supply voltage range	18 V DC ... 30 V DC IEC 61131-2 (including ripple)
Digital inputs	
Connection method	M8 plug-in connector
Connection technology	2, 3-wire
Maximum number of inputs	8
Description of the inputs	-
Filter time	3 ms
Input characteristic curve	IEC 61131-2 type 1
Protective circuit	Protection against polarity reversal
Digital outputs	
Connection method	-
Connection technology	-
Maximum number of outputs	-
Description of the outputs	-
Maximum output current per channel	-
Protective circuit	-
General data	
Weight	137 g
Drill hole spacing	133 mm
Width	29.8 mm
Degree of protection	IP65/67
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

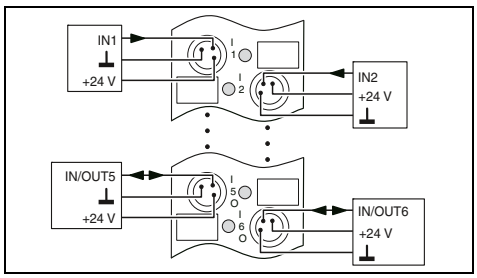
Description	Type	Order No.	Pcs. / Pkt.
Fieldline Modular M8 digital input device - 8 inputs, 500 kBD	**FLM DI 8 M8**	**2773348**	1
Fieldline Modular M8 digital I/O device - 4 inputs fixed, 4 inputs/outputs freely selectable, 500 kBD			
Fieldline Modular M8 digital output device - 4 outputs, 2 A, 500 kBD - 8 outputs, 500 kBD			

4 digital inputs and 4 digital inputs or outputs

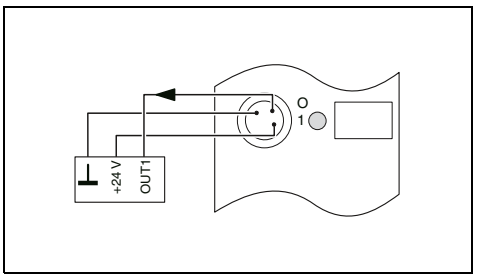
4 digital outputs

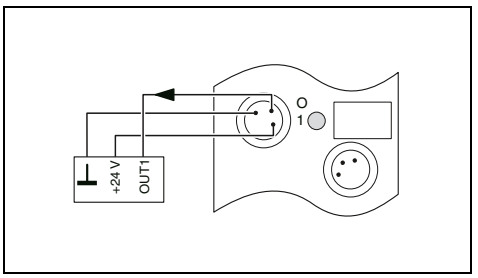
8 digital outputs

cULus
Ex: cULus



cULus
Ex: cULus





Technical data

Local bus	
M8 plug-in connector	
24 V DC	
M8 plug-in connector	
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
M8 plug-in connector	-
2, 3-wire	-
8	-
4 fixed, 4 freely selectable	-
3 ms	-
IEC 61131-2 type 1	-
Protection against polarity reversal	-
M8 plug-in connector	
2, 3-wire	
4	
Can also be used as inputs	
500 mA	
Short-circuit protection	
144 g	
133 mm	
29.8 mm	
IP65/67	
-25 °C ... 60 °C	

Technical data

Local bus	
2 M8 plug-in connector	
24 V DC	
M8 plug-in connector	
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
-	
-	
-	
-	
-	
-	
-	
M8 plug-in connector	
2, 3-wire	
4	
-	
2 A	
Short-circuit protection	
137 g	
133 mm	
29.8 mm	
IP65/67	
-25 °C ... 60 °C	

Technical data

Local bus	
M8 plug-in connector	
24 V DC	
M8 plug-in connector	
18 V DC ... 30 V DC IEC 61131-2 (including ripple)	
-	
-	
-	
-	
-	
-	
-	
M8 plug-in connector	
2, 3-wire	
8	
-	
500 mA	
Short-circuit protection	
137 g	
133 mm	
29.8 mm	
IP65/67	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM DIO 8/4 M8[1])	**2773351**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM DO 4 M8-2A[1])	**2736932**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM DO 8 M8[1])	**2736893**	1

Coupling options

Various adapters are available for connecting two systems.
- Connection of Fieldline Modular M8 to Fieldline Modular M12
- Connection of Fieldline Modular M8 or M12 to Inline Modular

Notes:

1) EMC: Class A product, see page 553

Fieldline Modular M12/M8/Inline adapter

Technical data

Local bus interface	
Interface	Fieldline Modular M12 local bus
Connection method	M12 plug-in connector, B-coded
Local bus interface	
Interface	Fieldline Modular M8 local bus
Connection method	2 M8 plug-in connectors

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Adapter piece for coupling Fieldline Modular M8 local bus devices to a Fieldline Modular M12 local bus	**FLM ADAP M12/M8**	**2736961**	1
Inline Modular branch terminal for coupling one Fieldline Modular M8 local bus at the end of an Inline station	**IB IL 24 FLM-PAC[1])**	**2736903**	1
Inline Modular branch terminal for coupling one Fieldline Modular M8 local bus to any location on each Inline station	**IB IL 24 FLM MULTI-PAC[1])**	**2737009**	1

Mounting plates

Up to seven Fieldline Modular M12 devices can be mounted on the mounting plates.

Mounting plate for up to 5 or 7 Fieldline Modular devices

Technical data

	FLM MP 5	FLM MP 7
General data		
Width	360 mm	502 mm
Depth	11 mm	
Height	185 mm	
Hole diameter	8.50 mm	
Note on dimensions	For fastening the mounting plate	
Assembly instructions	For mounting 5 Fieldline Modular devices	For mounting 7 Fieldline Modular devices
Material	Chromated aluminum	
Weight	650 g	900 g

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Modular mounting plate			
- For five Fieldline Modular M12 devices	**FLM MP 5**	**2736660**	1
- For seven Fieldline Modular M12 devices	**FLM MP 7**	**2736673**	1

System components

Various system components with M12 plug-in connectors enable the easy creation of different topologies.
– T-connectors
– Termination resistors
– Y-distributors for power and signal connections

Distributors and termination resistors

Description	Ordering data		
	Type	Order No.	Pcs. / Pkt.
Bus system T-connector, 5-pos., M12			
- PROFIBUS	**SAC-M12T/2XM12 PBDP**	**1458884**	1
- DeviceNet™/CANopen®	**SAC-5P-M12T/2XM12 VP**	**1541186**	1
Termination resistor, M12 plug			
- PROFIBUS	**SAC-5P-M12MS PB TR**	**1507803**	5
- DeviceNet™/CANopen®	**SAC-5P-M12MS CAN TR**	**1507816**	5
Power cable, 4-pos., PUR/PVC black, straight Y connector M12 on 2x straight socket M12, length: 0.3 m	**SAC-4P-M12Y/2X0,3-PUR/M12FS VP**	**1510722**	1
M12 Y-distributor/connector, with M12 socket			
M12 pin to 2 x M12 sockets	**SAC-3P-M12Y/2XM12FS PE**	**1683455**	5

Installation material

– Sealing caps with external or inner thread
– Printed marking labels or marking labels without color print

Sealing caps and marking material

Description	Ordering data		
	Type	Order No.	Pcs. / Pkt.
M12 screw plug			
for non-assigned M12 sensor/actuator connections	**PROT-M12**	**1680539**	5
for unoccupied M12 connectors of the sensor/actuator cable, flush-type plug-in connectors, and I/O devices in the field	**PROT-M12 FS**	**1560251**	5
M8 screw plug			
for unoccupied M8 sockets of the sensor/actuator cable, boxes, and flush-type plug-in connectors	**PROT-M8**	**1682540**	5
Zack marker strip, flat, 5-section, without color print			
5-section	**ZBF 12:UNBEDRUCKT**	**0809735**	10
	ZBF 8:UNBEDRUCKT	**0808781**	10
5-section	**ZBF 12 CUS**	**0825018**	1
	ZBF 8 CUS	**0825030**	1

Bus and power cable with M12 plug-in connector

Phoenix Contact offers a complete range of bus and power cables for the Fieldline system.

INTERBUS bus cable

PROFINET bus cable

PROFIBUS bus cable

DeviceNet™/CANopen® bus cable

		Ordering data		Ordering data		Ordering data		Ordering data	
Description	**Length of cable**	**Order No.**	Pcs. / Pkt.	**Order No.**	Pcs. / Pkt.	**Order No.**	Pcs. / Pkt.	**Order No.**	Pcs. / Pkt.
Pre-assembled bus cable M12 pin, straight, shielded, free conductor end									
	1 m			**1407495**	1				
	2 m	**1517877**	1	**1407496**	1	**1518025**	1	**1518177**	1
	5 m	**1517880**	1	**1407497**	1	**1518038**	1	**1518180**	1
	10 m	**1517893**	1	**1407498**	1	**1518041**	1	**1518193**	1
	15 m	**1517903**	1	**1524336**	1	**1518054**	1	**1518203**	1
Pre-assembled bus cable M12 socket, straight, shielded, free conductor end									
	1 m			**1407528**	1				
	2 m	**1517916**	1	**1407529**	1	**1518067**	1	**1518216**	1
	5 m	**1517929**	1	**1407530**	1	**1518070**	1	**1518229**	1
	10 m	**1517932**	1	**1407531**	1	**1518083**	1	**1518232**	1
	15 m	**1517945**	1			**1518096**	1	**1518245**	1
Pre-assembled bus cable M12 pin, straight, shielded, M12 socket, straight, shielded									
	0.3 m	**1517958**	1			**1518106**	1	**1518258**	1
	0.5 m	**1517961**	1			**1518119**	1	**1518261**	1
	1 m	**1517974**	1	**1407553**	1	**1518122**	1	**1518274**	1
	2 m	**1517987**	1	**1407554**	1	**1518135**	1	**1518287**	1
	5 m	**1517990**	1	**1407555**	1	**1518148**	1	**1518290**	1
	10 m	**1518009**	1	**1407556**	1	**1518151**	1	**1518300**	1
	15 m	**1518012**	1			**1518164**	1	**1518313**	1
Pre-assembled bus cable M12 pin, straight, shielded, M12 pin, straight, shielded									
	0.3 m			**1524349**	1				
	0.5 m			**1524352**	1				
	1 m			**1407524**	1				
	2 m			**1407525**	1				
	5 m			**1407526**	1				
	10 m			**1407527**	1				
	15 m			**1524404**	1				

Ethernet bus cable

Local bus cable

Fieldline Modular power cable

Fieldline Stand-Alone power cable

Description	Length of cable	Ordering data		Ordering data		Ordering data		Ordering data	
		Order No.	Pcs. / Pkt.	Order No.	Pcs. / Pkt.	Order No.	Pcs. / Pkt.	Order No.	Pcs. / Pkt.
Pre-assembled bus cable M12 pin, straight, shielded, free conductor end									
	1 m	1407356	1						
	2 m	1407357	1	1517877	1				
	5 m	1407358	1	1517880	1				
	10 m	1407359	1	1517893	1				
	15 m	1569427	1	1517903	1				
Pre-assembled bus cable M12 socket, straight, shielded, free conductor end									
	1 m	1407380	1						
	2 m	1407381	1	1517916	1				
	5 m	1407382	1	1517929	1				
	10 m	1407383	1	1517932	1				
	15 m			1517945	1				
Pre-assembled bus cable M12 pin, straight, shielded, M12 socket, straight, shielded									
	0.13 m			1518478	1				
	0.3 m			1517958	1				
	0.5 m			1517961	1				
	1 m	1407400	1	1517974	1				
	2 m	1407401	1	1517987	1				
	5 m	1407402	1	1517990	1				
	10 m	1407403	1	1518009	1				
	15 m			1518012	1				
Pre-assembled bus cable M12 pin, straight, shielded, M12 pin, straight, shielded									
	0.3 m	1569430	1						
	0.5 m	1569443	1						
	1 m	1407376	1						
	2 m	1407377	1						
	5 m	1407378	1						
	10 m	1407379	1						
	15 m	1569498	1						
Pre-assembled power cable M12 pin, straight, free conductor end									
	2 m					1518326	1	1555606	1
	5 m					1518339	1	1555619	1
	10 m					1518342	1	1555622	1
	15 m					1518355	1	1555635	1
Pre-assembled power cable M12 socket, straight, free conductor end									
	2 m					1518368	1	1555648	1
	5 m					1518371	1	1555651	1
	10 m					1518384	1	1555664	1
	15 m					1518397	1	1555677	1
Pre-assembled power cable M12 pin, straight, M12 socket, straight									
	0.13 m					1518481	1		
	0.3 m					1518407	1	1555680	1
	0.5 m					1518410	1	1555693	1
	1 m					1518423	1	1555703	1
	2 m					1518436	1	1555716	1
	5 m					1518449	1	1555729	1
	10 m					1518452	1	1555732	1
	15 m					1518465	1	1555745	1

Bus and power cable with M8 plug-in connector

The following assembled cables are available for connecting Fieldline Modular M8 devices:

– System cables for the supply voltage and bus signal
– Power cables for the actuator voltage

Straight connector

Angled connector

Description	Length of cable	Ordering data: Type	Order No.	Pcs. / Pkt.	Ordering data: Type	Order No.	Pcs. / Pkt.
Pre-assembled system cable M8 pin, straight, shielded, free conductor end							
	2 m	**SAC-4P-M 8MS/ 2,0-950**	**1543249**	1			
	5 m	**SAC-4P-M 8MS/ 5,0-950**	**1543252**	1			
	10 m	**SAC-4P-M 8MS/10,0-950**	**1543265**	1			
	20 m	**SAC-4P-M 8MS/20,0-950**	**1543281**	1			
Pre-assembled system cable M8 pin, angled, shielded, free conductor end							
	2 m				**SAC-4P-M 8MR/ 2,0-950**	**1550850**	1
	5 m				**SAC-4P-M 8MR/ 5,0-950**	**1550863**	1
	10 m				**SAC-4P-M 8MR/10,0-950**	**1550876**	1
	20 m				**SAC-4P-M 8MR/20,0-950**	**1550892**	1
Pre-assembled system cable M8 socket, straight, shielded, free conductor end							
	2 m	**SAC-4P- 2,0-950/M 8FS**	**1543294**	1			
	5 m	**SAC-4P- 5,0-950/M 8FS**	**1543304**	1			
	10 m	**SAC-4P-10,0-950/M 8FS**	**1543317**	1			
	20 m	**SAC-4P-20,0-950/M 8FS**	**1543333**	1			
Pre-assembled system cable M8 socket, angled, shielded, free conductor end							
	2 m				**SAC-4P- 2,0-950/M 8FR**	**1550902**	1
	5 m				**SAC-4P- 5,0-950/M 8FR**	**1550915**	1
	10 m				**SAC-4P-10,0-950/M 8FR**	**1550928**	1
	20 m				**SAC-4P-20,0-950/M 8FR**	**1550944**	1
Pre-assembled system cable M8 pin, straight, shielded, M8 socket, straight, shielded							
	0.13 m	**SAC-4P-M 8MS/ 0,13-950/M 8FS**	**1543346**	1			
	0.3 m	**SAC-4P-M 8MS/ 0,3-950/M 8FS**	**1543511**	1			
	0.5 m	**SAC-4P-M 8MS/ 0,5-950/M 8FS**	**1543524**	1			
	1 m	**SAC-4P-M 8MS/ 1,0-950/M 8FS**	**1543537**	1			
	2 m	**SAC-4P-M 8MS/ 2,0-950/M 8FS**	**1543359**	1			
	5 m	**SAC-4P-M 8MS/ 5,0-950/M 8FS**	**1543362**	1			
	10 m	**SAC-4P-M 8MS/10,0-950/M 8FS**	**1543375**	1			
	20 m	**SAC-4P-M 8MS/20,0-950/M 8FS**	**1543391**	1			
Pre-assembled system cable M8 pin, angled, shielded, M8 socket, angled, shielded							
	0.13 m				**SAC-4P-M 8MR/ 0,13-950/M 8FR**	**1550957**	1
	0.3 m				**SAC-4P-M 8MR/ 0,3-950/M 8FR**	**1550960**	1
	0.5 m				**SAC-4P-M 8MR/ 0,5-950/M 8FR**	**1550973**	1
	1 m				**SAC-4P-M 8MR/ 1,0-950/M 8FR**	**1550986**	1
	2 m				**SAC-4P-M 8MR/ 2,0-950/M 8FR**	**1550999**	1
	5 m				**SAC-4P-M 8MR/ 5,0-950/M 8FR**	**1551008**	1
	10 m				**SAC-4P-M 8MR/10,0-950/M 8FR**	**1551011**	1
	20 m				**SAC-4P-M 8MR/20,0-950/M 8FR**	**1551037**	1
Pre-assembled power cable M8 socket, straight, free conductor end, 4 x 0.34 mm²							
	2 m	**SAC-4P- 2,0-PUR/M 8FS 0,34**	**1543582**	1			
	5 m	**SAC-4P- 5,0-PUR/M 8FS 0,34**	**1534818**	5			
	10 m	**SAC-4P-10,0-PUR/M 8FS 0,34**	**1543595**	1			
	20 m	**SAC-4P-20,0-PUR/M 8FS 0,34**	**1543618**	1			
Pre-assembled power cable M8 socket, angled, free conductor end, 4 x 0.34 mm²							
	2 m				**SAC-4P- 2,0-PUR/M 8FR 0,34**	**1553077**	1
	5 m				**SAC-4P- 5,0-PUR/M 8FR 0,34**	**1553080**	1
	10 m				**SAC-4P-10,0-PUR/M 8FR 0,34**	**1553093**	1
	20 m				**SAC-4P-20,0-PUR/M 8FR 0,34**	**1553116**	1

Mountable plug-in connectors

Connectors that can be assembled enable the flexible cabling of Fieldline devices.
– M12 or M8 connection method
– Shielded or unshielded
– Spring-cage, QUICKON or Piercecon connection

M12 plug-in connector

M8 plug-in connector

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
M12 plug-in connector, shielded						
M12 pin, 5-pos., A-coded, spring-cage connection	**SACC-M12MS-5SC SH**	**1512555**	1			
M12 pin, 5-pos., B-coded, spring-cage connection	**SACC-M12MSB-5SC SH**	**1513570**	1			
M12 pin, 4-pos., D-coded, QUICKON connection	**SACC-M12MSD-4Q SH**	**1543223**	1			
M12 socket, 5-pos., A-coded, spring-cage connection	**SACC-M12FS-5SC SH**	**1512571**	1			
M12 socket, 5-pos., B-coded, spring-cage connection	**SACC-M12FSB-5SC SH**	**1513596**	1			
M8 plug-in connector, shielded						
M8 pin, 4-pos., screw connection				**SACC-M 8MS-4CON-M-0,34-SH**	**1542897**	1
M8 socket, 4-pos., screw connection				**SACC-M 8FS-4CON-M-0,34-SH**	**1542910**	1
M12 plug-in connector, unshielded						
M12 pin, 4-pos., A-coded, QUICKON connection method, cross section 0.14 - 0.34 mm², SPEEDCON quick locking system	**SACC-MS-4QO-0,34-M SCO**	**1521575**	1			
M12 socket, 4-pos., A-coded, QUICKON connection method, cross section 0.14 - 0.34 mm², SPEEDCON quick locking system	**SACC-FS-4QO-0,34-M SCO**	**1521588**	1			
M12 pin, 4-pos., A-coded, QUICKON connection method, cross section 0.34 - 0.75 mm², SPEEDCON quick locking system	**SACC-MS-4QO-0,75-M SCO**	**1521591**	1			
M12 socket, 4-pos., A-coded, QUICKON connection method, cross section 0.34 - 0.75 mm², SPEEDCON quick locking system	**SACC-FS-4QO-0,75-M SCO**	**1521601**	1			
M12 pin, 5-pos., A-coded, spring-cage connection	**SACC-M12MS-5SC M**	**1508187**	1			
M12 socket, 5-pos., A-coded, spring-cage connection	**SACC-M12FS-5SC M**	**1508200**	1			
M8 plug-in connector, unshielded						
M8 pin, 3-pos., Piercecon® connection				**SACC-M 8MS-3PCON**	**1506752**	1
M8 socket, 4-pos., Piercecon® connection				**SACC-M 8FS-4PCON**	**1506781**	1

Product overview

M12 I/O devices

Digital input	Digital input/output			Digital output
4 channels	2/2 channels	4/3 channels	4/4 channels	8 channels
312	313	313	313	312

M8 I/O devices

Digital input	Digital output
4 channels	4/4 channels
314	314

I/O devices in ME housing

Digital input/output		Digital output
4/4 channels	4/3 channels	4 channels
315	315	315

Gateways

PROFIBUS DP

Standard function	Extended function
316	316

Inline Modular

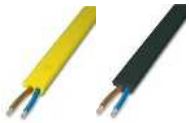
Standard function
317

Power supply units

Primary-switched

2.4 A	4.8 A
318	318

Accessories – installation material



VS-ASI-FC-...

Flat-ribbon conductors

319

...ASI-...-FIX

Mounting material

319

Q 1,5/...-ASI BK

Panel feed-throughs

319

HC-M-KV-...

Screw connections

319

VS-ASI-J-Y...

Distributors

320

VS-ASI-...-PUR-...M12...

Distributors with M12 round cable

320

VS-ASI-J-Y-...

Distributors with M12 connection

321

SAC-4P-...

M12 round cables

307

ASI CC ADR

Manual addressing device for AS-i modules

ASI CC ADR CAB CINCH

Cinch connecting cable, for addressing FLX ASI M12 devices

PB ECO LINK

PROFIBUS ECO Link, RS-232 (V.24) PROFIBUS converter

www.phoenixcontact.net/products

Digital I/O devices with M12 connection technology

The innovative locking mechanism enables quick and easy installation of the I/O devices.

Features:

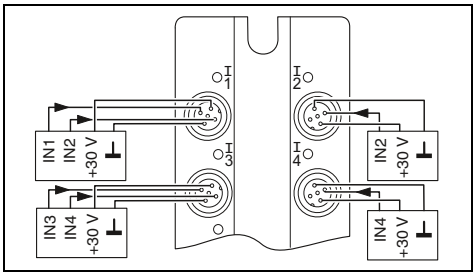
- Optimized for direct mounting and DIN rail mounting
- Tool-free connection to AS-Interface using penetration technique
- M12 connection technology with SPEEDCON rapid interlock system for the I/Os

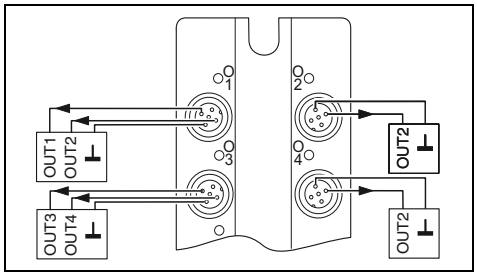
Notes:

1) EMC: Class A product, see page 553

4 digital inputs

4 digital outputs





Technical data

Interface		
Fieldbus system	AS-i	AS-i
Connection method	Flat-ribbon cable penetration technique	Flat-ribbon cable penetration technique
AS-Interface		
AS-i specification	2.1	2.0
Required master specification	>= 2.0	>= 2.0
AS-i profile	S-0.A.2	S-8.1
Digital inputs		
Connection method	M12 plug-in connector	-
Connection technology	2, 3-wire	-
Maximum number of inputs	4	-
Input characteristic curve	IEC 61131-2 type 2	-
Digital outputs		
Connection method	-	M12 plug-in connector
Connection technology	-	2-wire
Maximum number of outputs	-	4
Maximum output current per channel	-	2 A
Maximum output current per module / terminal block	-	4 A
General data		
Weight	195 g	195 g
Drill hole spacing	108 mm	108 mm
Width	58 mm	58 mm
Height	118 mm	118 mm
Depth	35 mm	35 mm
Degree of protection	IP65/67	IP65/67
Ambient temperature (operation)	-25 °C ... 70 °C	-25 °C ... 70 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Extension AS-i digital input device			
- 4 inputs	**FLX ASI DI 4 M12[1])**	**2773429**	1
Fieldline Extension AS-i digital output device			
- Four outputs, 2 A	**FLX ASI DO 4 M12-2A[1])**	**2773458**	1
Fieldline Extension AS-i digital I/O device			
- 2 inputs, 2 outputs, 2 A			
- Four inputs, three outputs, 2 A			
- 4 inputs, 4 outputs, 2 A			

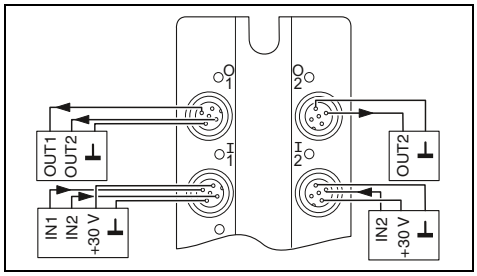
Accessories

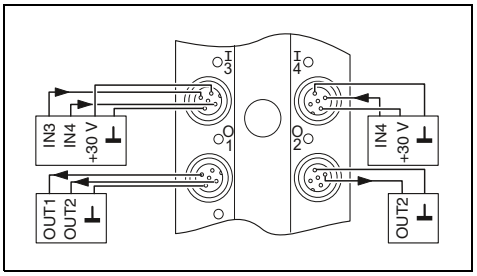
M12 screw plug	**PROT-M12**	**1680539**	5
Label sheet for laser printers, 64 x 16 mm, color: white	**BMKL 64X16 WH**	**0821807**	2
Label sheet for laser printers, 108 x 16 mm, color: white			
Manual addressing device, for AS-Interface devices	**ASI CC ADR**	**2741338**	1
Programming cable, for addressing the AS-i devices	**ASI CC ADR CAB CINCH**	**2741341**	1

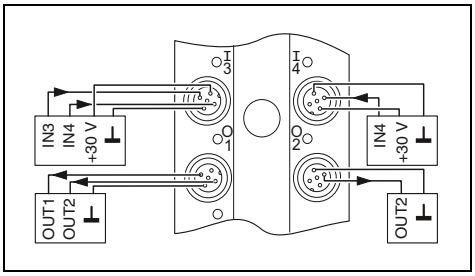
2 digital inputs and 2 digital outputs

4 digital inputs and 3 digital outputs

4 digital inputs and 4 digital outputs







Technical data

AS-i	
Flat-ribbon cable penetration technique	
2.1	
>= 2.0	
S-B.A.2	
M12 plug-in connector	
2, 3-wire	
2	
IEC 61131-2 type 2	
M12 plug-in connector	
2-wire	
2	
2 A	
4 A	
195 g	
108 mm	
58 mm	
118 mm	
35 mm	
IP65/67	
-25 °C ... 70 °C	

Technical data

AS-i	
Flat-ribbon cable penetration technique	
2.1	
>= 2.0	
S-7.A.2	
M12 plug-in connector	
2, 3-wire	
4	
IEC 61131-2 type 2	
M12 plug-in connector	
2-wire	
3	
2 A	
4 A	
245 g	
108 mm	
58 mm	
150 mm	
35 mm	
IP65/67	
-25 °C ... 70 °C	

Technical data

AS-i	
Flat-ribbon cable penetration technique	
3.0	
>= 3.0	
S-7.A.7	
M12 plug-in connector	
2, 3-wire	
4	
IEC 61131-2 type 2	
M12 plug-in connector	
2-wire	
4	
2 A	
245 g	
108 mm	
58 mm	
150 mm	
35 mm	
IP65/67	
-25 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FLX ASI DIO 2/2 M12-2A[1])	2773432	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLX ASI DIO 4/3 M12-2A[1])	2773445	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLX ASI 3.0 DIO 4/4 M12-2A[1])	2773474	1

Accessories

PROT-M12	1680539	5
BMKL 64X16 WH	0821807	2
ASI CC ADR	2741338	1
ASI CC ADR CAB CINCH	2741341	1

Accessories

PROT-M12	1680539	5
BMKL 11,5 (108X16) WH	0821797	2
ASI CC ADR	2741338	1
ASI CC ADR CAB CINCH	2741341	1

Accessories

PROT-M12	1680539	5
BMKL 11,5 (108X16) WH	0821797	2
ASI CC ADR	2741338	1
ASI CC ADR CAB CINCH	2741341	1

Digital I/O devices with M8 connection technology

The digital I/O devices are particularly suitable for use in machines close to the process.

Features:

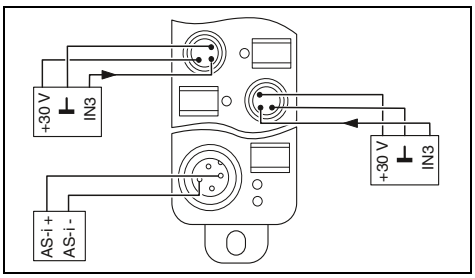
– Optimized for 30 mm mounting profile
– M12 connection technology with SPEEDCON rapid interlock system for the AS-Interface connection
– M8 connection technology for the I/Os

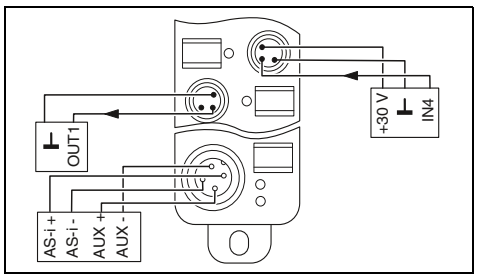
Notes:

1) EMC: Class A product, see page 553

4 digital inputs

4 digital inputs and 4 digital outputs





Technical data

Interface	
Fieldbus system	AS-i
Connection method	M12 plug-in connector, (A-coded)
AS-Interface	
AS-i specification	2.0
Required master specification	>= 2.0
AS-i profile	S-0.0
Digital inputs	
Connection method	M8 plug-in connector
Connection technology	2, 3-wire
Maximum number of inputs	4
Input characteristic curve	IEC 61131-2 type 2
Digital outputs	
Connection method	-
Connection technology	-
Maximum number of outputs	-
Maximum output current per channel	-
Maximum output current per module / terminal block	-
General data	
Weight	85 g
Drill hole spacing	93 mm
Width	30 mm
Height	26 mm
Depth	103 mm
Degree of protection	IP65/67
Ambient temperature (operation)	-25 °C ... 70 °C

Technical data

Interface	
Fieldbus system	AS-i
Connection method	M12 plug-in connector, (A-coded)
AS-Interface	
AS-i specification	2.0
Required master specification	>= 2.0
AS-i profile	S-7.0
Digital inputs	
Connection method	M8 plug-in connector
Connection technology	2, 3-wire
Maximum number of inputs	4
Input characteristic curve	IEC 61131-2 type 2
Digital outputs	
Connection method	M8 plug-in connector
Connection technology	2-wire
Maximum number of outputs	4
Maximum output current per channel	1 A
Maximum output current per module / terminal block	4 A
General data	
Weight	125 g
Drill hole spacing	133 mm
Width	30 mm
Height	26 mm
Depth	143 mm
Degree of protection	IP65/67
Ambient temperature (operation)	-25 °C ... 70 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Extension AS-i digital input device			
- 4 inputs	**FLX ASI DI 4 M8[1])**	**2773403**	1
Fieldline Extension AS-i digital I/O device			
- 4 inputs, 4 outputs, 1 A			

Ordering data

Type	Order No.	Pcs. / Pkt.
FLX ASI DIO 4/4 M8-1A[1])	**2773416**	1

Accessories

M8 screw plug	**PROT-M8**	**1682540**	5
Zack marker strip, flat, 10-section, without color print	**ZBF 8:UNBEDRUCKT**	**0808781**	10
Manual addressing device, for AS-Interface devices	**ASI CC ADR**	**2741338**	1

Accessories

PROT-M8	**1682540**	5
ZBF 8:UNBEDRUCKT	**0808781**	10
ASI CC ADR	**2741338**	1

Digital I/O devices with COMBICON connection technology

The narrow digital I/O devices in the ME range are particularly suitable for use in the control cabinet.

Features:

– 12.5 mm design width
– Optimized for DIN rail mounting
– COMBICON connection technology for AS-Interface
– COMBICON connection technology for the I/Os

Notes:

1) EMC: Class A product, see page 553

4 digital outputs

4 digital inputs and 3/4 digital outputs

Technical data

Interface	
Fieldbus system	AS-i
Connection method	COMBICON plug-in connectors
AS-Interface	
AS-i specification	2.1
Required master specification	>= 2.0
AS-i profile	S-0.A.0
Digital inputs	
Connection method	COMBICON plug-in connectors
Connection method	2, 3-wire
Maximum number of inputs	4
Digital outputs	
Connection method	-
Connection method	-
Maximum number of outputs	-
Maximum output current per channel	-
Maximum output current per module / terminal block	-
General data	
Weight	150 g
Width	22.5 mm
Height	102 mm
Depth	105 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 60 °C

Technical data

	ASI IO ME DIO 4/4 AB[1])	ASI IO ME DIO 4/3 AB[1])
Interface		
Fieldbus system	AS-i	
Connection method	COMBICON plug-in connectors	
AS-Interface		
AS-i specification	3.0	2.1
Required master specification	>= 3.0	>= 2.0
AS-i profile	S-7.A.7	S-7.A.0
Digital inputs		
Connection method	COMBICON plug-in connectors	
Connection method	2, 3-wire	
Maximum number of inputs	4	
Digital outputs		
Connection method	COMBICON plug-in connectors	
Connection method	2-wire	2, 3-wire
Maximum number of outputs	4	3
Maximum output current per channel	0.7 A	1.5 A
Maximum output current per module / terminal block	2.8 A	6 A
General data		
Weight	150 g	
Width	22.5 mm	
Height	102 mm	
Depth	105 mm	
Degree of protection	IP20	
Ambient temperature (operation)	-25 °C ... 60 °C	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Extension AS-i digital input device, including COMBICON plug - 4 inputs	**ASI IO ME DI 4 AB[1])**	**2741671**	1
Fieldline Extension AS-i digital I/O device, including COMBICON plug - 4 inputs, 4 outputs - 4 inputs, 3 outputs			

Ordering data

Type	Order No.	Pcs. / Pkt.
ASI IO ME DIO 4/4 AB[1])	**2773542**	1
ASI IO ME DIO 4/3 AB[1])	**2741668**	1

Accessories

Manual addressing device, for AS-Interface devices	**ASI CC ADR**	**2741338**	1
Programming cable, for addressing the AS-i devices	**ASI CC ADR CAB CINCH**	**2741341**	1

Accessories

ASI CC ADR	**2741338**	1
ASI CC ADR CAB CINCH	**2741341**	1

Gateways for PROFIBUS DP

Fieldline Extension AS-Interface gateways enable the easy integration of AS-Interface in a PROFIBUS DP system.

Features:

– AS-Interface specification 3.0
– For one or two AS-Interface networks
– Stainless steel housing
– IP20 protection

Notes:

1) EMC: Class A product, see page 553

Standard function

Extended function, double master

	Technical data	Technical data
Interfaces		
PROFIBUS DP remote bus	1x D-SUB-9 plug	1x D-SUB-9 plug
AS-Interface	2-pos. COMBICON plug	2 x 2-pos. COMBICON plug
Power supply		
Typical current consumption	Approx. 200 mA (from the AS-i network)	Approx. 200 mA (from AS-i circuit 1)
Indicators		
Operating voltage, electronics module (UL)	Green LED	Green LED
Operating voltage AS-i (U ASI)	Green LED	Green LED
AS-i transmission (ASI ACTIVE)	Green LED	Green LED
Programming mode active, automatic slave programming possible	Green LED	Green LED
Configuration mode active (PRJ Enable)	Yellow LED	Yellow LED
AS-i configure error (CONFIG ERR)	Red LED	Red LED
AS-Interface		
Number of AS-i slaves	62	62
AS-i specification	3.0	3.0
Operating elements		
Keys	2 buttons (Mode/Set) for configuring the AS-i network	4 buttons (Mode/Set/ESC/OK) for configuring the AS-i network
General data		
Weight	300 g	460 g
Width	45 mm	75 mm
Height	120 mm	120 mm
Depth	44 mm	83 mm
Degree of protection	IP20	IP20
Ambient temperature (operation)	0 °C ... 55 °C	0 °C ... 55 °C
Ambient temperature (storage/transport)	-25 °C ... 85 °C	-25 °C ... 85 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fieldline Extension AS-i gateway for PROFIBUS DP			
- With standard function	**FLX ASI MA PB SF[1])**	**2773597**	1
- With extended function, double master	**FLX ASI MA 2 PB EF[1])**	**2773607**	1

Accessories

PROFIBUS ECO Link, RS-232 (V.24) PROFIBUS converter, incl. software for PC	**PB ECO LINK[1])**	**2741480**	1

Gateway for Inline Modular

When used in combination with an appropriate Inline bus coupler, the AS-Interface gateway for Inline enables universal integration in the following networks, for example:
– INTERBUS
– PROFINET
– PROFIBUS
– CANopen®
– DeviceNet™
– EtherNet/IP™

Notes:

The driver function blocks can be obtained free of charge on the Internet at www.phoenixcontact.net/products under Download on the product page of the corresponding module.

1) EMC: Class A product, see page 553

Standard function

Technical data

Interfaces	
Local bus	Inline data jumper
AS-Interface	Inline connectors
Power supply	
Typical current consumption	200 mA (from the AS-i network)
Indicators	
Local bus diagnostics	Green LED
Operating voltage AS-i (U ASI)	Green LED
PCP communication	Green LED
Automatic address programming active	Green LED
Configuration mode active (PRJ Enable)	Yellow LED
AS-i configure error (CONFIG ERR)	Red LED
AS-Interface	
Number of AS-i slaves	62
AS-i specification	2.1
Operating elements	
Keys	2 buttons (Mode/Set) for configuring the AS-i network
General data	
Number of PCP data	1 word
Weight	210 g
Width	73.2 mm
Height	119.8 mm
Depth	71.5 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 55 °C
Ambient temperature (storage/transport)	-25 °C ... 85 °C

Ordering data

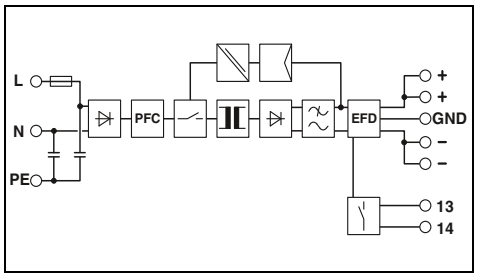
Description	Type	Order No.	Pcs. / Pkt.
Fieldline Extension AS-i gateway for Inline Modular			
	ASI MA IL UNI[1])	**2736628**	1

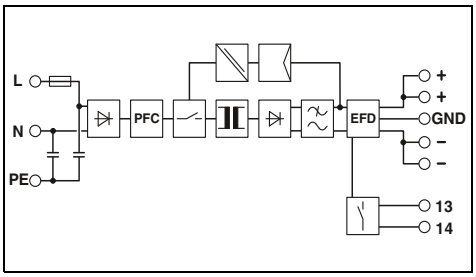
Power supply units

The power supply units specially designed for AS-Interface offer the following features:
– 2.4 A or 4.8 A nominal output current
– Integrated ground fault detector
– Wide-range input for operation on all common AC and DC networks

2.4 A

4.8 A





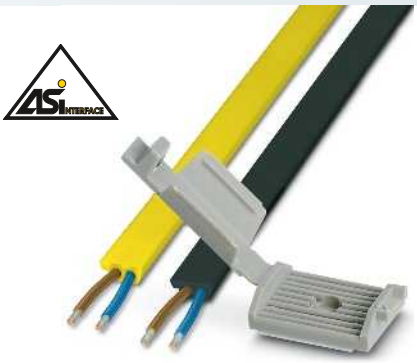
	Technical data	Technical data
Input data		
Nominal input voltage range	100 V AC ... 240 V AC	100 V AC ... 240 V AC
Frequency range	45 Hz ... 65 Hz / 0 Hz	45 Hz ... 65 Hz / 0 Hz
Current consumption (nominal load)	Approx. 1 A (120 V AC) / 0.5 A (230 V AC)	Approx. 1.8 A (120 V AC) / 1 A (230 V AC)
Inrush current limitation at 25°C (typ.) / I^2t	< 15 A / 2.2 A^2s	< 15 A / 2.2 A^2s
Mains buffering (I_N, typ.)	> 20 ms (120 V AC) / > 80 ms (230 V AC)	> 60 ms (120 V AC) / > 100 ms (230 V AC)
Switch-on time after applying the mains voltage	< 0.5 s	< 0.5 s
Input fuse	5 A (slow-blow, internal)	5 A (slow-blow, internal)
Output data		
Nominal output voltage	30.1 V DC ±1.5%	30.1 V DC ±1.5%
Output current	2.4 A / 3 A	4.8 A / 6 A
Output current / max. output current	2.4 A / - 3 A	4.8 A / - 6 A
Max. power dissipation (no load / nominal load)	3 W / 11 W	4 W / 16 W
Residual ripple	< 30 mV_{PP}	< 30 mV_{PP}
Signaling		
Signaling DC OK	LED	LED
Signaling EFD	LED, relay contact	LED, relay contact
General data		
Weight / dimensions W x H x D	0.75 kg / 55 x 145 x 125 mm	0.9 kg / 70 x 145 x 125 mm
Installation position	horizontal DIN rail NS 35, EN 60715	horizontal DIN rail NS 35, EN 60715
Spacing when mounting	Can be aligned: horizontally 0 mm, vertically 50 mm	Can be aligned: horizontally 0 mm, vertically 50 mm
Connection method	Plug-in spring-cage connection	Plug-in spring-cage connection
Degree of protection / protection class	IP20 / I, IEC 61140, EN 61140, VDE 0140-1	IP20 / I, IEC 61140, EN 61140, VDE 0140-1
MTBF (EN 29500, 40°C)	> 500000 h	> 500000 h
Type of housing	AluNox (AlMg1)	AluNox (AlMg1)
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C derating)	-25 °C ... 70 °C (> 60 °C derating)
Ambient temperature (storage/transport)	-40 °C ... 85 °C	-40 °C ... 85 °C
UL approvals	UL/C-UL listed UL 508, UL/C-UL Recognized UL 60950	UL/C-UL listed UL 508, UL/C-UL Recognized UL 60950

Description	Ordering data Type	Order No.	Pcs. / Pkt.	Ordering data Type	Order No.	Pcs. / Pkt.
Power supply unit, primary-switched	**ASI QUINT 100-240/2.4 EFD**	**2736686**	1	**ASI QUINT 100-240/4.8 EFD**	**2736699**	1

Flat-ribbon conductors, flat-ribbon conductor connectors and panel feed-throughs

Applications can be implemented in a wide range of fields thanks to the four different flat-ribbon conductor materials.

Components, e.g., with QUICKON fast connection technology, are available to connect or feed through these flat-ribbon conductors.



Flat-ribbon conductors and accessories

Flat-ribbon conductors and panel feed-throughs with QUICKON fast connection technology

Technical data

		VS-ASI-FC-PVC...	VS-ASI-FC-PUR...
Mechanical data			
No. of pos.		2	2
Degree of protection		-	-
Cable data			
Outer sheath material		PVC	PUR
Conductor cross section		1.5 mm²	1.5 mm²
Connector data QUICKON connection			
Conductor cross section [mm²]		- ... -	- ... -
Conductor cross section [AWG]		- ... -	- ... -
Temperature data			
Plug / socket	[°C]	-	-
Cable, fixed installation	[°C]	-30 ... 90	-40 ... 85
Cable, flexible installation	[°C]	-20 ... 90	-30 ... 85

Technical data

		Q 1,5/4IDC	Q 1,5/4M20
Mechanical data			
No. of pos.		4	4
Degree of protection		IP65/67	IP65/67
Cable data			
Outer sheath material		-	-
Conductor cross section		-	-
Connector data QUICKON connection			
Conductor cross section [mm²]		0.75 mm² ... 1.5 mm²	0.75 mm² ... 1.5 mm²
Conductor cross section [AWG]		18 ... 16	18 ... 16
Temperature data			
Plug / socket	[°C]	-25 ... 80	-25 ... 80
Cable, fixed installation	[°C]	-	-
Cable, flexible installation	[°C]	-	-

Ordering data

Description	Cable length	Type	Order No.	Pcs. / Pkt.
AS-Interface EPDM flat-ribbon conductor, 2 x 1.5 mm²				
Yellow	100 m	**VS-ASI-FC-EPDM-YE 100M**	**1432402**	1
Yellow	1000 m	**VS-ASI-FC-EPDM-YE 1000M**	**1434646**	1
Black	100 m	**VS-ASI-FC-EPDM-BK 100M**	**1432415**	1
Black	1000 m	**VS-ASI-FC-EPDM-BK 1000M**	**1434659**	1
AS-Interface PVC flat-ribbon conductor acc. to UL, 2 x 1.5 mm²				
Yellow	100 m	**VS-ASI-FC-PVC-UL-YE 100M**	**1404906**	1
Yellow	1000 m	**VS-ASI-FC-PVC-UL-YE/1000**	**1404867**	1
Black	100 m	**VS-ASI-FC-PVC-UL-BK 100M**	**1404919**	1
Black	1000 m	**VS-ASI-FC-PVC-UL-BK/1000**	**1404870**	1
AS-Interface TPE flat-ribbon conductor acc. to UL, 2 x 1.5 mm²				
Yellow	100 m	**VS-ASI-FC-TPE-UL-YE 100M**	**1404922**	1
Yellow	1000 m	**VS-ASI-FC-TPE-UL-YE 1000M**	**1434662**	1
Black	100 m	**VS-ASI-FC-TPE-UL-BK 100M**	**1404935**	1
Black	1000 m	**VS-ASI-FC-TPE-UL-BK 1000M**	**1434675**	1
AS-Interface PUR flat-ribbon conductor, 2 x 1.5 mm²				
Yellow	100 m	**VS-ASI-FC-PUR-YE 100M**	**1404883**	1
Yellow	1000 m	**VS-ASI-FC-PUR-YE/1000**	**1404841**	1
Black	100 m	**VS-ASI-FC-PUR-BK 100M**	**1404896**	1
Black	1000 m	**VS-ASI-FC-PUR-BK/1000**	**1404854**	1
Flat connector, 4-pos., for connecting one or two AS-i flat-ribbon conductors				
Panel feed-through, for accommodating one or two AS-i flat-ribbon conductors, on the rear side with manual solder/slip-on connection 4.8 x 0.8 mm				
Panel feed-through, for accommodating one or two AS-Interface flat-ribbon conductors, on the rear side with four individual 1.5 mm² wires				
	0.5 m			
Metal gland, for AS-Interface flat-ribbon conductor				
Thread type: M20				
Thread type: M25				

Ordering data

Type	Order No.	Pcs. / Pkt.
Q 1,5/4IDC/24-24KU-KU-ASI-BK	**1585058**	1
Q 1,5/4FL/24-M20KU-ESA-ASI BK	**1437261**	1
Q 1,5/4A50/24-M20KU-ESA-ASI BK	**1437274**	1
HC-M-KV-M20(1ASI)	**1584017**	10
HC-M-KV-M25(1ASI)	**1584020**	10

Distributor with spring-cage connection and with round conductors

Thanks to the distributors, it is extremely easy to create various topologies.

The following combinations are available:

– Flat-ribbon conductor to spring-cage terminal block
– Flat-ribbon conductor to flat-ribbon conductor
– Flat-ribbon conductor to round cable

Flat-ribbon conductor distributors and distributors with spring-cage connection

Distributor with round cable and molded M12 plug-in connector with SPEEDCON

Technical data

		SAC-ASI-J-Y-B...	VS-ASI-J-Y-Y-N
Electrical data			
Rated voltage		≤ 35 V	≤ 35 V
Rated current		≤ 6 A	≤ 8 A
Material specifications for exit			
Material of grip		-	-
Material specifications for distributor			
Housing material		PA-GF	PA-GF
Mechanical data			
No. of pos.		4	4
Degree of protection		IP20	IP65/IP67/IP69K
Connection data for spring-cage terminal blocks			
Conductor cross section		0.2 mm² ... 1.5 mm²	-
Connection cross section AWG		24 ... 16	-
Cable data			
Outer sheath material		-	-
External cable diameter		-	-
Conductor cross section		-	-
Temperature data			
Plug / socket	[°C]	-25 ... 75	-25 ... 75
Cable, fixed installation	[°C]	-	-
Cable, flexible installation	[°C]	-	-

Technical data

		SAC-ASI-J-Y-N...	SAC-ASI-J-Y-B...
Electrical data			
Rated voltage		≤ 35 V	≤ 35 V
Rated current		≤ 4 A	≤ 4 A
Material specifications for exit			
Material of grip		TPU	TPU
Material specifications for distributor			
Housing material		PA-GF	PA-GF
Mechanical data			
No. of pos.		2	4
Degree of protection		IP65/67	IP65/67
Connection data for spring-cage terminal blocks			
Conductor cross section		-	-
Connection cross section AWG		-	-
Cable data			
Outer sheath material		PUR	PUR
External cable diameter		4.70 mm	4.70 mm
Conductor cross section		0.34 mm²	0.34 mm²
Temperature data			
Plug / socket	[°C]	-25 ... 75	-25 ... 75
Cable, fixed installation	[°C]	-25 ... 75	-25 ... 75
Cable, flexible installation	[°C]	-5 ... 75	-5 ... 75

Ordering data

Description	Cable length	Type	Order No.	Pcs. / Pkt.
AS-Interface distributor with IP20 degree of protection for **two flat-ribbon conductors**, 4-pos., with **spring-cage terminal blocks**		**VS-ASI-J-Y-B-FFKDS**	**1404498**	1
AS-Interface H distributors with high degree of protection, for distribution from one to two flat-ribbon conductors		**VS-ASI-J-Y-Y-N**	**1404508**	1
AS-Interface distributors with IP67 protection for **one flat-ribbon conductor**, with **PUR** round cable and molded, **straight**, A-coded, **2-pos.** M12 socket with SPEEDCON	1 m			
	2 m			
AS-Interface distributors with IP67 protection for **two flat-ribbon connectors**, with **PUR** round cable and molded, **straight**, A-coded, **4-pos.** M12 socket with SPEEDCON	1 m			
	2 m			
AS-Interface distributors with IP67 protection for **two flat-ribbon connectors**, with **PUR** round cable and molded, **angled**, A-coded, **4-pos.** M12 socket with SPEEDCON	1 m			
	2 m			

Ordering data

Type	Order No.	Pcs. / Pkt.
VS-ASI-J-Y-N-PUR-1,0-M12FS SCO	**1404430**	1
VS-ASI-J-Y-N-PUR-2,0-M12FS SCO	**1404443**	1
VS-ASI-J-Y-B-PUR-1,0-M12FS SCO	**1404456**	1
VS-ASI-J-Y-B-PUR-2,0-M12FS SCO	**1404472**	1
VS-ASI-J-Y-B-PUR-1,0-M12FR SCO	**1404469**	1
VS-ASI-J-Y-B-PUR-2,0-M12FR SCO	**1404485**	1

Distributors with M12 sockets, with screw connection, pre-assembled round conductors

Thanks to the distributors, it is extremely easy to create various topologies.

The following combinations are available:

– Flat-ribbon conductor to M12 socket
– Flat-ribbon conductor to screw connection

Distributors with M12 slot and with screw connection

PUR round conductors with molded M12-SPEEDCON plug-in connectors

		Technical data		Technical data
		VS-ASI-J-Y-N-M12FS	VS-ASI-J-Y-N-SWA-LC	-
Material data				
Housing material		PA-GF	PA	-
Material of grip body		-	-	TPU, hardly inflammable, self-extinguishing
No. of pos.		2	2	4
Degree of protection		IP65/IP67/IP69K	IP67	IP65/IP68/IP69K
Connection data for screw connection				
Conductor cross section		-	0.14 mm² ... 1 mm² (solid)	-
Connection cross section AWG		-	26 ... 17 (solid)	-
Conductor cross section		-	0.14 mm² ... 0.75 mm² (With ferrules)	-
Connection cross section AWG		-	26 ... 18 (With ferrules)	-
Cable data				
Conductor cross section		-	-	0.75 mm²
Temperature data				
Plug / socket	[°C]	-25 ... 75	-25 ... 70	-25 ... 90
Cable, fixed installation	[°C]	-	-	-25 ... 80
Cable, flexible installation	[°C]	-	-	-5 ... 80

		Ordering data			Ordering data		
Description	Cable length	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
AS-Interface distributor for flat-ribbon conductors, with straight, A-coded M12 socket							
oneflat-ribbon conductor, 2-pos.		**VS-ASI-J-Y-N-M12FS**	**1404414**	1			
two flat-ribbon conductors, 4-pos.		**VS-ASI-J-Y-B-M12FS**	**1404427**	1			
AS-Interface distributor, with straight, A-coded M12 socket							
oneflat-ribbon conductor 2-pos.		**VS-ASI-J-Y-N-M12FS-LC**	**1433155**	1			
AS-Interface distributor, with screw connection, angled							
one flat-ribbon conductor, 2-pos.		**VS-ASI-J-Y-N-SWA-LC**	**1433168**	1			
Pre-assembled round conductor M12 pin, straight, free conductor end							
	2 m				**SAC-4P-MS/ 2,0-186 SCO**	**1555606**	1
	5 m				**SAC-4P-MS/ 5,0-186 SCO**	**1555619**	1
	10 m				**SAC-4P-MS/10,0-186 SCO**	**1555622**	1
	15 m				**SAC-4P-MS/15,0-186 SCO**	**1555635**	1
Pre-assembled round conductor M12 socket, straight, free conductor end							
	2 m				**SAC-4P- 2,0-186/FS SCO**	**1555648**	1
	5 m				**SAC-4P- 5,0-186/FS SCO**	**1555651**	1
	10 m				**SAC-4P-10,0-186/FS SCO**	**1555664**	1
	15 m				**SAC-4P-15,0-186/FS SCO**	**1555677**	1
Pre-assembled round conductor M12 pin, straight, M12 socket, straight							
	0.3 m				**SAC-4P-MS/ 0,3-186/FS SCO**	**1555680**	1
	0.5 m				**SAC-4P-MS/ 0,5-186/FS SCO**	**1555693**	1
	1 m				**SAC-4P-MS/ 1,0-186/FS SCO**	**1555703**	1
	2 m				**SAC-4P-MS/ 2,0-186/FS SCO**	**1555716**	1
	5 m				**SAC-4P-MS/ 5,0-186/FS SCO**	**1555729**	1
	10 m				**SAC-4P-MS/10,0-186/FS SCO**	**1555732**	1
	15 m				**SAC-4P-MS/15,0-186/FS SCO**	**1555745**	1

Product overview for PROFINET devices

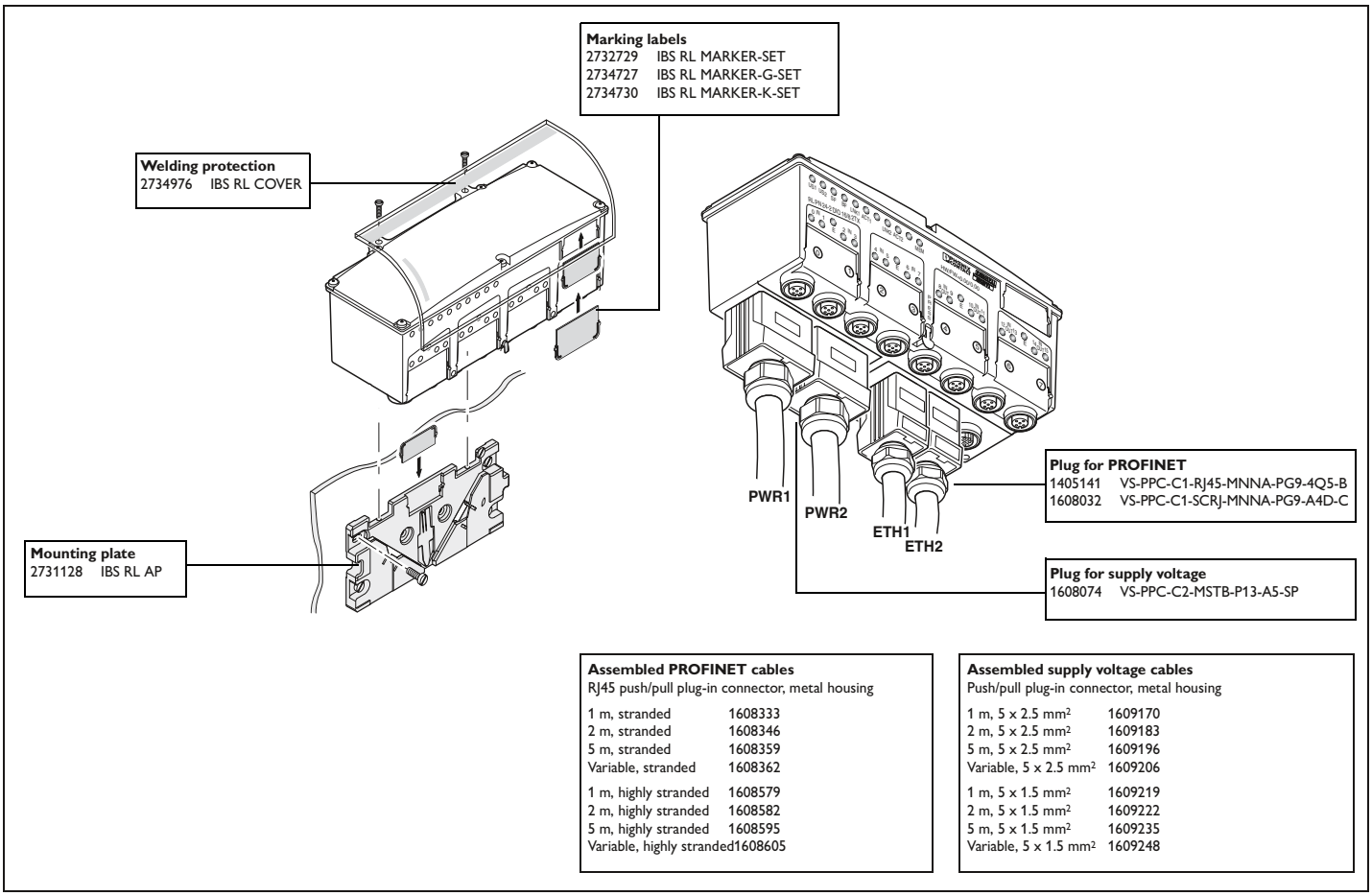
System components

Monitoring device	
PROFINET	
324	

Digital I/O devices

Digital input	Digital input/output	
16 channels	16/8 channels	8/8 channels
325	325	325

PROFINET accessories



Assembled PROFINET cables
RJ45 push/pull plug-in connector, metal housing

1 m, stranded	1608333
2 m, stranded	1608346
5 m, stranded	1608359
Variable, stranded	1608362
1 m, highly stranded	1608579
2 m, highly stranded	1608582
5 m, highly stranded	1608595
Variable, highly stranded	1608605

Assembled supply voltage cables
Push/pull plug-in connector, metal housing

1 m, 5 x 2.5 mm²	1609170
2 m, 5 x 2.5 mm²	1609183
5 m, 5 x 2.5 mm²	1609196
Variable, 5 x 2.5 mm²	1609206
1 m, 5 x 1.5 mm²	1609219
2 m, 5 x 1.5 mm²	1609222
5 m, 5 x 1.5 mm²	1609235
Variable, 5 x 1.5 mm²	1609248

Product overview for INTERBUS devices

System components

Bus terminals INTERBUS	Monitoring devices INTERBUS
326	327

Digital I/O devices

Digital input	Digital output		Digital input/output	
16 channels	16 channels	8 channels	4/2 channels	8/8 channels
327	327	328	329	329

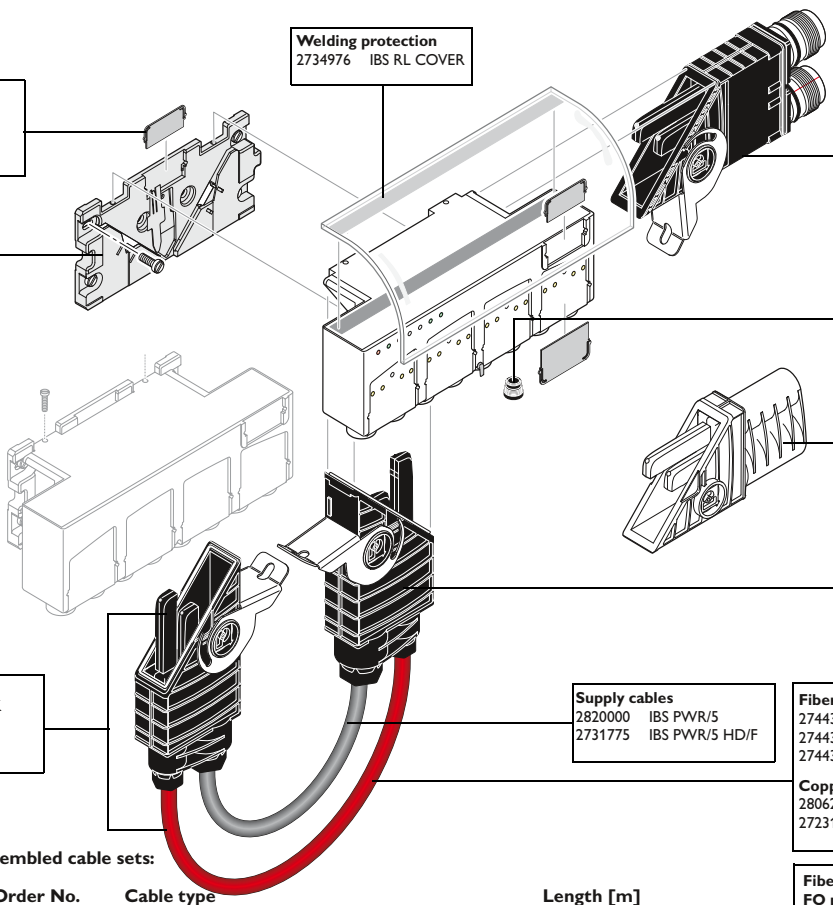
Relay devices

Relay N/O contact outputs	
5 channels	8 channels
330	330

Motor starters

Single-channel, reversing-load operation	
400 V	480 V
331	331

INTERBUS accessories



Marking labels
2732729 IBS RL MARKER-SET
2734727 IBS RL MARKER-G-SET
2734730 IBS RL MARKER-K-SET

Mounting plate
2731128 IBS RL AP

Welding protection
2734976 IBS RL COVER

Adapter plug
2725037 IBS RL 24 ADAP-T/LK
2725040 IBS RL 24 ADAP-LK/T
2734109 IBS RL 24 ADAP-M23/T
2734112 IBS RL 24 ADAP-T/M23

M12 filler plug
1680539 PROT-M12

Ruggedline dust protection plug
2819969 IBS RL PROT LK
(Not an IP67 plug)

Plug for fiber optic bus
2731076 IBS RL PLUG-LK/POF
2734183 IBS RL PLUG-LK/POF-F

Plug for copper bus
2731898 IBS RL PLUG-T
2734196 IBS RL PLUG-T-F

Pre-assembled cables
2733029 IBS RL CONNECTION-LK
2733061 IBS RL CONNECTION-T
2819956 IBS RL CABLE POF/1/Y

Supply cables
2820000 IBS PWR/5
2731775 IBS PWR/5 HD/F

Fiber optic bus cable:
2744319 PSM-LWL/KDHEAVY-980/1000
2744322 PSM-LWL/RUGGED-980/1000
2744335 PSM-LWL/RUGGED-FLEX-980/1000

Copper bus cable:
2806286 IBS RBC METER-T
2723123 IBS RBC METER/F-T

Fiber cutter for FO plug assembly
2725147 IBS RL FOC

Ordering example for pre-assembled cable sets:

Quantity	Order No.	/	Cable type	/	Length [m]
1	2819956	/	C78	/	1.1
1 plug, 2 cables	Standard		C78 = RL plug/open end, FO + voltage		1 m - 1.5 m
	Stranded		C79 = RL plug/open end, FO + voltage, stranded		(in 0.1 m increments)
2 plugs, 2 cables	Standard		C80 = RL plug/RL plug, FO + voltage		
	Stranded		C81 = RL plug/RL plug, FO + voltage, stranded		2 m - 50 m
1 plug, 1 cable	Standard		C82 = RL plug/open end, FO + voltage		(in 1 m increments)
(voltage)	Stranded		C83 = RL plug/open end, voltage only, stranded		
2 plugs, 1 cable	Standard		C84 = RL plug/RL plug, voltage only		
(voltage)	Stranded		C85 = RL plug/RL plug, voltage only, stranded		

PROFINET monitoring and digital I/O devices

The rugged I/O devices are particularly suitable for use in harsh industrial environments, such as in welding applications.

Features:

– Rugged metal housing
– Push/pull connector for PROFINET, either with fiber optic or twisted pair
– Push/pull connector for supply voltage
– M12 plug-in connector for I/O devices
– Comprehensive diagnostic functions

Notes:

1) EMC: Class A product, see page 553

N

Monitoring device, 2 FO network connections

Technical data

Interface	
Fieldbus system	PROFINET
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	18.5 V DC ... 30 V DC (including ripple)
Ripple	Max 3.6 V_{SS} within the permissible voltage range
Digital inputs	
Connection technology	-
Maximum number of inputs	-
Protective circuit	-
Digital outputs	
Connection technology	-
Maximum number of outputs	-
Maximum output current per channel	-
Protective circuit	-
General data	
Weight	1180 g
Width	182.5 mm
Height	71.5 mm
Depth	79.8 mm
Degree of protection	IP65/67
Ambient temperature (operation)	-20 °C ... 55 °C
Permissible humidity (operation)	100%

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ruggedline monitoring device			
- Fiber optics connection	**RL PN 24-2 OC 2SCRJ[1])**	**2700654**	1
Ruggedline digital input device			
- 2 power plugs			
Ruggedline digital I/O device			
- 2 power plugs			

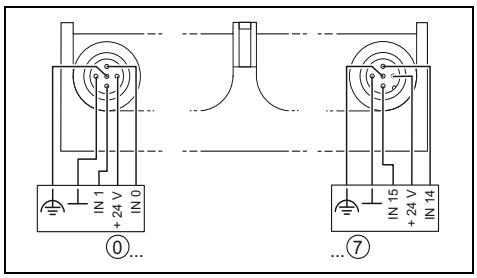
Accessories

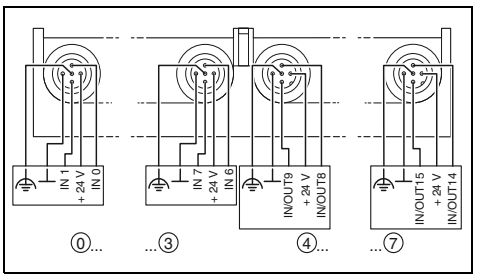
Plug-in connector, IP67, with push/pull interlocking			
- Fiber optic, SCRJ	**VS-PPC-C1-SCRJ-MNNA-PG9-A4D-C**	**1608032**	1
- Twisted pair, RJ45			
- Power, COMBICON	**VS-PPC-C2-MSTB-MNNA-P13-A5-SP**	**1608074**	1
Ruggedline mounting plate	**IBS RL AP**	**2731128**	10

**16 digital inputs,
2 TX network connections**

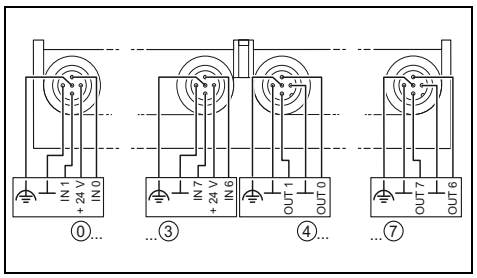
**8 digital inputs, 8 digital I/Os,
2 TX network connections**

**8 digital inputs, 8 digital outputs,
2 FO network connections**





PROFIBUS



Technical data

PROFINET	
24 V DC 18.5 V DC ... 30 V DC (including ripple) Max 3.6 V_{SS} within the permissible voltage range	
2, 3, 4-wire 16 Electronic short-circuit/overload protection for each group	
- - - -	2, 3-wire 8 500 mA Electronic short-circuit/overload protection for each channel
1180 g 182.5 mm 71.5 mm 79.8 mm IP65/67 -20 °C ... 55 °C 100%	

Technical data

PROFINET	
24 V DC 18.5 V DC ... 30 V DC (including ripple) Max 3.6 V_{SS} within the permissible voltage range	
2, 3, 4-wire 16 Electronic short-circuit/overload protection for each group	
2, 3-wire 8 500 mA Electronic short-circuit/overload protection for each channel	
1180 g 182.5 mm 71.5 mm 79.8 mm IP65/67 -20 °C ... 55 °C 100%	

Technical data

PROFINET	
24 V DC 18.5 V DC ... 30 V DC (including ripple) Max 3.6 V_{SS} within the permissible voltage range	
2, 3, 4-wire 8 Electronic short-circuit/overload protection for each group	
2, 3-wire 8 500 mA Electronic short-circuit/overload protection for each channel	
1180 g 182.5 mm 71.5 mm 79.8 mm IP65/67 -20 °C ... 55 °C 100%	

Ordering data

Type	Order No.	Pcs. / Pkt.
RL PN 24-2 DI 16 2TX[1])	**2773665**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
RL PN 24-2 DIO 16/8 2TX[1])	**2773652**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
RL PN 24-2 DIO 8/8 2SCRJ[1])	**2773513**	1

Accessories

VS-PPC-C1-RJ45-MNNA-PG9-4Q5-B	**1405141**	1
VS-PPC-C2-MSTB-MNNA-P13-A5-SP	**1608074**	1
IBS RL AP	**2731128**	10

Accessories

VS-PPC-C1-RJ45-MNNA-PG9-4Q5-B	**1405141**	1
VS-PPC-C2-MSTB-MNNA-P13-A5-SP	**1608074**	1
IBS RL AP	**2731128**	10

Accessories

VS-PPC-C1-SCRJ-MNNA-PG9-A4D-C	**1608032**	1
VS-PPC-C2-MSTB-MNNA-P13-A5-SP	**1608074**	1
IBS RL AP	**2731128**	10

INTERBUS bus terminals, monitoring, and digital I/O devices

The rugged devices are particularly suitable for use in harsh industrial environments, such as in welding applications.

Features:

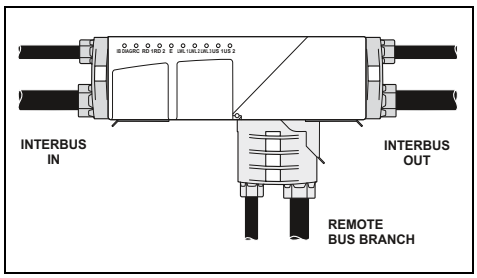
– Rugged metal housing
– Ruggedline connector for INTERBUS, either with fiber optic or twisted pair, and supply voltage
– M12 plug-in connector for I/O devices
– Comprehensive diagnostic functions

Notes:

1) EMC: Class A product, see page 553

Bus terminal module

INTERBUS CLUB



Technical data

Interface	
Fieldbus system	INTERBUS
Name	Remote bus
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	18.5 V DC ... 32 V DC (including ripple)
Ripple	Max 3.6 V_{SS} within the permissible voltage range
Digital inputs	
Connection method	QUICKON connection
Maximum number of inputs	-
Protective circuit	-
Digital outputs	
Connection method	-
Maximum number of outputs	-
Maximum output current per channel	-
Protective circuit	-
General data	
Weight	610 g
Width	179 mm
Height	67 mm
Depth	71 mm
Degree of protection	IP65/67
Ambient temperature (operation)	0 °C ... 55 °C
Permissible humidity (operation)	100%

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ruggedline bus terminal module			
- Fiber optics connection	**IBS RL 24 BK RB-LK-LK[1])**	**2725024**	1
- Fiber optics connection, transmission speed 2 Mbps	**IBS RL 24 BK RB-LK-LK-2MBD[1])**	**2731597**	1
- Twisted pair connection	**IBS RL 24 BK RB-T-T[1])**	**2731063**	1
Ruggedline monitoring device			
- Fiber optics connection			
- Fiber optics connection, transmission speed 2 Mbps			
Ruggedline digital I/O device			
- Fiber optics connection			
- Fiber optics connection, transmission speed 2 Mbps			
- Twisted pair connection			

Accessories

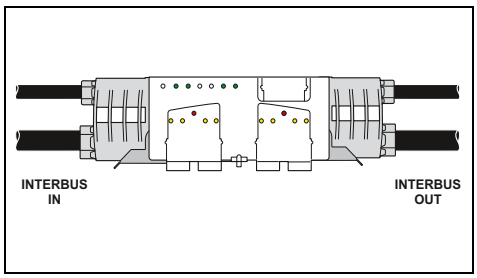
Bus connector			
- QUICKON fiber optic connection method	**IBS RL PLUG-LK/POF**	**2731076**	1
- QUICKON twisted pair connection method	**IBS RL PLUG-T**	**2731898**	1
Ruggedline mounting plate	**IBS RL AP**	**2731128**	10

Monitoring device

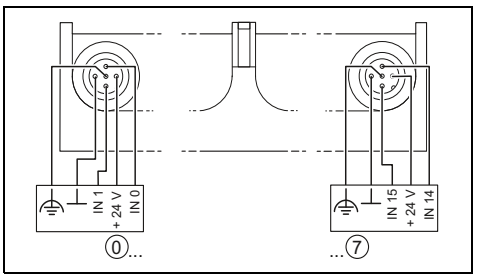
16 digital inputs

16 digital outputs that can be read

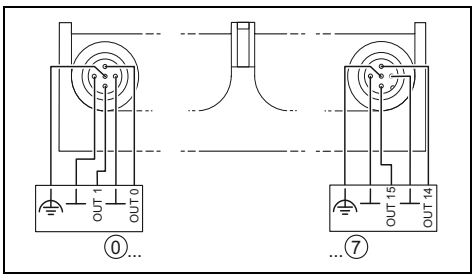
INTERBUS CLUB



INTERBUS CLUB



INTERBUS CLUB



Technical data

INTERBUS	
Remote bus	
24 V DC	
18.5 V DC ... 32 V DC (including ripple)	
Max 3.6 V_{SS} within the permissible voltage range	
-	2, 3, 4-wire
-	16
-	Electronic short-circuit/overload protection for each group
-	-
-	-
-	-
-	-
640 g	720 g
127 mm	179 mm
67 mm	67 mm
71 mm	71 mm
IP65/67	IP65/67
0 °C ... 55 °C	0 °C ... 55 °C
100%	100%

Technical data

INTERBUS
Remote bus
24 V DC
18.5 V DC ... 32 V DC (including ripple)
Max 3.6 V_{SS} within the permissible voltage range
-
-
-
2, 3-wire
16
500 mA
Electronic short-circuit/overload protection for each channel
810 g
179 mm
67 mm
71 mm
IP65/67
-20 °C ... 55 °C
100%

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS RL 24 OC-LK[1])	**2819972**	1
IBS RL 24 OC-LK-2MBD[1])	**2732499**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS RL 24 DI 16/8-LK[1])	**2724850**	1
IBS RL 24 DI 16/8-LK-2MBD[1])	**2731584**	1
IBS RL 24 DI 16/8-T[1])	**2836463**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS RL 24 DO 16/8-R-LK[1])	**2734170**	1
IBS RL 24 DO 16/8-R-LK-2MBD[1])	**2734507**	1

Accessories

IBS RL PLUG-LK/POF	**2731076**	1
IBS RL AP	**2731128**	10

Accessories

IBS RL PLUG-LK/POF	**2731076**	1
IBS RL PLUG-T	**2731898**	1
IBS RL AP	**2731128**	10

Accessories

IBS RL PLUG-LK/POF	**2731076**	1
IBS RL AP	**2731128**	10

INTERBUS digital I/O devices

The rugged I/O devices are particularly suitable for use in harsh industrial environments, such as in welding applications.

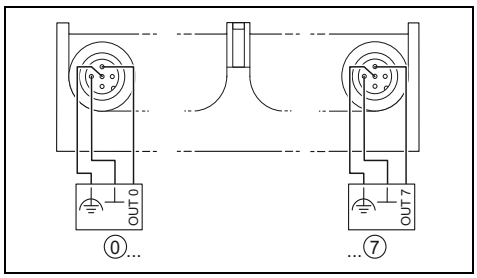
Features:

– Rugged metal housing
– Ruggedline connector for INTERBUS, either with fiber optic or twisted pair, and supply voltage
– M12 plug-in connector for I/O devices
– Comprehensive diagnostic functions

Notes:

1) EMC: Class A product, see page 553

8 digital outputs



Technical data

Interface	
Fieldbus system	INTERBUS
Name	Remote bus
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	18.5 V DC ... 32 V DC (including ripple)
Ripple	Max 3.6 V_{SS} within the permissible voltage range
Digital inputs	
Connection technology	-
Maximum number of inputs	-
Protective circuit	-
Digital outputs	
Connection technology	2, 3-wire
Maximum number of outputs	8
Maximum output current per channel	2 A
Protective circuit	Electronic short-circuit/overload protection for each channel
General data	
Weight	720 g
Width	179 mm
Height	67 mm
Depth	71 mm
Degree of protection	IP65/67
Ambient temperature (operation)	-20 °C ... 55 °C
Permissible humidity (operation)	100%

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ruggedline digital output device			
- Fiber optics connection	**IBS RL 24 DO 8/8-2A-LK[1])**	**2731034**	1
- Fiber optics connection, transmission speed 2 Mbps	**IBS RL 24 DO 8/8-2A-LK-2MBD[1])**	**2731827**	1
- Twisted pair connection	**IBS RL 24 DO 8/8-2A-T[1])**	**2731856**	1
Ruggedline digital I/O device			
- Fiber optics connection			
- Fiber optics connection, transmission speed 2 Mbps			
- Twisted pair connection			

Accessories

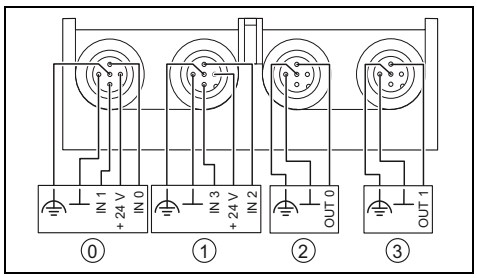
Bus connector			
- QUICKON fiber optic connection method	**IBS RL PLUG-LK/POF**	**2731076**	1
- QUICKON twisted pair connection method	**IBS RL PLUG-T**	**2731898**	1
Ruggedline mounting plate	**IBS RL AP**	**2731128**	10

4 digital inputs and 2 digital outputs

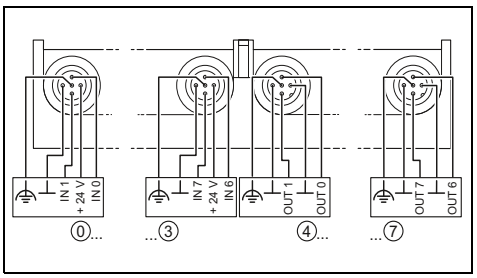
8 digital inputs and 8 digital outputs

8 digital inputs and 8 digital outputs that can be read

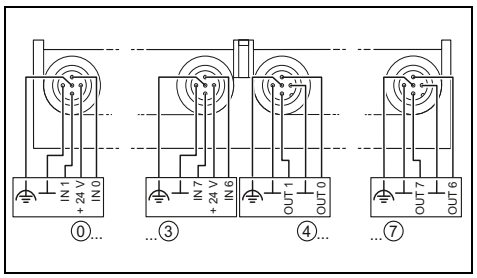
INTERBUS CLUB



INTERBUS CLUB



INTERBUS CLUB



Technical data

INTERBUS	
Remote bus	
24 V DC	
18.5 V DC ... 32 V DC (including ripple)	
Max 3.6 V_{SS} within the permissible voltage range	
2, 3, 4-wire	
4	
Electronic short-circuit/overload protection for each group	
2, 3-wire	
2	
500 mA	
Electronic short-circuit/overload protection for each channel	
650 g	
127 mm	
67 mm	
71 mm	
IP65/67	
0 °C ... 55 °C	
100%	

Technical data

INTERBUS	
Remote bus	
24 V DC	
18.5 V DC ... 32 V DC (including ripple)	
Max 3.6 V_{SS} within the permissible voltage range	
2, 3, 4-wire	
8	
Electronic short-circuit/overload protection for each group	
2, 3-wire	
8	
500 mA	
Electronic short-circuit/overload protection for each channel	
720 g	
179 mm	
67 mm	
71 mm	
IP65/67	
0 °C ... 55 °C	
100%	

Technical data

INTERBUS	
Remote bus	
24 V DC	
18.5 V DC ... 32 V DC (including ripple)	
Max 3.6 V_{SS} within the permissible voltage range	
2, 3, 4-wire	
8	
Electronic short-circuit/overload protection for each group	
2, 3-wire	
8	
500 mA	
Electronic short-circuit/overload protection for each channel	
790 g	
179 mm	
67 mm	
71 mm	
IP65/67	
-20 °C ... 55 °C	
100%	

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS RL 24 DIO 4/2/4-LK[1])	**2819985**	1
IBS RL 24 DIO 4/2/4-LK-2MBD[1])	**2732486**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS RL 24 DIO 8/8/8-LK[1])	**2724847**	1
IBS RL 24 DIO 8/8/8-LK-2MBD[1])	**2731571**	1
IBS RL 24 DIO 8/8/8-T[1])	**2836476**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS RL 24 DIO 8/8/8-R-LK[1])	**2734167**	1
IBS RL 24 DIO 8/8/8-R-LK-2MBD[1])	**2734510**	1

Accessories

IBS RL PLUG-LK/POF	**2731076**	1
IBS RL AP	**2731128**	10

Accessories

IBS RL PLUG-LK/POF	**2731076**	1
IBS RL PLUG-T	**2731898**	1
IBS RL AP	**2731128**	10

Accessories

IBS RL PLUG-LK/POF	**2731076**	1
IBS RL AP	**2731128**	10

INTERBUS relay devices

The relay devices are used, for example, on electric overhead conveyor systems to monitor and disconnect block sections.

Features:

– Rugged metal housing
– Ruggedline connector for INTERBUS with fiber optic and supply voltage
– M12 plug-in connector for digital inputs
– COMBICON plug-in connector for relay outputs
– Comprehensive diagnostic functions

Notes:

1) EMC: Class A product, see page 553

8 digital inputs and 5/8 relay outputs

INTERBUS CLUB

Technical data

	IBS RL 24 DIO 8/5-RS-LK-2MBD[1])	IBS RL 24 DIO 8/8/8 RS-LK-2MBD[1])
Interface		
Fieldbus system	INTERBUS	
Name	Remote bus	
Power supply for module electronics		
Supply voltage	24 V DC	
Supply voltage range	18.5 V DC ... 32 V DC (including ripple)	
Ripple	Max 3.6 V_{SS} within the permissible voltage range	
Digital inputs		
Connection technology	2, 3, 4-wire	
Maximum number of inputs	6	8
Number of inputs 230 V	2	-
Protective circuit	Electronic short-circuit/overload protection	
Digital outputs		
Maximum number of outputs	5	8
Output name	Relay output	
Maximum output current per channel	2 A	-
Maximum switching voltage	440 V AC	250 V AC
Minimum switching voltage	12 V AC	
General data		
Weight	3.5 kg	
Width	185 mm	
Height	193 mm	
Depth	138 mm	
Degree of protection	IP65/67	
Ambient temperature (operation)	0 °C ... 55 °C	-20 °C ... 55 °C
Permissible humidity (operation)	100%	
Air pressure (operation)	860 hPa ... 1080 hPa (up to 1500 m above mean sea level)	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ruggedline relay device, with fiber optics connection			
- Five relay N/O contact outputs, transmission speed 2 Mbps	**IBS RL 24 DIO 8/5-RS-LK-2MBD[1])**	**2734905**	1
- Eight relay N/O contact outputs, transmission speed 2 Mbps	**IBS RL 24 DIO 8/8/8 RS-LK-2MBD[1])**	**2731733**	1

Accessories

Bus connector			
- QUICKON fiber optic connection method	**IBS RL PLUG-LK/POF**	**2731076**	1
- Spring-cage fiber optic connection method	**IBS RL PLUG-LK/POF-F**	**2734183**	1
Ruggedline mounting plate	**IBS RL AP**	**2731128**	10
Connector set, connector and Pg screw connection for Ruggedline IBS RL 24 DIO 8/5-RS-LK... relay device	**IBS RL PLSET DIO 8/5-RS-LK**	**2737452**	1
Connector set, connector and Pg screw connection for Ruggedline IBS RL 24 DIO 8/8/8-RS-LK... relay device	**IBS RL PLSET DIO 8/8/8-RS-LK**	**2740465**	1

INTERBUS motor starters

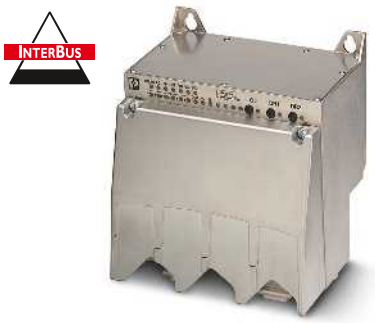
The motor starters are used in systems manufacturing and conveying technology, e.g., on tool platforms or roller conveyors.

Features:

- Rugged metal housing
- Ruggedline plug-in connector for INTERBUS with fiber optic and supply voltage
- M12 plug-in connector for digital inputs
- COMBICON plug-in connector for motor output
- Comprehensive diagnostic functions including motor current monitoring
- Emergency operation on the device or via external operating elements

Notes:

1) EMC: Class A product, see page 553



Single-channel, reversing-load operation, 6 digital inputs, and 1 digital output

INTERBUS CLUB

Technical data

	IBS RL 400 MLR R DIO6/1 LK[1])	IBS RL 480 MLR R DIO6/1-LK[1])
Interface		
Fieldbus system	INTERBUS	
Name	Remote bus	
Power supply for module electronics		
Supply voltage	24 V DC	
Supply voltage range	18.5 V DC ... 32 V DC (including ripple)	
Power supply for sensors		
Minimum voltage	$U_{INI} = U_{S1}$ minus 1 V	
Nominal current per sensor	50 mA	
Digital inputs		
Number of inputs	6	
Connection method	M12 plug-in connector	
Typical input current per channel	5 mA (for U_{S1} = 24 V)	
Digital outputs		
Number of outputs	1	
Connection method	M12 plug-in connector	
Minimum output voltage with nominal current	U_{S1} minus 2 V	
Output current	0.5 A	
Type of protection	Electronic short-circuit/overload protection	
Motor starter, output		
Number	1	
Connection method	POWER-COMBICON	
Operating voltage	200 V AC ... 440 V AC	230 V AC ... 480 V AC
Nominal current range	0.2 A ... 8 A (parameterizable, observe derating)	
Frequency range	50 Hz ... 60 kHz	
Power factor	0.3	
Switching rate	5 cycles per minute, maximum	
Motor starter, brake		
Type of contact	Mechanical relay contact	
Continuous load current	max. 1 A	
Connection voltage	12 V AC/DC ... 440 V AC/DC	12 V AC/DC ... 480 V AC/DC
General data		
Weight	3.8 kg	
Degree of protection	IP65/67	
Width	185.1 mm	
Height	193 mm	
Depth	138 mm	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Ruggedline motor starter, with fiber optics connection			
- 400 V	**IBS RL 400 MLR R DIO6/1 LK[1])**	**2734769**	1
- 400 V, transmission speed 2 Mbps	**IBS RL 400 MLR R DIO6/1 LK2MBD[1])**	**2731830**	1
Ruggedline motor starter, with fiber optics connection			
- 480 V	**IBS RL 480 MLR R DIO6/1-LK[1])**	**2737384**	1
- 480 V, transmission speed 2 Mbps	**IBS RL 480 MLR R DIO6/1-LK2MBD[1])**	**2734497**	1

Accessories

Bus connector			
- QUICKON fiber optic connection method	**IBS RL PLUG-LK/POF**	**2731076**	1
- Spring-cage fiber optic connection method	**IBS RL PLUG-LK/POF-F**	**2734183**	1
Ruggedline mounting plate	**IBS RL AP**	**2731128**	10
Set of accessories (connector and Pg screw connections)	**IBS RL MLR PLSET R-8A**	**2740504**	1
Hand-held operator panel, for motor starters and variable frequency drives	**IBS HVO/M12**	**2837006**	1

Connectors

Ruggedline connector technology combines communication and supply voltage. Connection is by means of separate cables.

Features:

– Fiber optic or twisted pair version
– QUICKON or spring-cage connection method
– Polymer fibers do not need to be polished

Plugs

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Bus connector			
- QUICKON fiber optic connection method	**IBS RL PLUG-LK/POF**	**2731076**	1
- QUICKON twisted pair connection method	**IBS RL PLUG-T**	**2731898**	1
Bus connector			
- Spring-cage fiber optic connection method	**IBS RL PLUG-LK/POF-F**	**2734183**	1
- Twisted pair connection	**IBS RL PLUG-T-F**	**2734196**	1

Accessories

Plug-in connector, with plastic knurl	**SACC-M12MS-4QO-0,75**	**1641769**	1
M12 Y-distributor	**SAC-3P-M12Y/2XM12FS PE**	**1683455**	5

Further distributors and cables can be found on the Internet at www.phoenixcontact.net/products.

Adapter

Notes:

1) EMC: Class A product, see page 553

The adapters can be used to switch between fiber optic and copper as the transmission medium or to convert to an M23 plug-in connector.

Adapter

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Converter of the remote bus connection, from circular plug-in connector to fiber optics			
	IBS RL 24 ADAP-T/LK[1])	**2725037**	1
	IBS RL 24 ADAP-LK/T[1])	**2725040**	1
Copper bus connector with M23 circular plug-in connector, connection of incoming remote bus and supply voltage			
	IBS RL 24 ADAP-M23/T	**2734109**	1
	IBS RL 24 ADAP-T/M23	**2734112**	1

Accessories

Solder connection for bus plug-in connector set (plug/socket) M23	**IBS CCO-R/L**	**2759883**	1
Power supply plug-in connectors (socket/solder connection) M23	**IBS CCO-PSF/L**	**2780878**	1
Power plug-in connectors (pin/solder connection) M23	**IBS CCO-PSM/L**	**2759906**	1

Further distributors and cables can be found on the Internet at www.phoenixcontact.net/products.

Accessories

Pre-assembled cables for fast installation.
Corresponding materials and tools are available for cable assembly.

Notes:
1) EMC: Class A product, see page 553

Cabling

Installation material and tools

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Assembled cable bridge, as a short connection between two Ruggedline devices, 30 cm						
- Fiber optics bus connector	**IBS RL CONNECTION-LK**	**2733029**	1			
- Copper bus connector	**IBS RL CONNECTION-T**	**2733061**	1			
Pre-assembled cable sets with fiber optics bus connectors, by the meter	**IBS RL CABLE POF/**	**2819956**	1			
Remote bus cable, by the meter,						
- Fixed installation	**IBS RBC METER-T**	**2806286**	1			
- Flexible application	**IBS RBC METER/F-T**	**2723123**	1			
Polymer fiber cable POF, duplex, 980/1000 µm, medium-weight standard version, for permanent indoor installation						
- By the meter **w/o** plug	**PSM-LWL-KDHEAVY-980/1000**	**2744319**	1			
Polymer fiber cable POF, duplex, 980/1000 µm, heavy-weight standard version, for permanent indoor installation						
- By the meter **w/o** plug	**PSM-LWL-RUGGED-980/1000**	**2744322**	1			
Polymer fiber cable POF, duplex 980/1000 µm, heavy-weight, highly flexible standard version for flexible power conduit applications						
- By the meter **w/o** plug	**PSM-LWL-RUGGED-FLEX-980/1000**	**2744335**	1			
Supply cable, gray, welding-splash-resistant in standard applications, 5 x 1.5 mm², by the meter						
- Standard	**IBS PWR/5**	**2820000**	1			
- Highly flexible	**IBS PWR/5HD/F**	**2731775**	1			
INTERBUS/fiber optic converter, for converting the remote OUT interface to fiber optic cables				**IBS OPTOSUB-MA/M/R-LK-OPC**[1])	**2732635**	1
Transport protection for fiber optics bus connection				**IBS RL PROT-LK**	**2819969**	50
M12 screw plug for non-assigned M12 sensor/actuator connections				**PROT-M12**	**1680539**	5
Marking labels						
- Set of 50 small and 50 large labels				**IBS RL MARKER-SET**	**2732729**	1
- Set of 100 large labels				**IBS RL MARKER-G-SET**	**2734727**	1
- Set of 100 small labels				**IBS RL MARKER-K-SET**	**2734730**	1
Fiber cutter, for quick and easy mounting of fiber optic cables with the Ruggedline connector				**IBS RL FOC**	**2725147**	1
Stripping tool, for stripping wires (especially fiber optics wires) of 4 – 16–mm–Ø				**WIREFOX-D 16**	**1212173**	1
Fiber optic measuring case, comprising an optical power meter, F-SMA and B-FOC (ST®) coupling, reference fibers, and operating instructions				**PSM-FO-POWERMETER**	**2799539**	1
Measuring device adapter, for INTERBUS-RL modules				**IBS RL ADAP FO**	**2725121**	1
Polymer fiber DIY Case, consisting of: stripping knife, stripping pliers, polishing wheel for F-SMA and SCRJ quick mounting connectors, polishing pad and emery paper				**PSM-POF-KONFTOOL**	**2744131**	1

Industrial lighting and signaling

LED machine lights and signal towers from Phoenix Contact are the perfect solution for illuminating machinery and for signaling machine states.

LED machine lights

The LED machine lights from the PLD (Phoenix Lighting Devices) range from Phoenix Contact provide efficient, homogenous, and glare-free illumination of your machinery during startup, maintenance, and fault clearance, as well as during the production process thanks to LED technology and integrated optics. You can easily adjust the brightness to the relevant conditions inside your machine (e.g., reflections) and to the machine states by means of dimming.

If required, several lights can be connected in series and you can thereby save cabling material and time. Further savings can be made with regard to maintenance costs thanks to the long LED service life of 65,000 hours.

Would you like to integrate machine lighting directly in your machine control system? No problem with the communication modules which can be connected upstream.

Signal towers

Early detection of problems affecting machinery and systems is key to reducing downtimes and avoiding any resulting unnecessary costs.

Thanks to the considerable signal diversity of the modular signal towers in the PSD (Phoenix Signaling Devices) product range from Phoenix Contact, you can implement unambiguous signaling of your machine and system states.

Would you like to transmit the state wirelessly? No problem thanks to the WIN (Wireless Information Network) signal tower wireless system.

Product overview	**336**
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PSD signal towers	
Optical signal elements	**342**
Audible signal elements	**344**
Wireless elements	**347**
Connection and mounting elements	**348**

PLD machine lights

	Communication modules		LED machine lights		
Type	**PLD CM 360 PB...**	**PLD CM 360 PN**	**PLD M 360 W...200**	**PLD M 360 W...365**	**PLD M 360 W...695**
Description	Communication module for PROFIBUS	Communication module for PROFINET	LED machine light, Length 200 mm	LED machine light, Length 365 mm	LED machine light, Length 695 mm
Page	**338**	**339**	**340**	**341**	**341**

PSD signal towers

	Optical and audible signal elements			Wireless elements		
Type	**PSD-S OE ...**	**PSD-S AE...**	**PSD-S AE V15/1**	**PSD-S WIN ...**	**PSD-S WIN STARTERKIT**	**PSD-S MUX SET**
Description	**Optical signal elements** Colors: Red, yellow, green, clear, blue	**Audible signal elements** Buzzers, sirens	Voice output element	Master/slave for wireless system	Starter kit for wireless system	Wireless multiplexer
Page	**342**	**344**	**345**	**347**	**347**	**347**

Connection and mounting elements			Accessories			
PSD-S CE-SM(TM) ...	**PSD-S ME...**	**PSD-S ME ...**	**PSD-S AS BULB 5W**	**PSD-S AS CABLE GLAND...**	**PSD-S AS LABEL BOARD**	**PSD-S AS END COVER**
Connection elements for base and tube mounting	Mounting elements for base and tube mounting	Mounting feet and tubes	Light bulb for PSD-S OE ..., 5 W, 24 V permanent light element	M16 x 1.5 mm cable gland	Marking field for towers with tube mounting	End cover (replacement part)
348	**348**	**349**	**342**	**348**	**342**	**342**

PSD signal towers

Erecting a tower

A signal tower can be erected or extended without using any tools in a matter of seconds by simply placing the individual signal elements on top of each other and turning the bayonet locking system.

This automatically establishes an electrical connection between the elements. The control lines are then connected to screw or spring-cage terminal blocks in the connection element (bottom element).

Optical signal elements

The optical elements are available in a choice of five colors with various different signal types.

Audible signal elements

Signaling can also be supported by an audible element.

Wireless elements

Wireless elements enable the wireless transmission of signal states to a PC or the mirroring of the state of one tower to another.

Mounting elements

The signal tower portfolio is completed by a wide range of mounting elements, which ensure optimum mounting of the signal towers according to the conditions.

Assembling the signal tower

To assemble your signal tower, proceed as follows:

① Select the appropriate mounting method for your signal tower application: base or tube mounting.

② If applicable, select the mounting bracket or junction box.

③ If applicable, select the foot and the required tube length:
110 mm ... 1000 mm.

④ Select the appropriate connection element for the mounting type:
screw or spring-cage connection.

⑤ Select the required optical signal elements and, if applicable, the audible signal element or wireless element.

Communication modules

N

The communication modules enable the direct integration of machine lighting in the machine control system.

This PROFIBUS communication module enables PLD machine lights to be parameterized and controlled directly via a PROFIBUS DP network.

Features:

- PROFIBUS DP slave
- Data transmission speed of 9.6 kbps to 12 Mbps
- PROFIBUS address can be set via two rotary coding switches
- Two PWM outputs for controlling the PLD machine lights
- Adjustable brightness, flashing frequency, and flashing duration
- Specification of the failsafe state for controlled lights
- A digital input for error messages from the controlled lights
- Diagnostic and status indicators
- Resistant to flying chips and sparks
- Resistant to cooling lubricants

PROFIBUS DP

Technical data

Interface	
Fieldbus system	PROFIBUS DP
Connection method	M12 plug-in connector, B-coded
Transmission speed	9.6 kbps ... 12 Mbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 28.8 V DC
Digital inputs	
Number of inputs	1 (error signal from the light(s))
Description of the inputs	EN 61131-2 type 1
Nominal input voltage U_{IN}	24 V DC
Digital outputs	
Number of outputs	2 (PWM signal)
Output voltage	24 V DC
Maximum output current per channel	500 mA
Type of protection	Short-circuit protection, overload protection of the outputs
General data	
Connection method	M12 plug-in connector
Weight	450 g
Degree of protection	IP67
Width	60 mm
Height	144 mm
Depth	35 mm
Note on dimensions	Height without M12 plug-in connector
Mounting position	Any
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Communication module, for PLD machine lights			
- PROFIBUS DP interface	**PLD CM 360 PB**	**2701695**	1

Communication modules

N

The communication modules enable the direct integration of machine lighting in the machine control system.

This PROFINET communication module enables PLD machine lights to be parameterized and controlled directly via a PROFINET network.

Features:

- PROFINET I/O device
- PROFINET RT
- Two PROFINET ports with integrated switch
- Two PWM outputs for controlling the PLD machine lights
- Adjustable brightness, flashing frequency, and flashing duration
- Specification of the failsafe state for controlled lights
- A digital input for error messages from the controlled lights
- Diagnostic and status indicators
- Resistant to flying chips and sparks
- Resistant to cooling lubricants

PROFINET

Technical data

Interface	
Fieldbus system	PROFINET
Connection method	M12 plug-in connectors, D-coded
Transmission speed	100 Mbps
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 28.8 V DC
Digital inputs	
Number of inputs	1 (Error signal from the light(s))
Description of the inputs	EN 61131-2 type 1
Nominal input voltage U_{IN}	24 V DC
Digital outputs	
Number of outputs	2 (PWM signal)
Output voltage	24 V DC
Maximum output current per channel	500 mA
Type of protection	Short-circuit protection, overload protection of the outputs
General data	
Connection method	M12 plug-in connector
Weight	450 g
Degree of protection	IP67
Width	60 mm
Height	144 mm
Depth	35 mm
Note on dimensions	Height without M12 plug-in connector
Mounting position	Any
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Communication module, for PLD machine lights			
- PROFINET interface	**PLD CM 360 PN**	**2701696**	1

LED machine lights

N

These LED lights are designed for use inside machinery. They provide surface illumination of the interior of the machine.

Features:

- 50° and 100° emission angle
- Light lengths of 200 mm, 365 mm or 695 mm
- Can be connected and controlled in series with M12-SPEEDCON cabling
- Optional control via communication module or I/O station
- Steady light or flashing light
- Can be switched on and off when under no load
- Can be continuously dimmed with PWM signal
- Flashing light control with PWM signal
- Protective functions against polarity reversal, excessively high supply voltage, and overtemperature
- Error indication via digital output
- Resistant to flying chips and sparks
- Resistant to cooling lubricants
- Glare suppression thanks to integrated optics
- Highly efficient thanks to LED technology
- LED service life of 65,000 hours
- High color rendering index

Length 200 mm

Technical data

	PLD M 360 W-50 200	PLD M 360 W-100 200
Power supply for module electronics		
Supply voltage	24 V DC	
Supply voltage range	19.2 V DC ... 28.8 V DC	
Current consumption	Typ. 0.23 A (at 24 V DC)	Typ. 0.375 A (at 24 V DC)
Power consumption	Typ. 5.5 W	Typ. 9 W
Light properties		
Source of light type	LED	
Service life, lighting appliance	65,000 h	
Number of LEDs	4	
Light color	Neutral white	
Color temperature	5000 K ±5%	
Color rendering index	Ra ≥ 80	
Illumination	max. 2350 lx (50 cm distance)	max. 680 lx (50 cm distance)
Average illumination	330 lx (1 m x 1 m measuring field with 50 cm distance)	
Glare suppression	Thanks to integrated optics	
Can be dimmed	Via PWM signal	
General data		
Connection method	M12 plug-in connector, (A-coded)	
Weight	550 g	
Degree of protection	IP67	
Width	60 mm	
Height	35 mm	
Length	200.00 mm	
Note on dimensions	Length without M12 flush-type plug-in connector	
Mounting position	Any	
Ambient temperature (operation)	-25 °C ... 60 °C	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
LED machine light			
- 50° emission angle	**PLD M 360 W-50 200**	**2701689**	1
- 100° emission angle	**PLD M 360 W-100 200**	**2701692**	1

N

Length 365 mm

N

Length 695 mm

Technical data

PLD M 360 W-50 365	PLD M 360 W-100 365
24 V DC	
19.2 V DC ... 28.8 V DC	
Typ. 0.46 A (at 24 V DC)	Typ. 0.75 A (at 24 V DC)
Typ. 11 W	Typ. 18 W
LED	
65,000 h	
8	
Neutral white	
5000 K ±5%	
Ra ≥ 80	
max. 3800 lx (50 cm distance)	max. 1200 lx (50 cm distance)
660 lx (1 m x 1 m measuring field with 50 cm distance)	630 lx (1 m x 1 m measuring field with 50 cm distance)
Thanks to integrated optics	
Via PWM signal	
M12 plug-in connector, (A-coded)	
1000 g	
IP67	
60 mm	
35 mm	
365.00 mm	
Length without M12 flush-type plug-in connector	
Any	
-25 °C ... 60 °C	

Technical data

PLD M 360 W-50 695	PLD M 360 W-100 695
24 V DC	
19.2 V DC ... 28.8 V DC	
Typ. 0.92 A (at 24 V DC)	Typ. 1.5 A (at 24 V DC)
Typ. 22 W	Typ. 36 W
LED	
65,000 h	
16	
Neutral white	
5000 K ±5%	
Ra ≥ 80	
max. 5200 lx (50 cm distance)	max. 2000 lx (50 cm distance)
1200 lx (1 m x 1 m measuring field with 50 cm distance)	1100 lx (1 m x 1 m measuring field with 50 cm distance)
Thanks to integrated optics	
Via PWM signal	
M12 plug-in connector, (A-coded)	
1950 g	
IP67	
60 mm	
35 mm	
695.00 mm	
Length without M12 flush-type plug-in connector	
Any	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
PLD M 360 W-50 365	**2701690**	1
PLD M 360 W-100 365	**2701693**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PLD M 360 W-50 695	**2701691**	1
PLD M 360 W-100 695	**2701694**	1

Optical signal elements

The optical signal elements enable clear optical indication of the machine or system state.

– 5 signal types to choose from
– Can be freely combined
– High light and color intensity
– Minimum LED service life of 50,000 h
– All elements for a minimum of 24 V DC
– Tool-free lamp change
– Random flashing beacon ensures display cannot be ignored

Optical signal element, red

Optical signal element, yellow

Notes:

1) At 240 V, 5 W lighting

Technical data

		①	②	③	④	⑤	⑥	⑦
PSD electrical data								
Input voltage			24 V DC	24 V AC/DC		24 V DC		24 V AC/DC
Nominal input voltage range	[V AC/DC]	12 ... 240						
Maximum inrush current	[mA]	21[1]	200	500		200	500	
Current consumption	[mA]	21[1]	125	30		35	350	40
General data								
Material		Polycarbonate PC						
Weight	[g]	55	73	58	59	72	78	65
Height	[mm]	66						
Diameter	[mm]	70						
Degree of protection		IP65, when installed or with cover						
Ambient temperature (operation)	[°C]	-20 ... 60	-20 ... 50					
Mounting position		Any						

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Permanent light element, without light bulb ①	PSD-S OE RD	2700096	1
Flashing light element, Xenon flash tube ②	PSD-S OE FL RD	2700101	1
LED permanent light element ③	PSD-S OE LED RD	2700107	1
LED blinking light element ④	PSD-S OE LED BL RD	2700114	1
LED flashing light element, double flash ⑤	PSD-S OE LED FL RD	2700115	1
LED random flashing beacon element ⑥	PSD-S OE LED RFL RD	2700118	1
LED rotating light element ⑦	PSD-S OE LED RL RD	2700116	1

Accessories

Light bulb for PSD–S OE ... permanent light element, 5 W, 24 V, BA15d base	PSD-S AS BULB 5W	2700142	1
End cover, black (replacement part)	PSD-S AS END COVER	2700148	1
Marking field for towers with tube mounting, complete with assembly material	PSD-S AS LABEL BOARD	2700147	1

Technical data

		①	②	③	④	⑤	⑥	⑦
PSD electrical data								
Input voltage			24 V DC	24 V AC/DC		24 V DC		24 V AC/DC
Nominal input voltage range	[V AC/DC]	12 ... 240						
Maximum inrush current	[mA]	21[1]	200	500		200	500	
Current consumption	[mA]	21[1]	125	30		35	350	40
General data								
Material		Polycarbonate PC						
Weight	[g]	55	73	58	59	72	78	65
Height	[mm]	66						
Diameter	[mm]	70						
Degree of protection		IP65, when installed or with cover						
Ambient temperature (operation)	[°C]	-20 ... 60	-20 ... 50					
Mounting position		Any						

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S OE YE	2700098	1
PSD-S OE FL YE	2700103	1
PSD-S OE LED YE	2700122	1
PSD-S OE LED BL YE	2700123	1
PSD-S OE LED FL YE	2700124	1
PSD-S OE LED RFL YE	2700126	1
PSD-S OE LED RL YE	2700125	1

Accessories

Type	Order No.	Pcs. / Pkt.
PSD-S AS BULB 5W	2700142	1
PSD-S AS END COVER	2700148	1
PSD-S AS LABEL BOARD	2700147	1

Optical signal element, green

Optical signal element, clear

Optical signal element, blue

Technical data

①	②	③	④		
	24 V DC	24 V AC/DC			
12 ... 240					
21[1])	200	500			
21[1])	125	25			
Polycarbonate PC					
55	73	58	59		
		66			
		70			
IP65, when installed or with cover					
-20 ... 60	-20 ... 50				
Any					

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S OE GN	2700097	1
PSD-S OE FL GN	2700102	1
PSD-S OE LED GN	2700119	1
PSD-S OE LED BL GN	2700121	1

Accessories

PSD-S AS BULB 5W	2700142	1
PSD-S AS END COVER	2700148	1
PSD-S AS LABEL BOARD	2700147	1

Technical data

①	②	③	④	⑤	⑥	
	24 V DC	24 V AC/DC		24 V DC		
12 ... 240						
21[1])	200	500		200	500	
21[1])	125	25		35	250	
Polycarbonate PC						
55	73	58	59	72	78	
		66				
		70				
IP65, when installed or with cover						
-20 ... 60	-20 ... 50					
Any						

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S OE CL	2700099	1
PSD-S OE FL CL	2700105	1
PSD-S OE LED CL	2700127	1
PSD-S OE LED BL CL	2700128	1
PSD-S OE LED FL CL	2700129	1
PSD-S OE LED RFL CL	2700130	1

Accessories

PSD-S AS BULB 5W	2700142	1
PSD-S AS END COVER	2700148	1
PSD-S AS LABEL BOARD	2700147	1

Technical data

①	②	③	④	⑤	⑥	
	24 V DC	24 V AC/DC		24 V DC		
12 ... 240						
21[1])	200	500		200	500	
21[1])	125	25		35	250	
Polycarbonate PC						
55	73	58	59	72	78	
		66				
		70				
IP65, when installed or with cover						
-20 ... 60	-20 ... 50					
Any						

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S OE BU	2700100	1
PSD-S OE FL BU	2700106	1
PSD-S OE LED BU	2700131	1
PSD-S OE LED BL BU	2700132	1
PSD-S OE LED FL BU	2700134	1
PSD-S OE LED RFL BU	2700135	1

Accessories

PSD-S AS BULB 5W	2700142	1
PSD-S AS END COVER	2700148	1
PSD-S AS LABEL BOARD	2700147	1

Audible signal elements

The audible signal elements enable clear audible indication of the machine or system state.

They offer the following features:

– Buzzer and siren elements
– Minimum volume of 80 dB(A)
– Adjustable volume
– Multi-tone siren signaling depending on the situation
– Multilingual signaling thanks to voice output

Buzzer element, continuous/pulse tone

Siren element, alternating

	Technical data	Technical data
PSD electrical data		
Input voltage	-	24 V DC
Nominal input voltage range	12 V AC/DC ... 30 V AC/DC	-
Maximum inrush current	max. 200 mA	max. 500 mA
Current consumption	25 mA	150 mA
Signaling		
Type of acoustic signal	Continuous/pulse tone	Continuous tone, alternating
Signal frequency	Approx. 1 Hz	-
Tone frequency	Approx. 1.75 kHz	Approx. 2.5 kHz
Volume	85 dB(A)	105 dB(A)
General data		
Material	Polycarbonate PC	Polycarbonate PC
Weight	73 g	106 g
Height	72 mm	79 mm
Diameter	70 mm	70 mm
Degree of protection	IP65, when installed	IP40, when installed
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C
Electromagnetic compatibility	Conformance with EMC Directive 2004/108/EC	Conformance with EMC Directive 2004/108/EC
Mounting position	Any	Any

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Buzzer element, continuous/pulse tone	**PSD-S AE BM2-1 85DB**	**2700136**	1			
Siren element - Alternating - Pulse tone, automatic volume control - 8 tones, tone selection via DIP switches - 7 tones, tone selection via 3 signal cables				**PSD-S AE SC1-2 105DB**	**2700139**	1
Voice output element, up to 15 sound sequences, maximum play time of 60 minutes						

Siren element, pulse tone

Siren element, tones can be selected

Voice output element

Technical data

24 V DC	
-	
max. 500 mA	
150 mA	
Pulse tone, automatic volume control	
Approx. 1 Hz	
Approx. 2.5 kHz	
-	
Polycarbonate PC	
122 g	
110 mm	
71.5 mm	
IP65, when installed	
-20 °C ... 50 °C	
Conformance with EMC Directive 2004/108/EC	
Any	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S AE SP1-3 100DB/2	**2700137**	1

Technical data

	PSD-S AE SM8-5 100DB/1	PSD-S AE SM7-4 100DB/3
	24 V AC/DC	24 V DC
	-	
	max. 500 mA	
	80 mA	
	8 tones, adjustable volume	7 tones, remotely controlled
	Approx. 1 Hz (pulse tone)	
	Approx. 1.6 kHz	
	max. 100 dB(A) (for continuous and pulse tone of 3.4 kHz)	
	Polycarbonate PC	
	81 g	80 g
	72 mm	
	70 mm	
	IP65, when installed	
	-20 °C ... 50 °C	
	Conformance with EMC Directive 2004/108/EC	
	Any	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S AE SM8-5 100DB/1	**2700138**	1
PSD-S AE SM7-4 100DB/3	**2700141**	1

Technical data

24 V DC	
-	
max. 3 A (for approximately 2 ms)	
< 50 mA (in standby mode)	
Voice, max. 15 texts, max. 1 complete h	
-	
-	
Approx. 88 dB(A)	
Polycarbonate PC	
184 g	
110 mm	
71.5 mm	
IP65, when installed	
-20 °C ... 50 °C	
Conformance with EMC Directive 2004/108/EC	
Any	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S AE V15/1	**2700140**	1

Wireless elements

The WIN (Wireless Information Network) wireless system enables the wireless transmission of the signal states of several signal towers.

The wireless elements (slaves) integrated in the signal towers transmit the signal states of the relevant signal tower to a receiver unit (master), which is connected to the USB connection of a PC.

The signal states are displayed and evaluated via software.

The wireless system offers the following additional features:

– Range of a wireless element with a free line of sight of up to 300 m
– Repeater for increasing the range integrated in each wireless element
– Simultaneous detection of up to 50 wireless elements
– Existing signal towers can be extended without additional wiring
– Can be operated parallel to other wireless applications
– Error messages can be sent via e-mail

In addition to creating a complete wireless system, it is also possible to mirror the state of **one** signal tower wirelessly to another signal tower located within the line of sight.

– Range with a free line of sight of up to 300 m
– Existing signal tower can be extended without additional wiring

Both the WIN wireless system and the wireless multiplexer are available in versions with C-UL-US approval.

WIN slave/WIN master

Technical data

	PSD-S WIN SL	PSD-S WIN MA
Electrical data, master		
Input voltage	-	5 V DC (USB ; only use USB cables with a maximum length of 3 m.)
Maximum inrush current	-	100 mA
Current consumption	-	max. 100 mA
Interface	-	USB
Electrical data, slave		
Input voltage	24 V AC/DC	-
Maximum inrush current	430 mA	-
Current consumption	max. 40 mA	-
Interface	USB, for configuration	-
Wireless interface		
Transmission power	10 dBm (at 50 ohm)	
Transmission speed	38.4 kbps (can be adjusted via WIN software) 76.8 kbps (default)	
Range	300 m, maximum	
Wireless modules that can be connected	-	Up to 50 (2700681 PSD-S WIN SL)
General data		
Material	Polycarbonate PC	Acrylonitrile butadiene styrene (ABS)
Weight	80 g	106 g
Height	65.5 mm	188 mm
Width	-	77 mm
Depth	-	117 mm
Diameter	70 mm	-
Degree of protection	IP65, when installed or with cover	IP20
Ambient temperature (operation)	-20 °C ... 50 °C	
Mounting position	The slave is the bottom element in the signal tower	
Scope of delivery	1 slave	1 master with antenna including accessories, USB cable (3 m), software CD
Additional product required	PSD-S WIN MA...	PSD-S WIN SL...

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
WIN slave			
- 868 MHz frequency	**PSD-S WIN SL**	**2700681**	1
- 915 MHz frequency, with C-UL-US approval	**PSD-S WIN SL/UL**	**2701565**	1
WIN master			
- 868 MHz frequency	**PSD-S WIN MA**	**2700682**	1
- 915 MHz frequency, with C-UL-US approval	**PSD-S WIN MA/UL**	**2701664**	1
WIN set			
- 868 MHz frequency			
- 915 MHz frequency, with C-UL-US approval			
WIN starter kit			
- 868 MHz frequency			
- 915 MHz frequency, with C-UL-US approval			
Wireless multiplexer set			
- 868 MHz frequency			
- 915 MHz frequency, with C-UL-US approval			

WIN set

WIN starter kit

Wireless multiplexer set

Technical data	Technical data	Technical data
-	-	24 V DC (pos. + neg. logic)
-	-	430 mA
-	-	max. 40 mA (own current consumption) max. 860 mA (total current of the elements above the master)
-	-	USB, for configuration
-	-	24 V AC/DC
-	-	430 mA
-	-	max. 40 mA
-	-	USB, for configuration
-	-	10 dBm (at 50 ohm)
-	-	38.4 kbps
-	-	300 m, maximum
-	-	-
-	-	Polycarbonate PC
-	-	184 g
-	-	65.5 mm
-	-	-
-	-	-
-	-	70 mm
-	-	IP65, when installed or with cover
-	-	-20 °C ... 50 °C
-	-	The master and slave are the bottom element in the signal tower
1 master with antenna including accessories, 3 slaves, USB cable (3 m), software CD	1 master with antenna including accessories, 3 slaves, 9 LED steady-light optical elements (3 red, 3 yellow, 3 green), 3 bases with integrated tube, 3 connection elements (spring-cage), USB cable (3 m), software CD	1 transmitter module (slave) and 1 receiver module (master)
-	-	-

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S WIN SET-1MA-3SL	**2700679**	1
PSD-S WIN SET-1MA-3SL/UL	**2701563**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S WIN STARTERKIT	**2700680**	1
PSD-S WIN STARTERKIT/UL	**2701564**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSD-S MUX SET	**2700683**	1
PSD-S MUX SET/UL	**2701566**	1

Connection elements for base and tube mounting

The cables for controlling the optical and/or audible elements are connected to the connection element. They can either be mounted directly on a surface or on a tube.

The following connection methods are available:

– Screw terminal blocks
– Spring-cage terminal blocks

Connection elements for base mounting

Connection elements for tube mounting

	Technical data	Technical data
PSD electrical data		
Nominal input voltage range	12 V AC/DC ... 240 V AC/DC	12 V AC/DC ... 240 V AC/DC
General data		
Material	PA-GF	PA-GF
Weight	83 g	84 g
Height	27 mm	27 mm
Diameter	69 mm	69 mm
Degree of protection	IP65, when installed	IP65, when installed
Ambient temperature (operation)	-20 °C ... 50 °C	-20 °C ... 50 °C

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Connection element						
- With screw connection terminal blocks	**PSD-S CE-SM SCREW**	**2700093**	1	**PSD-S CE-TM SCREW**	**2700095**	1
- With spring-cage terminal blocks	**PSD-S CE-SM SPRING**	**2700091**	1	**PSD-S CE-TM SPRING**	**2700092**	1
	Accessories			**Accessories**		
Cable gland, M16 x 1.5 mm, black	**PSD-S AS CABLE GLAND M16X1,5**	**2700145**	1			

Mounting elements for base mounting

For base mounting, the mounting foot of the connection element can be mounted on a junction box or an angled connector as an option.

The options are as follows:

– Without concealed cable routing
– With concealed cable routing
– Two-sided mounting for up to 10 signal elements

Outlet box and angled connector for base mounting

Angled connector with concealed cable routing for base mounting

	Technical data		Technical data	
	PSD-S ME OB	PSD-S ME BR-SM	PSD-S ME BR-SM/1S	PSD-S ME BR-SM/2S
General data				
Material	PA-GF	PA A3 x 2G5	PA A3 x 2G5	PA A3 x 2G5
Weight	73 g	40 g	78 g	71 g
Ambient temperature (operation)	-30 °C ... 60 °C	-20 °C ... 50 °C	-20 °C ... 60 °C	-20 °C ... 60 °C
Mounting type	Base mounting	Base mounting	Base mounting	Base mounting

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Junction box with lateral cable entry						
- For base mounting	**PSD-S ME OB**	**2700153**	1			
Angled connector						
- With visible cable routing	**PSD-S ME BR-SM**	**2700144**	1			
Angled connector with concealed cable routing						
- For single-sided base mounting				**PSD-S ME BR-SM/1S**	**2700160**	1
- For two-sided base mounting				**PSD-S ME BR-SM/2S**	**2700161**	1

Mounting feet and tubes

For tube mounting, the connection element is mounted directly on a tube.

The options are as follows:

– Plastic foot for short tubes
– Metal foot for long tubes
– Foot with integrated tube
– Foldaway base for vertical alignment with angled surfaces
– Adapter for single hole mounting

Adapter and mounting foot with tube

Mounting feet and tubes

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Adapter for single hole mounting	**PSD-S ME A-SH M18**	**2700150**	1			
Foot with integrated tube - 110 mm long	**PSD-S ME BT 110**	**2700156**	1			
Foot for tube, Ø 25 mm - Plastic				**PSD-S ME B-P**	**2700163**	1
- Metal				**PSD-S ME B-M**	**2700164**	1
Tube, Ø 25 mm - 250 mm long				**PSD-S ME T-M 250**	**2700157**	1
- 400 mm long				**PSD-S ME T-M 400**	**2700158**	1
- 1000 mm long				**PSD-S ME T-M 1000**	**2700154**	1
Foldaway base - 7.5° pitch				**PSD-S ME FB**	**2700151**	1
Tube, for direct mounting on the foldaway base - 45 mm long				**PSD-S ME T-P 45**	**2700152**	1

Mounting elements for tube mounting

For tube mounting, the mounting foot can be mounted on a junction box or an angled connector as an option.

The options are as follows:

– Without concealed cable routing
– With concealed cable routing
– Magnetic base for tool-free mounting on metal surfaces

Junction boxes for tube mounting

Angled connector for tube mounting

	Technical data		Technical data	
	PSD-S ME OB	PSD-S ME OB/MB	PSD-S ME BR-BM/HCR	PSD-S ME BR-BM
General data				
Material	PA-GF	PA-GF	ABS-PC	PA A3 x 2G5
Weight	73 g	299 g	80 g	60 g
Ambient temperature (operation)	-30 °C ... 60 °C	-30 °C ... 60 °C	-20 °C ... 60 °C	-20 °C ... 50 °C
Mounting type	Base mounting	Base mounting	Base mounting, concealed cable routing	Base mounting

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Outlet box with lateral cable entry						
- For base mounting	**PSD-S ME OB**	**2700153**	1			
- With magnetic base	**PSD-S ME OB/MB**	**2700155**	1			
Angled connector						
- With concealed cable routing				**PSD-S ME BR-BM/HCR**	**2700149**	1
- With visible cable routing				**PSD-S ME BR-BM**	**2700143**	1

PHOENIX CONTACT
PSI MODEM SMS RELAY
Ord-No. 23 13 520
Input
Output
GSM Status
Prog
SIM
POWER
VPN
ALR
LAN
VCC
TD
RD
FO SIGNAL
ERR A
ERR B
VCC
FEF
LINK

Industrial communication technology

As modern systems and machines become increasingly automated, ever larger amounts of information need to be processed. The higher data volumes, coupled with the integration of complex field devices, is demanding more and more in terms of the performance capabilities of the communication networks used.

The "main arteries" of these networks consist of various types of serial data link, which are neither inter-compatible nor capable of satisfying the increasingly stringent requirements with regard to immunity to interference, range, and speed. Even in harsh industrial environments, our products ensure interference-free and high-performance data transmission.

Copper transmission

High-performance isolators, repeaters, and converters are available for all leading networks. The devices excel thanks to their high insulation voltages between the interfaces, which effectively prevent faults and compensating currents.

Fiber optic transmission

Fiber optic data transmission has become the norm, particularly in critical applications with very high requirements regarding availability. Whether immunity to interference, high performance, electrical isolation or network expansion, the use of fiber optic technology is unavoidable.

Remote communication

Global networking of machines and systems. Alarm generation, remote maintenance, and continual data acquisition. From classic analog modems to fast mobile phone routers: the right system for every application.

Wireless

Signals from measuring and monitoring stations often have to be transmitted over long distances. Modern wireless systems are a flexible, extendable, and low-cost alternative. Depending on the distance to be covered and the signals to be transmitted, various wireless technologies are available such as Trusted Wireless, Bluetooth or WLAN.

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Copper transmission

	Repeaters	Active bus termination	Isolators + converters	Patch panels	Segment couplers
System	DeviceNet, PROFIBUS, RS-485, ControlNet	RS-485, Modbus, PROFIBUS	TTY (CL), RS-232/RS-422/RS-485	Ethernet, PROFINET	FOUNDATION, PROFIBUS PA
Description	For electrical isolation and increasing the range	Termination resistor, for active bus termination	Interface isolators and converters, for electrical isolation	Passive mini patch panels, with various connection options	Device coupler, **See section: Process infrastructure**
Page	355	356	360	452	483

Fiber optic transmission

	FO converters	FO converters	FO converters	FO converters	FO converters
System	PROFIBUS	ControlNet, DeviceNet, CANopen	INTERBUS	Modbus, RS-485 2-wire, RS-485 4-wire	RS-422, RS-232
Description	For PROFIBUS, Termination devices and T-couplers	For ControlNet™, DeviceNet™, CANopen®, Termination devices and T-couplers	For INTERBUS, Termination devices and T-couplers	For RS-485 2-wire and RS-485 4-wire systems, Termination devices and T-couplers	For RS-422 and RS-232 up to 115.2 kbps Termination devices and T-couplers
Page	365	369	372	371	373

Ethernet networks

	Media converters	COMSERVER	Isolator	Switches	Secure networks
System	EtherNet/IP, Modbus, PROFINET, Ethernet	Ethernet, RS-232, RS-422, RS-485	EtherNet/IP, Modbus, PROFINET, Ethernet		
Description	Conversion of 10/100Base-T(X) Ethernet to fiber optics WDM technology	Device servers for converting serial interfaces	4 kV Ethernet ISOLATOR for electrical isolation	Switches, INTERFACE modules, hubs, Power over Ethernet module **See section: Ethernet networks**	Router with firewall for control cabinet, for mobile use, PCI **See section: Ethernet networks**
Page	451	460	414	6	40

Remote communication

	Mobile phone network		Public network		Private network
System	GSM I/O	GSM UMTS/3G Ethernet	ADSL Annex A, B Ethernet/RS-232	V.34 (analog) Ethernet/RS-232	Ethernet PROFIBUS RS-232/RS-422/RS-485
Description	**GSM/SMS relays,** 6 analog/digital inputs, 4 digital outputs	**Industrial mobile phone router,** for GPRS/EDGE and UMTS/HSPA	**DSL broadband router/modem,** with firewall, VPN and serial device server	**Analog modem,** for dial-up line/permanent line operation	**Extender (SHDSL)** for in-house cables
Page	421	423	427	428	431

Fieldbus components and systems

	Controller boards	
System	INTERBUS	INTERBUS
Description	**PC master/slave controller boards**	**Master controller boards** for SIMATIC S7-300/400
Page	434	436

Wireless data communication

	Radioline	Bluetooth/WirelessHART	RAD-Line (900 MHz)
System	TRUSTED WIRELESS RS-232 RS-422 RS-485	Bluetooth WirelessHART	Trusted Wireless Ethernet
Description	Radioline wireless modules 2.4 GHz and 900 MHz with I/O extension modules	Wireless-MUX WirelessHART gateway/adapter Bluetooth interface converter	Unidirectional and bidirectional wireless systems
Page	From page 448		

Fast connection technology

	SUBCON	
System	PROFIBUS CANopen	RS-232 RS-422 RS-485 INTERBUS
Description	D-SUB fast connection for PROFIBUS, CANopen®, and SafetyBUSp	D-SUB fast connection for Modbus, INTERBUS, RS-232, RS-422, RS-485
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Accessories

	Cables, plugs, and tools		
System	PROFIBUS	Ethernet	FO
Description	PROFIBUS cable, type A Fast Connect and quick stripping tool	CAT5e cable SF/UTP, RJ45 plug, crimping pliers, patch cable	Fiber optic cables, plugs, and tools
Page	439	417	378

Repeater for PROFIBUS DP and RS-485 2-wire systems

The performance and availability of bus systems can be significantly increased by using repeaters. Segmenting the bus with repeaters makes it possible to increase the permissible extent of the network many times over and to extend the number of devices. Bus cable short circuits only affect the relevant segment.

The **PSI-REP-PROFIBUS/12MB** modular repeater has been specially developed for the requirements of PROFIBUS systems. As stipulated by the PROFIBUS installation guidelines, the PROFIBUS network is connected using D-SUB connectors.

– Automatic data rate detection or fixed data rate setting via DIP switches
– Suitable for all data rates of up to 12 Mbps
– High-quality 4-way electrical isolation between all interfaces (PROFIBUS (A) // PROFIBUS (B) // power supply // DIN rail connector)
– Bit oversampling for reliable detection of sporadic disturbances
– Bit retiming for unrestricted cascading of devices
– Filtering of faulty telegrams based on start delimiter detection
– Routing of supply voltage and data signals through DIN rail connectors
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

As a modular repeater, the **PSI-REP-RS485W2** can be used in RS-485 2-wire bus systems. The device supports bus systems that rely on the UART/NRZ data format with a character length of 10 or 11 bits.

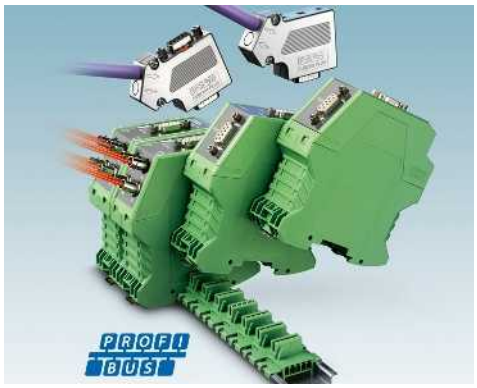
– Suitable for data rates of up to 500 kbps (adjustable via DIP switches)
– High-quality 4-way isolation between all interfaces (RS-485 (A) // RS-485 (B) // power supply // DIN rail connector)
– Bit oversampling for reliable detection of sporadic disturbances
– Bit retiming for unrestricted cascading of devices
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

The **PSM-ME-RS485/RS485-P** compact repeater is designed for universal use in RS-485 2-wire bus systems.

– Transmission speeds of up to 1.5 Mbps
– Space-saving narrow 22.5 mm device
– High-quality 3-way isolation (RS-485 (A) // RS-485 (B) // power supply)
– Shipbuilding approval according to DNV

Notes:

1) EMC: Class A product, see page 553

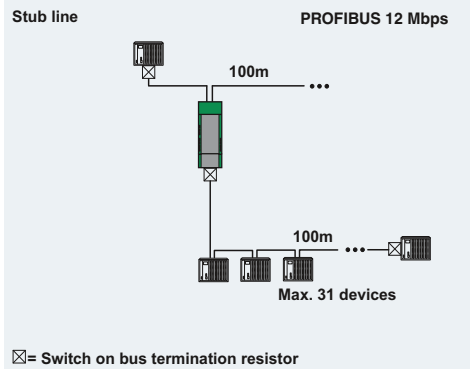


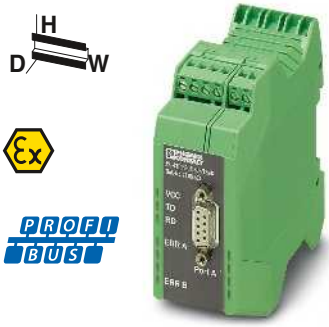
Supply	
Supply voltage	
Nominal current consumption	
RS-485 interface	
Data format/coding	
Data direction switching	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
General data	
Bit distortion, input	
Bit distortion, output	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Electrical isolation	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Repeater, for electrical isolation and increased range
for PROFIBUS up to 12 Mbps, 4-way isolation, modular expansion possible
for RS-485-2-wire bus systems, 4-way isolation, modular expansion possible
for RS-485-2-wire bus systems, 3-way isolation

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device

System power supply unit, primary-switched





Repeater for PROFIBUS

Ex: // Applied for: cUL / UL

Technical data

Supply	24 V DC ±20%
Current consumption	90 mA (24 V DC)
Interface	PROFIBUS acc. to IEC 61158, RS-485 2-conductor
Protocol	UART (11 bit, NRZ)
Baud rate detection	Automatic control, min. station response time 2 bits
Termination	(external)
Transmission speed	Manual and automatic adjustment: 9.6/19.2/45.45/93.75/187.5/500 kbps ; 1.5/3/6/12 Mbps
Transmission length	max. 1200 m (depends on transmission speed and cable type)
Connection	D-SUB-9 socket
Relative humidity	Max. ± 35%
Power loss	< 6.25%
Insulation voltage	< 1 bit
Max. switching voltage	60 V DC / 42 V AC, 1 A
Surge voltage	1.5 kV
Ambient temperature	-20 °C ... 60 °C
Potential	(VCC // TBUS // PROFIBUS (A) // PROFIBUS (B))
Dimensions	35 mm / 99 mm / 105 mm
Ex approval	II 3 G Ex nAC IIC T4 X
Approvals	508 recognized

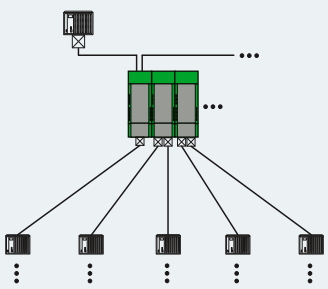
Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-REP-PROFIBUS/12MB[1])	2708863	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

Star structure



☒= Switch on bus termination resistor

Repeater for RS-485 2-wire systems

Ex: // Applied for: cUL / UL

Technical data

Supply	24 V DC ±20%
Current consumption	75 mA (24 V DC)
Interface	RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire
Protocol	UART (11/10 bit switchable ; NRZ)
Baud rate detection	Automatic control, min. station response time 2 bits
Termination	390 Ω / 180 Ω / 390 Ω (can be connected)
Transmission speed	Can be set manually: 4,8/9,6/19,2/38,4/57,6/75/93,75/115,2/136/187,5/375/500 Kbps
Transmission length	max. 1200 m (depends on transmission speed, bus system and cable type)
Connection	Plug-in screw connection
Relative humidity	Max. ± 35%
Power loss	< 6.25%
Insulation voltage	< 1 bit
Max. switching voltage	-
Surge voltage	1.5 kV
Ambient temperature	-20 °C ... 60 °C
Potential	(VCC // TBUS // RS-485 (A) // RS-485 (B))
Dimensions	35 mm / 99 mm / 105 mm
Ex approval	II 3 G Ex nA II T4 X
Approvals	508 recognized

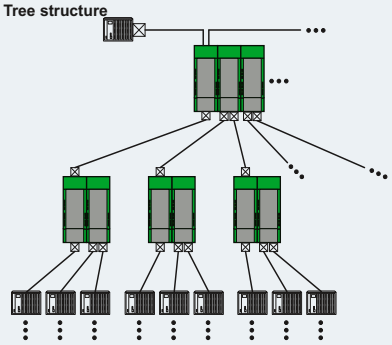
Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-REP-RS485W2[1])	2313096	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

Tree structure



☒= Switch on bus termination resistor

Basic repeater for RS-485 2-wire systems

Ex: // Applied for: cUL / UL

Technical data

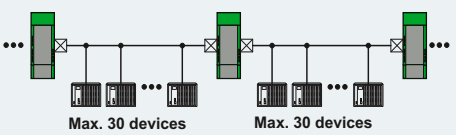
Supply	24 V AC/DC ±20%
Current consumption	90 mA (24 V DC)
Interface	RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire
Protocol	UART (11/10 bit switchable ; NRZ)
Baud rate detection	Automatic control, min. station response time 1 bits
Termination	390 Ω / 220 Ω / 390 Ω (can be connected)
Transmission speed	4.8/ 9.6/ 19.2/ 38.4/ 57.6/ 75/ 93.75/ 115.2/ 136/ 187.5/ 375/ 500/ 1500 kbps
Transmission length	max. 1200 m (depends on transmission speed, bus system and cable type)
Connection	Plug-in screw connection
Relative humidity	Max. ± 35%
Power loss	< 3.6%
Insulation voltage	< 200 ns
Max. switching voltage	-
Surge voltage	2 kV
Ambient temperature	0 °C ... 55 °C
Potential	(VCC // RS-485 (A) // RS-485 (B))
Dimensions	22.5 mm / 99 mm / 114.5 mm
Ex approval	-
Approvals	508 recognized Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSM-ME-RS485/RS485-P[1])	2744429	1

Accessories

Linear structure



☒= Switch on bus termination resistor

Active bus termination for PROFIBUS DP and RS-485 networks

PROFIBUS and RS-485 networks can be actively terminated using the PSI-TERMINATOR-PB.

This device relies on permanent termination to ensure interference-free communication, particularly in applications that involve alternating bus devices. The bus cable can be connected using either a plug-in double spring terminal block or a D-SUB socket.

Active programming and diagnostic devices are supplied with power via the D-SUB connection. This also makes the device ideal for use as a defined service and measuring connection within a bus system.

Properties:

- Interference-free bus communication thanks to active termination
- Fixed programming interface on the network
- Electrical isolation of supply and data interface
- Redundant power supply
- Diagnostic LEDs for voltage and data activity
- Extended temperature range of -20° … +65°C
- Termination can be activated externally
- Compact housing type
- DIN rail mounting

Application:

Motor Control Center (MCC)

- Replacement of MCC racks

Automatic vehicles

- Mobile industrial trucks that are regularly coupled to and uncoupled from machining stations

Changeover tools

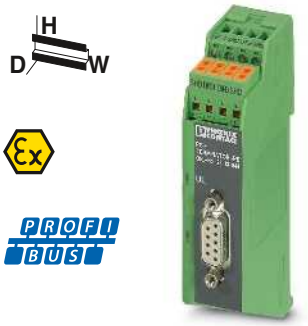
- Robot tools with bus interface

Service, programming, and diagnostics

- Fixed programming interface in the bus system

Notes:

1) EMC: Class A product, see page 553



Active bus termination

Ex: // Applied for: cUL / UL

Technical data

Supply		
Supply voltage		24 V DC ± 20% (via plug-in COMBICON screw terminal block)
Nominal current consumption		45 mA (24 V DC)
RS-485 interface		PROFIBUS acc. to IEC 61158, RS-485 2-conductor
Termination resistor		390 Ω / 220 Ω / 390 Ω (can be connected)
Transmission speed		≤ 12 Mbps
Transmission length		≤ 1200 m (depends on transmission speed and cable type)
Nominal output voltage		5 V DC
Strain relief		Shield connection clamp in spring-cage terminal block
Connection method		D-SUB 9, COMBICON
General data		
Test voltage		1.5 kV
Ambient temperature range		-20 °C ... 65 °C
Electrical isolation		DIN EN 50178 (RS-485 // VCC)
Dimensions	W / H / D	22.5 mm / 99 mm / 56 mm
Conformance / approvals		
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA / Canada		508 listed

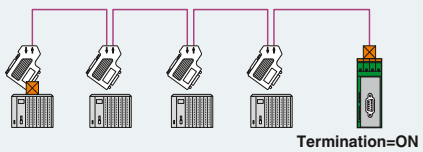
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Active termination resistor, for PROFIBUS and RS-485 bus systems, compact design, electrical isolation, bus termination that can be activated, programming interface	**PSI-TERMINATOR-PB[1])**	**2313944**	1

Accessories

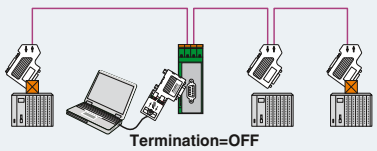
Description	Type	Order No.	Pcs. / Pkt.
PROFIBUS connector, up to 12 Mbps, integrated termination resistor which can be switched on externally, 9-pos. D-SUB pin, pin assignment 3, 5, 6, 8			
- Angled 90°, IDC connection	**SUBCON-PLUS-PROFIB/90/IDC**	**2313672**	1
- Angled 90°, screw connection	**SUBCON-PLUS-PROFIB/90/SC**	**2313698**	1
PROFIBUS cable, Fast Connect type, up to 12 Mbps, for permanent connection (02YSY (ST)CY 1X2X22 AWG) (Length in meters as per customer specifications)	**PSM-CABLE-PROFIB/FC**	**2744652**	1

Termination operation



☒ = Active bus termination resistor

Programming access



☒ = Active bus termination resistor

Repeater for ControlNet™

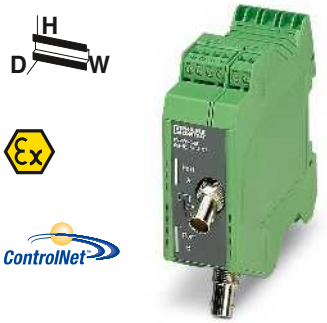
The **PSI-REP-CNET** modular repeater has been specially developed for the requirements of ControlNet™ systems. The ControlNet™ connection is established using standard BNC connectors.

The performance and availability of bus systems can be significantly increased by using repeaters. Segmenting the bus with repeaters makes it possible to increase the permissible extent of the network many times over and to extend the number of devices. Another advantage is that bus cable short circuits are restricted to the relevant segment.

- High-quality electrical isolation between all interfaces (ControlNet™ (A) // ControlNet™ (B) // power supply // DIN rail connector)
- Bit retiming for unrestricted cascading of devices
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- All connections can be plugged in using BNC connectors or a COMBICON screw terminal block
- Can be combined with the PSI-MOS FO converters in a modular way using DIN rail connectors
- Approved for use in zone 2

Notes:

1) EMC: Class A product, see page 553



Repeater for ControlNet™

Ex:

Technical data

Supply		
Supply voltage		24 V DC
Nominal current consumption		38 mA (24 V DC)
ControlNet™ interface		ControlNet™ interface, according to EN 50170
Transmission speed		5 Mbps
Transmission length		≤ 1000 m
Connection method		BNC 75 Ω
General data		
Bit distortion, input		± 35%
Bit distortion, output		< 6.25%
Bit delay		< 3 bit
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Ambient temperature range		-20 °C ... 60 °C
Electrical isolation		(VCC // CNET // CNET)
Dimensions	W / H / D	35 mm / 108 mm / 117 mm
Conformance / approvals		
ATEX		II 3 G Ex nA IIC T4 Gc X
UL, USA / Canada		508 listed

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Repeater for electrical isolation and increasing the range	**PSI-REP-CNET[1])**	**2313737**	1

Accessories

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device	**ME 17,5 TBUS 1,5/ 5-ST-3,81 GN**	**2709561**	10
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1

Repeaters, segment couplers, and bridge for DeviceNet™ and CANopen®

The infrastructure components for CAN-based transmission systems (DeviceNet™ and CANopen®) can be used to implement interference-free and high-performance networks. Important requirements such as segmentation, electrical isolation, and expansion of the network coverage can now be implemented as easily as almost any network structures. The use of active infrastructure components increases network availability significantly.

Depending on the transmission speed, the signal runtimes in cables and devices limit the maximum achievable network coverage, as the CSMA/CA method typical of CAN only works in a limited time slot. Repeaters and segment couplers can be configured to eliminate these restrictions.

The **PSI-REP-DNET CAN** modular repeater provides an electrically isolated connection between two segments with the same data rate.
– Automatic data rate detection or fixed data rate setting via DIP switches
– Data rates of up to 1 Mbps
– High-quality 4-way isolation between all interfaces (CAN (A) // CAN (B) // power supply // DIN rail connector)
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

The **PSI-SC-DNET CAN** modular segment coupler connects two segments with different data rates. The segment coupler is configured using the PSI-CONF software that is supplied as standard so that only data telegrams with specific addresses (identifiers) are transmitted to the other segment. A segment coupler can be used to connect remote network segments using a slower CAN data rate.
– Data rates of up to 1 Mbps
– High-quality 4-way isolation between all interfaces (CAN (A) // CAN (B) // power supply // DIN rail connector)
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

The **PSI-BRIDGE-DNET CAN** modular bridge connects two segments of a network via different infrastructure solutions. The segments can operate at the same or different data rates. Modem/DSL paths, wireless connections or Ethernet networks can be used as alternative transmission technologies via the FL COMSERVER. An RS-422 interface is integrated as standard for connecting the desired infrastructure. The bridge is configured using the PSI-CONF software that is supplied as standard so that only data telegrams with specific addresses (identifiers) are transmitted via the RS-422. The advantage of the bridge is that it can be used to combine CAN-based networks with alternative infrastructure solutions.
– CAN data rates of up to 1 Mbps
– RS-422 data rates of up to 500 kbps
– High-quality 4-way isolation (CAN // RS-422 // power supply // DIN rail connector)
– Can be combined with PSI-MOS FO converters in a modular way using DIN rail connectors

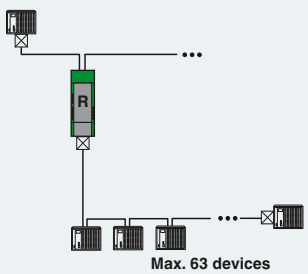
Notes:
1) EMC: Class A product, see page 553

Supply	
Supply voltage	
Nominal current consumption	
RS-422 interface	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
CAN interface	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
General data	
Bit distortion, input	
Bit distortion, output	
Bit delay	
Test voltage	
Ambient temperature range	
Electrical isolation	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Modular repeater for electrical isolation and increasing the range
Modular segment coupler for connecting slow network segments
Modular bridge that allows the use of alternative transmission technologies

System power supply unit, primary-switched

Stub line



☒= Switch on bus termination resistor

Repeater
for DeviceNet™ and CANopen®

Ex:

Technical data

24 V DC	
55 mA (24 V DC)	
-	
-	
-	
-	
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®	
124 Ω (integrated and ready to be switched)	
≤ 1000 kbps	
≤ 5000 m (dependent on the data rate and the protocol used)	
COMBICON plug-in screw terminal block	
± 35%	
< 6.25%	
< 1 bit (configurable)	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
(VCC // CAN A // CAN B)	
35 mm / 107 mm / 121 mm	
Ex II 3 G Ex nA IIC T4 Gc X	
508 listed	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-REP-DNET CAN[1])	**2313423**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Segment coupler
for DeviceNet™ and CANopen®

Ex:

Technical data

24 V DC	
55 mA (24 V DC)	
-	
-	
-	
-	
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®	
124 Ω (integrated and ready to be switched)	
≤ 1000 kbps	
≤ 5000 m (dependent on the data rate and the protocol used)	
COMBICON plug-in screw terminal block	
± 35%	
< 6.25%	
≤ 108 bit	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
(VCC // CAN A // CAN B)	
35 mm / 107 mm / 121 mm	
Ex II 3 G Ex nA IIC T4 Gc X	
508 listed	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-SC-DNET CAN[1])	**2313449**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Bridge
for DeviceNet™ and CANopen®

Ex:

Technical data

24 V DC	
55 mA (24 V DC)	
RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
150 Ω	
≤ 500 kbps	
≤ 1200 m (dependent on the data rate)	
COMBICON plug-in screw terminal block	
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®	
124 Ω (integrated and ready to be switched)	
≤ 1000 kbps	
≤ 5000 m (dependent on the data rate and the protocol used)	
COMBICON plug-in screw terminal block	
± 35%	
< 6.25%	
-	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
(VCC // CAN // RS-422)	
35 mm / 107 mm / 121 mm	
Ex II 3 G Ex nA IIC T4 Gc X	
508 listed	

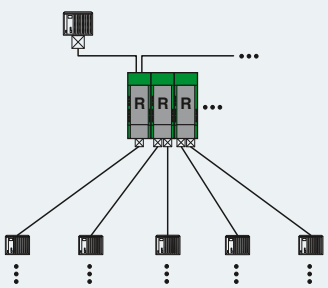
Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-BRIDGE-DNET CAN[1])	**2313533**	1

Accessories

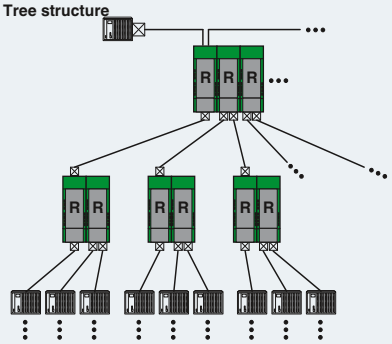
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Star structure



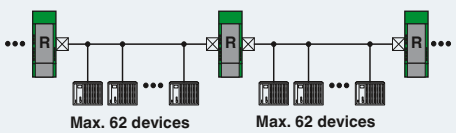
☒= Switch on bus termination resistor

Tree structure



☒= Switch on bus termination resistor

Linear structure



☒= Switch on bus termination resistor

Interface isolator

RS-232 / RS-232 interface isolator

The V.24 (RS-232) interface is an asymmetric voltage interface (common signal ground for all signals). As well as having a very low signal power, the signal ground is connected to ground potential. This results in very little immunity to interference and a maximum range of 15 m.

A considerably higher level of immunity to interference can be achieved in industrial applications by using V.24 (RS-232) isolator modules. The high-quality 3-way isolation results in an electrically isolated and interference-proof V.24 (RS-232) interface. This decoupling also protects the expensive terminal devices against damage.

Features:

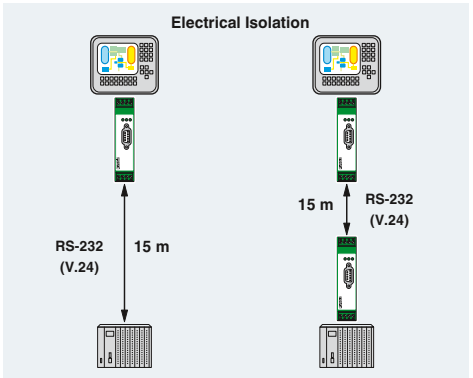
– High-quality 3-way isolation up to 2 kV (VCC // V.24 (RS-232) // V.24 (RS-232))
– Max. transmission rate of up to 115.2 kbps
– 24 V DC or AC power supply suitable for control cabinet
– Mounting on standard EN DIN rails
– Integrated surge protection with transient discharge to the DIN rail
– In the case of variable cable lengths, the V.24 (RS-232) connection on the field side can be established conveniently using plug-in screw terminal blocks
– Transmission of TxD/RxD data channels and RTS/CTS control lines
– Active data transmission indicated by separate data indicators for the transmit and receive channels

Application:

– Higher level of immunity to interference for industrial conditions
– Compensating currents avoided through electrical isolation
– Protection of expensive terminal devices through decoupling
– Optimum protection of both interface sides thanks to two V.24 (RS-232)/V.24 (RS-232) interface isolators

Notes:

1) EMC: Class A product, see page 553



RS-232

V.24 (RS-232) interface isolator

Ex: cULus // Applied for: cUL / UL

Technical data

Supply		
Supply voltage		24 V AC/DC ±20%
Nominal current consumption		40 mA (24 V DC)
V.24 (RS-232) interface		V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission speed		115.2 kbps
Transmission length		15 m (twisted pair)
Connection method		D-SUB-9 plug Plug-in screw connection
General data		
Bit distortion		< 5%
Bit delay		< 3 µs
Test voltage		2 kV
Ambient temperature range		0 °C ... 55 °C
Housing material		PA
Transmission channels		4 (2/2), RxD, TxD, RTS, CTS ; full duplex
Electrical isolation		(VCC // V.24 (RS-232) (A) // V.24 (RS-232) (B))
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm
Conformance / approvals		
UL, USA / Canada		508 recognized Class I, Div. 2, Groups A, B, C, D

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Interface isolator, for electrical isolation of RS-232 (V.24) interfaces, four channels, rail-mountable	PSM-ME-RS232/RS232-P[1])	2744461	1

Accessories

RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 25-pos. socket	PSM-KA 9 SUB 25/BB/2METER	2761059	1
- 9-pos. socket on 9-pos. socket	PSM-KA9SUB9/BB/2METER	2799474	1

Interface converters

RS-232 / TTY interface converter

This converter converts a V.24 (RS-232) interface into a 20 mA TTY current loop interface bidirectionally.

The interference immune TTY signal allows problem-free data transmission over distances of up to 1000 m using a twisted-pair and shielded 4-wire cable.

Features:

- Conversion of V.24 (RS-232) TxD/RxD full duplex data signals into the TTY current loop standard
- Semi-active, active or passive TTY operating mode, depending on pin assignment
- Transmission speed of up to 19.2 kbps
- Transmission distances of up to 1000 m in active TTY mode
- 24 V DC or AC power supply suitable for control cabinet
- Active data transmission indicated by separate data indicators for the transmit and receive channels
- Convenient connection for variable cable lengths, enabling the TTY connection on the field side to be established via plug-in screw terminal blocks
- V.24 (RS-232) connection via D-SUB 9 and standard V.24 (RS-232) cable
- High-quality 3-way isolation up to 2 kV (VCC // V.24 (RS-232) // TTY)
- Mounting on standard EN DIN rails
- Integrated surge protection with transient discharge to the DIN rail

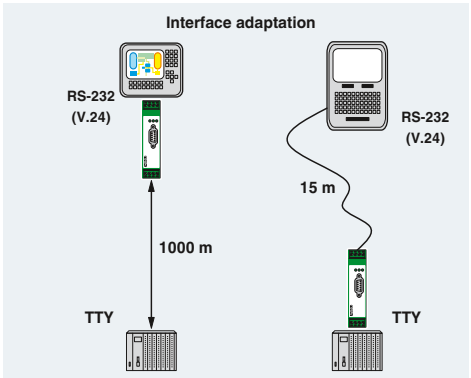
Application:

The following tasks are generally solved with the converters (see illustration):

- Interface adaptation between V.24 (RS-232) and TTY interfaces
- Increased range of up to 1000 m
- Programming connection between PC (V.24 (RS-232)) and, for example, S5 controllers with TTY programming interface for temporary coupling

Notes:

1) EMC: Class A product, see page 553



TTY converter, 2 channels

Ex: // Applied for: cUL / UL

Technical data

Supply		
Supply voltage		24 V AC/DC ±20%
Nominal current consumption		75 mA (24 V DC)
V.24 (RS-232) interface		V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission speed		≤ 19.2 kbps
Transmission length		15 m (twisted pair)
Connection method		D-SUB-9 plug
TTY interface		TTY interface, CL2 in acc. with DIN 66348-1
Transmission speed		≤ 19.2 kbps
Transmission length		1000 m (twisted pair)
Connection method		Plug-in screw connection
Operating mode		Active, semi active, passive
Load		≤ 500 Ω
General data		
Bit distortion		< 5%
Bit delay		< 3 µs
Test voltage		2 kV
Ambient temperature range		0 °C ... 55 °C
Housing material		PA
Transmission channels		2 (1/1), RxD, TxD, full duplex
Electrical isolation		(VCC // V.24 (RS-232) // TTY)
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm
Conformance / approvals		
UL, USA / Canada		508 recognized Class I, Div. 2, Groups A, B, C, D

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Interface converter, for conversion from RS-232 (V.24) to TTY, with electrical isolation, two channels, rail-mountable	**PSM-ME-RS232/TTY-P**[1]	**2744458**	1

Accessories

RS-232-D-SUB cable, length: 2 m			
- 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1

Interface converters
RS-232 (V.24) / RS-422 (V.11)
RS-232 (V.24) / RS-485

The RS-422 standard can be used to set up rapid, interference-free point-to-point connections in industrial applications. Connections covering a distance of up to 1200 m can be established using a twisted-pair and shielded 4-wire cable.

The RS-485 standard allows more than two devices to communicate with one another. Converting the V.24 (RS-232) point-to-point interface into the bus-capable RS-485 standard makes it possible to network up to 32 devices via a 2 or 4-wire cable.

PSM-ME-RS232/RS485-P

This interface converter converts TxD/RxD data signals with speeds of up to 115.2 kbps on the V.24 (RS-232) interface bidirectionally into either RS-422 or RS-485 signals. The V.24 (RS-232) connection is established via a 9-pos. D-SUB, and the RS-422/RS-485 field connection is established using COMBICON plug-in screw terminal blocks.

Features:
- RS-422 4-wire point-to-point mode
- RS-485 2-wire mode, half duplex
- RS-485 4-wire mode, full duplex
- Automatic RS-485 transmit/receive changeover
- Transmission speed between 4.8 kbps and 115.2 kbps
- Integrated data indicator for dynamic indication of send and receive data
- High-quality 3-way isolation between power supply, V.24 (RS-232), and RS-422/485 for reliable decoupling of the potentials with 2 kV
- Integrated surge protection with transient discharge to the DIN rail

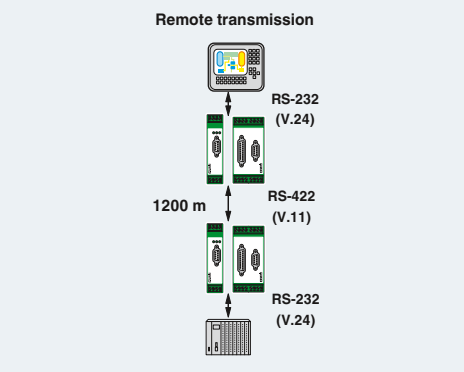
Applications:
- Fast and interference-free point-to-point connection between two V.24 (RS-232) interfaces via RS-422
- Increase in range or remote transmission up to 1200 m
- Programming or parameterizing link between PC (V.24 (RS-232)) and a piece of equipment such as a PLC or variable frequency drive with an RS-422 connection
- A temporary programming or parameterizing link can be set up between a PC (V.24 (RS-232)) and a piece of equipment such as a PLC or variable frequency drive with an RS-485 connection

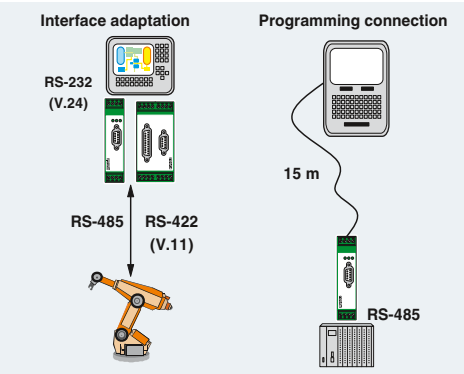
PSM-EG-RS 232/RS 422-P/4K

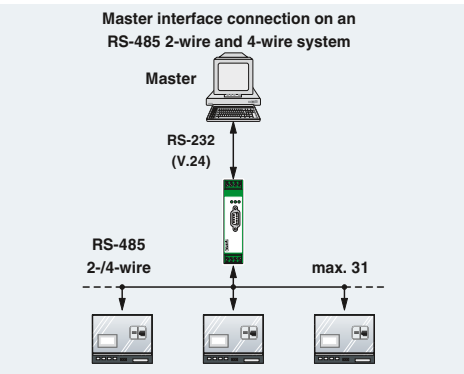
The PSM-EG... control cabinet module also converts the V.24 (RS-232) signals in full duplex mode with a data rate of up to 64 kbps to the powerful RS-422 standard. However, in addition to the TxD/RxD transmit and receive channels, the converter also provides two further channels for transmitting RTS and CTS control lines.

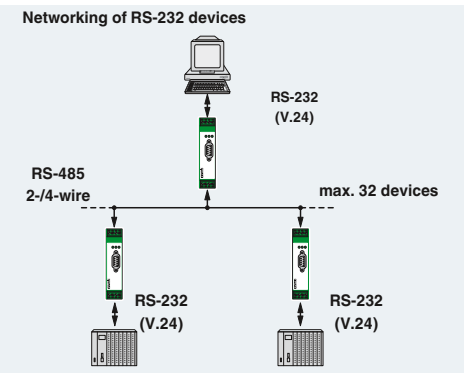
Features:
- RS-422 4-wire point-to-point mode
- High-quality 3-way isolation between power supply, V.24 (RS-232), and RS-422 for reliable electrical isolation of the potentials with 2.5 kV
- Integrated surge protection with transient discharge to the DIN rail
- Transmission speed of up to 64 kbps

Applications:
- Fast and interference-free point-to-point connection between two V.24 (RS-232) interfaces via RS-422
- Programming or parameterizing link between PC (V.24 (RS-232)) and a piece of equipment such as a PLC or variable frequency drive with an RS-422 connection
- Increased range of up to 1200 m, incl. control cables







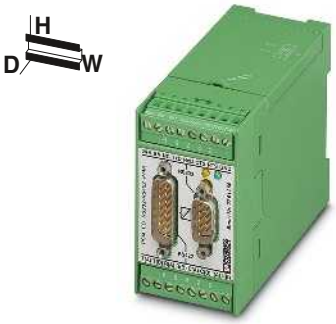


Notes:

1) EMC: Class A product, see page 553

V.24 (RS-232) converter for RS-422 and RS-485, 2 channels

Ex: cULus // Applied for: cUL / UL



V.24 (RS-232) converter for RS-422, 4 channels

cULus

		Technical data	Technical data
Supply			
Supply voltage		24 V AC/DC ±20%	24 V DC ±20%
Nominal current consumption		85 mA (24 V DC)	130 mA (24 V DC)
V.24 (RS-232) interface		V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
Transmission speed		115.2 kbps	64 kbps
Connection method		D-SUB-9 plug	D-SUB-9 plug
RS-422 interface		RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
Termination resistor		390 Ω / 180 Ω / 390 Ω (can be connected)	510 Ω / 150 Ω / 510 Ω (can be connected)
Transmission speed		115.2 kbps	64 kbps
Transmission length		1200 m (twisted pair)	1200 m (twisted pair)
Connection method		Plug-in screw connection	D-SUB-15 plug
RS-485 interface		RS-485 interface in acc. with EIA/TIA-485, DIN 66259-1	
Data direction switching		Automatic control or via RTS/CTS	-
Termination resistor		390 Ω / 180 Ω / 390 Ω (can be connected)	-
Transmission length		1200 m (twisted pair)	-
Connection method		Plug-in screw connection	-
General data			
Bit distortion		≤ 5%	≤ 5%
Bit delay		≤ 3 µs	≤ 3 µs
Test voltage		2 kV	2.5 kV
Ambient temperature range		0 °C ... 55 °C	0 °C ... 50 °C
Housing material		PA	ABS
Transmission channels		2 (1/1), RxD, TxD, full duplex	4 (2/2), RxD, TxD, RTS, CTS ; full duplex
Electrical isolation		(VCC // V.24 (RS-232) // RS-485)	(VCC // V.24 (RS-232) // RS-422)
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm	45 mm / 75 mm / 110 mm
Conformance / approvals			
UL, USA / Canada		508 recognized Class I, Div. 2, Groups A, B, C, D	cUL 508 recognized

Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
	Ordering data			**Ordering data**		
Interface converter, for conversion from RS-232 (V.24) to RS-485, with electrical isolation, rail-mountable, changeover of data direction self-controlling or through RTS/CTS						
- 2 channels	**PSM-ME-RS232/RS485-P[1])**	**2744416**	1			
Interface converter, for conversion from RS-232 (V.24) to RS-422 (V.11), with electrical isolation, rail-mountable						
- 4 channels				**PSM-EG-RS232/RS422-P/4K[1])**	**2761266**	1
	Accessories			**Accessories**		
RS-232-D-SUB cable, length: 2 m						
- 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1	**PSM-KA9SUB9/BB/2METER**	**2799474**	1

FO converters for PROFIBUS

The **PSI-MOS-PROFIB/FO...** devices convert copper-based PROFIBUS interfaces to fiber optics.

The integrated optical diagnostics allow permanent monitoring of the FO paths during installation and also during operation. The floating switch contact is activated when the signal output on the fiber optic paths drops to a critical level.

Depending on which wavelength is used in conjunction with the corresponding fibers, transmission distances of 70 m to 45 km can be achieved between two devices. Depending on the wavelength, devices can be used with polymer, HCS, and fiberglass.

- Automatic data rate detection or fixed data rate setting via DIP switches
- Suitable for all data rates of up to 12 Mbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (PROFIBUS // fiber optic ports // power supply // DIN rail connector)
- Bit retiming for any cascading depth
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- Can be combined with the PSI copper repeater for PROFIBUS in a modular way using DIN rail connectors

The **PSI-MOS-PROFIB/FO... E** terminal devices convert a PROFIBUS interface to a **FO cable**. They are ideal for point-to-point connections.

The **PSI-MOS-PROFIB/FO...** T T-couplers allow the interface to be converted to two **FO cables**. They can be used to create linear structures and ring structures for increased system availability.

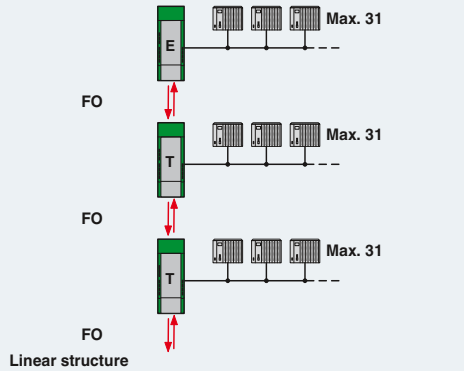
Notes:

1) EMC: Class A product, see page 553

Supply	
Supply voltage range	
Nominal current consumption	
RS-485 interface	
Data format/coding	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal device, for converting data signals from PROFIBUS FMS/DP **to an FO cable**
T-coupler, for converting data signals from PROFIBUS FMS/DP **to two FO cables**

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through the supply voltage, 2 required per device
System power supply unit, primary-switched



Linear structure

PROFIBUS
polymer and HCS fibers

Ex:

Technical data

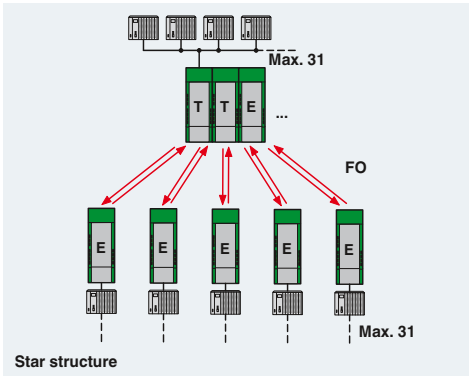
18 V DC ... 30 V DC	
100 mA (24 V DC)	
PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control	
UART (11 bit, NRZ)	
≤ 12 Mbps	
≤ 1200 m (depending on the data rate, with shielded, twisted pair data cable)	
D-SUB-9 socket	
F-SMA	
660 nm	
70 m (with F-P 980/1000 230 dB/km with quick mounting connector)	
400 m (with F-K 200/230 10 dB/km with quick mounting connector)	
< 1 bit	
-20 °C ... 60 °C	
35 mm / 99 mm / 106 mm	
II 3 G Ex nAC IIC T4 X	
II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5	
Class I, Zone 2, Ex nC nL IIC T5 X	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

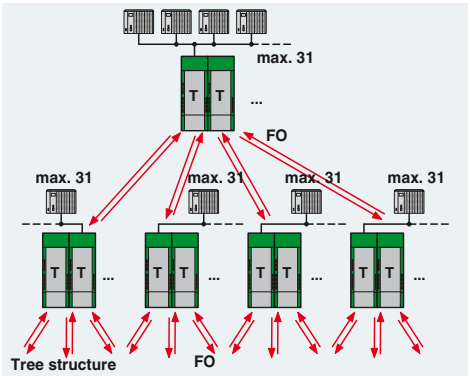
Type	Order No.	Pcs. / Pkt.
PSI-MOS-PROFIB/FO 660 E[1])	2708290	1
PSI-MOS-PROFIB/FO 660 T[1])	2708287	1

Accessories

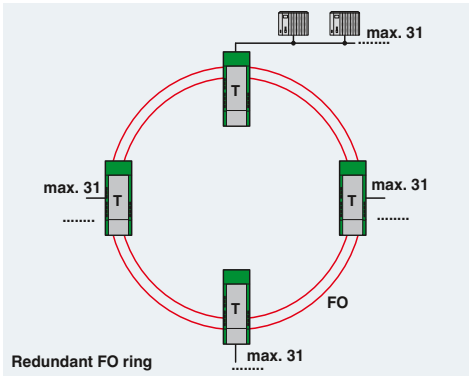
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Star structure



Tree structure



Redundant FO ring

PROFIBUS
HCS and fiberglass
(multi mode)

Ex:

Technical data

18 V DC ... 30 V DC	
120 mA (24 V DC)	
PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control	
UART (11 bit, NRZ)	
≤ 12 Mbps	
≤ 1200 m (depending on the data rate, with shielded, twisted pair data cable)	
D-SUB-9 socket	
B-FOC (ST®)	
850 nm	
2600 m (with F-G 50/125 2.5 dB/km)	
3300 m (with F-G 62.5/125 3.0 dB/km)	
800 m (with F-K 200/230 10 dB/km with quick mounting connector)	
< 1 bit	
-20 °C ... 60 °C	
35 mm / 99 mm / 106 mm	
II 3 G Ex nAC IIC T4 X	
II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5	
Class I, Zone 2, Ex nC nL IIC T5 X	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-PROFIB/FO 850 E[1])	2708274	1
PSI-MOS-PROFIB/FO 850 T[1])	2708261	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

PROFIBUS
fiberglass
(multi mode and single mode)

Technical data

18 V DC ... 32 V DC	
170 mA (24 V DC)	
PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control	
UART (11 bit, NRZ)	
≤ 12 Mbps	
≤ 1200 m (depending on the data rate, with shielded, twisted pair data cable)	
D-SUB-9 socket	
SC duplex	
1300 nm	
25 km (with F-G 50/125 0.7 dB/km at 1300 nm)	
22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)	
45 km (with F-E 9/125 0.4 dB/km at 1300 nm)	
< 1 bit	
-20 °C ... 60 °C	
35 mm / 105 mm / 106 mm	
II 3 G Ex nA nC IIC T4 Gc X	
508 listed	
508 recognized	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-PROFIB/FO1300 E[1])	2708559	1
PSI-MOS-PROFIB/FO1300 T[1])	2708892	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

FO converters for ControlNet™

With the infrastructure components for ControlNet™, copper-based and fiber optic networks can benefit from the advantages of active devices. The main advantage is the electrically isolated connection of bus devices, which means that the negative effects of voltage equalization currents and electromagnetic interference on the bus cables are a thing of the past. In addition, bus cable short circuits only affect the specific potential segment concerned. In addition to interference-free and electrically isolated networking, the use of fiber optic technology also enables longer branch lines and star and tree structures to be created.

- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (ControlNet™ // fiber optic ports // power supply // DIN rail connector)
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- Can be combined with the PSI copper repeater in a modular way using DIN rail connectors

The **PSI-MOS-CNET/FO... E** terminal device converts a PROFIBUS interface to a **fiber optic cable**. It is ideal for point-to-point connections.

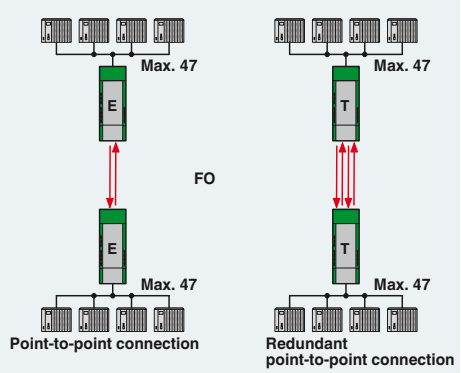
The **PSI-MOS-CNET/FO... T** T-coupler allows the interface to be converted to **two FO cables**. This device can be used to create redundant network structures for increased system availability.

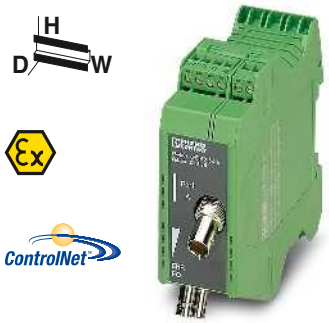
Notes:

1) EMC: Class A product, see page 553

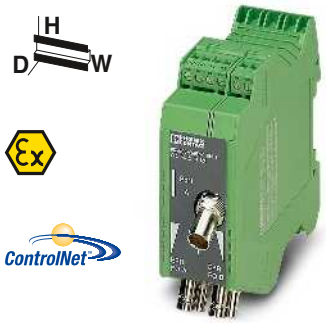
Supply	
Supply voltage range	
Nominal current consumption	
ControlNet™ interface	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Electrical isolation	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Fiber optic converter, termination device for converting data signals to a fiber optic cable
Fiber optic converter, T-coupler for converting data signals to two fiber optic cables
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
System power supply unit, primary-switched





ControlNet™, one optical channel



ControlNet™, two optical channels

Ex:

Ex:

Technical data

18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
100 mA (24 V DC)	100 mA (24 V DC)
ControlNet™ interface, according to EN 50170	ControlNet™ interface, according to EN 50170
5 Mbps	5 Mbps
≤ 1000 m	≤ 1000 m
BNC 75 Ω	BNC 75 Ω
B-FOC (ST®)	B-FOC (ST®)
850 nm	850 nm
1200 m (with F-K 200/230 8 dB/km with quick mounting connector) 3100 m (with F-G 50/125 2.5 dB/km) 3000 m (with F-G 62.5/125 3.0 dB/km)	1200 m (with F-K 200/230 8 dB/km with quick mounting connector) 3100 m (with F-G 50/125 2.5 dB/km) 3000 m (with F-G 62.5/125 3.0 dB/km)
< 3 bit	< 3 bit
18 V DC ... 30 V DC, 500 mA	18 V DC ... 30 V DC, 500 mA
1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C	-20 °C ... 60 °C
(VCC // ControlNet™)	(VCC // ControlNet™)
35 mm / 105 mm / 117 mm	35 mm / 105 mm / 117 mm
II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II 3 G Ex nA IIC T4 Gc X	II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II 3 G Ex nA IIC T4 Gc X
508 listed	508 listed

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-CNET/FO 850 E[1])	**2313711**	1

Accessories

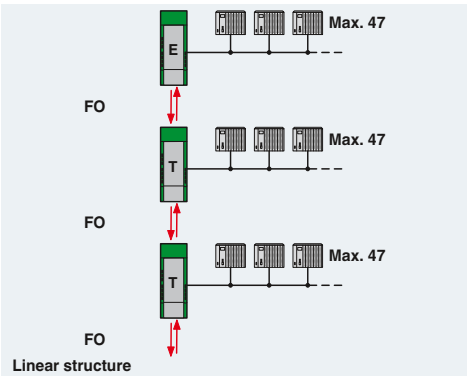
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

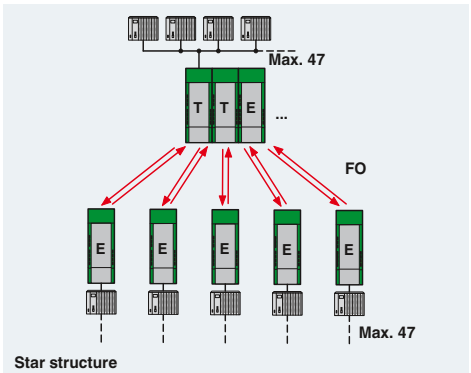
Ordering data

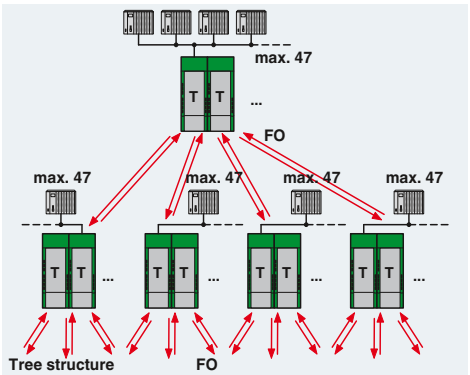
Type	Order No.	Pcs. / Pkt.
PSI-MOS-CNET/FO 850 T[1])	**2313724**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1







FO converters for DeviceNet™ and CANopen®

The PSI-MOS-DNET... fiber optic transmission system enables DeviceNet™ and CANopen® users to benefit from simple and interference-free networking based on fiber optics. In addition, bus cable short circuits only affect the specific potential segment concerned. This increases overall availability, and improves flexibility when designing the bus topology. The use of fiber optic technology enables branch lines and star and tree structures to be created.

The 22.5 mm space-saving devices from the **PSI-MOS-DNET CAN/FO…** series feature an internal backplane. The maximum network expansion that can be achieved (sum total of copper and fiber optic cables) essentially depends on the data rate used.

- Data rates of up to 800 kbps, set via DIP switches
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact in basic module for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (DeviceNet™ // fiber optic port // power supply // backplane)
- Integrated backplane for routing through the supply voltage and data signals

Thanks to extended functions, the modular devices in the **PSI-MOS-DNET/FO…** series support network expansion that is not dependent on the data rate.

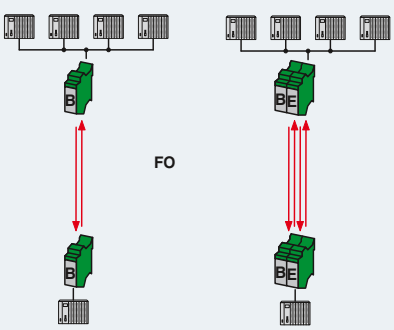
- Automatic data rate detection or fixed data rate setting via DIP switches
- Data rates of up to 1000 kbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (DeviceNet™ // fiber optic ports // power supply // DIN rail connector)
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- Can be combined with the PSI copper repeater in a modular way using DIN rail connectors

Notes:

1) EMC: Class A product, see page 553

Supply	
Supply voltage range	
Nominal current consumption	
CAN interface	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Basic module for conversion of the CAN-based interface **to a fiber optics interface**
Extension module with a fiber optics interface
FO converter, terminal device for converting a CAN-based interface to a fiber optic cable
FO converter, T-coupler for converting a CAN-based interface to two fiber optic cables



Branch line / redundant branch line

DeviceNet™ and CANopen®
Polymer and HCS fibers

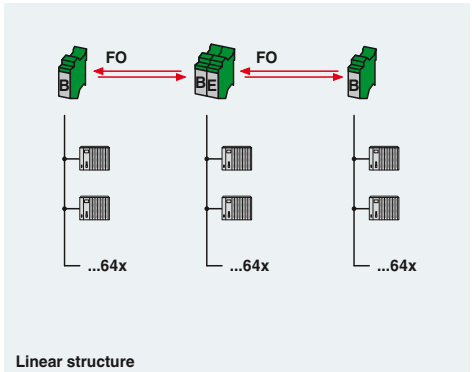
Ex:

Technical data

10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
100 mA (24 V DC)
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®
120 Ω (can be connected)
≤ 800 kbps
≤ 5000 m (dependent on the data rate and the protocol used)
Plug-in screw connection
F-SMA
660 nm
100 m (with F-P 980/1000 230 dB/km with quick mounting connector) 800 m (with F-K 200/230 10 dB/km with quick mounting connector)
< 1 bit
60 V DC / 42 V AC, 0.46 A
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
22.5 mm / 99 mm / 114.5 mm
II 3 G Ex nAC IIC T4 X II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
Class I, Zone 2, AEx nc IIC T5 Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-DNET CAN/FO 660/BM[1])	**2708054**	1
PSI-MOS-DNET CAN/FO 660/EM[1])	**2708067**	1



Linear structure

DeviceNet™ and CANopen®
HCS and fiberglass
(multi mode)

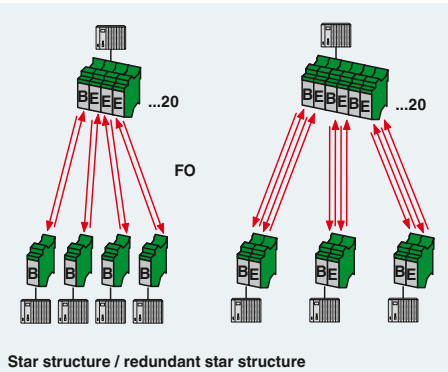
Ex:

Technical data

10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
100 mA (24 V DC)
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®
120 Ω (can be connected)
≤ 800 kbps
≤ 5000 m (dependent on the data rate and the protocol used)
Plug-in screw connection
B-FOC (ST®)
850 nm
2800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4800 m (with F-G 50/125 2.5 dB/km) 4200 m (with F-G 62.5/125 3.0 dB/km)
< 1 bit
60 V DC / 42 V AC, 0.46 A
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
22.5 mm / 99 mm / 114.5 mm
II 3 G Ex nAC IIC T4 X II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
Class I, Zone 2, AEx nc IIC T5 Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-DNET CAN/FO 850/BM[1])	**2708083**	1
PSI-MOS-DNET CAN/FO 850/EM[1])	**2708096**	1



Star structure / redundant star structure

DeviceNet™ and CANopen®
HCS and fiberglass
(multi mode) external backplane

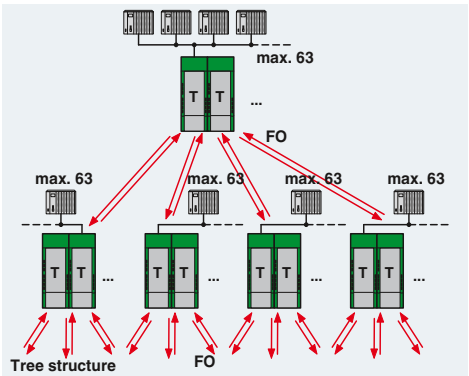
Ex:

Technical data

11 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
130 mA (24 V DC)
CAN interface, in accordance with ISO/IS 11898 for DeviceNet™, CAN, CANopen®
124 Ω (integrated and ready to be switched)
≤ 1000 kbps
≤ 5000 m (dependent on the data rate and the protocol used)
COMBICON plug-in screw terminal block
B-FOC (ST®)
850 nm
1800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4600 m (with F-G 50/125 2.5 dB/km) 4200 m (with F-G 62.5/125 3.0 dB/km)
< 1 bit (configurable)
-
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
35 mm / 102 mm / 119 mm
II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U) II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U) II 3 G Ex nA IIC T4 Gc X 508 listed

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-DNET/FO 850 E[1])	**2313999**	1
PSI-MOS-DNET/FO 850 T[1])	**2313986**	1



Tree structure

Fiber optic converters for RS-485 2-wire bus systems

The RS-485 2-wire interface is the most widely used interface in the field of automation technology. Well-known bus systems, such as SUCONET K, Modbus ASCII, Modbus RTU, S-BUS, and DH-485, are all based on this interface, as are many other company-specific bus systems.

The **PSI-MOS-RS485W2/FO...** FO converters convert the electrical data signal into an optical one by protocol transparent means.

The integrated optical diagnostics allow permanent monitoring of the FO paths during installation and also during operation. The floating switch contact is activated when the signal output on the fiber optic paths drops to a critical level.

Depending on which wavelength is used in conjunction with the corresponding fibers, distances of 100 m to 45 km can be achieved between two devices.

- Automatic data rate detection or fixed data rate setting via DIP switches
- Suitable for data rates of up to 500 kbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (RS-485 // fiber optic ports // power supply // DIN rail connector)
- Routing of supply voltage and data signals through DIN rail connectors
- Redundant power supply supported in the form of optional system power supply unit
- Can be combined with the PSI copper repeater in a modular way using DIN rail connectors

The **PSI-MOS-RS485W2/FO... E** termination devices convert an RS-485 interface to a fiber optic cable. They are ideal for point-to-point connections.

The **PSI-MOS-RS485W2/FO... T** T-couplers allow the interface to be converted to **two FO cables**. They can be used to create linear structures and redundant structures for increased system availability.

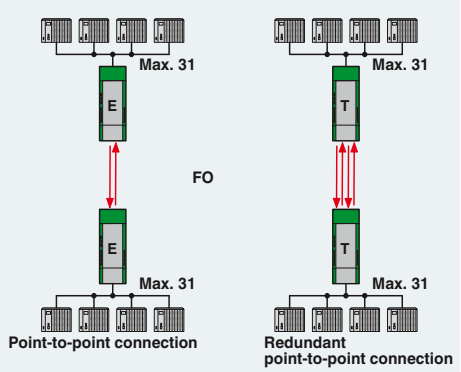
Notes:

1) EMC: Class A product, see page 553

Supply voltage range	
Nominal current consumption	
RS-485 interface	
Data format/coding	
Termination resistor	
Transmission speed	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal device, for converting data signals from RS-485 2-wire **to an FO cable**
T-coupler, for converting data signals from RS-485 2-wire **to two FO cables**

DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through the supply voltage, 2 required per device
System power supply unit, primary-switched



RS-485 2-wire
polymer and HCS fibers

Ex:

Technical data

18 V DC ... 30 V DC
100 mA (24 V DC)
RS-485 interface, 2-wire
UART (11/10 bit switchable ; NRZ), slip-tolerant
390 Ω / 220 Ω / 390 Ω (can be connected)
4,8/ 9,6/ 19,2/ 38,4/ 57,6/ 75/ 93,75/ 115,2/ 136/ 187,5/ 375/ 500
≤ 1200 m (depending on the data rate, with shielded, twisted data cable)
Plug-in screw connection

F-SMA
660 nm
100 m (with F-P 980/1000 230 dB/km with quick mounting connector)
800 m (with F-K 200/230 10 dB/km with quick mounting connector)

< 1 bit
60 V DC / 42 V AC, 0.46 A
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
35 mm / 99 mm / 105 mm

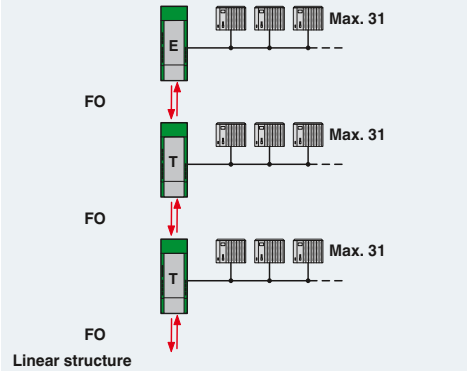
II 3 G Ex nAC IIC T4 X
II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
Class I, Zone 2, AEx nc IIC T5
Class I, Zone 2, Ex nC nL IIC T5 X
Class I, Div. 2, Groups A, B, C, D

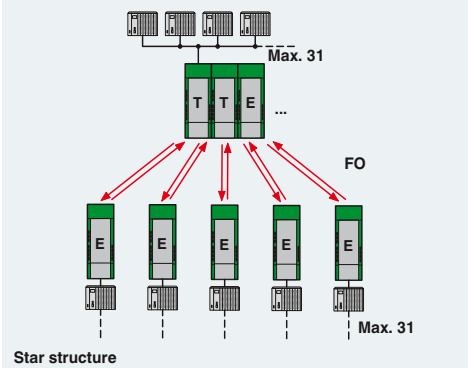
Ordering data

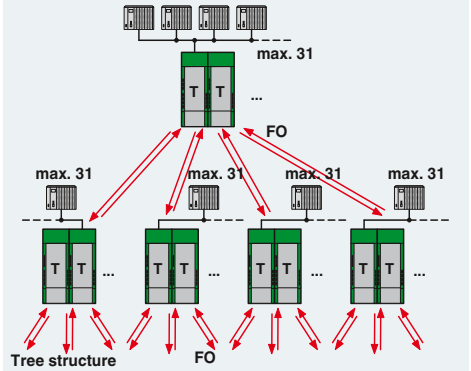
Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS485W2/FO 660 E[1])	**2708313**	1
PSI-MOS-RS485W2/FO 660 T[1])	**2708300**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1







RS-485 2-wire
HCS and fiberglass
(multi mode)

Ex:

Technical data

18 V DC ... 30 V DC
120 mA (24 V DC)
RS-485 interface, 2-wire
UART (11/10 bit switchable ; NRZ), slip-tolerant
390 Ω / 220 Ω / 390 Ω (can be connected)
4,8/ 9,6/ 19,2/ 38,4/ 57,6/ 75/ 93,75/ 115,2/ 136/ 187,5/ 375/ 500
≤ 1200 m (depending on the data rate, with shielded, twisted data cable)
Plug-in screw connection

B-FOC (ST®)
850 nm
2800 m (with F-K 200/230 8 dB/km with quick mounting connector)
4200 m (with F-G 50/125 2.5 dB/km)
3300 m (with F-G 62.5/125 3.0 dB/km)

< 1 bit
60 V DC / 42 V AC, 0.46 A
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
35 mm / 99 mm / 105 mm

II 3 G Ex nAC IIC T4 X
II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)
Class I, Zone 2, AEx nc IIC T5
Class I, Zone 2, Ex nC nL IIC T5 X
Class I, Div. 2, Groups A, B, C, D

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS485W2/FO 850 E[1])	**2708339**	1
PSI-MOS-RS485W2/FO 850 T[1])	**2708326**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

RS-485 2-wire
fiberglass
(multi mode and single mode)

Technical data

18 V DC ... 32 V DC
170 mA (24 V DC)
RS-485 interface, 2-wire
UART (11/10 bit switchable ; NRZ), slip-tolerant
390 Ω / 220 Ω / 390 Ω (can be connected)
4,8/ 9,6/ 19,2/ 38,4/ 57,6/ 75/ 93,75/ 115,2/ 136/ 187,5/ 375/ 500
≤ 1200 m (depending on the data rate, with shielded, twisted data cable)
Plug-in screw connection

SC duplex
1300 nm
25 km (with F-G 50/125 0.7 dB/km at 1300 nm)
22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)
45 km (with F-E 9/125 0.4 dB/km at 1300 nm)

< 1 bit
60 V DC / 42 V AC, 1 A
1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C
35 mm / 99 mm / 105 mm

II 3 G Ex nA nC IIC T4 Gc X

508 listed
508 recognized

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS485W2/FO1300 E[1])	**2708562**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Fiber optic converter for INTERBUS

The **PSI-MOS-RS422/FO...** devices are used for converting INTERBUS interfaces to fiber optics. The conversion is performed using a transparent protocol for all data rates up to max. 2 Mbps. The integrated optical diagnostics allow permanent monitoring of the FO paths during installation and also during operation. The floating switch contact is activated when the signal output on the fiber optic paths drops to a critical level. This early alarm generation enables critical system states to be diagnosed before they result in failure.

- Automatic data rate detection for all data rates up to 2 Mbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (INTERBUS // fiber optic ports // power supply // DIN rail connector)
- Connections can be plugged in using a COMBICON screw terminal block
- Redundant power supply supported in the form of optional system power supply unit
- Routing through of the supply voltage via the DIN rail connector
- Approved for use in zone 2
- Intrinsically safe FO interface (Ex op is) for direct connection to devices in zone 1 (all 660 and 850 nm versions)

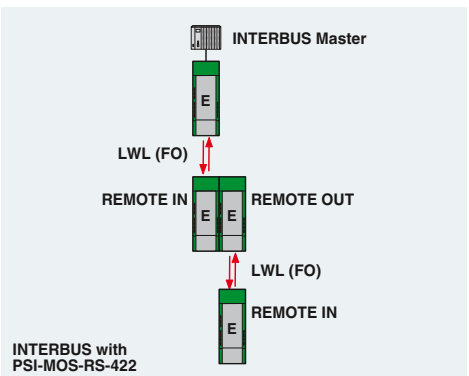
INTERBUS lines are constructed with the **PSI-MOS-RS422...E terminal devices**. The **PSI-MOS-RS422...T T-couplers** also allow redundant **INTERBUS connections** via fiber optics.

Notes:

1) EMC: Class A product, see page 553

Supply voltage range	
Nominal current consumption	
RS-422 interface	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal device, for converting data signals from RS-422 (V.11) /RS-485 4-wire **to an FO cable**
T-coupler, for converting data signals from RS-422 (V.11) /RS-485 4-wire to two FO cables
DIN rail connector, (optional), for routing through the supply voltage, 2 required per device
System power supply unit, primary-switched



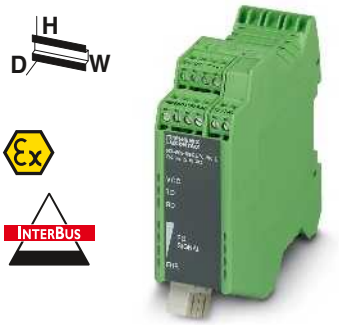
INTERBUS with PSI-MOS-RS-422

INTERBUS
polymer and HCS fibers

Ex: c UL us Ex

INTERBUS
HCS and fiberglass
(multi mode)

Ex: c UL us Ex



INTERBUS
fiberglass
(multi mode and single mode)

c UL us c UL us

Technical data

18 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 32 V DC
100 mA (24 V DC)	120 mA (24 V DC)	110 mA (24 V DC)
RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1
≤ 1000 m (depending on the data rate, with shielded, twisted data cable)	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)	≤ 1000 m (depending on the data rate, with shielded, twisted data cable)
Plug-in screw connection	Plug-in screw connection	Plug-in screw connection
F-SMA	B-FOC (ST®)	SC duplex
660 nm	850 nm	1300 nm
100 m (with F-P 980/1000 230 dB/km with quick mounting connector) 800 m (with F-K 200/230 10 dB/km with quick mounting connector)	2800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4200 m (with F-G 50/125 2.5 dB/km) 4800 m (with F-G 62.5/125 3.0 dB/km)	27 km (with F-G 50/125 0.7 dB/km at 1300 nm) 22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm) 45 km (with F-E 9/125 0.4 dB/km at 1300 nm)
< 1 bit	< 1 bit	< 1 bit
60 V DC / 42 V AC, 0.46 A	60 V DC / 42 V AC, 0.46 A	60 V DC / 42 V AC, 1 A
1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C	-20 °C ... 60 °C	-20 °C ... 60 °C
35 mm / 99 mm / 103 mm	35 mm / 99 mm / 103 mm	35 mm / 105 mm / 103 mm
Ex II 3 G Ex nAC IIC T4 X Ex II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	Ex II 3 G Ex nAC IIC T4 X Ex II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	Ex II 3 G Ex nA nC IIC T4 Gc X
Class I, Zone 2, AEx nc IIC T5 Class I, Zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D	Class I, Zone 2, AEx nc IIC T5 Class I, Zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D	508 listed 508 recognized

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO 660 E[1])	**2708342**	1
PSI-MOS-RS422/FO 660 T[1])	**2708384**	1

Accessories

ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO 850 E[1])	**2708355**	1
PSI-MOS-RS422/FO 850 T[1])	**2708397**	1

Accessories

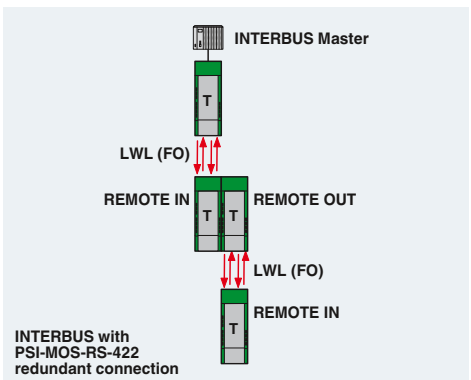
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO1300 E[1])	**2708575**	1

Accessories

ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1



INTERBUS with PSI-MOS-RS-422 redundant connection

FO converters for RS-422 and RS-485 4-wire bus systems

Data transfer via copper cables reaches its limits very quickly in an industrial environment. Particularly in applications with a high level of electromagnetic interference, interference-free communication can only be achieved with great complexity in terms of shielding and surge protection. The **PSI-MOS-RS422/FO...** devices convert copper for fiber optics. A transparent protocol is used for conversion.

- Automatic data rate detection for all data rates up to 2 Mbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (RS-422 // fiber optic ports // power supply // DIN rail connector)
- Connections can be plugged in using a COMBICON screw terminal block
- Redundant power supply supported in the form of optional system power supply unit
- Routing of supply voltage and data signals through DIN rail connectors
- Approved for use in zone 2
- Intrinsically safe FO interface (Ex op is) for direct connection to devices in zone 1 (all 660 and 850 nm versions)

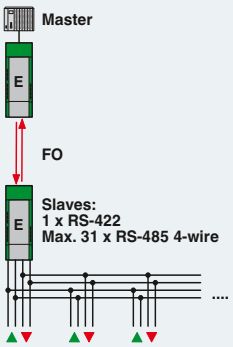
If RS-422 terminal devices are used, only one terminal device can be connected to each PSI-MOS-RS422/FO... device. If devices with an RS-485 4-wire interface are used, it is possible to create a network with up to 31 slave devices connected to one FO converter. In both cases, a suitable communication protocol capable of terminal device addressing is required (e.g., Modbus RTU).

Notes:

1) EMC: Class A product, see page 553

Supply voltage range	
Nominal current consumption	
RS-422 interface	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal device, for converting data signals from RS-422 (V.11) /RS-485 4-wire **to an FO cable**
T-coupler, for converting data signals from RS-422 (V.11) /RS-485 4-wire **to two FO cables**
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through he supply voltage, 2 required per device
System power supply unit, primary-switched



Point-to-point connection

RS-422/RS-485 4-wire polymer and HCS fibers

Ex:

Technical data

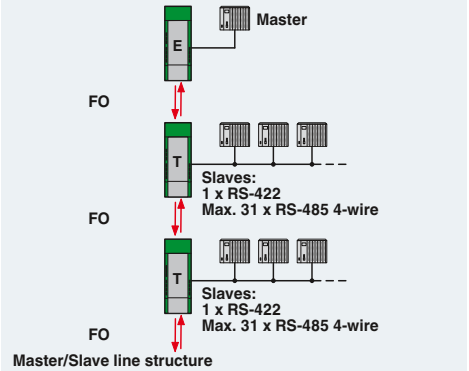
18 V DC ... 30 V DC	
100 mA (24 V DC)	
RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
≤ 1000 m (depending on the data rate, with shielded, twisted data cable)	
Plug-in screw connection	
F-SMA	
660 nm	
100 m (with F-P 980/1000 230 dB/km with quick mounting connector)	
800 m (with F-K 200/230 10 dB/km with quick mounting connector)	
< 1 bit	
60 V DC / 42 V AC, 0.46 A	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
35 mm / 99 mm / 103 mm	
II 3 G Ex nAC IIC T4 X	
II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5	
Class I, Zone 2, Ex nC nL IIC T5 X	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

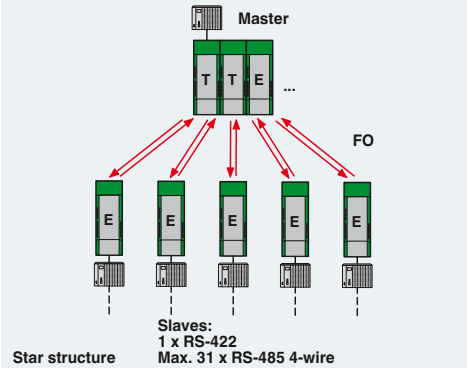
Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO 660 E[1])	2708342	1
PSI-MOS-RS422/FO 660 T[1])	2708384	1

Accessories

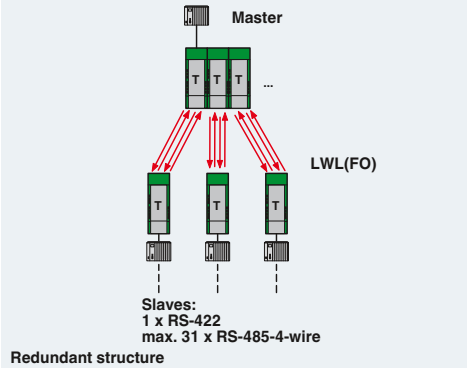
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



Master/Slave line structure



Star structure



Redundant structure

RS-422/RS-485 4-wire HCS and fiberglass (multi mode)

Ex:

Technical data

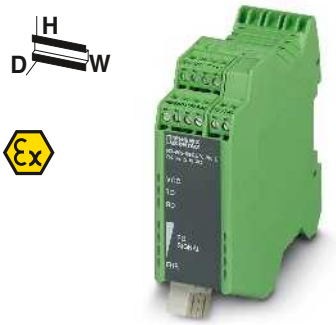
18 V DC ... 30 V DC	
120 mA (24 V DC)	
RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
≤ 1000 m (depending on the data rate, with shielded, twisted data cable)	
Plug-in screw connection	
B-FOC (ST®)	
850 nm	
2800 m (with F-K 200/230 8 dB/km with quick mounting connector)	
4200 m (with F-G 50/125 2.5 dB/km)	
4800 m (with F-G 62.5/125 3.0 dB/km)	
< 1 bit	
60 V DC / 42 V AC, 0.46 A	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
35 mm / 99 mm / 103 mm	
II 3 G Ex nAC IIC T4 X	
II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U)	
Class I, Zone 2, AEx nc IIC T5	
Class I, Zone 2, Ex nC nL IIC T5 X	
Class I, Div. 2, Groups A, B, C, D	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO 850 E[1])	2708355	1
PSI-MOS-RS422/FO 850 T[1])	2708397	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1



RS-422/RS-485 4-wire fiberglass (multi mode and single mode)

Ex:

Technical data

18 V DC ... 32 V DC	
110 mA (24 V DC)	
RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
≤ 1000 m (depending on the data rate, with shielded, twisted data cable)	
Plug-in screw connection	
SC duplex	
1300 nm	
27 km (with F-G 50/125 0.7 dB/km at 1300 nm)	
22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm)	
45 km (with F-E 9/125 0.4 dB/km at 1300 nm)	
< 1 bit	
60 V DC / 42 V AC, 1 A	
1.5 kV_{rms} (50 Hz, 1 min.)	
-20 °C ... 60 °C	
35 mm / 105 mm / 103 mm	
II 3 G Ex nA nC IIC T4 Gc X	
508 listed	
508 recognized	

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS422/FO1300 E[1])	2708575	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	2709561	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	2890014	10
MINI-SYS-PS-100-240AC/24DC/1.5	2866983	1

Fiber optic converters for RS-232 (V.24)

Due to its electrical properties, the V.24 (RS-232) is very susceptible to EMC influences and potential differences. For this reason, it can only be used for short distances of up to max. 15 m. FO transmission technology is, therefore, the first choice for longer transmission distances and for eliminating EMC influences. The **PSI-MOS-RS232/FO...** devices convert the V.24 (RS-232) interface for fiber optics. A transparent protocol is used for conversion. If addressable V.24 (RS-232) devices and a suitable communication protocol are used, even multi-point networks can be constructed. These can be implemented as linear, star, and even redundant star structures.

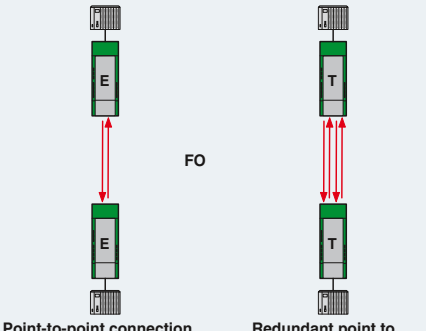
- Automatic data rate detection for all data rates up to 115.2 kbps
- Integrated optical diagnostics for continuous monitoring of fiber optic paths
- Floating switch contact for leading alarm generation in relation to critical fiber optic paths
- High-quality electrical isolation between all interfaces (V.24 (RS-232) // fiber optic ports // power supply // DIN rail connector)
- Redundant power supply supported in the form of optional system power supply unit
- Connections can be plugged in using a COMBICON screw terminal block
- Routing of supply voltage and data signals through DIN rail connectors
- Approved for use in zone 2
- Intrinsically safe FO interface (Ex op is) for direct connection to devices in zone 1 (all 660 and 850 nm versions)

Notes:

1) EMC: Class A product, see page 553

Supply voltage range	
Nominal current consumption	
V.24 (RS-232) interface	
Transmission length	
Connection method	
Optical interface	
Connection	
Wavelength	
Transmission length incl. 3 dB system reserve	
General data	
Bit delay	
Alarm output	
Test voltage	
Ambient temperature range	
Dimensions	W / H / D
Conformance / approvals	
ATEX	
UL, USA / Canada	

Description
Terminal equipment, for converting data signals from RS-232 (V.24) **to an FO cable**
T-coupler, for converting data signals from RS-232 (V.24) **to two FO cables**
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DIN rail connector, (optional), for routing through the supply voltage, 2 required per device
System power supply unit, primary-switched



Point-to-point connection

Redundant point to point connection

RS-232

V.24 (RS-232)
polymer and HCS fibers

Ex:

RS-232

V.24 (RS-232)
HCS and fiberglass
(multi mode)

Ex:

RS-232

V.24 (RS-232)
fiberglass
(multi mode and single mode)

Technical data

18 V DC ... 30 V DC	18 V DC ... 30 V DC	18 V DC ... 32 V DC
100 mA (24 V DC)	120 mA (24 V DC)	100 mA (24 V DC)
V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1	V.24 (RS-232) interface in acc. with ITU-T V.28, EIA/TIA-232, DIN 66259-1
≤ 15 m	≤ 15 m	≤ 15 m
D-SUB-9 plug	D-SUB-9 plug	D-SUB-9 plug
F-SMA	B-FOC (ST®)	SC duplex
660 nm	850 nm	1300 nm
100 m (with F-P 980/1000 230 dB/km with quick mounting connector) 800 m (with F-K 200/230 10 dB/km with quick mounting connector)	2800 m (with F-K 200/230 8 dB/km with quick mounting connector) 4200 m (with F-G 50/125 2.5 dB/km) 4800 m (with F-G 62.5/125 3.0 dB/km)	27 km (with F-G 50/125 0.7 dB/km at 1300 nm) 22 km (with F-G 62.5/125 0.8 dB/km at 1300 nm) 45 km (with F-E 9/125 0.4 dB/km at 1300 nm)
< 1 bit	< 1 bit	< 1 bit
60 V DC / 42 V AC, 0.46 A	60 V DC / 42 V AC, 0.46 A	60 V DC / 42 V AC, 1 A
1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
-20 °C ... 60 °C	-20 °C ... 60 °C	-20 °C ... 60 °C
35 mm / 99 mm / 105 mm	35 mm / 99 mm / 105 mm	35 mm / 99 mm / 105 mm
II 3 G Ex nAC IIC T4 X II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U) Class I, Zone 2, AEx nc IIC T5 Class I, Zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D	II 3 G Ex nAC IIC T4 X II (2) GD [Ex op is] IIC (PTB 06 ATEX 2042 U) Class I, Zone 2, AEx nc IIC T5 Class I, Zone 2, Ex nC nL IIC T5 X Class I, Div. 2, Groups A, B, C, D	II 3 G Ex nA nC IIC T4 Gc X 508 listed 508 recognized

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS232/FO 660 E[1])	**2708368**	1
PSI-MOS-RS232/FO 660 T[1])	**2708410**	1

Accessories

ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS232/FO 850 E[1])	**2708371**	1
PSI-MOS-RS232/FO 850 T[1])	**2708423**	1

Accessories

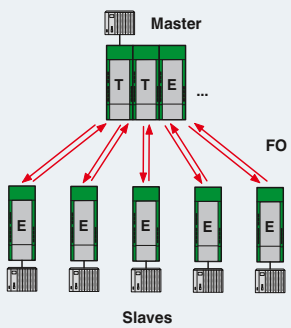
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Ordering data

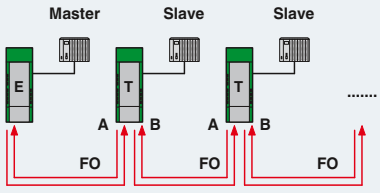
Type	Order No.	Pcs. / Pkt.
PSI-MOS-RS232/FO1300 E[1])	**2708588**	1

Accessories

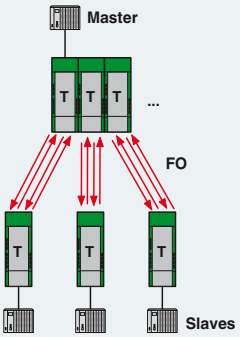
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
ME 17,5 TBUS 1,5/PP000-3,81 BK	**2890014**	10
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1



Star structure

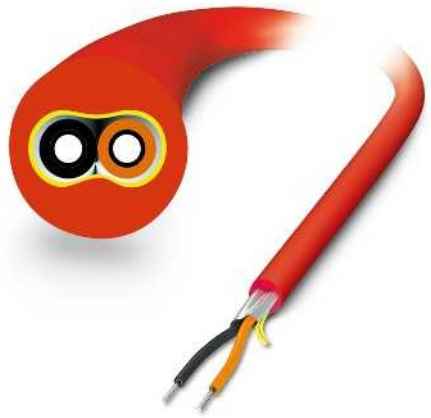


Master/Slave line structure



Redundant structure

Universal POF cable for assembly, type KDHEAVY-1011



- Universal installation cable for fixed installation indoors
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2744319	Variable	2901553	Variable	2901553
FSMA connector, IP20						
FSMA	Variable	2901553	Variable	2901553	Variable	2901553
SCRJ connectors, IP20						
SCRJ	Variable	2901553	Variable	2901553	Variable	2901553
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901553	Variable	2901553	Variable	2901553
SCRJ connector, IP67						
IP67	Variable	1402188	Variable	1402188	Variable	1402188
Push/pull SCRJ, plastic						
PPCPL	Variable	1402188	Variable	1402188	Variable	1402188
Push/pull SCRJ, metal						
PPCME	Variable	1402188	Variable	1402188	Variable	1402188

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402188	SCRJ	PPCPL	15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

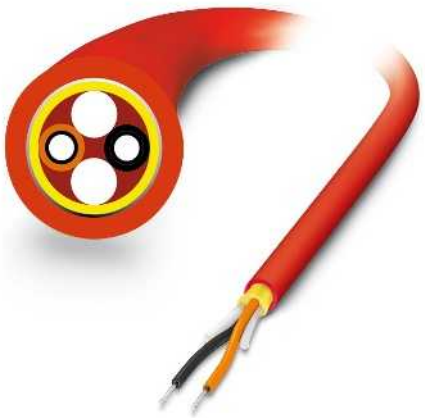
Order No.	Length [m]
2744319	70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	SCRJ connector, IP67	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	IP67	PPCPL	PPCME
Ordering data	Ordering data	Ordering data	Ordering data
Order No.	Order No.	Order No.	Order No.
Variable 2901553	Variable 1402188	Variable 1402188	Variable 1402188
Variable 2901553	Variable 1402188	Variable 1402188	Variable 1402188
Variable 2901553	Variable 1402188	Variable 1402188	Variable 1402188
Variable 2901553	Variable 1402188	Variable 1402188	Variable 1402188
Variable 1402188	Variable 1402188		
Variable 1402188		Variable 1402188	
Variable 1402188			Variable 1402188

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 160A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	230 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	red
Diameter	5.5 - 6.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	black/orange
Diameter	2.2 mm ±0.07 mm
General data	
Weight	33 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Rugged POF cable for free assembly, type RUGGED-1012



- Rugged installation cable for fixed installation indoors
- Dimensioned for higher requirements in respect of tensile load and lateral pressure
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Reinforced polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2744322	Variable	2901548	Variable	2901548
FSMA connector, IP20						
FSMA	Variable	2901548	Variable	2901548	Variable	2901548
SCRJ connectors, IP20						
SCRJ	Variable	2901548	Variable	2901548	Variable	2901548
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901548	Variable	2901548	Variable	2901548
SCRJ connector, IP67						
IP67	Variable	1402185	Variable	1402185	Variable	1402185
Push/pull SCRJ, plastic						
PPCPL	Variable	1402185	Variable	1402185	Variable	1402185
Push/pull SCRJ, metal						
PPCME	Variable	1402185	Variable	1402185	Variable	1402185

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402185	SCRJ	PPCPL	15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

Order No.	Length [m]
2744322	70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	SCRJ connector, IP67	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	IP67	PPCPL	PPCME
Ordering data	Ordering data	Ordering data	Ordering data
Order No.	Order No.	Order No.	Order No.
Variable 2901548	Variable 1402185	Variable 1402185	Variable 1402185
Variable 2901548	Variable 1402185	Variable 1402185	Variable 1402185
Variable 2901548	Variable 1402185	Variable 1402185	Variable 1402185
Variable 2901548	Variable 1402185	Variable 1402185	Variable 1402185
Variable 1402185	Variable 1402185		
Variable 1402185		Variable 1402185	
Variable 1402185			Variable 1402185

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 160A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	230 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	red
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	black/orange
Diameter	2.2 mm ±0.07 mm
General data	
Weight	54 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Highly flexible POF cable for free assembly, type RUGGED-FLEX-1013

- Highly flexible round cable for use in trailing cables or drag chains
- Dimensioned for an alternating bending frequency of up to 5,000,000 cycles
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2744335	Variable	2901549	Variable	2901549
FSMA connector, IP20						
FSMA	Variable	2901549	Variable	2901549	Variable	2901549
SCRJ connectors, IP20						
SCRJ	Variable	2901549	Variable	2901549	Variable	2901549
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901549	Variable	2901549	Variable	2901549
SCRJ connector, IP67						
IP67	Variable	1402187	Variable	1402187	Variable	1402187
Push/pull SCRJ, plastic						
PPCPL	Variable	1402187	Variable	1402187	Variable	1402187
Push/pull SCRJ, metal						
PPCME	Variable	1402187	Variable	1402187	Variable	1402187

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402187	SCRJ	PPCPL	15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

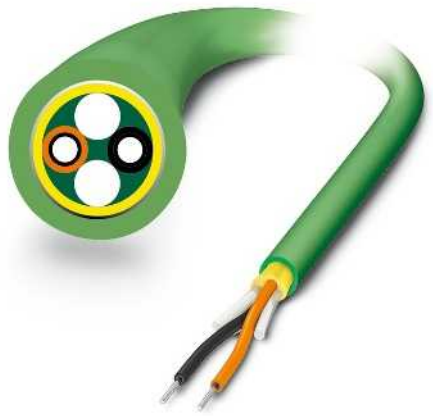
Order No.	Length [m]
2744335	70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	SCRJ connector, IP67	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	IP67	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**	**Order No.**
Variable **2901549**	Variable **1402187**	Variable **1402187**	Variable **1402187**
Variable **2901549**	Variable **1402187**	Variable **1402187**	Variable **1402187**
Variable **2901549**	Variable **1402187**	Variable **1402187**	Variable **1402187**
Variable **2901549**	Variable **1402187**	Variable **1402187**	Variable **1402187**
Variable **1402187**	Variable **1402187**		
Variable **1402187**		Variable **1402187**	
Variable **1402187**			Variable **1402187**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 180A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	275 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	red
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	black/orange
Diameter	2.2 mm ±0.07 mm
General data	
Weight	54 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

PROFINET B POF cable for free assembly, type PN-B-1000



- Universal installation cable for fixed installation indoors
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath
- PROFINET type B

Ethernet

PROFINET

	free end	FSMA connector, IP20	SCRJ connector, IP20
	OE	FSMA	SCRJ
	Ordering data	Ordering data	Ordering data
	Order No.	Order No.	Order No.
free end OE	By the meter 2313397	Variable 2901551	Variable 2901551
FSMA connector, IP20 FSMA	Variable 2901551	Variable 2901551	Variable 2901551
SCRJ connectors, IP20 SCRJ	Variable 2901551	Variable 2901551	Variable 2901551
B-FOC (ST®) connector, IP20 BFOC	Variable 2901551	Variable 2901551	Variable 2901551
Push/pull SCRJ, plastic PPCPL	Variable 1402172	Variable 1402172	Variable 1402172
Push/pull SCRJ, metal PPCME	Variable 1402172	Variable 1402172	Variable 1402172

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402172	SCRJ	PPCPL	15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

Order No.	Length [m]
2313397	70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**
Variable **2901551**	Variable **1402172**	Variable **1402172**
Variable **2901551**	Variable **1402172**	Variable **1402172**
Variable **2901551**	Variable **1402172**	Variable **1402172**
Variable **2901551**	Variable **1402172**	Variable **1402172**
Variable **1402172**	Variable **1402172**	
Variable **1402172**		Variable **1402172**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 160A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	230 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	Green
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	Black and orange with arrow labeling
Diameter	2.2 mm ±0.07 mm
General data	
Weight	49 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Highly flexible PROFINET C POF cable for free assembly, type PN-C-1003

- Highly flexible round cable for use in trailing cables or drag chains
- Dimensioned for an alternating bending frequency of up to 5,000,000 cycles
- 2.2 mm single wires made from extremely hard-wearing polyamide chloride (PA)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath
- PROFINET type C

Ethernet

PROFINET

		free end		FSMA connector, IP20		SCRJ connector, IP20	
		OE		FSMA		SCRJ	
		Ordering data		Ordering data		Ordering data	
			Order No.		Order No.		Order No.
free end	OE	By the meter	2313407	Variable	2901552	Variable	2901552
FSMA connector, IP20	FSMA	Variable	2901552	Variable	2901552	Variable	2901552
SCRJ connectors, IP20	SCRJ	Variable	2901552	Variable	2901552	Variable	2901552
B-FOC (ST®) connector, IP20	BFOC	Variable	2901552	Variable	2901552	Variable	2901552
Push/pull SCRJ, plastic	PPCPL	Variable	1402175	Variable	1402175	Variable	1402175
Push/pull SCRJ, metal	PPCME	Variable	1402175	Variable	1402175	Variable	1402175

Ordering example for configured cable:

For a **POF cable**, fitted with an **SCRJ plug** at one end and a **plastic SCRJ push/pull plug-in connector** at the other end, and **15 m in length**, the ordering data is as follows:

Order No.	Plug 1	Plug 2	Length [m]
1402175	SCRJ	PPCPL	15

Length:	Min. 0.5 m Max. 100 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 100 m

Ordering example for cable sold by the meter:

For a **POF cable 70 m in length**, the ordering data is as follows:

Order No.	Length [m]
2313407	70

Length:	Min. 0.5 m Max. 500 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 500 m

B-FOC (ST®) connector, IP20	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
BFOC	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**
Variable **2901552**	Variable **1402175**	Variable **1402175**
Variable **2901552**	Variable **1402175**	Variable **1402175**
Variable **2901552**	Variable **1402175**	Variable **1402175**
Variable **2901552**	Variable **1402175**	Variable **1402175**
Variable **1402175**	Variable **1402175**	
Variable **1402175**		Variable **1402175**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V11Y 4Y2P 980/1000 180A 10
Fibers	Polymer fiber, 980/1000 µm
Attenuation, typical	275 dB/km (at 660 nm)
Outer sheath	
Material	PUR
Color	Green
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PA
Color	Black and orange with arrow labeling
Diameter	2.2 mm ±0.07 mm
General data	
Weight	51 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 80 °C
Ambient temperature (installation)	5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Universal PROFINET B HCS cable for free assembly, type PN-B-HCS-1018

- Universal installation cable for fixed installation indoors
- 2.2 mm single wires made from extremely hard-wearing polyvinyl chloride (PVC)
- Halogen-free, ozone and UV resistant
- PVC outer cable sheath
- PROFINET type B

Ethernet

PROFINET

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end OE	By the meter	2313766	Variable	2901556	Variable	2901556
FSMA connector, IP20 FSMA	Variable	2901556	Variable	2901556	Variable	2901556
SCRJ connectors, IP20 SCRJ	Variable	2901556	Variable	2901556	Variable	2901556
SC duplex connector, IP20 SCDUP	Variable	2901556	Variable	2901556	Variable	2901556
B-FOC (ST®) connector, IP20 BFOC	Variable	2901556	Variable	2901556	Variable	2901556
LC connector LC	Variable	2901556	Variable	2901556	Variable	2901556
Push/pull SCRJ, plastic PPCPL	Variable	1402190	Variable	1402190	Variable	1402190
Push/pull SCRJ, metal PPCME	Variable	1402190	Variable	1402190	Variable	1402190

Ordering example:

For an **HCS cable** with two **SCRJ plugs with IP20 protection** and **70 m in length**, the ordering data is as follows:

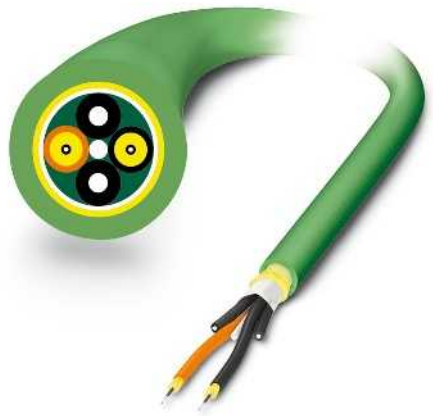
Order No.	Length [m]
1408466	/ 70

Length:	Min. 1 m Max. 2000 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
SCDUP	BFOC	LC	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**	**Order No.**	**Order No.**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **2901556**	Variable **2901556**	Variable **2901556**	Variable **1402190**	Variable **1402190**
Variable **1402190**	Variable **1402190**	Variable **1402190**	Variable **1402190**	
Variable **1402190**	Variable **1402190**	Variable **1402190**		Variable **1402190**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	AT-V(ZN)YY 2K200/230 HCS
Fibers	HCS, 200/230 µm
Attenuation, typical	10 dB/km (at 660 nm), 8 dB/km (at 850 nm)
Outer sheath	
Material	PVC
Color	Green
Diameter	6.7 - 7.7 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PVC
Color	Black and orange with arrow labeling
Diameter	2.2 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	45 kg/km
Ambient temperature (operation)	-40 °C ... 90 °C
Ambient temperature (storage/transport)	-40 °C ... 90 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	-

PROFINET C HCS broadband cable (GI) for free assembly, type PN-C-HCS-GI-1005



- Highly flexible round cable for use in trailing cables or drag chains
- Rugged installation cable for indoor use
- Gradient index fiber for maximum power requirements in respect of transmission bandwidth
- Can be used in 10/100/1000 Mbps Ethernet systems
- 2.2 mm single wires made from polyvinyl chloride (PVC)
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath
- Highly tear-resistant aramid strain relief elements
- PROFINET type C

Ethernet

PROFINET

		free end		FSMA connector, IP20		SCRJ connector, IP20	
		OE		FSMA		SCRJ	
		Ordering data		Ordering data		Ordering data	
			Order No.		Order No.		Order No.
free end	OE	By the meter	2313410	Variable	2901554	Variable	2901554
FSMA connector, IP20	FSMA	Variable	2901554	Variable	2901554	Variable	2901554
SCRJ connectors, IP20	SCRJ	Variable	2901554	Variable	2901554	Variable	2901554
SC duplex connector, IP20	SCDUP	Variable	2901554	Variable	2901554	Variable	2901554
B-FOC (ST®) connector, IP20	BFOC	Variable	2901554	Variable	2901554	Variable	2901554
LC connector	LC	Variable	2901554	Variable	2901554	Variable	2901554
Push/pull SCRJ, plastic	PPCPL	Variable	1402189	Variable	1402189	Variable	1402189
Push/pull SCRJ, metal	PPCME	Variable	1402189	Variable	1402189	Variable	1402189

Ordering example for configured cable:

For an **HCS cable 15 m in length** equipped with an **SCRJ connector** at one end and an **SCRJ push/pull plastic connector** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
1402189	SCRJ	PPCPL	15

Length:	Min. 1 m Max. 2000 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

Ordering example for cable sold by the meter:

For an **HCS cable 70 m in length**, the order data is as follows:

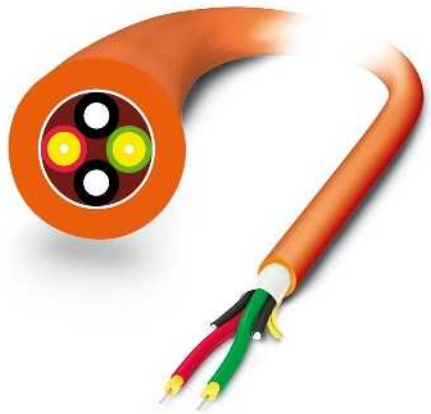
Order No.	Length [m]
2313410	70

Length:	Min. 1 m Max. 2000 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector	Push/pull SCRJ, plastic	Push/pull SCRJ, metal
SCDUP	BFOC	LC	PPCPL	PPCME
Ordering data	**Ordering data**	**Ordering data**	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**	**Order No.**	**Order No.**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **2901554**	Variable **2901554**	Variable **2901554**	Variable **1402189**	Variable **1402189**
Variable **1402189**	Variable **1402189**	Variable **1402189**	Variable **1402189**	
Variable **1402189**	Variable **1402189**	Variable **1402189**		Variable **1402189**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	J-V(ZN)12Y(ZN)11Y 2GK200/230 GI-HCS
Fibers	HCS gradient index, 200/230 µm
Attenuation, typical	18 dB/km (at 660 nm), 12 dB/km (at 850 nm)
Outer sheath	
Material	PUR
Color	Green
Diameter	7.5 - 8.5 mm
Strain relief elements	Non-metallic, aramid fiber
Single wire	
Material	PVC
Color	Black and orange with arrow labeling
Diameter	2.2 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	52 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Rugged HCS cable for free assembly, type HCS-RUGGED-1014



- Rugged installation cable for indoor use
- Highly tear-resistant aramid strain relief elements
- 2.9 mm single wires made from highly flexible FRNC material
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2799885	Variable	2901555	Variable	2901555
FSMA connector, IP20						
FSMA	Variable	2901555	Variable	2901555	Variable	2901555
SCRJ connectors, IP20						
SCRJ	Variable	2901555	Variable	2901555	Variable	2901555
SC duplex connector, IP20						
SCDUP	Variable	2901555	Variable	2901555	Variable	2901555
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901555	Variable	2901555	Variable	2901555
LC connector						
LC	Variable	2901555	Variable	2901555	Variable	2901555
Push/pull SCRJ, plastic						
PPCPL	Variable	1402191	Variable	1402191	Variable	1402191
Push/pull SCRJ, metal						
PPCME	Variable	1402191	Variable	1402191	Variable	1402191
SCRJ connector, IP67						
IP67	Variable	1402191	Variable	1402191	Variable	1402191

Ordering example for configured cable:

For an **HCS cable 15 m in length** equipped with an **SCRJ connector** at one end and an **SCRJ push/pull plastic connector** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
1402191	/ SCRJ	/ PPCPL	/ 15

Length:	Min. 1 m Max. 2000 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

Ordering example for cable sold by the meter:

For an **HCS cable 70 m in length**, the order data is as follows:

Order No.	Length [m]
2799885	/ 70

Length:	Min. 1 m Max. 2000 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 2000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector	Push/pull SCRJ, plastic	Push/pull SCRJ, metal	SCRJ connector, IP67
SCDUP	BFOC	LC	PPCPL	PPCME	IP67
Ordering data	Ordering data	Ordering data	Ordering data	Ordering data	Ordering data
Order No.	Order No.	Order No.	Order No.	Order No.	Order No.
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 2901555	Variable 2901555	Variable 2901555	Variable 1402191	Variable 1402191	Variable 1402191
Variable 1402191	Variable 1402191	Variable 1402191	Variable 1402191		
Variable 1402191	Variable 1402191	Variable 1402191		Variable 1402191	
Variable 1402191	Variable 1402191	Variable 1402191			Variable 1402191

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	I-VH11Y 2K200/230 HCS
Fibers	HCS, 200/230 µm
Attenuation, typical	10 dB/km (at 660 nm), 8 dB/km (at 850 nm)
Outer sheath	
Material	PUR
Color	orange
Diameter	7.5 - 8.5 mm
Single wire	
Material	FRNC material
Color	Red/green
Diameter	2.9 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	54 kg/km
Ambient temperature (operation)	-40 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Ambient temperature (installation)	-20 °C ... 60 °C

Outdoor cables for free assembly, type HCSO-1015

- Rugged round cable for laying outdoors
- Longitudinally water-tight
- Integrated vapor barrier and rodent-proof scrim
- 2.9 mm single wires made from highly flexible FRNC material
- Ozone and UV resistant
- Extremely rugged polyethylene outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
	Order No.		Order No.		Order No.	
free end						
OE	By the meter	2799445	Variable	2901557	Variable	2901557
FSMA connector, IP20						
FSMA	Variable	2901557	Variable	2901557	Variable	2901557
SCRJ connectors, IP20						
SCRJ	Variable	2901557	Variable	2901557	Variable	2901557
SC duplex connector, IP20						
SCDUP	Variable	2901557	Variable	2901557	Variable	2901557
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901557	Variable	2901557	Variable	2901557
LC connector						
LC	Variable	2901557	Variable	2901557	Variable	2901557

Ordering example for configured cable:

For an **HCS cable 15 m in length** equipped with an **SCRJ connector** at one end and a **B-FOC(ST®) connector, IP20** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
2901557	SCRJ	BFOC	15

Length:	Min. 1 m Max. 1000 m	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 1000 m

Ordering example for cable sold by the meter:

For an **HCS cable 70 m in length**, the order data is as follows:

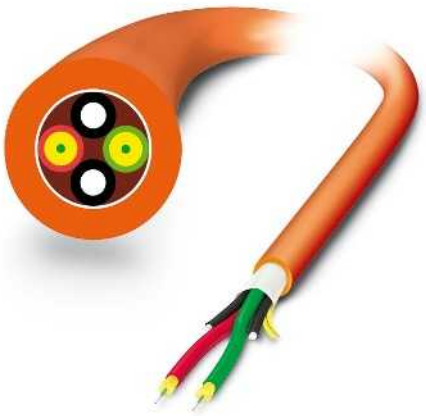
Order No.	Length [m]
2799445	70

Length:	Min. 1 m Max. 1000 m/cable drum	
Increment:	0.25 m 1 m	1 m ... 5 m 5 m ... 1000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector
SCDUP	BFOC	LC
Ordering data	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**
Variable **2901557**	Variable **2901557**	Variable **2901557**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	AT-VQHB2Y 2K200/230 10A17+8B20
Fibers	HCS, 200/230 µm
Attenuation, typical	10 dB/km (at 660 nm), 8 dB/km (at 850 nm)
Outer sheath	
Material	PE
Color	black
Diameter	10 - 11 mm
Strain relief elements	Non-metallic, aramid fiber
Rodent protection	Glass fibers
Lengthwise waterproofing	IEC 60794-1-2
Single wire	
Material	FRNC material
Color	Red/green
Diameter	2.9 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	97 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-25 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Multi-mode fiberglass cables for free assembly, type GDM-RUGGED-1016



- Rugged installation cable for indoor use
- Highly tear-resistant aramid strain relief elements
- 2.9 mm single wires made from highly flexible FRNC material
- Halogen-free, ozone and UV resistant
- Rugged polyurethane (PUR) outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end						
OE	By the meter	2799322	Variable	2901558	Variable	2901558
FSMA connector, IP20						
FSMA	Variable	2901558	Variable	2901558	Variable	2901558
SCRJ connectors, IP20						
SCRJ	Variable	2901558	Variable	2901558	Variable	2901558
SC duplex connector, IP20						
SCDUP	Variable	2901558	Variable	2901558	Variable	2901558
B-FOC (ST®) connector, IP20						
BFOC	Variable	2901558	Variable	2901558	Variable	2901558
LC connector						
LC	Variable	2901558	Variable	2901558	Variable	2901558
Push/pull SCRJ, plastic						
PPCPL	Variable	1402193	Variable	1402193	Variable	1402193
Push/pull SCRJ, metal						
PPCME	Variable	1402193	Variable	1402193	Variable	1402193
SCRJ connector, IP67						
IP67	Variable	1402193	Variable	1402193	Variable	1402193

Ordering example for configured cable:

For a **glass fiber cable 15 m in length** equipped with an SCRJ connector at one end and an **SCRJ push/pull plastic connector** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
1402193	/ SCRJ	/ PPCPL	/ 15

Length	Min. 1 m Max. 1000 m
Increment:	1 m 1 m ... 1000 m

Ordering example for cable sold by the meter:

For a **glass fiber cable 70 m in length**, the order data is as follows:

Order No.	Length [m]
2799322	/ 70

Length	Min. 1 m Max. 1000 m/cable drum
Increment:	1 m 1 m ... 1000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector	Push/pull SCRJ, plastic	Push/pull SCRJ, metal	SCRJ connector, IP67
SCDUP	BFOC	LC	PPCPL	PPCME	IP67
Ordering data	Ordering data	Ordering data	Ordering data	Ordering data	Ordering data
Order No.	Order No.	Order No.	Order No.	Order No.	Order No.
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 2901558	Variable 2901558	Variable 2901558	Variable 1402193	Variable 1402193	Variable 1402193
Variable 1402193	Variable 1402193	Variable 1402193	Variable 1402193		
Variable 1402193	Variable 1402193	Variable 1402193		Variable 1402193	
Variable 1402193	Variable 1402193	Variable 1402193			Variable 1402193

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	I-V(ZN)H11Y 2G50/125 2,5B600+0,7F1200
Fibers	Fiberglass, 50/125 µm
Attenuation, typical	2.5 dB/km (at 850 nm), 0.7 dB/km (at 1300 nm)
Outer sheath	
Material	PUR
Color	orange
Diameter	7.5 - 8.5 mm
Single wire	
Material	FRNC material
Color	Red/green
Diameter	2.9 mm ±0.1 mm
General data	
Weight	50 kg/km
Ambient temperature (operation)	-20 °C ... 70 °C
Ambient temperature (storage/transport)	-25 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Outdoor multi-mode fiberglass cables for free assembly, type GDO-1017

- Rugged round cable for laying outdoors
- Longitudinally water-tight
- Integrated vapor barrier and rodent-proof scrim
- 2.9 mm single wires made from highly flexible FRNC material
- Ozone and UV resistant
- Extremely rugged polyethylene outer cable sheath

	free end		FSMA connector, IP20		SCRJ connector, IP20	
	OE		FSMA		SCRJ	
	Ordering data		Ordering data		Ordering data	
		Order No.		Order No.		Order No.
free end OE	By the meter	2799432	Variable	2901559	Variable	2901559
FSMA connector, IP20 FSMA	Variable	2901559	Variable	2901559	Variable	2901559
SCRJ connectors, IP20 SCRJ	Variable	2901559	Variable	2901559	Variable	2901559
SC duplex connector, IP20 SCDUP	Variable	2901559	Variable	2901559	Variable	2901559
B-FOC (ST®) connector, IP20 BFOC	Variable	2901559	Variable	2901559	Variable	2901559
LC connector LC	Variable	2901559	Variable	2901559	Variable	2901559

Ordering example for configured cable:

For a **glass fiber cable 15 m in length** equipped with an **SCRJ connector** at one end and a **B-FOC(ST®) connector, IP20** at the other end, the order data is as follows:

Order No.	Connector 1	Connector 2	Length [m]
2901559	SCRJ	BFOC	15

Length:	Min. 1 m Max. 1000 m
Increment:	1 m 1 m ... 1000 m

Ordering example for cable sold by the meter:

For a **glass fiber cable 70 m in length**, the order data is as follows:

Order No.	Length [m]
2799432	70

Length:	Min. 1 m Max. 1000 m/cable drum
Increment:	1 m 1 m ... 1000 m

SC duplex connector, IP20	B-FOC (ST®) connector, IP20	LC connector
SCDUP	BFOC	LC
Ordering data	**Ordering data**	**Ordering data**
Order No.	**Order No.**	**Order No.**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**
Variable **2901559**	Variable **2901559**	Variable **2901559**

	Technical data
Cable data	
Cable abbreviation in accordance with IEC 61977:2010	AT-VQH(BN)2Y 2G50/125 2,5B600+0,7F1200
Fibers	Fiberglass, 50/125 µm
Attenuation, typical	2.5 dB/km (at 850 nm), 0.7 dB/km (at 1300 nm)
Outer sheath	
Material	PE
Color	black
Diameter	10 - 11 mm
Strain relief elements	Non-metallic, aramid fiber
Rodent protection	Glass fibers
Lengthwise waterproofing	IEC 60794-1-2
Single wire	
Material	FRNC material
Color	Red/green
Diameter	2.9 mm ±0.1 mm
Strain relief elements	Non-metallic, aramid fibers
General data	
Weight	97 kg/km
Ambient temperature (operation)	-25 °C ... 70 °C
Ambient temperature (storage/transport)	-30 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Halogen-free as per:	According to IEC 60754-2

Fiber optics patch cables

For fast integration of fiber optic devices into existing fiber optic networks, it is best to use preassembled patch cables. Patch cables can be ordered in lengths of one, two, and five meters for the following connector formats: SCRJ, SC duplex, LC, and B-FOC (ST®). Both single- and multi-mode fiberglass options are available.

Developed specifically for industrial applications, the preassembled patch cables feature a rugged design. The strong outer cable sheath and connector transitions with bending protection sleeve mean that they can be safely used inside control cabinets.

The extremely rugged patch cables are suitable for all fiber optic devices with an optical interface that supports single- and/or multi-mode fiberglass.

Connectors:
– LC
– SC duplex
– SCRJ
– B-FOC (ST®)

Fixed lengths:
– 1 m
– 2 m
– 5 m

Fiber types:
– Multi-mode fiberglass (MM)
– Single-mode fiberglass (SM)

Sheath colors:
– Multi-mode: orange
– Single mode: yellow

Technical data:
– Halogen-free
– Flame-retardant
– No corrosive or toxic fumes
– External dimensions: 2.8 mm x 5.7 mm

LC connector

Technical data

Cable, properties	
Single wire diameter	2.8 mm
Outer sheath, material	FRNC
External sheath, strain relief elements	Non-metallic, aramid fiber
Lateral pressure, long-term	60 N/cm
Tensile strength short-term/long-term	600 N
Halogen-free	According to IEC 60754-2
General data	
Ambient temperature (storage/transport)	-25 °C ... 70 °C
Ambient temperature (installation)	-5 °C ... 50 °C
Ambient temperature (operation)	-5 °C ... 70 °C

Ordering data

Description	Length of cable	Type	Order No.	Pcs. / Pkt.
FO patch cable with **multi-mode fiberglass (OM2)** - **LC connector** to LC, SC duplex, B-FOC or SCRJ connector				
	1 m	**FL MM PATCH 1,0 LC-LC**	**2989158**	1
	2 m	**FL MM PATCH 2,0 LC-LC**	**2989255**	1
	5 m	**FL MM PATCH 5,0 LC-LC**	**2901799**	1
FO patch cable with **multi-mode fiberglass (OM2)** - **SC duplex connector** to SC duplex, B-FOC or SCRJ connector				
	1 m			
	2 m			
	5 m			
FO patch cable with **multi-mode fiberglass (OM2)** - **B-FOC connector** to B-FOC or SCRJ connector				
	1 m			
	2 m			
	5 m			
FO patch cable with **multi-mode fiberglass (OM2)** - **SCRJ connector** to SCRJ connector				
	1 m			
	2 m			
	5 m			
FO patch cable with **single-mode fiberglass (OS1)** - **LC connector** to LC, SC duplex or B-FOC connector				
	1 m	**FL SM PATCH 1,0 LC-LC**	**2989187**	1
	2 m	**FL SM PATCH 2,0 LC-LC**	**2989284**	1
	5 m	**FL SM PATCH 5,0 LC-LC**	**2901826**	1
FO patch cable with **single-mode fiberglass (OS1)** - **SC duplex connector** to SC duplex or B-FOC connector				
	1 m			
	2 m			
	5 m			
FO patch cable with **single-mode fiberglass (OS1)** - **B-FOC connector** to B-FOC connector				
	1 m			
	2 m			
	5 m			

SC duplex connector

B-FOC connector

SCRJ connector

Technical data

2.8 mm	
FRNC	
Non-metallic, aramid fiber	
60 N/cm	
600 N	
According to IEC 60754-2	
-25 °C ... 70 °C	
-5 °C ... 50 °C	
-5 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MM PATCH 1,0 LC-SC	**2989161**	1
FL MM PATCH 2,0 LC-SC	**2989268**	1
FL MM PATCH 5,0 LC-SC	**2901800**	1
FL MM PATCH 1,0 SC-SC	**2901805**	1
FL MM PATCH 2,0 SC-SC	**2901807**	1
FL MM PATCH 5,0 SC-SC	**2901808**	1
FL SM PATCH 1,0 LC-SC	**2989190**	1
FL SM PATCH 2,0 LC-SC	**2989297**	1
FL SM PATCH 5,0 LC-SC	**2901827**	1
FL SM PATCH 1,0 SC-SC	**2901829**	1
FL SM PATCH 2,0 SC-SC	**2901830**	1
FL SM PATCH 5,0 SC-SC	**2901831**	1

Technical data

2.8 mm	
FRNC	
Non-metallic, aramid fiber	
60 N/cm	
600 N	
According to IEC 60754-2	
-25 °C ... 70 °C	
-5 °C ... 50 °C	
-5 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MM PATCH 1,0 LC-ST	**2989174**	1
FL MM PATCH 2,0 LC-ST	**2989271**	1
FL MM PATCH 5,0 LC-ST	**2901801**	1
FL MM PATCH 1,0 SC-ST	**2901809**	1
FL MM PATCH 2,0 SC-ST	**2901810**	1
FL MM PATCH 5,0 SC-ST	**2901811**	1
FL MM PATCH 1,0 ST-ST	**2901815**	1
FL MM PATCH 2,0 ST-ST	**2901816**	1
FL MM PATCH 5,0 ST-ST	**2901817**	1
FL SM PATCH 1,0 LC-ST	**2989242**	1
FL SM PATCH 2,0 LC-ST	**2989349**	1
FL SM PATCH 5,0 LC-ST	**2901828**	1
FL SM PATCH 1,0 SC-ST	**2901832**	1
FL SM PATCH 2,0 SC-ST	**2901833**	1
FL SM PATCH 5,0 SC-ST	**2901834**	1
FL SM PATCH 1,0 ST-ST	**2901836**	1
FL SM PATCH 2,0 ST-ST	**2901837**	1
FL SM PATCH 5,0 ST-ST	**2901838**	1

Technical data

2.8 mm	
FRNC	
Non-metallic, aramid fiber	
60 N/cm	
600 N	
According to IEC 60754-2	
-25 °C ... 70 °C	
-5 °C ... 50 °C	
-5 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MM PATCH 1,0 LC-SCRJ	**2901802**	1
FL MM PATCH 2,0 LC-SCRJ	**2901803**	1
FL MM PATCH 5,0 LC-SCRJ	**2901804**	1
FL MM PATCH 1,0 SC-SCRJ	**2901812**	1
FL MM PATCH 2,0 SC-SCRJ	**2901813**	1
FL MM PATCH 5,0 SC-SCRJ	**2901814**	1
FL MM PATCH 1,0 ST-SCRJ	**2901820**	1
FL MM PATCH 2,0 ST-SCRJ	**2901821**	1
FL MM PATCH 5,0 ST-SCRJ	**2901822**	1
FL MM PATCH 1,0 SCRJ-SCRJ	**2901823**	1
FL MM PATCH 2,0 SCRJ-SCRJ	**2901824**	1
FL MM PATCH 5,0 SCRJ-SCRJ	**2901825**	1

Quick mounting connectors for polymer fiber cable

These connectors are easy to assemble and allow fast and simple self-assembly on site. They correspond to the international F-SMA and SCRJ standards, although their quick mounting mechanism makes them stand out from conventional connectors. The stripped fiber is simply pushed into the connector and tightened with the knurled screw. To ensure optimum performance, the end face is then polished. The tools required are also available as a complete DIY case (PSM-POF-KONFTOOL).

Quick mounting connector for HCS (PCF) cables

The PSM-SET-...HCS connector sets for the 200/230 µm fibers make it possible to enjoy the benefits of self-assembly for the kinds of distances that could otherwise only be achieved by using cables made purely from fiberglass. The F-SMA, B-FOC (ST®), SCRJ, and SC duplex connector types are internationally standardized, although their quick mounting mechanism makes them stand out from conventional connectors. This new patented clamping device eliminates all time-consuming tasks such as crimping, sticking, and polishing operations. All that is required is to strip the fibers, slide and screw on the connector, and score and break off the protruding fibers. All the tools required, including the fiber scoring tool, are included in the PSM-HCS-KONFTOOL... tool set. Other connector-specific fiber cleaving tools can be added on request.

Connectors with a diameter of 2.9 mm must be used for our standard HCS fibers. In the case of our PROFINET-compliant fibers, connectors with a diameter of 2.2 mm should be used. Please refer to the following table and to the data sheets for our FO cables.

Quick mounting connector for polymer and HCS fibers

Technical data

	Polymer fiber	HCS fiber
Insertion attenuation		
- F-SMA connector	< 1.5 dB	< 2 dB
- B-FOC (ST®)	-	< 2 dB
- SCRJ connector	< 1.5 dB	< 2 dB
- SC duplex connector	-	< 2 dB

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Connector set for polymer fibers (diameter of the individual elements: 2.2 mm), for self-assembly, with bend protection			
- F-SMA set, 4 connectors	**PSM-SET-FSMA/4-KT**	**2799720**	1
- SCRJ set, 2 duplex connectors	**PSM-SET-SCRJ-DUP/2-POF**	**2708656**	1
Connector set for HCS fibers (diameter of the individual elements: 2.9 mm), for self-assembly, with bend protection			
- F-SMA set, 4 connectors	**PSM-SET-FSMA/4-HCS**	**2799487**	1
- B-FOC (ST®) set, 4 connectors	**PSM-SET-B-FOC/4-HCS**	**2708481**	1
- SCRJ set, 2 duplex connectors	**PSM-SET-SCRJ-DUP/2-HCS**	**2313070**	1
Connector set for PROFINET HCS fibers (diameter of the individual elements: 2.2 mm), for self-assembly, with bend protection			
- B-FOC (ST®) set, 4 connectors	**PSM-SET-B-FOC/4-HCS/PN**	**2313782**	1
- SCRJ set, 2 duplex connectors	**PSM-SET-SCRJ-DUP/2-HCS/PN**	**2313546**	1
- SC duplex set, 2 duplex connectors	**PSM-SET-SC-DUPLEX/2-HCS/PN**	**2313779**	1

Accessories

Polymer fiber DIY case, consisting of: stripping knife, stripping pliers, polishing wheel for F-SMA and SCRJ quick mounting connectors, polishing pad and emery paper	**PSM-POF-KONFTOOL**	**2744131**	1
Polymer fiber polishing set for quick mounting connectors, comprising polishing pads and polishing disks			
- For F-SMA connectors	**PSM-SET-FSMA-POLISH**	**2799348**	1
- For SCRJ connectors	**VS-SCRJ-POF-POLISH**	**1656673**	1
HCS DIY case for F-SMA quick mounting connectors, comprising stripping blade, stripping pliers, aramid yarn scissors, fiber stripper, fiber cleaving tool, and microscope			
- For F-SMA connectors	**PSM-HCS-KONFTOOL**	**2799526**	1
- For B-FOC (ST®) connectors	**PSM-HCS-KONFTOOL/B-FOC**	**2708465**	1
- For SCRJ/SC duplex connectors	**PSM-HCS-KONFTOOL/SC-RJ**	**2708876**	1

Permissible combinations of fiber optic cables and connector sets

Fiber optic cable		Connector set	
2799885	**PSM-LWL-HCS-RUGGED-200/230**	**2799487**	**PSM-SET-FSMA/4-HCS**
2799445	**PSM-LWL-HCSO-200/230**	**2708481**	**PSM-SET-B-FOC/4-HCS**
		2313070	**PSM-SET-SCRJ-DUP/2-HCS**
2313410	**FL FOC PN-C-HCS-GI-200/230**	**2313779**	**PSM-SET-SC-DUPLEX/2-HCS/PN**
2313766	**FL FOC PN-B-HCS-200/230**	**2313782**	**PSM-SET-B-FOC/4-HCS/PN**
		2313546	**PSM-SET-SCRJ-DUP/2-HCS/PN**

Assembly case for quick mounting connector

The DIY cases for polymer and HCS cables are designed for practical on-site assembly. These cases contain the complete tool range for assembly of the appropriate quick mounting connectors.

Polymer fiber cables are assembled quickly and easily using the PSM-POF-KONFTOOL DIY case. The F-SMA or SCRJ connectors are used in this context.

Various PSM-HCS-KONFTOOL... tool sets are available for fitting connectors to the powerful HCS fibers, as the HCS fibers can be connected to F-SMA, B-FOC (ST®), SCRJ, and SC duplex connectors, depending on the application and device concerned. An individual fiber cleaving tool (cleave tool) is required for this due to the different connector receptacles.

All fiber cleaving tools can also be ordered separately to allow the existing DIY cases to be upgraded if required. Similarly, all the tools in the DIY case can be ordered individually as replacement parts.

We will also provide you with our tool sets temporarily for a low rental rate on request. Please contact us for an individual quote.

Assembly case for quick mounting connector

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Polymer fiber DIY case, consisting of: stripping knife, stripping pliers, polishing wheel for F-SMA and SCRJ quick mounting connectors, polishing pad and emery paper	**PSM-HCS-KONFTOOL/B-FOC**	**2708465**	1
HCS DIY case for F-SMA quick mounting connectors, comprising stripping blade, stripping pliers, aramid yarn scissors, fiber stripper, fiber cleaving tool, and microscope	**PSM-HCS-KONFTOOL**	**2799526**	1
HCS (GI) DIY case for B-FOC (ST®) quick mounting connectors, stripping blade, stripping pliers, aramid yarn scissors, fiber stripper, fiber cleaving tool, and microscope	**PSM-HCS-KONFTOOL/B-FOC**	**2708465**	1
HCS (GI) DIY case for SCRJ and SC duplex quick mounting connectors, stripping blade, stripping pliers, aramid yarn scissors, fiber stripper, fiber cleaving tool, and microscope	**PSM-HCS-KONFTOOL/SC-RJ**	**2708876**	1

Accessories

Fiber cleaning tool for HCS fiber, pin arrangement F-SMA	**PSM-HCS-CLEAVETOOL**	**2744995**	1
Fiber cleaving tool for HCS (GI) fiber, pin arrangement B-FOC (ST®)	**PSM-HCS-CLEAVETOOL/B-FOC**	**2708478**	1
Fiber cleaving tool for HCS (GI) fiber, pin arrangement SCRJ/SC duplex	**PSM-HCS-CLEAVETOOL/SCRJ**	**2313122**	1

Measurement technology for fiber optics

The PSM-FO-POWERMETER fiber optic measuring case is used for carrying out optical power measurements. It provides a straightforward method for determining path attenuations and the remaining system reserves in fiber optic transmission systems with 660 nm and 850 nm.

The case contains a power meter and all the necessary reference cables and couplings for checking polymer, HCS, and fiberglass paths with an F-SMA or B-FOC (ST®) connection. An optional set can be ordered for terminal devices with an SCRJ connection.

– The power meter can be switched over between the following wavelengths: 660 nm, 780 nm, and 850 nm
– Suitable for terminal devices with an F-SMA, B-FOC (ST®), and SCRJ connection
– Reference cables with polymer, HCS, and fiberglass

Universal fiber optics measuring case

Technical data

Measuring instrument	
Receiver	Large-format silicon element
Wavelength	660 nm, 780 nm, 850 nm
Measuring range	-70 dB ... 6 dB
Accuracy	± 0.25 dB
Resolution	0.01 dB
Ambient temperature range	0 °C ... 45 °C
Relative humidity	max. 95%
Weight	180 g
Dimensions L / W / H	115 mm / 70 mm / 25 mm
Reference fibers, fiber optic measuring case	
Insertion attenuation in accordance with IEC874-1 method 7	
Polymer fiber 980/1000 µm F-SMA	1.5 dB ... 2 dB
HCS fiber 200/230 µm F-SMA	1.5 dB ... 2 dB
HCS fiber 200/230 µm B-FOC (ST®)	1.5 dB ... 2 dB
Fiberglass 50/125 µm B-FOC (ST®)	1.5 dB ... 2 dB
Reference fibers, Powermeter supplementary set	
Insertion attenuation in accordance with IEC874-1 method 7	
Polymer fiber 980/1000 µm SC/F-SMA	1.5 dB ... 2 dB
HCS GI fiber 200/230 µm SC/BFOC (ST®)	1.5 dB ... 2 dB

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Fiber optic measuring case, comprising an optical power meter, F-SMA and B-FOC (ST®) coupling, reference fibers, and operating instructions	**PSM-FO-POWERMETER**	**2799539**	1
Powermeter supplementary set for devices with SCRJ interface, comprising one-meter polymer reference fiber (SC Simplex connector to F-SMA connector), one-meter HCS GI reference fiber (SC Simplex connector to B-FOC (ST®) connector), and SCRJ coupling	**PSM-FO-POWERMETER SCRJ-SET**	**2901560**	1

Couplings for fiber optics

Couplings are used to connect two FO connectors with the same pin arrangement. Couplings are used when a cable needs to be extended or when creating a non-permanent panel feed-through. However, the extra transitional attenuation (< 2 dB for all couplings) must be taken into consideration when planning the path resources. The sets include two F-SMA couplings or two B-FOC (ST®) couplings for connecting duplex cables. The SCRJ duplex, SC duplex, and LC couplings are supplied separately.

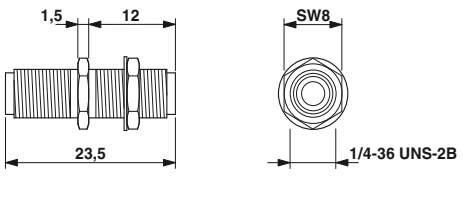
Notes:

Key:
B-FOC ≙ ST® (registered trademark of AT&T)

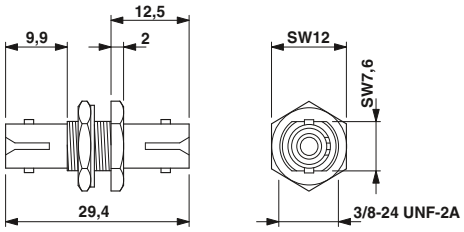
Couplings for connecting FO cables

Ordering data

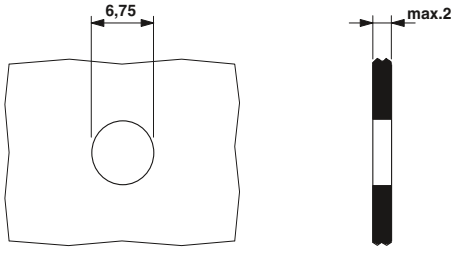
Description	Type	Order No.	Pcs. / Pkt.
Coupling ; set, consisting of:			
- 2x F-SMA/F-SMA	**PSM-SET-FSMA-LINK/2**	**2799416**	1
- 2x B-FOC (ST®)/B-FOC (ST®)	**PSM-SET-BFOC-LINK/2**	**2799429**	1
- 1x SCRJ/SCRJ (duplex)	**VS-SCRJ-GOF-BU/BU**	**1652978**	1
- 1 x LC/LC (duplex, multi-mode fiber)	**FL MM PATCH COUPLER LC-LC**	**2700312**	1
- 1 x LC/LC (duplex, single-mode fiber)	**FL SM PATCH COUPLER LC-LC**	**2700313**	1
- 1x SC duplex/SC duplex	**FL COUPLER SC-DUPLEX**	**2901788**	1



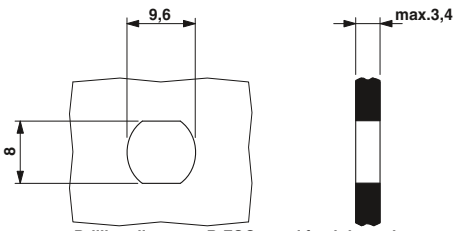
Dimensional drawing F-SMA coupling



Dimensional drawing B-FOC coupling



Drilling diagram F-SMA panel feed-through



Drilling diagranm B-FOC panel feed-through

Media converters for converting 10/100 BASE-T(X) Ethernet to fiber optics

Devices with 1300 nm wavelength

The FL MC EF 1300… media converters convert the Ethernet interface tofiber optics. This provides maximum immunity to interference and maximum transmission ranges in industrial Ethernet applications.

Ethernet interface:

– RJ45 socket
– 10/100 Mbps
– Auto negotiation
– Auto-MDI/MDI-X
– Link fault pass through
– Signal LEDs for activity, link status, 10/100 Mbps

Fiber optic interface:

– B-FOC (ST®) or SC-DUPLEX
– Multi-mode or single-mode cable
– Signal LEDs for link status and far end fault signaling

Features:

– Backplane bus contact (DIN rail connector), enabling alternative or redundant 24 V power supply
– Link fault pass through (LFP) and far end fault (FEF) functions for easy connection monitoring. The connection status between the devices is monitored and signaled.

Devices with WDM technology

The FL MC EF WDM... media converters enable full duplex communication with a single glass fiber via WDM technology (Wavelength Division Multiplex).

Features:

– 1310 nm and 1550 nm wavelengths for transmitting and receiving
– Single-mode fiberglass
– SC simplex connection

Application:

– Single-fiber transmission of optical signals in rotating applications with optical slip rings, e.g., wind power or automotive industry
– Doubling of the bandwidth or establishment of separate networks in existing wiring (separate outgoing/return line)

Notes:

1) EMC: Class A product, see page 553

Ethernet

Single-fiber transmission WDM technology

Ex:

Technical data

Supply		
Supply voltage		18 V DC ... 30 V DC (screw connection)
Supply voltage		18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		≤ 100 mA (24 V DC)
FO interface		
Wavelength		1310 / 1550 nm
Transmission length incl. 3 dB system reserve		38 km (with F-E 9/125 0.36 dB/km) 34 km (with F-E 9/125 0.4 dB/km) 28 km (with F-E 9/125 0.5 dB/km)
Signal LEDs		Far end fault (red LED), link status (yellow LED)
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100 Mbps
Auto-negotiation modes		Auto
Transmission length		100 m (twisted pair, shielded)
Link through		Link fault pass through
MDI-/MDI-X switchover		Auto-MDI(X)
Signal LEDs		Activity, link status, 10/100 Mbps
General data		
Ambient temperature (operation)		-40 °C ... 65 °C
Electrical isolation		(VCC // FE // Ethernet)
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm
Conformance / approvals		
ATEX		II 3 G Ex nA IIC T4 Gc X

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FO converter, for converting 10/100 BASE-TX to a single-mode optical fiber, WDM technology			
WDM set with devices A and B, SC simplex connection	**FL MC EF WDM-SET SC**	**2902660**	1
WDM device A, SC simplex connection	**FL MC EF WDM-A SC[1])**	**2902658**	1
WDM device B, SC simplex connection	**FL MC EF WDM-B SC[1])**	**2902659**	1
FO converter, for converting 10/100 BASE-TX to: Multi-mode fiberglass (1300 nm), SC duplex connection			
FO converter, for converting 10/100 BASE-TX to: Single-mode fiberglass (1300 nm), SC duplex connection			
FO converter, for converting 10/100 BASE-TX to: Multi-mode fiberglass (1300 nm), B-FOC (ST®) connection			

Accessories

DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
Fiberglass single mode patch cable	**FL SM PATCH 2,0 SC-SC**	**2901830**	1
PROFINET HCS GI cable, duplex, 200/230 µm, for indoor installation			
Connector set for PROFINET HCS fibers (diameter of the individual elements: 2.2 mm), for self-assembly, with bend protection			

Ethernet

PROFINET

Modbus

Multi-mode fiberglass
SC duplex connection

Ex:

Technical data

18 V DC ... 30 V DC (screw connection)
18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)

≤ 100 mA (24 V DC)

1310 nm
6.4 km (with F-G 50/125 0,7 dB/km F 1000)
2.8 km (with F-G 50/125 1,6 dB/km F 800)
10 km (with F-G 62.5/125 0,7 dB/km F 1000)
3 km (with F-G 62.5/125 2.6 dB/km F 600)
2 km (with 2GK200/230 GI-HCS)
Far end fault (red LED), link status (yellow LED)

RJ45 socket, shielded
10/100 Mbps
Auto
100 m (twisted pair, shielded)
Link fault pass through
Auto-MDI(X)
Activity, link status, 10/100 Mbps

-40 °C ... 65 °C
(VCC // FE // Ethernet)
1.5 kV_{rms} (50 Hz, 1 min.)
22.5 mm / 99 mm / 114.5 mm

II 3 G Ex nA IIC T4 Gc X
II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)
II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MC EF 1300 MM SC[1])	**2902853**	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
FL FOC PN-C-HCS-GI-200/230	**2313410**	1
PSM-SET-SC-DUPLEX/2-HCS/PN	**2313779**	1

Ethernet

PROFINET

Modbus

Single-mode fiberglass
SC duplex connection

Ex:

Technical data

18 V DC ... 30 V DC (screw connection)
18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)

≤ 100 mA (24 V DC)

1310 nm
36 km (with F-E 9/125 0.36 dB/km)
32 km (with F-E 9/125 0.4 dB/km)
26 km (with F-E 9/125 0.5 dB/km)

Far end fault (red LED), link status (yellow LED)

RJ45 socket, shielded
10/100 Mbps
Auto
100 m (twisted pair, shielded)
Link fault pass through
Auto-MDI(X)
Activity, link status, 10/100 Mbps

-40 °C ... 65 °C
(VCC // FE // Ethernet)
1.5 kV_{rms} (50 Hz, 1 min.)
22.5 mm / 99 mm / 114.5 mm

II 3 G Ex nA IIC T4 Gc X

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MC EF 1300 SM SC[1])	**2902856**	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
FL SM PATCH 2,0 SC-SC	**2901830**	1

Ethernet

PROFINET

Modbus

Multi-mode fiberglass
B-FOC (ST®) connection

Ex:

Technical data

18 V DC ... 30 V DC (screw connection)
18 V DC ... 30 V DC (as an alternative or redundant, via backplane bus contact and system current supply)

≤ 100 mA (24 V DC)

1310 nm
6.4 km (with F-G 50/125 0,7 dB/km F 1000)
2.8 km (with F-G 50/125 1,6 dB/km F 800)
10 km (with F-G 62.5/125 0,7 dB/km F 1000)
3 km (with F-G 62.5/125 2.6 dB/km F 600)
2 km (with 2GK200/230 GI-HCS)
Far end fault (red LED), link status (yellow LED)

RJ45 socket, shielded
10/100 Mbps
Auto
100 m (twisted pair, shielded)
Link fault pass through
Auto-MDI(X)
Activity, link status, 10/100 Mbps

-40 °C ... 65 °C
(VCC // FE // Ethernet)
1.5 kV_{rms} (50 Hz, 1 min.)
22.5 mm / 99 mm / 114.5 mm

II 3 G Ex nA IIC T4 Gc X
II (2) D [Ex op is Db] IIIC (PTB 06 ATEX 2042 U)
II (2) G [Ex op is Gb] IIC (PTB 06 ATEX 2042 U)

Ordering data

Type	Order No.	Pcs. / Pkt.
FL MC EF 1300 MM ST[1])	**2902854**	1

Accessories

ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
FL FOC PN-C-HCS-GI-200/230	**2313410**	1
PSM-SET-B-FOC/4-HCS/PN	**2313782**	1

Media converters for converting 10/100 BASE-T(X) Ethernet to fiber optics

Devices with 660 nm wavelength

The FL MC 10/100BASE-T/FO 660 media converter converts the 10/100Base-T(X) Ethernet interface to fiber optics. This allows maximum immunity to interference and maximum transmission ranges in industrial Ethernet applications.

Integrated fiber optic diagnostics continuously signal the receiving capacity by means of an LED bar graph and two floating switching outputs.

Applications:

– Increased transmission range in industrial Ethernet applications
– Immunity to electromagnetic interference

Ethernet interface:

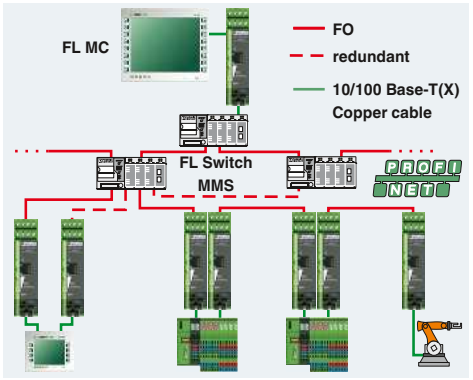
– RJ45 socket
– 10/100 Mbps
– Auto negotiation
– MDI/MDI-X switchover
– Signal LEDs for activity, link status, and 100 Mbps

Fiber optic interface

– SCRJ connection
– Polymer and HCS (PCF) fibers
– Transmission distance of up to 300 m at 100 Mbps with HCS GI fibers
– 660 nm wavelength
– Signal LEDs for link status
– LED bar graph for signaling the receiving capacity

Features:

– Backplane bus contact (TBUS), enabling alternative or redundant 24 V power supply
– Link through function for easy connection monitoring. The availability of the connected cable connection and devices is monitored and indicated.
– Choice between local or transparent auto negotiation function for maximum transmission capacity



For polymer and HCS fibers

Technical data

Supply		
Supply voltage		18 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage		23 V DC ... 25 V DC (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		≤ 100 mA (24 V DC)
FO interface		
Wavelength		660 nm
Transmission length incl. 3 dB system reserve		70 m (polymer fiber with F-P 980/1000 230 dB/km at 10 Mbps) 300 m (HCS fiber with F-K 200/230 8 dB/km at 10 Mbps) 50 m (polymer fiber with F-P 980/1000 230 dB/km at 100 Mbps) 100 m (HCS fiber with F-K 200/230 8 dB/km at 100 Mbps) 300 m (HCS GI fiber with F-GK 200/230 at 100 Mbps) 400 m (HCS GI fiber with F-GK 200/230 at 10 Mbps)
Signal LEDs		Optical receiver power: very good (green), good (green), critical (yellow), fault (red)
Switching output		Two floating relay outputs
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100 Mbps
Auto-negotiation modes		Optionally transparent via TP and FO (default) or locally on TP
Transmission length		100 m (twisted pair, shielded)
Link through		Link down is automatically forwarded to the second connection
MDI-/MDI-X switchover		Built-in switch for line (1:1) and crossover connection
Signal LEDs		Activity (yellow), link status (green, UL flashing), 100 Mbps (green)
General data		
Ambient temperature (operation)		-20 °C ... 60 °C
Electrical isolation		(VCC // Ethernet)
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Dimensions	W / H / D	22.5 mm / 99 mm / 114.5 mm
Conformance / approvals		
ATEX		II 3 G Ex nA nC IIC T4 Gc X
UL, USA / Canada		508 recognized

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FO converter, for converting 10/100Base-T to polymer or HCS fiber, (660 nm) SC-RJ connection	**FL MC 10/100BASE-T/FO-660**	**2708193**	1

Accessories

Polymer fiber cable POF, duplex, 980/1000 µm, heavy-duty PROFINET version, for permanent indoor installation			
- By the meter **w/o** plug	**FL FOC PN-B-980/1000**	**2313397**	1
- By the meter **w/o** plug	**FL FOC PN-C-FLEX-980/1000**	**2313407**	1
PROFINET HCS GI cable, duplex, 200/230 µm, for indoor installation			
- By the meter **w/o** plug	**FL FOC PN-C-HCS-GI-200/230**	**2313410**	1
	PSM-SET-SCRJ-DUP/2-POF	**2708656**	1
Plug set for polymer fibers, for self-assembly, with bend protection	**PSM-SET-SCRJ-DUP/2-HCS/PN**	**2313546**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1

N

Media converters for converting 10/100 BASE-T(X) Ethernet to fiber optics

Device with 1300 nm wavelength

The FL MC 2000E LC media converter is designed for use in energy technology. With its robust design, it can be used in environments subject to high levels of EMI around switchgear that have been designed according to the new IEC 61850 standard.

Features:

- 1300 nm wavelength
- Connection via multi-mode fiberglass cable with LC duplex plug
- Pass through mode with short latency for time-critical applications
- Link fault pass through (LFP) function for easy connection monitoring. The connection status between the devices is monitored and signaled.
- Wide operating temperature range (-40°C… 75°C)
- Redundant power supply with a wide range from 12 ... 57 V DC (24, 36, 48 V DC)
- Robust design for high EMC requirements
- Floating alarm contact for power supply monitoring and diagnostics and link monitoring

Notes:

An unmanaged switch which meets the same requirements that are required for switchgear and transformer substations in energy technology can be found on page 18

Ethernet

PROFINET

Modbus

Multi-mode fiberglass LC duplex connection

Technical data

Supply		
Supply voltage		12 V DC ... 57 V DC
Nominal current consumption		110 mA (24 V DC)
FO interface		
Wavelength		1300 nm
Transmission length incl. 3 dB system reserve		8 km (fiberglass with F-G 62.5/125 0.7 dB/km F1000) 3.3 km (fiberglass with F-G 62.5/125 2.6 dB/km F600) 9.6 km (fiberglass with F-G 50/125 0.7 dB/km F1200) 5.3 km (fiberglass with F-G 50/125 1.6 dB/km F800) 2 km (HCS GI fiber with F-GK 200/230)
Signal LEDs		LNK/ACT
Switching output		Floating relay output
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		100 Mbps
Auto-negotiation modes		Auto
Transmission length		100 m (twisted pair, shielded)
Link through		Link fault pass through
MDI-/MDI-X switchover		Auto-MDI(X)
Signal LEDs		LNK/ACT, 100
General data		
Ambient temperature (operation)		-40 °C ... 75 °C
Electrical isolation		(VCC // FE // Ethernet)
Test voltage		500 V DC
Dimensions	W / H / D	30 mm / 130 mm / 100 mm
Conformance / approvals		
ATEX		-
UL, USA / Canada		-

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FO converter, for converting 100 BASE-TX to:			
Multi-mode fiberglass (1300 nm), LC duplex connection	**FL MC 2000E LC**	**2891056**	1

Device servers for converting serial interfaces

The **FL COMSERVER...232/422/485** products are used to integrate serial V.24 (RS-232)/RS-422/RS-485 interfaces into existing Ethernet networks. This provides an easy way of implementing functions such as cable replacement, network integration or a Modbus gateway.

Cable replacement

Two devices in combination tunnel serial connections via Ethernet, using either the TCP or UDP protocol.

Network integration

You can integrate automation devices such as controllers or frequency inverters into a network using corresponding programming and diagnostics software. COM diversion software creates a virtual COM port on the PC and transmits the data to the FL COMSERVER.

Modbus gateway

The integrated Modbus gateway function provided in FL COMSERVER UNI converts serial Modbus ASCII or RTU data into Modbus TCP. Naturally, the conversion process also works in the opposite direction.

Features common to all devices:

- Serial interfaces, V.24 (RS-232), RS-422, RS-485
- 10/100 Base-T(X) interface
- Software for virtual COM ports supplied as standard
- Extended temperature range of -25°C to +60°C
- Redundant power supply and modular station structure with TBUS connectors
- 3-way electrical isolation VCC // V.24 (RS-232)/RS-422/RS-485 // network
- Integration into network management tools and visualization systems with the support of SNMP services
- LED diagnostic indicators
- Configuration via web-based management

FL COMSERVER UNI...

- Supports TCP, UDP, Modbus TCP/RTU/ASCII
- Can be used exactly as required on Modbus master or slave

FL COMSERVER BASIC...

- Best-value version
- Supports TCP and UDP

FL COMSERVER MPI-SET:

- For programming S7 controllers remotely over Ethernet
- Preconfigured FL COMSERVER BASIC...
- MPI adapter and V.24 (RS-232) cable supplied as standard

Notes:

1) EMC: Class A product, see page 553

Supply	
Supply voltage	
Supply voltage	
Nominal current consumption	
Serial port	
Interfaces	
Connection method	V.24 (RS-232) RS-422 RS-485
Data format/coding	
Data flow control/protocols	
Transmission speed	
Termination resistor	
Ethernet interface	
Connection method	
Transmission speed	
Transmission length	
Supported protocols	
Auxiliary protocols	
Functions	
Management	
General data	
Ambient temperature (operation)	
Electrical isolation	
Test voltage	
Electromagnetic compatibility	
Dimensions	W / H / D
Conformance / approvals	
UL, USA / Canada	

Description
FL COMSERVER...232/422/485, for converting serial interfaces to Ethernet. COM port redirector software and additional software supplied as standard
TCP, UDP, Modbus, PPP
FL COM SERVER, to convert a serial interface to Ethernet, incl. CD-ROM with drivers, additional software and user documentation (PDF)
TCP, UDP
MPI programming set, pre-configured, for coupling to the programming interface of a Siemens S7-300/400 controller, consisting of COM server, MPI adapter, and RS-232 cable

RS-232-D-SUB cable, length: 2 m
- 9-pos. socket on 9-pos. socket
- 9-pos. socket on 25-pos. socket
DIN rail connector
System power supply unit, primary-switched

Ethernet

Modbus

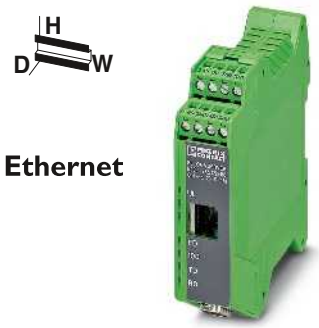
Universal device - Modbus gateway between RTU/ASCII and TCP

Ex: // Applied for: cUL / UL

Technical data	
Supply	24 V AC/DC ±20% (via plug-in COMBICON screw terminal block) 24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
Current consumption	100 mA (24 V DC)
Interface 1	V.24 (RS-232), RS-422, RS-485
Connection method	D-SUB-9 plug
Connection method	Plug-in/screw connection via COMBICON
Connection method	Plug-in/screw connection via COMBICON
Transmission protocol	UART/NRZ: 7/8 bit data, 1/2 bit stop, 1 bit parity
Handshake	Software handshake, Xon/Xoff, or hardware handshake RTS/CTS // 3964 R compatible, Modbus RTU/ASCII
Transmission speed	0.3 ; 0.6 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 38.4 ; 57.6 ; 115.2 ; 187.5 ; 230.4 kbps
Termination	390 Ω / 180 Ω / 390 Ω (configurable)
Interface 2	RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation
Transmission length	≤ 100 m (shielded twisted pair)
Transmission protocol	TCP/IP, UDP, Modbus (TCP, RTU/ASCII), PPP
Protocol	ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP
Configuration	Web-based management, SNMP, emergency exit with Telnet and serial
Ambient temperature (operation)	-25 °C ... 60 °C
Test voltage	DIN EN 50178 (VCC // Ethernet // Serial)
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)
Conformance	Conformance with EMC Directive 2004/108/EC
Dimensions	22.5 mm / 99 mm / 116 mm
Note	508 listed

Ordering data		
Type	**Order No.**	**Pcs. / Pkt.**
FL COMSERVER UNI 232/422/485[1])	**2313452**	1

Accessories		
PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA 9 SUB 25/BB/2METER	**2761059**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1



Basic version for redirector operation - TCP and UDP

Ex: // Applied for: cUL / UL

Technical data	
Supply	24 V AC/DC ±20% (via plug-in COMBICON screw terminal block) 24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
Current consumption	100 mA (24 V DC)
Interface 1	V.24 (RS-232), RS-422, RS-485
Connection method	D-SUB-9 plug
Connection method	Plug-in/screw connection via COMBICON
Connection method	Plug-in/screw connection via COMBICON
Transmission protocol	UART/NRZ: 7/8 bit data, 1/2 bit stop, 1 bit parity
Handshake	Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Transmission speed	0.3 ; 0.6 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 38.4 ; 57.6 ; 115.2 ; 187.5 ; 230.4 kbps
Termination	390 Ω / 180 Ω / 390 Ω (configurable)
Interface 2	RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation
Transmission length	≤ 100 m (shielded twisted pair)
Transmission protocol	TCP/IP, UDP
Protocol	ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP
Configuration	Web-based management, SNMP, emergency exit with Telnet and serial
Ambient temperature (operation)	-25 °C ... 60 °C
Test voltage	DIN EN 50178 (VCC // Ethernet // Serial)
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)
Conformance	Conformance with EMC Directive 2004/108/EC
Dimensions	22.5 mm / 99 mm / 116 mm
Note	508 listed

Ordering data		
Type	**Order No.**	**Pcs. / Pkt.**
FL COMSERVER BASIC 232/422/485[1])	**2313478**	1

Accessories		
PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA 9 SUB 25/BB/2METER	**2761059**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

MPI-SET device server, V.24 (RS-232) cable, and MPI adapter

Technical data	
Supply	24 V DC ±20% (via plug-in COMBICON screw terminal block) 24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
Current consumption	100 mA (24 V DC)
Interface 1	V.24 (RS-232)
Connection method	D-SUB-9 plug
Connection method	-
Connection method	-
Transmission protocol	Serially asynchronous UART/NRZ, 8 data, 1 stop, odd parity, 11 bit character length
Handshake	Hardware handshake RTS/CTS
Transmission speed	19200, 38400 bit/s, adjustable via web-based management
Termination	-
Interface 2	RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation
Transmission length	100 m (shielded twisted pair)
Transmission protocol	TCP/IP, UDP
Protocol	ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP
Configuration	Web-based management, SNMP, emergency exit with Telnet and serial
Ambient temperature (operation)	-25 °C ... 60 °C
Test voltage	DIN EN 50178 (VCC // Ethernet // Serial)
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)
Conformance	Conformance with EMC Directive 2004/108/EC
Dimensions	22.5 mm / 99 mm / 116 mm
Note	-

Ordering data		
Type	**Order No.**	**Pcs. / Pkt.**
FL COMSERVER-MPI-SET	**2313588**	1

Accessories		
PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA 9 SUB 25/BB/2METER	**2761059**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1

Device servers for converting serial interfaces

FL COMSERVER PRO...

Individual solutions that cannot be implemented with the the standard devices can be created with this freely programmable version. To do this, users program their own application program.

Features:

– Freely programmable version
– Programming in BCL (similar to BASIC)
– Integrated web server for visualization
– Pre-processing of data stream
– Adaptation of old protocols for compatibility with modern systems

A PCL program is required for operation. In addition, an HTML visualization can be saved on the web server in order to make settings in the BCL program or to display states.

Example applications when supplied as standard

Some program samples are available free of charge. These samples can be adapted and developed further as required.

– IP scanner: monitoring of network devices via ping
– TCP multicast: program for sending data to multiple devices across the network using the TCP protocol
– Modbus I/O monitor: in combination with a Modbus bus coupler, I/O data can be processed, controlled, and visualized

Software development kit (SDK)

A BCL program can be created using any editor. The SDK provides support when transferring the BCL program and for HTML visualization in the form of batch files.

The current version of the SDK together with samples can be found on our website.

Notes:

1) EMC: Class A product, see page 553

Freely programmable device server with HTTP server

Ex: // Applied for: cUL / UL

Technical data

Supply		
Supply voltage		24 V AC/DC ±20% (via plug-in COMBICON screw terminal block)
Supply voltage		24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		100 mA (24 V DC)
Serial port		
Interfaces		V.24 (RS-232), RS-422, RS-485
Connection method	V.24 (RS-232)	D-SUB-9 plug
	RS-422	Plug-in/screw connection via COMBICON
	RS-485	Plug-in/screw connection via COMBICON
Data format/coding		UART/NRZ: 7/8 bit data, 1/2 bit stop, 1 bit parity
Data flow control/protocols		Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Transmission speed		0.3 ; 0.6 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 38.4 ; 57.6 ; 115.2 ; 187.5 ; 230.4 kbps
Termination resistor		390 Ω / 180 Ω / 390 Ω (configurable)
Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100 Mbps, autonegotiation
Transmission length		≤ 100 m (shielded twisted pair)
Supported protocols		TCP/IP, UDP
Auxiliary protocols		ARP, DHCP, BOOTP, SNMP, RIP, RARP, HTTP, TFTP
Functions		
Management		Web-based management, SNMP, serial emergency access
General data		
Ambient temperature (operation)		-25 °C ... 60 °C
Electrical isolation		DIN EN 50178 (VCC // Ethernet // Serial)
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Electromagnetic compatibility		Conformance with EMC Directive 2004/108/EC
Dimensions	W / H / D	22.5 mm / 99 mm / 116 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FL COMSERVER PRO..., freely programmable version. Similar to BASIC. HTTP server for visualization. Software development kit containing examples and documentation supplied as standard	**FL COMSERVER PRO 232/422/485[1])**	**2313465**	1

Accessories

RS-232-D-SUB cable, length: 2 m			
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1
- 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1

Device servers for converting serial interfaces

The **FL COMSERVER WLAN 232/422/485** enables wireless connection of serial interfaces for machine and system access. This means that controllers and control panels can be integrated into wireless LAN networks via these device servers.

This device is ideal for use in all mobile and industrial mobile applications involving serial interfaces.

Easy cable replacement is performed in ad-hoc or infrastructure operating mode. Serial devices can be directly connected to each other or integrated into the network via access points.

Comprehensive diagnostics displays and an LED bar graph for displaying the wireless reception performance are integrated. They ensure straightforward startup and continuous monitoring during operation. In addition, the current signal strength can be read digitally and processed externally.

Interfaces:

– V.24 (RS-232), RS-422, RS-485, and USB
– 54 Mbps WLAN interface according to IEEE 802.11 b/g
– External SMA antenna connection

Security:

– WEP, up to 128 bits
– WPA / WPA2 (AES / TKIP)
– LED bar graph for displaying wireless reception performance

Features:

– Ad-hoc or infrastructure operation
– Software for virtual COM ports supplied as standard
– Extended temperature range of -25°C to +60°C
– Redundant power supply and modular station structure with TBUS connectors
– 3-way electrical isolation VCC // V.24 (RS-232)/RS-422/RS-485 // network
– LED diagnostic indicators
– Straightforward configuration software

Applications:

– Replacement of cables with wireless connections
– Network integration, wireless integration of automation devices and serial devices
– Remote maintenance

Serial device server for 802.11 Wireless LAN

Technical data

Supply		
Supply voltage		10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage		24 V DC ±20% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		≤ 100 mA (24 V DC)
Serial port		
Interfaces		V.24 (RS-232), RS-422, RS-485
Connection method	V.24 (RS-232)	D-SUB-9 plug
	RS-422	Plug-in/screw connection via COMBICON
	RS-485	Plug-in/screw connection via COMBICON
Data format/coding		Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length
Data flow control/protocols		Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Transmission speed		0.3 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 31.25 ; 38.4 ; 57.6 ; 75 ; 93.75 ; 115.2 kbps
Termination resistor		390 Ω / 180 Ω / 390 Ω (can be connected)
Wireless interface		
Interfaces		WLAN as per IEEE 802.11 b/g
Function		Infrastructure mode, ad-hoc mode
Transmission speed		≤ 54 Mbps
Security		802.11i, WPA PSK (preshared key), WPA2 PSK, AES, WEP 64 bit/128 bit, TKIP
Antenna connection		External
Transmission power		-28 dBm to 20 dBm (can be set via software)
Receiver sensitivity		-85.00 dBm
Frequencies		2.402 GHz ... 2.48 GHz (ISM bandwidth)
Supported protocols		TCP/IP, UDP
General data		
Ambient temperature (operation)		-25 °C ... 60 °C
Electrical isolation		(VCC // WLAN, RS-232, RS-422, RS-485, USB)
Test voltage		1.5 kV_{rms} (50 Hz, 1 min.)
Electromagnetic compatibility		Conformance with EMC Directive 2004/108/EC
Dimensions	W / H / D	22.5 mm / 99 mm / 121 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Serial device server, to convert a serial interface to 802.11 WLAN, incl. CD-ROM with drivers, additional software and user documentation TCP, UDP	**FL COMSERVER WLAN 232/422/485**	**2313559**	1

Accessories

RS-232-D-SUB cable, length: 2 m			
- 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1
- 9-pos. socket on 25-pos. socket	**PSM-KA 9 SUB 25/BB/2METER**	**2761059**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
OMNI omni-directional antenna with protection against vandalism	**RAD-ISM-2400-ANT-VAN- 3-0-SMA**	**2885867**	1
PANEL directional wireless antenna (without cable)	**RAD-ISM-2400-ANT-PAN- 8-0**	**2867610**	1
Antenna extension cable	**RAD-CAB-EF393- 3M**	**2867649**	1

4 kV Ethernet ISOLATOR for electrical isolation

The **FL ISOLATOR** is used for electrical isolation in copper-based Ethernet networks.

In industrial environments, potential differences pose a constant problem with regard to interference-free data transmission.

The high-quality isolation for up to 4 kV provides reliable protection for Ethernet devices and interfaces. This results in considerably higher immunity to interference in industrial applications.

The **FL ISOLATOR 100-M12** has been specifically developed for use in the railway industry. Featuring M12 connection technology and optional wall mounting, this network isolator can be used flexibly.

Features:

– Electrical isolation of data cables and cable shielding
– Dielectric strength up to 4 kV
– Transmission speed of up to 1000 Mbps, device-specific
– No power supply required
– Protection against aggressive environmental influences, particularly harsh industrial environments, thanks to coated PCB
– Approval for railway applications (rolling stock) according to EN 50155 and EN 50121
– Extended temperature range

Ethernet

PROFINET

Modbus

Transmission speeds up to 1 Gbps, two RJ45 connections

Technical data

Ethernet interface		
Connection method		RJ45 socket, shielded
Transmission speed		10/100/1000 Mbps
Transmission length		≤ 100 m (total length across both ports (dependent on data rate and cable used))
General data		
Ambient temperature (operation)		-25 °C ... 75 °C
Electrical isolation		(Ethernet // Ethernet)
Test voltage		4 kV AC (50 Hz, 1 min.)
Electromagnetic compatibility		Conformance with EMC Directive 2004/108/EC
Standards/regulations		EN 50121 and EN 50155 (for railway applications)
Dimensions	W / H / D	22.5 mm / 99 mm / 92 mm
Conformance / approvals		
UL, USA / Canada		508 listed

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Passive network isolator, for electrical isolation in Ethernet networks. For protection against potential differences of up to 4 kV. - For transmission speeds of up to 1 Gbps, connection: 2x RJ45 sockets - For transmission speeds of up to 100 Mbps, connection: 2x RJ45 sockets - For transmission speeds of up to 100 Mbps, connection: 1x RJ45 socket and COMBICON plug-in screw terminal block	**FL ISOLATOR 1000-RJ/RJ**	**2313915**	1
Passive network isolator, for electrical isolation in Ethernet networks. For protection against potential differences of up to 4 kV. - For transmission speeds of up to 100 Mbps, connection: two M12 sockets (D-coded)			

Accessories

Mounting material, for DIN rail mounting				
M12 connector, straight				
Bus system cable, Ethernet, 4-pos., PUR, halogen-free, RAL 5021 (water blue), shielded, straight M12 plug (D-coded) to free cable end, cable length: free input (0.2 ... 40.0 m)				
Patch cable, CAT5, preassembled	0.5 m	**FL CAT5 PATCH 0,5**	**2832263**	10
	1 m	**FL CAT5 PATCH 1,0**	**2832276**	10
	2 m	**FL CAT5 PATCH 2,0**	**2832289**	10
	3 m	**FL CAT5 PATCH 3,0**	**2832292**	10
Patch cable, CAT6, preassembled	0.5 m	**FL CAT6 PATCH 0,5**	**2891288**	10
	1 m	**FL CAT6 PATCH 1,0**	**2891385**	10
	2 m	**FL CAT6 PATCH 2,0**	**2891589**	10
	3 m	**FL CAT6 PATCH 3,0**	**2891686**	10

Ethernet

PROFINET

Modbus

Transmission speeds up to 100 Mbps, two RJ45 connections

Technical data

RJ45 socket, shielded
10/100 Mbps
≤ 100 m (total length across both ports (dependent on data rate and cable used))

-25 °C ... 75 °C
(Ethernet // Ethernet)
4 kV AC (50 Hz, 1 min.)
Conformance with EMC Directive 2004/108/EC
EN 50121 and EN 50155 (for railway applications)
22.5 mm / 99 mm / 92 mm

508 listed

Ordering data

Type	Order No.	Pcs. / Pkt.
FL ISOLATOR 100-RJ/RJ	**2313931**	1

Accessories

FL CAT5 PATCH 0,5	**2832263**	10
FL CAT5 PATCH 1,0	**2832276**	10
FL CAT5 PATCH 2,0	**2832289**	10
FL CAT5 PATCH 3,0	**2832292**	10
FL CAT6 PATCH 0,5	**2891288**	10
FL CAT6 PATCH 1,0	**2891385**	10
FL CAT6 PATCH 2,0	**2891589**	10
FL CAT6 PATCH 3,0	**2891686**	10

Ethernet

PROFINET

Modbus

Transmission speeds up to 100 Mbps RJ45 and screw connection

Technical data

RJ45 socket, shielded
10/100 Mbps
≤ 100 m (total length across both ports (dependent on data rate and cable used))

-25 °C ... 75 °C
(Ethernet // Ethernet)
4 kV AC (50 Hz, 1 min.)
Conformance with EMC Directive 2004/108/EC
EN 50121 and EN 50155 (for railway applications)
22.5 mm / 99 mm / 92 mm

508 listed

Ordering data

Type	Order No.	Pcs. / Pkt.
FL ISOLATOR 100-RJ/SC	**2313928**	1

Accessories

FL CAT5 PATCH 0,5	**2832263**	10
FL CAT5 PATCH 1,0	**2832276**	10
FL CAT5 PATCH 2,0	**2832289**	10
FL CAT5 PATCH 3,0	**2832292**	10
FL CAT6 PATCH 0,5	**2891288**	10
FL CAT6 PATCH 1,0	**2891385**	10
FL CAT6 PATCH 2,0	**2891589**	10
FL CAT6 PATCH 3,0	**2891686**	10

Ethernet

PROFINET

Modbus

Transmission speeds up to 100 Mbps M12 connection

Technical data

M 12 plug-in connectors (D-coded, female)
10/100 Mbps
≤ 100 m (total length across both ports (dependent on data rate and cable used))

-40 °C ... 75 °C
(Port X1//port X2)
4 kV AC (50 Hz, 1 min.)
Conformance with EMC Directive 2004/108/EC
EN 50121 and EN 50155 (for railway applications)
66 mm / 91 mm / 34 mm

UL applied for

Ordering data

Type	Order No.	Pcs. / Pkt.
FL ISOLATOR 100-M12	**2902985**	1

Accessories

FL EPA RMS	**2701133**	1
VS-M12MS-IP20-93E-LI/2,0	**1406056**	1
NBC-MSD SCO/.../...	**1408713**	1

Passive patch panel for the DIN rail

The mini patch panels provide a convenient alternative to on-site assembly of RJ45 connectors.

The cross-control-cabinet field cabling is simply connected to screw, spring-cage or LSA connection terminal blocks, depending on which option is selected. The connection to the terminal devices is then completed using pre-assembled RJ45 patch cables.

The completely shielded cable routing ensures transmission quality of up to 1000 Mbps.

General features

– CAT5e
– 10/100 Mbps
– Mounted on DIN rails
– Safe shield connection to ground potential

FL CAT 5 TERMINAL BOX

– RJ45 socket
– Screw terminal blocks
– 4-pin assignment: 1, 2, 3, 6
– Clearly labeled with PROFINET cable colors

FL-PP-RJ45-SCC

– RJ45 socket
– Spring-cage connection terminal blocks
– 8-pin assignment: 1:1
– Option of shield contacting on DIN rail via jumpers

FL-PP-RJ45-SC

– RJ45 socket
– Screw terminal blocks
– 8-pin assignment: 1:1
– Option of shield contacting on DIN rail via jumpers

FL-PP-RJ45-LSA

– RJ45 socket
– LSA connection terminal blocks
– 8-pin assignment: 1:1
– Option of shield contacting on DIN rail via jumpers

FL-PP-RJ45/RJ45

– RJ45 socket
– RJ45 socket
– 8-pin assignment: 1:1
– Option of shield contacting on DIN rail via jumpers

Notes:
For mini patch panel with electrical isolation, see page 414
For Ethernet cables and corresponding crimping pliers, see page 417
For RJ45 patch cables, see page 418

Ethernet

PROFINET

Modbus

Mini patch panel with various connection options

Technical data

Cable impedance	100 Ω
Transmission speed	10/100 Mbps
Connection line	Twisted pair, shielded, CAT5 or better
Transmission length	100 m (including patch cables)
Plug connection	RJ45 CAT5e
Insertion/withdrawal cycles	≤ 2500
Cable cross section (max./min.)	10 mm / 6 mm
Screw connection solid/stranded/AWG	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Ambient temperature (operation)	-25 °C ... 70 °C
Housing material	PVC/PA
Weight	39 g
Dimensions W / H / D	25 mm / 90 mm / 52 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Patch panel, one **RJ45 socket to 4 screw connection terminal blocks** (assignment 1, 2, 3, 6), CAT5e, 10/100 Mbps, DIN rail mounting, IP20, shield contacting on DIN rail	**FL CAT5 TERMINAL BOX**	**2744610**	1
Patch panel, one **RJ45 socket to 8 spring-cage connection terminal blocks** (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	**FL-PP-RJ45-SCC**	**2901642**	1
Patch panel, one **RJ45 socket to 8 screw connection terminal blocks** (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	**FL-PP-RJ45-SC**	**2901643**	1
Patch panel, one **RJ45 socket to 8 IDC connection terminal blocks** (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	**FL-PP-RJ45-LSA**	**2901645**	1
Patch panel, two RJ45 sockets (1:1 assignment), CAT5e, 10/100/1000 Mbps, DIN rail mounting, IP20, option of shield contacting on DIN rail via jumpers	**FL-PP-RJ45/RJ45**	**2901646**	1

Ethernet cables, plugs, tools

The Ethernet cables of category 5e (up to 125 Mbps) which have been developed especially for industrial applications round off the range to form a complete industrial installation concept.

The installation cable **FL CAT 5 HEAVY...** with solid twisted pair conductors, is particularly suitable for permanent installation outside the control cabinet or switch box. It is characterized by a highly durable second outer sheath made of polyurethane (PUR). With an external diameter of 7.5 mm, the cable has a high degree of mechanical load carrying capacity and fits perfectly through standard cable screw connections. Inside the control cabinet, the second outer sheath is simply removed (Ø 5.75 mm). The cable can therefore be assembled directly with the RJ45 connector and connected to the modules. In line with CAT 5e, cable lengths up to 100 m are permissible.

The flexible and lightweight design **FL CAT5 FLEX...** is used for wiring inside the control cabinet (e.g., as patch cable between switch and terminal device). Flexible single wires and a cable diameter of 5.75 mm facilitate installation where space is restricted. The permissible cable length with these highly flexible cables is 50 m.

Both cable types can be supplied ready assembled with RJ45 connector if required (see order sample).

Ethernet plugs and tools

The **FL PLUG...** connectors and matching crimping pliers are available for on-site assembly. The connectors comply with category 5e (up to 125 MHz) due to an extremely low cross-talk behavior. Therefore, the connectors can be used in 10/100 Mbps systems as well as in 1000Base-T-systems. For connections that are not crossed, it is recommended that you use the connector set (two connectors) with gray bend protection sleeve and for connections that are crossed, the connector set with green bend protection sleeve.

Ethernet

Ethernet-cable, 2-pair, CAT5/CAT5e in solid and stranded

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
CAT5e-SF/UTP cable (J-02YS(ST)C HP 2 x 2 x 24 AWG), heavy duty installation cable 2 x 2 x 0.22 mm², solid conductor, shielded, Outer sheath: 7.5 mm Ø ±0.3 mm Inner sheath: 5.75 mm Ø ±0.15 mm (Length in meters as per customer specifications)	**FL CAT5 HEAVY**	**2744814**	1
CAT5e-SF/UTP cable, same as before, however, assembled with RJ45 connector (refer to the order sample) on both sides	**FL CAT5 HEAVY CONF/**	**2744827**	1
CAT5e-SF/UTP cable (J-LI02YS(ST)C H 2 x 2 x 26 AWG), light duty stranded installation cable 2 x 2 x 0.14 mm², fine strand conductor, shielded, Outer sheath: 5.75 mm Ø ±0.15 mm (Length in meters as per customer specifications)	**FL CAT5 FLEX**	**2744830**	1
CAT5e-SF/UTP cable, same as before, however, assembled with RJ45 connector (refer to the order sample) on both sides	**FL CAT5 FLEX CONF/**	**2744843**	1

Accessories

RJ45 connector, shielded, with bend protection sleeve, x 2			
- Gray for straight cables	**FL PLUG RJ45 GR/2**	**2744856**	1
- Green for crossed cables	**FL PLUG RJ45 GN/2**	**2744571**	1
Crimping pliers, for assembling the RJ45 connectors	**FL CRIMPTOOL**	**2744869**	1

Ordering example for cable **with** connector

Light-weight and flexible installation cable, assembled with RJ45 connectors, crossover assignment, 3.5 m long

Quantity	Order No.	Connection	Length [m][1])
1	2744843	CO	3.5

CO ≙ Crossover
LI ≙ Line

[1]) min. 0.25 m
max. 50 m with FL CAT5 Flex
max. 100 m with FL CAT5 Heavy
step width: 0.25 m

Ordering example for cable **without** connector

Heavy-duty installation cable, 20 m long

Cable length	Order No.	Order designation
20	2744814	FL CAT5 HEAVY

In meters

RJ45 patch cables

Notes:

Additional accessories for network installation can be found in the "Ethernet networks" section on page 62

The preassembled patch cables have been specially developed for industrial use.

They are suitable for the quick installation of Ethernet components and patch fields or termination devices within a control cabinet. They form the link to a seamless high quality Ethernet system.

The patch cables are characterized by a new bend protection and are available in graded lengths from 0.3 to 20 m.

All patch cables are designed as 1:1 cable. They come with four pairs of conductors and are assembled with RJ45 plugs according to IEC 603-7/Class A. Each cable is tested separately for its transmission properties.

With their high, universal wiring quality across the active and passive infrastructure, the patch cables fulfill the requirements of the standards for CAT5/CAT6.

Ethernet

RJ45 patch cables for IP20 applications

Technical data

	FL CAT5 PATCH 0,3	FL CAT6 PATCH 0,3
Cable, properties		
External diameter	5.5 mm	5.5 mm
Single wire, material	Cu litz wire	Cu litz wire
Single wires per module	8	8
Single wire, cross section	0.14 mm²	0.14 mm²
Outer sheath, material	LSFROH	LSFROH
Smallest bending radius, fixed installation	30 mm	30 mm
Shielding	SF/UTP	S/FTP
Connector		
Volume resistance	≤ 0.003 Ω (IEC 60603-7)	≤ 0.003 Ω (IEC 60603-7)
General data		
Ambient temperature (operation)	-10 °C ... 60 °C	-10 °C ... 60 °C

Ordering data

Description	Length of cable	Type	Order No.	Pcs. / Pkt.
Patch cable, CAT5, preassembled				
	0.3 m	**FL CAT5 PATCH 0,3**	**2832250**	10
	0.5 m	**FL CAT5 PATCH 0,5**	**2832263**	10
	1 m	**FL CAT5 PATCH 1,0**	**2832276**	10
	1.5 m	**FL CAT5 PATCH 1,5**	**2832221**	10
	2 m	**FL CAT5 PATCH 2,0**	**2832289**	10
	3 m	**FL CAT5 PATCH 3,0**	**2832292**	10
	5 m	**FL CAT5 PATCH 5,0**	**2832580**	10
	7.5 m	**FL CAT5 PATCH 7,5**	**2832616**	10
	10 m	**FL CAT5 PATCH 10,0**	**2832629**	10
Patch cable, CAT6, preassembled				
	0.3 m	**FL CAT6 PATCH 0,3**	**2891181**	10
	0.5 m	**FL CAT6 PATCH 0,5**	**2891288**	10
	1 m	**FL CAT6 PATCH 1,0**	**2891385**	10
	1.5 m	**FL CAT6 PATCH 1,5**	**2891482**	10
	2 m	**FL CAT6 PATCH 2,0**	**2891589**	10
	3 m	**FL CAT6 PATCH 3,0**	**2891686**	10
	5 m	**FL CAT6 PATCH 5,0**	**2891783**	10
	7.5 m	**FL CAT6 PATCH 7,5**	**2891880**	10
	10 m	**FL CAT6 PATCH 10**	**2891877**	10
	12.5 m	**FL CAT6 PATCH 12,5**	**2891369**	5
	15 m	**FL CAT6 PATCH 15,0**	**2891372**	5
	20 m	**FL CAT6 PATCH 20,0**	**2891576**	5

Product overview

Mobile phone network

	SMS relay	Modem	Industrial mobile phone router		
System	I/O	GPRS RS-232	GPRS/EDGE Ethernet	UMTS/HSPA Ethernet	UMTS/HSPA/CDMA Ethernet
Description	**GSM/SMS relays,** 6 analog/digital inputs, 4 digital outputs	Quadband modem, for GPRS and GSM	**Industrial mobile phone router,** for GPRS/EDGE	**Industrial mobile phone router,** for UMTS/HSPA with GPRS/EDGE fallback	**MGUARD security router**
Page	421	423	423	423	425

Public network

	DSL broadband router		Analog modem
System	ADSL Annex A, B Ethernet	ADSL Annex A, B Ethernet/RS-232	V.34 (analog) Ethernet/RS-232
Description	**DSL broadband router/modem,** with firewall	**DSL broadband router/modem,** with firewall, VPN, and serial device server	**Analog modem,** for dial-up line/permanent line operation
Page	427	427	428

Private network

	SHDSL
System	Ethernet RS-232/RS-422/RS-485
Description	**Extender (SHDSL)** for in-house cables
Page	431

Accessories

System	PSI-GSM/UMTS-ANT-OMNI... PSI-GSM/UMTS-QB-ANT	PSI-CAB-GSM/UMTS... CSMA-LAMBDA/4-2.0-BS-SET	PSI-MPI/RS232-PC PSI-MODEM-MPI-SET1	PSI-MODEM-SPLITTER PSI-CA-MODEM-SPLITTER	DT-TELE-RJ45
Description	Multiband antennae for UMTS and quadband GSM	Antenna extension cables and surge protection for UMTS and quadband GSM	Programming adapter and programming set for remote maintenance	Interface converter RS-232 flat-ribbon connecting cable	SHDSL surge protection
Page	432	432	433	433	433

Mobile phone network/ SMS relay modules

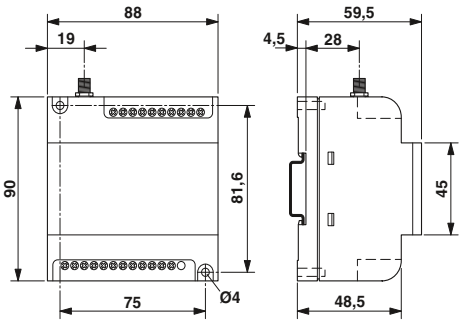
The PSI-MODEM-SMS-REL… is a compact remote control and signaling system. Six digital or configurable analog/digital inputs and four relay outputs with PDT contacts are monitored and controlled using SMS messages via any GSM mobile phone network.

Product features:

- Installation component device as per DIN 43880
- For worldwide use
- Message via SMS in case of status change at the input
- Alarming in case of voltage failure via SMS
- Switching on call
- SMS remote control of the outputs
- Switching of outputs for a predefined time
- SMS status query of all inputs and outputs
- Password protection
- Integrated phone book for up to 50 numbers
- Max. 5 recipients per SMS
- Configuration software and programming cable supplied as standard
- Easy configuration on the PC without programming knowledge

Possible areas of application for the PSI-MODEM-SMS-REL… are:

- Building and system monitoring
- Switching of pumps
- Monitoring of levels and temperatures
- Alarm and domestic engineering
- Climate and ventilation engineering



SMS remote and signaling system with six inputs and four relay outputs

Technical data

Supply		
Supply voltage	12 V DC ... 48 V DC	110 V AC ... 240 V AC
Nominal current consumption	15 mA	10 mA
Input data		
Switching input	Digital: 6 x $U_{N,}$ switching threshold 9.5 V DC Analog: 0 - 10 V	Digital: 6 x $U_{N,}$ switching threshold 85 V AC Analog: -
Output data		
Contact type	Single contact, 4x1 PDT contact	
Max. switching voltage	250 V AC/DC	
Min. switching voltage	12 V AC/DC	
Limiting continuous current	10 A	
GSM		
Frequencies	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM))	
SIM interface	3 volt SIM card	
Antenna connection	50 Ω impedance SMA antenna socket	
General data		
Ambient temperature (operation)	-25 °C ... 55 °C	
Electromagnetic compatibility	Conformance with R&TTE directive 1999/5/EC	
Dimensions W / H / D	88 mm / 90 mm / 60 mm	

Ordering data

Description	Voltage U_N	Type	Order No.	Pcs. / Pkt.
SMS relay with six analog or digital configurable inputs and four relay outputs	12 V DC ... 48 V DC	PSI-MODEM-SMS-REL/6ADI/4DO/DC	2313520	1
SMS relay with six digital inputs and four relay outputs	110 V AC ... 240 V AC	PSI-MODEM-SMS-REL/6 DI/4DO/AC	2313513	1

Accessories

Multi-band antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm	PSI-GSM/UMTS-QB-ANT	2313371	1
Multiband antenna for external panel and external mast mounting for UMTS and quad-band GSM, with omnidirectional characteristics, 5 m antenna cable with SMA round connector	PSI-GSM/UMTS-ANT-OMNI-2-5	2900982	1
Antenna extension cable for UMTS and quad-band GSM, 5 m long, antenna cable with SMA connector and SMA coupling	PSI-CAB-GSM/UMTS- 5M	2900980	1
Antenna extension cable for UMTS and quad-band GSM, 10 m long, antenna cable with SMA connector and SMA coupling	PSI-CAB-GSM/UMTS-10M	2900981	1
Surge protection for UMTS and quad-band GSM antenna, with SMA connector and SMA coupling	CSMA-LAMBDA/4-2.0-BS-SET	2800491	1
Connection cable, D-9-SUB to USB, with adapter D-9-SUB to D-25-SUB	CM-KBL-RS232/USB	2881078	1

Mobile phone network/ serial quad band modem for GPRS and GSM

Send V.24 (RS-232) data all around the world via mobile phone network

Mobile phone network:
– GSM mobile phone networks: 850, 900, 1800, and 1900 MHz
– For worldwide use

GPRS TCP/IP connection:
– Connection established via IP addresses
– Client/server functionality
– IPT compatible
– Integrated TCP/IP stack for TCP and UDP connections
– Data rates of up to 53.6 kbps
– Security:
  - Firewall

GSM dial-up connection:
– Connection established via data phone number (CSD)
– Security:
  - Connection established with password protection
  - Selective call acceptance
  - Callback function

V.24 (RS-232) interface:
– Freely parameterizable (baud rate, data bits, parity, stop bit, flow control)

Digital I/Os:
– Two digital switching inputs: sending of freely configurable text messages (SMS, FAX, e-mail)
– One switching output on the backplane

Additional features:
– Encryption of SIM card PINs
– Can be used regardless of controller manufacturer
– High electromagnetic compatibility
– Electrical isolation
– NEW: convenient configuration software
– Configuration via SMS

Notes:

1) EMC: Class A product, see page 553

Quad-band modem for GPRS and GSM with RS-232 interface, integrated TCP/IP stack and 2 alarm inputs

Technical data

Supply		
Supply voltage		10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage		24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		< 350 mA (24 V DC)
Stand-by current consumption		< 80 mA
V.24 (RS-232) interface		
Connection method		D-SUB-9 plug
Data format/coding		Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length
Data flow control/protocols		Software handshake, Xon/Xoff or hardware handshake RTS/CTS
Transmission speed		Automatic data rate detection (default) or fixed setting to 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps, can be set via software
Mobile phone network		
Frequencies		850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM))
SIM interface		1.8 volt, 3 volt
GPRS compatibility		Class 10, Class B
Network function		4 time slots for receiving data, 2 time slots for transmitting data. The PIN is saved in the modem. After a voltage interruption, there is automatic redialing into the network Integrated TCP/IP stack, independent connection establishment.
Network check		LED to show data signal quality
Antenna connection		50 Ω impedance SMA antenna socket
Input/output		
Switching input		2 x U_{Nom} 24 V DC / 5 mA, input range 9...60 V DC
Switching output		On the backplane (10 V DC ... 30 V DC / 80 mA at 24 V DC)
General data		
Ambient temperature (operation)		-25 °C ... 60 °C
Electrical isolation		(VCC // V.24 (RS-232) // GSM)
Test voltage		1.5 kV
Approvals for countries		EU, USA, Canada, other countries in preparation
Electromagnetic compatibility		Conformance with R&TTE directive 1999/5/EC
Dimensions	W / H / D	22.5 mm / 99 mm / 118.6 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial GPRS/GSM modem with RS-232 interface, scope of supply: modem, CD with configuration software and user manual	**PSI-GPRS/GSM-MODEM/RS232-QB**[1])	**2313106**	1

Accessories

Multi-band antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm	**PSI-GSM/UMTS-QB-ANT**	**2313371**	1
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
RS-232-D-SUB cable, length: 2 m	**PSM-KA9SUB9/BB/2METER**	**2799474**	1
RS-232-D-SUB cable, length: 0.5 m	**PSM-KA9SUB9/BB/0,5METER**	**2708520**	1

Mobile phone network/ mobile phone routers with firewall and VPN

Mobile phone routers support high-performance remote connections to remote Ethernet networks. These connections can be used to transmit sensitive data securely over mobile phone networks.

The integrated firewall and VPN (Virtual Private Network) support reliably protect the application against unauthorized access. The Ethernet connection can be used for system-wide communication between all connected components in the network, such as drives, controllers, control panels or visualization PCs.

Mobile TCP/IP connection:

– Connection established via IP addresses
– GPRS/EDGE data rates of up to 210 kbps
– UMTS/HSPA data rates of up to 7.2 Mbps
– Security:
  - Firewall
  - NAT table

VPN (virtual private network):

– IPsec and OpenVPN support
– Up to three VPN tunnels simultaneously
– Authentication with X.509 certificates and via pre-shared key (PSK)
– VPN remote start via call or SMS
– 1:1 NAT in the VPN

Digital I/Os:

– 6 digital switching inputs: Sending of freely configurable text messages (SMS, FAX, e-mail) and starting of user-defined functions
– Four switching outputs: can be activated via SMS and Ethernet and for GSM and connection diagnostics

Additional features:

– Configuration via web-based management
– Upload and download configuration
– Configurable daily restart
– Continuous connection monitoring
– High electromagnetic compatibility
– Electrical isolation

Notes:

1) EMC: Class A product, see page 553

GPRS/EDGE and UMTS/HSPA mobile phone routers for worldwide network access

Technical data

Supply	
Supply voltage	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption	< 200 mA (24 V DC)
Stand-by current consumption	< 90 mA (stand by)
Ethernet interface	
Connection method	RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation
Transmission length	100 m (shielded twisted pair)
Functions	
Management	Web-based management, SNMP
Mobile phone network	
Frequencies	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 850 MHz (0.25 W (UMTS)) / 1900 MHz (0.25 W (UMTS)) / 2100 MHz (0.25 W (UMTS))
SIM interface	1.8 volt, 3 volt
GPRS compatibility	Class 12, Class B
Network check	LED bar graph to display receive quality
Antenna connection	50 Ω impedance SMA antenna socket
Input/output	
Switching input	6 x $U_{Nom,}$ input range 10 V DC ... 30 V DC/5 mA
Switching output	4 x $U_{Nom,}$ input range 10 V DC ... 30 V DC/50 mA, short-circuit-proof
General data	
Ambient temperature (operation)	-25 °C ... 65 °C (not aligned)
Electrical isolation	(VCC // UMTS // Ethernet // PE)
Test voltage	1 kV (50 Hz, 1 min.)
Approvals for countries	EU, USA, Canada, other countries in preparation
Electromagnetic compatibility	Conformance with R&TTE directive 1999/5/EC
Dimensions W / H / D	45 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial mobile phone router, with integrated firewall and VPN, 6 digital inputs and 4 outputs, and continuous connection monitoring			
- For UMTS/HSPA with GPRS/EDGE fallback and dual SIM for backup provider	**PSI-MODEM-3G/ROUTER**	**2314008**	1
- For GPRS/EDGE quad band, 35 mm housing width	**PSI-MODEM-GSM/ETH[1])**	**2313355**	1

Accessories

Multi-band antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm	**PSI-GSM/UMTS-QB-ANT**	**2313371**	1
Multiband antenna for external panel and external mast mounting for UMTS and quad-band GSM, with omnidirectional characteristics, 5 m antenna cable with SMA round connector	**PSI-GSM/UMTS-ANT-OMNI-2-5**	**2900982**	1
Antenna extension cable for UMTS and quad-band GSM, 5 m long, antenna cable with SMA connector and SMA coupling	**PSI-CAB-GSM/UMTS- 5M**	**2900980**	1
Antenna extension cable for UMTS and quad-band GSM, 10 m long, antenna cable with SMA connector and SMA coupling	**PSI-CAB-GSM/UMTS-10M**	**2900981**	1

Mobile phone network/ MGUARD security routers

Industrial mobile phone routers featuring mGuard technology for global communication via UMTS and CDMA networks.

Thanks to the integrated high-speed mobile phone interface and 4-port switch in compact metal housing, the new **TC MGUARD RS2/4000 VPN** security appliances create a system for global, secure industrial remote communication.

They have an SD card slot at the front for configuration memory. The SD cards can be used for starting up or replacing the devices quickly and easily. The devices feature an extended temperature range and have a buffered realtime clock and trusted platform module (TPM) for secure key generation and management. They support precise time synchronization and positioning, specifically for mobile applications, via GPS and GLONASS.

The **TC MGUARD RS4000 3G** devices provide high-availability high-end security for industry and a remote maintenance infrastructure for the secure connection of machines and systems. For maximum availability, an additional external network is supported redundantly alongside the internal network (LAN) and the external network (WAN) in the form of the mobile phone interface. The integrated 4-port switch offers management features and supports EtherNet/IP™.

The **TC MGUARD RS2000 3G** devices are designed for applications with fewer complex requirements and allow secure remote maintenance of machines and systems in the field via the Internet. In this context, they are used as industrial remote service routers with a simplified configuration. The integrated 4-port switch saves valuable space on the DIN rail.

Both versions have all the necessary standard functions for operating an Ethernet network that is both flexible and robust.

Features:

– Port mirroring
– Configuration can be stored externally
– Web-based management, SNMP
– Replaceable configuration memory
– Comprehensive connection options
– Flexible routing
– Intelligent stateful inspection firewall
– Secure remote services (VPN) according to IPsec standard

Serial device server included

The integrated COMSERVER function is used to integrate serial RS-232 interfaces into Ethernet networks. This provides an easy way of implementing functions such as cable replacement or network integration.

– Cable replacement: two devices in combination tunnel serial connections via Ethernet
– Network integration: you can integrate automation devices such as controllers or frequency inverters into a network using corresponding programming and diagnostics software

Device Manager

The Device Manager simplifies the management of MGUARD security appliances. The tool features a template mechanism that enables the user to configure and manage all MGUARD devices centrally – from a few hundred devices to several thousand.

Notes:

Central device management software, the Device Manager for FL MGUARD devices, can be found on page 45

N

UMTS/HSPA mobile phone router with firewall and VPN, manageable 4-port switch, DMZ port and second WAN interface

N

UMTS/HSPA mobile phone router with firewall and VPN, integrated 4-port switch

Technical data

Supply	
Supply voltage	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption	< 200 mA (24 V DC)
Ethernet interface	
Connection method	RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation
Transmission length	100 m (shielded twisted pair)
Functions	
Management	Web-based management, SNMP
Basic functions	Router with intelligent firewall and VPN for 10 tunnels (up to 250 supported with optional additional license), CIFS Integrity Monitoring (as an option), metal housing, slot for SD memory card
Security functions	
Number of VPN tunnels	10 (as an option, up to 250, with additional license FL MGUARD LIC VPN-250/ Order No. 2700193 or 2700192)
Encryption methods	DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode	ESP-Tunnel / ESP-Transport
Authentication	X.509v3 certificates with RSA or PSK
Firewall rules	Configurable stateful inspection firewall with full scope of functions
Routing	Standard routing, NAT, 1:1-NAT, port forwarding
Mobile phone network	
Frequencies	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 800 MHz (0.25 W (UMTS)) / 850 MHz (0.25 W (UMTS)) / 900 MHz (0.25 W (UMTS)) / 1900 MHz (0.25 W (UMTS)) / 2100 MHz (0.25 W (UMTS)) / 800 MHz (CDMA2000 EV-DO) / 1900 MHz (CDMA2000 EV-DO)
SIM interface	1.8 volt, 3 volt
GPRS compatibility	Class 12, Class B
Network check	LED bar graph to display receive quality
Antenna connection	50 Ω impedance SMA antenna socket
Input/output	
Switching input	3 x U_{Nom}, input range: 10 V DC ... 30 V DC/5 mA
Switching output	3 x U_{Nom}, input range: 10 V DC ... 30 V DC/250 mA, short-circuit-proof
General data	
Ambient temperature (operation)	-20 °C ... 60 °C
Electrical isolation	(VCC // PE)
Test voltage	1 kV (50 Hz, 1 min.)
Dimensions W / H / D	45 mm / 130 mm / 114 mm

Technical data

Supply	
Supply voltage	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption	< 200 mA (24 V DC)
Ethernet interface	
Connection method	RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation
Transmission length	100 m (shielded twisted pair)
Functions	
Management	Web-based management, SNMP
Basic functions	Router with simplified 2-click firewall and VPN for 2 tunnels (fixed), metal housing, slot for any SD memory card
Security functions	
Number of VPN tunnels	2 (fixed, Ipsec (IETF standard))
Encryption methods	DES, 3DES, AES-128, -192, -256
Internet Protocol Security (IPsec) mode	ESP-Tunnel / ESP-Transport
Authentication	X.509v3 certificates with RSA or PSK
Firewall rules	Simplified 2-click stateful inspection firewall
Routing	Standard routing, NAT, 1:1-NAT, port forwarding
Mobile phone network	
Frequencies	850 MHz (2 W (EGSM)) / 900 MHz (2 W (EGSM)) / 1800 MHz (1 W (EGSM)) / 1900 MHz (1 W (EGSM)) / 800 MHz (0.25 W (UMTS)) / 850 MHz (0.25 W (UMTS)) / 900 MHz (0.25 W (UMTS)) / 1900 MHz (0.25 W (UMTS)) / 2100 MHz (0.25 W (UMTS)) / 800 MHz (CDMA2000 EV-DO) / 1900 MHz (CDMA2000 EV-DO)
SIM interface	1.8 volt, 3 volt
GPRS compatibility	Class 12, Class B
Network check	LED bar graph to display receive quality
Antenna connection	50 Ω impedance SMA antenna socket
Input/output	
Switching input	3 x U_{Nom}, input range: 10 V DC ... 30 V DC/5 mA
Switching output	3 x U_{Nom}, input range: 10 V DC ... 30 V DC/250 mA, short-circuit-proof
General data	
Ambient temperature (operation)	-20 °C ... 60 °C
Electrical isolation	(VCC // PE)
Test voltage	1 kV (50 Hz, 1 min.)
Dimensions W / H / D	45 mm / 130 mm / 114 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Mobile phone router with mGuard technology, VPN and firewall, replaceable memory, GPS time synchronization, serial device server for RS-232			
- 2 x WAN interface (1 x RJ45, 1 x mobile phone technology), 4 x LAN interface (RJ45, manageable), DMZ port	**TC MGUARD RS4000 3G VPN**	**2903440**	1
- 1 x WAN interface (mobile phone technology), 4 x LAN interface (RJ45)	**TC MGUARD RS2000 3G VPN**	**2903441**	1

Accessories

Parameterization memory	**SD FLASH 256MB**	**2988120**	1
License to configure and operate **250 VPN tunnels** on FL MGUARD	**FL MGUARD LIC VPN-250**	**2700193**	1
License to configure **any number of tunnels** and operate **250 VPN** tunnels on FL MGUARD	**FL MGUARD LIC VPN-250 GROUP**	**2700192**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
TC MGUARD RS2000 3G VPN	**2903441**	1

Accessories

SD FLASH 256MB	**2988120**	1

Public network/ DSL broadband routers

Industrial ADSL broadband router - supports ADSL/ADSL2/ADSL2+ according to Annex A and B

The **TC DSL ROUTER** range supports the high-speed connection of industrial Ethernet or RS-232 devices to the Internet using high-availability ADSL technology. Machines, systems or complete Ethernet networks can therefore be accessed from anywhere in the world at any time using a broadband Internet connection.

Developed specifically for use in industrial environments, the TC DSL ROUTERs are suitable both for short-term high-speed access in the case of servicing and for the permanent connection of remote stations to a central company network when used in combination with the integrated security functions.

Remote maintenance (short-term high-speed access)
- Quick and easy remote access to machines, systems or Ethernet networks

Remote control (VPN tunnel)
- Permanent connection of substations to the control room for cyclic data acquisition and monitoring
- Highly secure broadband alternative to analog permanent line applications

Alarm generation and remote control
- High-availability alarm generation via e-mail
- Individual configuration of switching outputs, such as worldwide remote control of switching outputs or indication of a DSL connection abort, etc.

Features:

The DSL broadband routers are designed for worldwide and flexible use, there is no need for the application/provider requirements to be clarified in advance. This enables individual and fast startup on site.

One universal device type
- All common ADSL standards are supported (ADSL/ADSL2/ADSL2+)
- Integrated Annex A/B switchover

Note: the specifications for the standard and frequency range used (Annex) depend on the provider and are included in the access data sent by the provider.
- Annex A: DSL operation parallel to analog telephony (in most of the world)
- Annex B: DSL operation parallel to ISDN (in Germany and neighboring countries)

Individual function selection between modem or router function
- DSL modem: converter from DSL to LAN - the router/firewall function is performed by a separate router, e.g., FL MGUARD
- DSL router: DSL modem plus integrated router functions, e.g., firewall, VPN, NAT, etc.

All TC DSL routers offer increased resistance to typical industrial influences, such as temperature and EMI, and therefore increased fault tolerance and application availability.

TC DSL ROUTER X400 A/B
- Quick and easy startup
- Optimized to the key functions of an industrial DSL broadband router/modem
- Integrated firewall

TC DSL ROUTER X500 A/B
- Multifunctional for highly secure network access
- Suitable for special applications
- DSL broadband router/modem
- VPN tunneling:
  IPsec (client and server)
  Open VPN (client)
- NAT table
- Serial device server for 10/100Base-T(X) with RS-232
- Alarm inputs: send e-mails
- Switching outputs: set by WBM local/remote, VPN service, connection lost, DSL/Internet link

DSL router/modem with firewall

DSL router/modem with firewall, VPN, serial device server, inputs/outputs

	Technical data	Technical data
Supply		
Supply voltage	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Nominal current consumption	< 150 mA (24 V DC)	< 150 mA (24 V DC)
Stand-by current consumption	< 135 mA (stand by)	< 135 mA (stand by)
V.24 (RS-232) interface		
Connection method	-	D-SUB-9 plug
Transmission speed	-	0.3 ; 1.2 ; 2.4 ; 4.8 ; 9.6 ; 19.2 ; 38.4 ; 57.6 ; 115.2 kbps
Transmission length	-	15 m
Ethernet interface		
Connection method	8P8C RJ45 socket, shielded	8P8C RJ45 socket, shielded
Transmission speed	10/100 Mbps, autonegotiation	10/100 Mbps, autonegotiation
Transmission length	≤ 100 m (shielded twisted pair)	≤ 100 m (shielded twisted pair)
Supported protocols	TCP/IP, UDP/IP, FTP, HTTP	TCP/IP, UDP/IP, FTP, HTTP
Auxiliary protocols	ARP, DHCP, PING (ICMP), SNMP V1, SMTP	ARP, DHCP, PING (ICMP), SNMP V1, SMTP
DSL interface		
Connection method	6P2C RJ11 socket, shielded COMBICON plug-in screw terminal block	6P2C RJ11 socket, shielded COMBICON plug-in screw terminal block
Transmission speed	≤ 25 Mbps (downstream from Internet) ≤ 1 Mbps (upstream to Internet)	≤ 25 Mbps (downstream from Internet) ≤ 1 Mbps (upstream to Internet)
Transmission length	≤ 5 km	≤ 5 km
Functions		
Management	Web-based management	Web-based management
Security functions		
Number of VPN tunnels	-	3
Firewall rules	Stateful inspection firewall	Stateful inspection firewall
Input/output		
Switching input	-	6 x $U_{Nom,}$ input range 10 V DC ... 30 V DC/5 mA
Switching output	-	4 x $U_{Nom,}$ input range 10 V DC ... 30 V DC/50 mA, short-circuit-proof
General data		
Ambient temperature (operation)	-20 °C ... 60 °C	-20 °C ... 60 °C
Electrical isolation	(VCC//ADSL//Ethernet//FE)	(VCC + IO + RS-232//ADSL//Ethernet//FE)
Test voltage	1.5 kV_{rms} (50 Hz, 1 min.)	1.5 kV_{rms} (50 Hz, 1 min.)
Approvals for countries	EU, other countries in preparation	EU, other countries in preparation
Electromagnetic compatibility	Conformance with R&TTE directive 1999/5/EC	Conformance with R&TTE directive 1999/5/EC
Dimensions W / H / D	45 mm / 99 mm / 112 mm	45 mm / 99 mm / 112 mm
Degree of protection	IP20	IP20

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Industrial ADSL broadband router, according to Annex A and B	**TC DSL ROUTER X400 A/B**	**2902709**	1	**TC DSL ROUTER X500 A/B**	**2902710**	1
	Accessories			**Accessories**		
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
DATATRAB, surge protection for two signal pairs of the analog and digital (DSL) telecommunication interface	**DT-TELE-RJ45**	**2882925**	1	**DT-TELE-RJ45**	**2882925**	1
DATATRAB adapter, protective adapters for inserting into the data line	**DT-LAN-CAT.6+**	**2881007**	1	**DT-LAN-CAT.6+**	**2881007**	1

Public network/ analog modems

These analog modems are specifically designed to meet industrial requirements for worldwide remote maintenance and alarm generation. Serial connections on the public, analog phone network with speeds of up to 33.6 kbps are supported, as is dial-up to the GSM mobile phone network.

Remote maintenance via dial-up connection:
– Direct access to remotely located controllers for software updates and remote diagnostics

Remote control via permanent line:
– Substations permanently connected to control room for the purpose of monitoring and controlling remote system components

Automatic alarm messaging:
– Individual, configurable SMS and e-mail messaging functions for quick resolution of faults

Features:

PSI-MODEM/ETH
Dial-up line modem for accessing a remote Ethernet network
– Permanent 128-bit authentication
– CHAP protocol

PSI-DATA/FAX-MODEM/RS232
Dial-up/permanent line modem with advanced alarm generation functions for remote control, remote maintenance, and alarm generation applications
– 1x switching input/output

PSI-DATA/BASIC-MODEM/RS232
Dial-up line modem for remote maintenance of systems with a V.24 (RS-232) interface

PSI-MODEM-BASIC/USB
Dial-up line modem for remote maintenance of systems with USB interface
– 5 V DC supply via USB interface

All devices feature:
a) For interference-proof operation, including under harsh EMI conditions:
– High-quality electrical isolation
– Integrated surge protection
b) Comprehensive security functions that prevent unauthorized access by means of
– Configurable, selective call acceptance
– Connection establishment with password protection
– Callback function

Notes:
1) EMC: Class A product, see page 553

Ethernet

Modem for dial-up operation with Ethernet connection (LAN)

Technical data

Supply		
Supply voltage		10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage		-
Supply voltage		24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption		< 100 mA (24 V DC)
Stand-by current consumption		< 70 mA
Serial port		
Connection method		RJ45 socket, shielded
Data format/coding		-
Data flow control/protocols		TCP/IP, UDP, TFTP, HTTP, Modbus TCP, PPP, PROFINET, EtherNet IP, CHAP
Transmission speed		10/100 Mbps, autonegotiation
PSTN port (a/b line)		
Connection method		RJ12, 6-pos.
Dialing procedure		Multiple frequency/pulse dialing, configuration via software
Input/output		
Switching input		-
Switching output		-
General data		
Ambient temperature (operation)		0 °C ... 55 °C
Electrical isolation		(VCC // PSTN // Ethernet)
Test voltage		1.5 kV
Approvals for countries		EU, USA, Canada, other countries in preparation
Electromagnetic compatibility		Conformance with EMC Directive 2004/108/EC
Dimensions	W / H / D	45 mm / 99 mm / 114.5 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Industrial, analog Ethernet modem, Scope of supply: modem, RJ12/RJ12 cable, TAE adapter	**PSI-MODEM/ETH[1])**	**2313300**	1
Industrial analog modem, scope of delivery: modem, CD with configuration software, manual and RJ12/RJ12 cable			
Industrial analog modem with USB connection, scope of supply: modem, driver CD with manual, USB cable and RJ12/RJ12 cable			

Accessories

System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50
MPI adapter for coupling to the programming interface of a Siemens SIMATIC® S7-300/400 controller			
Interface converter for switching between two RS-232 interfaces			
RS-232-D-SUB cable, length: 2 m			
RS-232-D-SUB cable, length: 0.5 m			

RS-232

Modem for dial-up/permanent line operation With V.24 (RS-232) connection and 1 DI/DO

Ex:

Technical data	
10 V DC ... 60 V DC (via plug-in COMBICON screw terminal block)	
16 V AC ... 40 V AC (via plug-in COMBICON screw terminal block)	
24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	
< 100 mA (24 V DC) < 40 mA	
D-SUB-9 plug	
Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length	
Software handshake, Xon/Xoff, direct mode or hardware handshake RTS/CTS	
Automatic data rate detection (default) or fixed setting to 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bps, can be set via software	
RJ12, 6-pos., or plug-in COMBICON screw terminal block	
Multiple frequency/pulse dialing, configuration via software	
U_{Nom} 24 V DC / 5 mA, input range 9...48 V DC, floating	
Miniature switching relay 60 V DC / 1 A ; 42 V AC / 1 A, N/O contact	
0 °C ... 55 °C (VCC // PSTN // V.24 (RS-232)) 1.5 kV EU, USA, Canada, Australia, other countries in preparation	
Conformance with EMC Directive 2004/108/EC 35 mm / 99 mm / 114.5 mm	

Ordering data		
Type	**Order No.**	**Pcs. / Pkt.**
PSI-DATA/FAX-MODEM/RS232	**2708203**	1

Accessories		
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
PSI-MPI/RS232-PC	**2313148**	1
PSI-MODEM-SPLITTER	**2708766**	1
PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA9SUB9/BB/0,5METER	**2708520**	1

RS-232

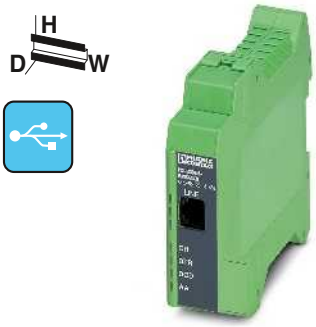
Modem for dial-up operation with V.24 (RS-232) connection

Ex:

Technical data	
10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	
-	
24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	
< 100 mA (24 V DC) < 40 mA	
D-SUB-9 plug	
Serial asynchronous UART/NRZ, 7/8 data, 1/2 stop, 1 parity, 10/11-bit character length	
Software handshake, Xon/Xoff or hardware handshake RTS/CTS	
Automatic data rate detection 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bits/s	
RJ12, 6-pos.	
Multiple frequency/pulse dialing, configuration via software	
-	
-	
0 °C ... 55 °C (VCC // PSTN // V.24 (RS-232)) 1.5 kV EU, USA, Canada, other countries in preparation	
Conformance with EMC Directive 2004/108/EC 22.5 mm / 99 mm / 114.5 mm	

Ordering data		
Type	**Order No.**	**Pcs. / Pkt.**
PSI-DATA/BASIC-MODEM/RS232[1])	**2313067**	1

Accessories		
MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50
PSI-MPI/RS232-PC	**2313148**	1
PSM-KA9SUB9/BB/2METER	**2799474**	1
PSM-KA9SUB9/BB/0,5METER	**2708520**	1



Modem for dial-up operation with USB connection

Technical data	
-	
-	
5 V DC (via mini USB type B)	
< 100 mA (for 5 V DC, nominal operation) < 40 mA (for 5 V DC, sleep mode)	
Mini USB type B	
-	
-	
-	
RJ12, 6-pos.	
Multiple frequency/pulse dialing, configuration via software	
-	
-	
0 °C ... 55 °C (PSTN // USB) 1.5 kV EU, USA, Canada, other countries in preparation	
Conformance with EMC Directive 2004/108/EC 22.5 mm / 99 mm / 114.5 mm	

Ordering data		
Type	**Order No.**	**Pcs. / Pkt.**
PSI-MODEM-BASIC/USB[1])	**2313436**	1

Accessories		

Private network/ extender

Network devices that are up to 20 km away from each other via existing copper cables, e.g., using in-house telephone lines. Special Ethernet or fiberglass cables are not required.

Ethernet:
– Plug and play
– Distances up to 20 km
– Data rates of up to 30 Mbps (4-wire)
– Data rates of up to 15.3 Mbps (2-wire)
– Robust modulation method (SHDSL)
– Via in-house cables, not via the public telephone network
Ethernet interface:
– Plug and play
– No IP configuration required
– Protocol transparent (IPv4 and IPv6)
– RSTP (Rapid Spanning Tree Protocol) support
– PROFINET (strict priority)

Topologies:
– Point-to-point
– Line structure
– Ring structure
– Redundancy operation

Additional features:
– Two digital outputs for status transmission
– Configuration software for extended functionality
– Online diagnostics
– Logbook function
– Saving and printing of project and device configurations

PROFIBUS:
– Distances up to 20 km
– Data rates of up to 1.5 Mbps (point-to-point)
– Data rates of up to 500 kbps (line structure - up to 30 devices)
– Via in-house cables, not via the public telephone network
– Robust modulation method (SHDSL)
– Redundancy operation supported
Configuration software
– Easy, guided configuration
– Calculation of the maximum PROFIBUS data rate
– Calculation of the slot time
– Online diagnostics
– Mixed operation of copper cables and fiber optics

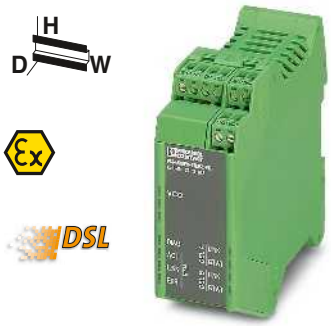
RS-232/RS-422/RS-485:
– RS-232 interface (9-pos. D-SUB):
Data rates of up to 230.4 kbps
– Automatic DCE/DTE switchover
– RS-422/RS-485 W2 interface (COMBICON plug):
Data rates of up to 2000 kbps
– Termination resistor, can be enabled/disabled (RS-485 W2)

Additional information can be found in the relevant data sheets/user manuals.

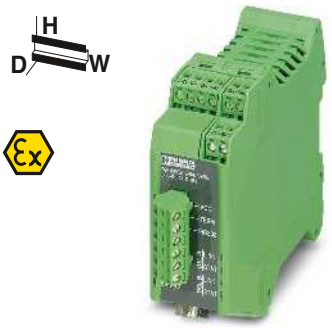
Notes:
1) EMC: Class A product, see page 553

Supply	
Supply voltage	
Supply voltage	
Nominal current consumption	
V.24 (RS-232) interface	
Connection method	
Transmission speed	
RS-422 interface	
Connection method	
Transmission speed	
RS-485 interface	
Connection method	
Transmission speed	
Ethernet interface	
Connection method	
Transmission speed	
SHDSL interface	
Connection method	
Transmission speed	
USB interface	
Connection method	
Transmission length	
Functions	
Management	
Input/output	
Switching output	
General data	
Ambient temperature (operation)	
Electrical isolation	
Test voltage	
Electromagnetic compatibility	
Dimensions	W / H / D

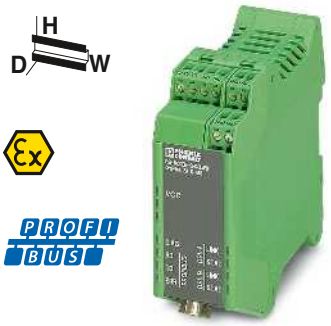
Description
SHDSL permanent line modem, for point-to-point, linear, and star structures on in-house 2- and 4-wire cables
System power supply unit, primary-switched
DIN rail connector (optional), for routing through the supply voltage and data signal, two pieces are required per device
DATATRAB, surge protection for two signal pairs of the analog and digital (DSL) telecommunication interface



Ethernet extender



Serial extender



PROFIBUS extender

Ex:

Technical data

18 V DC ... 30 V DC 24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	18 V DC ... 30 V DC 24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)	18 V DC ... 30 V DC 24 V DC ±5% (as an alternative or redundant, via backplane bus contact and system current supply)
< 180 mA (24 V DC)	< 180 mA (24 V DC)	< 180 mA (24 V DC)
- -	D-SUB-9 plug 0.11/0.3/1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2/230.4 kbps, NRZ	- -
	RS-422 interface in acc. with ITU-T V.11, EIA/TIA-422, DIN 66348-1	
- -	Plug-in/screw connection via COMBICON 1.2/2.4/4.8/7.0/9.6/19.2/38.4/57.6/75/93.75/115.2/136/187.5/375/500/1500/2000 kbps, NRZ	- -
	RS-485 interface, in acc. with EIA/TIA-485, DIN 66259-4/RS-485 2-wire	PROFIBUS acc. to IEC 61158, RS-485 2-wire, half duplex, automatic control
- -	Plug-in/screw connection via COMBICON 1.2/2.4/4.8/7.0/9.6/19.2/38.4/57.6/75/93.75/115.2/136/187.5/375/500/1500/2000 kbps, NRZ	D-SUB-9 socket 9.6/19.2/45.45/93.75/187.5/500/1500 kbps, set via configuration software
RJ45 socket, shielded 10/100 Mbps, autonegotiation	- -	- -
SHDSL interface according to ITU-T G.991.2.bis	SHDSL interface according to ITU-T G.991.2.bis	SHDSL interface according to ITU-T G.991.2.bis
2 x 2-pos. COMBICON plug-in screw terminal blocks 4-wire operation: 64 kbps ... 30 Mbps 2-wire operation: 32 kbps ... 15.3 Mbps	2 x 2-pos. COMBICON plug-in screw terminal blocks 4-wire operation: 64 kbps ... 30 Mbps 2-wire operation: 32 kbps ... 15.3 Mbps	2 x 2-pos. COMBICON plug-in screw terminal blocks 4-wire operation: 64 kbps ... 30 Mbps 2-wire operation: 32 kbps ... 15.3 Mbps
USB 2.0	USB 2.0	USB 2.0
Mini-USB type B, 5-pos. max. 5 m (only for configuration and diagnostics)	Mini-USB type B, 5-pos. max. 5 m (only for configuration and diagnostics)	Mini-USB type B, 5-pos. max. 5 m (Only for configuration and diagnostics)
Plug and play, user-friendly software: diagnostic functions, log book, individual configuration	User-friendly software: guided configuration, plausibility checks, diagnostic functions, log book	User-friendly software: guided configuration, plausibility checks, diagnostic functions, log book
2 x U_{Nom}/150 mA (the digital outputs cannot be used for power supply via the TBUS), short-circuit-proof	2 x U_{Nom}/150 mA (the digital outputs cannot be used for power supply via the TBUS), short-circuit-proof	2 x U_{Nom}/150 mA (the digital outputs cannot be used for power supply via the TBUS), short-circuit-proof
-20 °C ... 60 °C (freestanding (40 mm spacing to the right and left), no supply of other modules via the device)	-20 °C ... 60 °C (for derating, see technical documentation)	-20 °C ... 60 °C (for derating, see technical documentation)
DIN EN 50178 (VCC // Ethernet // DSL (A) // DSL (B))	DIN EN 50178 (VCC // RS-422, RS-485 // DSL Port A // DSL Port B // FE)	DIN EN 50178 (VCC // PROFIBUS // DSL (A) // DSL (B))
1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2004/108/EC 35 mm / 99 mm / 114.5 mm	1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2004/108/EC 35 mm / 99 mm / 114.5 mm	1.5 kV_{rms} (50 Hz, 1 min.) Conformance with EMC Directive 2004/108/EC 35 mm / 99 mm / 114.5 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MODEM-SHDSL/ETH[1])	**2313643**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
DT-TELE-RJ45	**2882925**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MODEM-SHDSL/SERIAL[1])	**2313669**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
DT-TELE-RJ45	**2882925**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-MODEM-SHDSL/PB[1])	**2313656**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 17,5 TBUS 1,5/ 5-ST-3,81 GN	**2709561**	10
DT-TELE-RJ45	**2882925**	1

Antennas

The PSI-GSM/UMTS-ANT-OMNI-2-5 and PSI-GSM/UMTS-QB-ANT multiband antenna are suitable for GSM networks operating at 850 MHz, 900 MHz, 1800 MHz, and 1900 MHz, as well as for UMTS networks.

The PSI-GSM/UMTS-ANT-OMNI-2-5 antenna is suitable for external panel and external mast mounting. The PSI-GSM/UMTS-QB-ANT antenna is ideal for mounting on a control cabinet or control box.

External antenna

Control cabinet antenna

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Multiband antenna for external panel and external mast mounting for UMTS and quad-band GSM, with omnidirectional characteristics, 5 m antenna cable with SMA round connector	PSI-GSM/UMTS-ANT-OMNI-2-5	2900982	1			
Multi-band antenna for UMTS and quad band GSM, with omnidirectional characteristic, 2 m antenna cable with SMA round connector, degree of protection: IP65, dimensions: 76 x 20 mm				PSI-GSM/UMTS-QB-ANT	2313371	1

Antenna extension cables and surge protection

The 5 m and 10 m long antenna extension cables allow greater flexibility when installing antennas. The surge protection is suitable for GSM networks operating at 850 MHz, 900 MHz, 1800 MHz, and 1900 MHz, as well as for UMTS networks.

Antenna extension cable

Protective adapter set with SMA connection, grounded shield

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Antenna extension cable for UMTS and quad-band GSM, 5 m long, antenna cable with SMA connector and SMA coupling	PSI-CAB-GSM/UMTS- 5M	2900980	1			
Antenna extension cable for UMTS and quad-band GSM, 10 m long, antenna cable with SMA connector and SMA coupling	PSI-CAB-GSM/UMTS-10M	2900981	1			
Surge protection for UMTS and quad-band GSM antenna, with SMA connector and SMA coupling				CSMA-LAMBDA/4-2.0-BS-SET	2800491	1

Programming adapter

The MPI adapter makes it possible to convert a V.24 (RS-232) interface to the MPI bus (19.2 or 187.5 kbps). It is used to couple modems, Bluetooth converters, and FL COM servers to the programming interface of a Siemens SIMATIC®S7 300/400 controller.

Programming adapter

Programming set

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
MPI adapter for coupling to the programming interface of a Siemens SIMATIC® S7-300/400 controller	PSI-MPI/RS232-PC	2313148	1			
Programming set, for remote monitoring of Siemens-SIMATIC® S7-300/400 controllers, consisting of pre-configured analog modem, RS-232 cable, and MPI adapter				PSI-MODEM-MPI-SET1	2313261	1

Interface converter and SHDSL surge protection

Interface converter

Makes it possible to switch over to a second terminal device with a V.24 (RS-232) interface.

SHDSL surge protection

Surge protection for broadband communication devices.

Interface converter

SHDSL surge protection

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Interface converter for switching between two RS-232 interfaces	PSI-MODEM-SPLITTER	2708766	1			
RS-232 flat-ribbon connecting cable between the modem and the PSI-MODEM-SPLITTER	PSI-CA-MODEM-SPLITTER	2311425	1			
DATATRAB, surge protection for two signal pairs of the analog and digital (DSL) telecommunication interface				DT-TELE-RJ45	2882925	1

INTERBUS PC master/slave controller boards

Generation 4 master controller boards from Phoenix Contact are intelligent solutions for connecting INTERBUS systems. They feature a compatible structure:
– Compatible driver
– Parameterization and diagnostics with Diag+
– Access to high-level language applications via HFI
– Direct integration in OPC-based visualization systems via OPC server

The slave controller boards are plug-in boards which integrate a PC in an INTERBUS system as a remote bus device.

Features:
– Access to INTERBUS system data and controller data via visualization stations
– Installation of several boards in a PC with monitoring of multiple INTERBUS lines
– Number of data words can range from 1 to 24
– INTERBUS parameter channel (PCP) supported
– External 24 V DC power supply

Notes:
1) EMC: Class A product, see page 553

PCI master

Technical data

Interfaces	
Host system	PCI bus, 32 bit, 33 MHz, 5 V
INTERBUS remote bus	9-pos. D-SUB socket strip, with electrical isolation
INTERBUS remote bus, incoming	-
Parameterization/operation/diagnostics	RS-232-C, Mini-DIN socket
Direct I/Os	14-pos. FLK pin strip
INTERBUS master	
Number of devices with parameter channel (PCP)	max. 126 (512 words)
Number of I/O nodes	max. 8192
Number of supported devices	max. 512 (of which 254 are remote bus devices/bus segments)
INTERBUS slave	
Amount of process data	-
Supported transmission speed	-
Direct I/Os	
Number of inputs	6
Number of outputs	2
Software interfaces	
Software driver	Windows NT / Windows 2000 / Windows XP / Windows 7 / Venturcom RTX 5.x / further types on request
Application interface	HFI OPC DDI
Power supply	
Power supply connection	Via PCI bus
Supply voltage	5 V DC
Supply voltage range	± 5% (including ripple)
Typical current consumption	0.7 A
General data	
Weight	150 g
Format	Short plug-in card, 1-slot
Ambient temperature (operation)	0 °C ... 55 °C (in acc. with EN 60204-1)
Ambient temperature (storage/transport)	-25 °C ... 75 °C (in acc. with EN 60204-1)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PC controller board			
	IBS PCI SC/I-T[1])	**2725260**	1
Slave controller board, with external voltage supply			
- Copper connection - Fiber optics connection			

Accessories

Diag+ full version, for INTERBUS diagnostics (ActiveX Control with programming interface)	**DIAG+**	**2730307**	1
INTERBUS OPC server, data interface between distributed INTERBUS and Ethernet networks and visualization systems	**IBS OPC SERVER**	**2729127**	1

PCI slave

PCI/104 master

PC/104 master

Technical data

IBS PCI RI/I-T[1])	IBS PCI RI-LK[1])
PCI slot in acc. with PCI specification 2.1 or higher, PCI bus, 32 bits, 33 MHz, 3.3/5 V	
9-pos. D-SUB socket strip	FSMA plugs
9-pos. D-SUB pin strip	FSMA plugs
-	
-	
-	
-	
Max. 24 data words	
500 kbps / 2Mbps (can be switched)	
-	
-	
Windows NT / Windows 2000 / Windows XP	
DDI OPC-DA server	
Via PCI bus or 2-pos. MINI-COMBICON	
3.3 V DC (internal)	
5 V DC (internal)	
24 V DC (external)	
18 V DC ... 30 V DC	
1 A	
130 g	
Short plug-in card, 1-slot	
0 °C ... 55 °C	
-20 °C ... 70 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS PCI RI/I-T[1])	**2730129**	1
IBS PCI RI-LK[1])	**2704045**	1

Accessories

DIAG+	**2730307**	1
IBS OPC SERVER	**2729127**	1

Technical data

PCI-104 bus, 32 bits, 33 MHz, 5 V
10-pos. DIL pin strip
-
RS-232-C, 10-pos. DIL pin strip
-
max. 126 (512 words)
max. 8192
max. 512 (of which 254 are remote bus devices/bus segments)
-
-
-
-
Windows NT / Windows 2000 / Windows XP / Venturcom RTX 5.x / further types on request
HFI OPC DDI
Via PCI-104 bus
5 V DC
± 5% (including ripple)
0.7 A
80 g
PCI-104
0 °C ... 55 °C (in acc. with EN 60204-1)
-25 °C ... 75 °C (in acc. with EN 60204-1)

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS PCI 104 SC-T[1])	**2737494**	1

Accessories

DIAG+	**2730307**	1
IBS OPC SERVER	**2729127**	1

Technical data

PC-104 bus
10-pos. DIL pin strip
-
RS-232-C, 10-pos. DIL pin strip
-
max. 62 (512 words)
max. 8192
max. 512 (of which 254 are remote bus devices/bus segments)
-
-
-
-
Windows NT / Windows 2000 / Windows 95/98 / DOS / further types on request
OPC DDI
Via PC/104 bus
5 V DC
± 5% (including ripple)
0.4 A
80 g
PC/104
0 °C ... 55 °C (in acc. with EN 60204-1)
-25 °C ... 75 °C (in acc. with EN 60204-1)

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS PC 104 SC-T[1])	**2721701**	1

Accessories

DIAG+	**2730307**	1
IBS OPC SERVER	**2729127**	1

INTERBUS master controller boards for Simatic S7-300/400

INTERBUS master controller boards enable INTERBUS to be used as the fieldbus directly at the SIMATIC S7-300/400 controller.

The boards can easily read in INTERBUS and start it directly or parameterize it with the Config+ software.

The IBS S7 400 ETH DSC/I-T board enables direct access to INTERBUS from an Ethernet network, without having to route the information through the control program.

A STEP 7 block library is available for positioning tasks, drives, and other tasks.

Features:

– INTERBUS with up to 8192 I/O points per controller board
– Maximum INTERBUS transmission speed of 2 Mbaud
– Blocks for STEP 7 simplify integration

Notes:

1) EMC: Class A product, see page 553

INTERBUS master for S7-300 systems

Technical data

Interfaces	
Control system	SIMATIC® S7-300 I/O bus
INTERBUS remote bus	9-pos. D-SUB socket strip
Ethernet	-
Parameterization/operation/diagnostics	RS-232-C, D-SUB plug
INTERBUS master	
Number of possible parameter channels	-
Number of I/O nodes	max. 8192
Number of supported devices	max. 512 (of which 254 are remote bus devices/bus segments)
Supported transmission speed	500 kbps / 2 Mbps
Software interfaces	
Application interface	S7 I/O driver S7 function blocks
Programming tool	STEP 7 from version 5.x
Power supply	
Power supply connection	External power supply
Supply voltage	24 V DC
Typical current consumption	-
General data	
Weight	500 g
Format	1 slot
Width	80 mm
Height	125 mm
Depth	110 mm
Ambient temperature (operation)	0 °C ... 60 °C (0°C to 40°C (vertical installation))
Ambient temperature (storage/transport)	-25 °C ... 65 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Controller board for Siemens SIMATIC® controllers - S7-300 - S7-400	**IBS S7 300 DSC-T[1])**	**2719975**	1

Accessories

Config + full version for configuration and diagnosis of networks	**CONFIG+**	**2868059**	1
Diag+ full version, for INTERBUS diagnostics (ActiveX Control with programming interface)	**DIAG+**	**2730307**	1
Programming cable, to connect the controller boards to the PC (V.24 (RS-232-C)), length 3 m	**IBS PRG CAB**	**2806862**	1
Program and configuration memory - 2 MB	**IBS MC FLASH 2MB**	**2729389**	1

INTERBUS master for S7-400 systems

INTERBUS master for S7-400 systems with Ethernet interface

Technical data

SIMATIC® S7-400 P bus	SIMATIC® S7-400 P bus
9-pos. D-SUB socket strip	9-pos. D-SUB socket strip
-	10/100Base-T via RJ45
RS-232-C, D-SUB plug	RS-232-C, D-SUB plug
-	-
max. 8192	max. 8192
max. 512 (of which 254 are remote bus devices/bus segments)	max. 512 (of which 254 are remote bus devices/bus segments)
500 kbps / 2 Mbps	500 kbps / 2 Mbps
S7 I/O driver	S7 I/O driver
S7 function blocks	S7 function blocks
STEP 7 from version 5.x	STEP 7 from version 5.x
Via SIMATIC I/O bus	Via SIMATIC I/O bus
5 V DC	5 V DC
0.9 A	2.5 A
800 g	1200 g
2 slots	2 slots
50 mm	50 mm
290 mm	290 mm
210 mm	210 mm
0 °C ... 60 °C	0 °C ... 60 °C
-25 °C ... 65 °C	-25 °C ... 65 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS S7 400 DSC/I-T[1])	**2719962**	1

Accessories

CONFIG+	**2868059**	1
DIAG+	**2730307**	1
IBS PRG CAB	**2806862**	1
IBS MC FLASH 2MB	**2729389**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
IBS S7 400 ETH DSC/I-T[1])	**2731102**	1

Accessories

CONFIG+	**2868059**	1
DIAG+	**2730307**	1
IBS PRG CAB	**2806862**	1
IBS MC FLASH 2MB	**2729389**	1

SUBCON.../SUBCON-PLUS...
D-SUB fast connection connector

Convenient connection technology

An idea has taken hold - absolutely no soldering or crimping tools: the SUBCON... D-SUB connectors can be connected quickly and conveniently in field conditions. The connector contacts are clearly routed onto consecutively numbered screw terminal blocks. This means clarity during wiring and it simplifies every startup.

High EMI shielding effect

The SUBCON... connector range, trimmed to the smallest dimensions, provides a high level of shielding against EMI influences in industrial environments by virtue of its metallic housing.

Optional cable infeed

The connection block can be inserted in either the upper or lower shell. This allows the cable to be fed in at 0° to 90° from right or left.

This allows on-site configuration of the cable infeed and requires only an order number with the order.

A wide product range

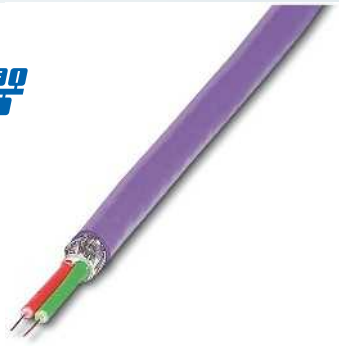
Irrespective of whether the application requires 9, 15 or 25-pos. connectors with one or two cable entries for point-to-point or RS-485 bus connections, a suitable version is available for each and every application. Optimized designs for PROFIBUS, CANopen® and SafetyBUSp with the right cables and tools complete the comprehensive range.

Customer-specific solutions

Does your application need an exclusive solution? We would be pleased to provide you with an offer using our know-how. Of course, space can be made for your own company logo in the plastic parts.

PROFIBUS cables and fast connection tools for SUBCON-PLUS-PROFIBUS

If the Fast Connect PSM-CABLE-PROFIB/FC cable is used, work is reduced to a minimum by using the quick stripping tool, **PSM-STRIP-FC/PROFIB**:
– Strip cables and single wires
– Insert them into the connector, and
– Close the housing cover.

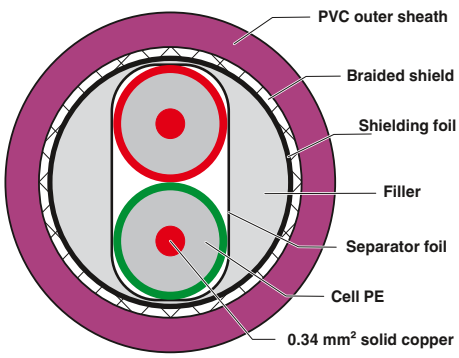


PROFIBUS cable, type Fast Connect

Quick stripping tool for SUBCON-PLUS-PROFIBUS connectors

	Technical data	Technical data
Cable cross section (max./min.)	8.4 mm / 7.6 mm	-
Ambient temperature (operation)	-40 °C ... 60 °C	-
Loop resistance	≤ 110 Ω (per kilometer)	-
Working capacitance	28.5 nF (per kilometer)	-
Wave impedance	150 Ω ±15%	-
Conductor	Solid copper wire, bare	-
Cross section	0.34 mm² / AWG 22	-
Outer sheath, material	PVC FR VI	-
External sheath, color	Violet	-
Behavior in fire	Flame-resistant as per IEEE and IEC 60 332-3 test type C	-
Resistance to oil	Limited resistance to mineral oils and greases	-
Cable type	PROFIBUS in acc. with IEC 61158, Type A	-
Operations per knife block	-	PUR cable: max. 300 per knife block PVC cable: max. 3000 per knife block

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
PROFIBUS cable, Fast Connect type, up to 12 Mbps, for permanent connection (02YSY (ST)CY 1X2X22 AWG) (Length in meters as per customer specifications)	**PSM-CABLE-PROFIB/FC**	**2744652**	1			
Quick stripping tool for PROFIBUS cable, Fast Connect type				**PSM-STRIP-FC/PROFIB**	**2744623**	1
	Accessories			**Accessories**		
Spare knife block for quick stripping tool blue				**PSM-STRIP-KNIFEBLOCK**	**2744636**	1
Stripping tool, for conductors and cables black	**QUICK WIREFOX 6**	**1204384**	1	**QUICK WIREFOX 6**	**1204384**	1



SUBCON-PLUS-PROFIBUS
D-SUB fast connection

PROFIBUS connectors with fast connection

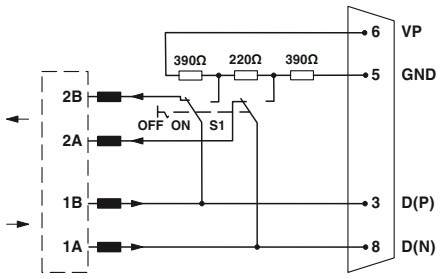
The SUBCON-PLUS-PROFIB/... and D-UFB-PB D-SUB series have been specially designed for use in PROFIBUS systems up to 12 Mbps. Under field conditions, they allow convenient and fast connection of the incoming and outgoing bus cable. The series includes six fast connection connectors - the perfect solution for every PROFIBUS application:

– 35° and 90° angled cable entry
– Axial cable entry
– With an additional programming interface
– Integrated surge protection

The connectors can be used for PROFIBUS cables with solid as well as with stranded copper wires (…FC 90 only for solid conductors. For permissible cable types, see the data sheet). The terminating resistor is already integrated in all versions. It can be connected externally by means of a slide switch. At the same time, the outgoing bus segment is switched off. This makes it easy to start up segment by segment while incorrect terminations are avoided. In addition, the connector housing with high-quality shielding guarantees high immunity to interference even at maximum transmission speeds. A special feature of the 35° angled connector is that the internal connection unit can be turned round. Whether the cable is to be inserted from the right or left can therefore be decided on-site. If it is not possible to use the angled version, the SUBCON-PLUS.../AX compact connector with axial cable entry can be used instead. The connectors have been designed for all standard PROFIBUS cables with an outside diameter of 8 mm (type A and B).

Notes:

A 35° plug with built-in surge protection can be found under designation D-UFB-PB in Catalog 6 or at www.phoenixcontact.net/products.



Functional diagram of the connector range SUBCON-PLUS-PROFIB/...

35° PROFIBUS connector, screw connection, reversible cable entry

Technical data

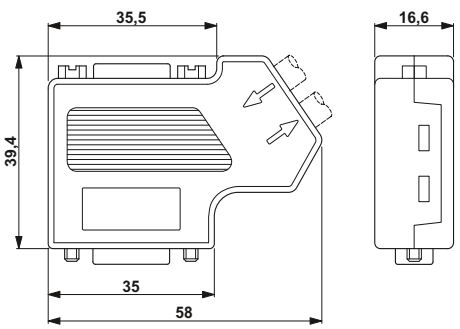
Cable entry	35° (right or left)
Pin assignment	3, 5, 6, 8
Connection cross section (solid/stranded/AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	8.4 mm / 7.6 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP40
Housing material	ABS, metal-plated
Termination resistor	390 Ω - 220 Ω - 390 Ω (switchable)
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PROFIBUS connector, up to 12 Mbps, integrated termination resistor which can be activated externally, 9-pos. pin, pin assignment 3, 5, 6, 8			
- Angled 35°, screw connection	**SUBCON-PLUS-PROFIB/SC2**	**2708232**	1
- Angled 35°, screw connection with second D-SUB socket	**SUBCON-PLUS-PROFIB/PG/SC2**	**2708245**	1
- Angled 90°, screw connection			
- Angled 90°, screw connection with second 9-pos. D-SUB socket			
- Angled 90°, IDC connection			
- Angled 90°, IDC connection with second 9-pos. D-SUB socket			
- Axial cable entry, screw connection			

Accessories

PROFIBUS cable, Fast Connect type, up to 12 Mbps, for permanent connection (02YSY (ST)CY 1X2X22 AWG) (Length in meters as per customer specifications)		
Quick stripping tool for PROFIBUS cable, Fast Connect type	**PSM-CABLE-PROFIB/FC**	**2744652** 1
Stripping tool, for conductors and cables	**PSM-STRIP-FC/PROFIB**	**2744623** 1
Screwdriver	**QUICK WIREFOX 6**	**1204384** 1
Screwdriver	**SZK PH1 VDE**	**1205150** 10
	SZF 0-0,4X2,5	**1204504** 10



90° PROFIBUS connector, screw connection

90° PROFIBUS connector, IDC insulation displacement connection method

Axial PROFIBUS connector, screw connection

Technical data

90° (left)	90° (left)	180° (axial)
3, 5, 6, 8	3, 5, 6, 8	3, 5, 6, 8
0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16	0.32 - 1 mm² / 0.32 - 1 mm² / 22 - 18	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
> 200	> 200	> 200
8.4 mm / 7.6 mm	8.4 mm / 7.6 mm	8.4 mm / 7.6 mm
-20 °C ... 75 °C	-20 °C ... 75 °C	-20 °C ... 75 °C
IP40	IP40	IP40
ABS, metal-plated	ABS, metal-plated	ABS, metal-plated
390 Ω - 220 Ω - 390 Ω (switchable)	390 Ω - 220 Ω - 390 Ω (switchable)	390 Ω - 220 Ω - 390 Ω (switchable)
4-40 UNC 0.4 Nm	4-40 UNC 0.4 Nm	4-40 UNC 0.4 Nm

Ordering data

Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-PROFIB/90/SC	2313698	1
SUBCON-PLUS-PROFIB/90/PG/SC	2313708	1

Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-PROFIB/90/IDC	2313672	1
SUBCON-PLUS-PROFIB/90/PG/IDC	2313685	1

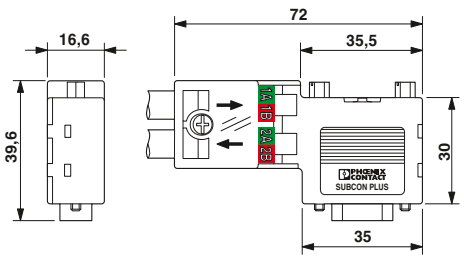
Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-PROFIB/AX/SC	2744380	1

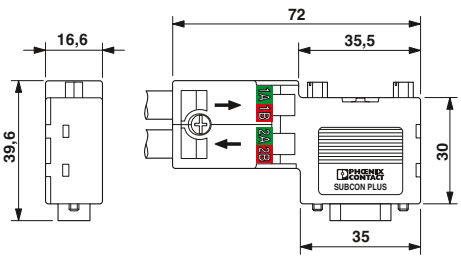
Accessories

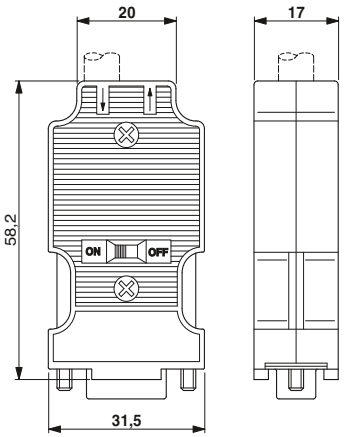
PSM-CABLE-PROFIB/FC	2744652	1
PSM-STRIP-FC/PROFIB	2744623	1
QUICK WIREFOX 6	1204384	1
SZK PH1 VDE	1205150	10

PSM-CABLE-PROFIB/FC	2744652	1
PSM-STRIP-FC/PROFIB	2744623	1
QUICK WIREFOX 6	1204384	1
SZK PH1 VDE	1205150	10

PSM-CABLE-PROFIB/FC	2744652	1
PSM-STRIP-FC/PROFIB	2744623	1
QUICK WIREFOX 6	1204384	1
SZK PH1 VDE	1205150	10
SZF 0-0,4X2,5	1204504	10







SUBCON-PLUS-CAN
D-SUB fast connection connector

The SUBCON-PLUS-CAN/... D-SUB series is specially designed for use in CAN systems. Under field conditions, it enables the quick and easy connection of the incoming and outgoing bus cable.

The terminating resistor is already integrated in all versions. It can be connected externally by means of a slide switch. At the same time, the outgoing bus segment is switched off. This makes it easy to start up segment by segment while incorrect terminations are avoided. In addition, the connector housing with high-quality shielding guarantees high immunity to interference even at maximum transmission speeds.

A special feature of the angled plug is that the internal connection unit can be turned round. Whether the cable is to be inserted from the right or left can therefore be decided on-site. If it is not possible to use the angled design, a compact connector with axial cable entry is available with the SUBCON-PLUS-CAN/AX type.

Features:

– Assembly under field conditions
– Separate terminal blocks for bus cables
– Termination resistor can be connected
– Segment-by-segment startup
– High transmission speed
– High level of EMC
– Flexibility in terms of cable entry selection
– Suitable for bus cables as per the CiA Draft Recommendation 303-1 with an outside diameter of 8 mm
– For special cables, there is a version with a variable cable entry

Versions:

– Angled with programming interface
– Angled without programming interface
– Axial cable entry

35° D-SUB connector (socket), screw connection, two cable entries

Technical data

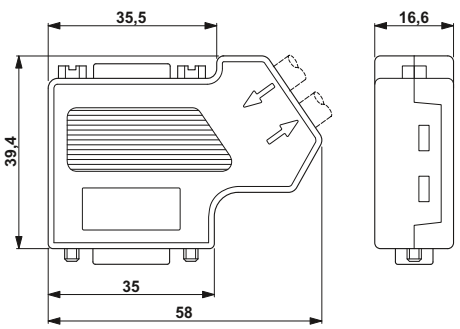
Cable entry	35° (right or left)
Pin assignment	2, 3, 7, 9
Nominal voltage U_N	50 V
Nominal current I_N	100 mA
Connection cross section (solid/stranded/AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	8.4 mm / 7.6 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP40
Housing material	ABS, metal-plated
Termination resistor	120 Ω (can be connected externally)
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
CAN, CANopen®, SafetyBUS p connector, integrated termination resistor that can be activated from the outside, with screw connection, 9-pos., socket			
- Angled 35°	**SUBCON-PLUS-CAN/SC2**	**2708999**	1
- Angled 35°, with second D-SUB connection	**SUBCON-PLUS-CAN/PG**	**2708119**	1
- Angled 35°, for variable cable diameters			
CAN, CANopen®, SafetyBUS p connector, integrated termination resistor that can be activated from the outside, with screw connection, 9-pos., socket - Axial cable entry			

Accessories

Screwdriver	**SZS 0,4X2,5 VDE**	**1205037**	10



35° D-SUB connector (socket), variable cable diameter

Axial D-SUB connector (socket), two cable entries

Technical data

	35° (right or left)
	2,3,7
	50 V
	100 mA
	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
	> 200
	10 mm / 6 mm
	-20 °C ... 75 °C
	IP40
	ABS, metal-plated
	120 Ω (can be connected externally)
	4-40 UNC 0.4 Nm

Ordering data

Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-CAN	2744694	1

Accessories

SZS 0,4X2,5 VDE	1205037	10

Technical data

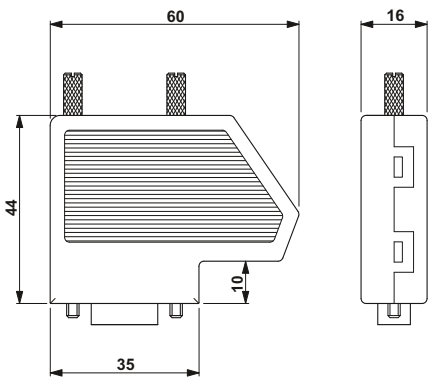
	180° (axial)
	2, 3, 7
	50 V
	100 mA
	0.14 - 0.5 mm² / 0.14 - 0.5 mm² / 26 - 20
	> 200
	8.4 mm / 7.6 mm
	-20 °C ... 75 °C
	IP40
	ABS, metal-plated
	120 Ω (can be connected externally)
	4-40 UNC 0.4 Nm

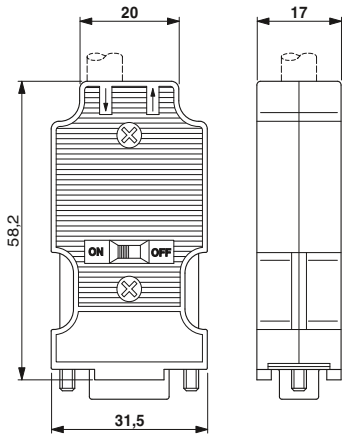
Ordering data

Type	Order No.	Pcs. / Pkt.
SUBCON-PLUS-CAN/AX	2306566	1

Accessories

SZS 0,4X2,5 VDE	1205037	10





SUBCON-PLUS
D-SUB fast connection connector

Field bus connector with screw connection

Two cable infeeds are often required on the D-SUB connectors used in order to build fieldbus systems with RS-485 interfaces. The SUBCON-PLUS connectors range fulfills this requirement and routes the connection to screw terminal blocks – however, duplicated – for two cables. This means clarity during wiring and it simplifies every startup. These connectors are of course also shielded against EMI influences with a metallized housing. In addition, by placing the connection block in either the upper or lower shell, it is possible to select the cable infeed on site from the right or left.

Features:

– For universal use
– Assembly under field conditions
– Separate terminal blocks for each cable
– High transmission speed
– High level of EMC
– Flexibility in terms of cable entry selection
– Straightforward assembly thanks to knurled screws

Versions:

– Bus-specific types with matching partial assignment
– Universal type with full assignment
– Short mounting screw as an accessory for when space is at a premium

RS-485

Modbus

With two cable entries, 35° angled and axial

Technical data

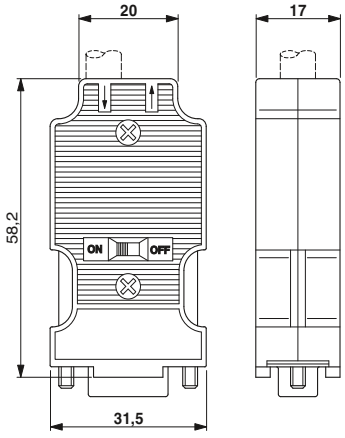
Nominal voltage U_N	50 V
Nominal current I_N	100 mA
Connection cross section (solid/stranded/AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	10 mm / 6 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP20
Housing material	ABS, metal-plated
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

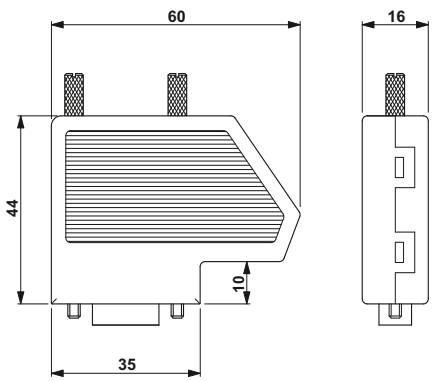
Description	Type	Order No.	Pcs. / Pkt.
D-SUB connector, with **two** cable entries for Modbus, Modbus-PLUS, BITBUS, ARCNET, MULT/MININET (B&R), SYSTEM 2003 (B&R), P-NET, pin assignment 1,2,3,5,6,8			
- Angled 35°, 9-pos., pin	**SUBCON-PLUS M1**	**2761826**	1
- Angled 35°, 9-pos., socket	**SUBCON-PLUS F1**	**2744267**	1
D-SUB connector, with **two** cable entries for SUCONET K1, K2 (EATON/Moeller), S-BUS (Saia), J-BUS (Merlin Gerin), pin assignment 2, 3, 4, 5, 7, 9			
- Angled 35°, 9-pos., pin	**SUBCON-PLUS M2**	**2761839**	1
- Angled 35°, 9-pos., socket	**SUBCON-PLUS F2**	**2799490**	1
D-SUB connector, with **two** cable entries for Modbus, CEGELEC, pin assignment 1,1,2,3,6,7			
- Angled 35°, 9-pos., socket	**SUBCON-PLUS F5**	**2744102**	1
D-SUB connector, with **two** cable entries, **universal type**, pin assignment 1,2,3,4,5,6,7,8,9 on **every** screw terminal block			
- Angled 35°, 9-pos., pin	**SUBCON-PLUS 9/M**	**2744018**	1
- Angled 35°, 9-pos., socket	**SUBCON-PLUS 9/F**	**2744241**	1
- Axial, 9-pos., pin	**SUBCON-PLUS-M/AX 9**	**2904467**	1
- Axial, 9-pos., socket	**SUBCON-PLUS-F/AX 9**	**2311797**	1

Accessories

Optional mounting screw, short (without knurl)	**SUBCON-SHORT-SCREW**	**2799694**	1
Screwdriver	**SZS 0,4X2,5 VDE**	**1205037**	10



Dimensional drawing SUBCON-PLUS-.../AX...



Dimensional drawing SUBCON-PLUS...

SUBCON
D-SUB fast connection connector

The 9-pos. version of the SUBCON-... connector range is not just suitable for INTERBUS, but is positively ideal. A whole host of further applications are opened up by having all the connections assigned to their own 1 mm² screw terminal block.

The range covers SUBCON connectors for point-to-point connections with a cable infeed in 9, 15 and 25-pos. pin or socket versions.

Installing the connection block either in the upper or lower shell makes it possible to introduce the cable at an angle of 0° to 90° from the right or the left. The completely metallized housing also ensures a high degree of shielding against EMI influences.

The optional SUBCON-SHORT-SCREW fastening screw is available as an accessory for narrow installation conditions. The screw is completely integrated into the housing by not having a knurl.

Features:
- For universal use
- Assembly under field conditions
- High level of EMC
- Flexibility in terms of cable entry selection
- Straightforward assembly thanks to knurled screws

Versions:
- 9-, 15-, and 25-pos. versions
- Short mounting screw as an accessory for when space is at a premium

INTERBUS

RS-232

RS-422

With one cable entry

Technical data

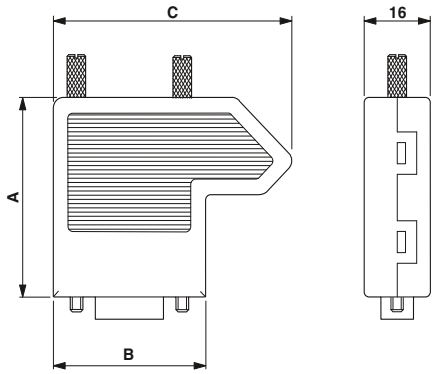
Cable entry	35° (right or left)
Pin assignment	All connections are 1:1 on the screw terminal block
Nominal voltage U_N	50 V
Nominal current I_N	100 mA
Connection cross section (solid/stranded/AWG)	0.14 - 1.5 mm² / 0.14 - 1 mm² / 26 - 16
Insertion/withdrawal cycles	> 200
Cable cross section (max./min.)	10 mm / 4 mm
Ambient temperature (operation)	-20 °C ... 75 °C
Degree of protection	IP20
Housing material	ABS, metal-plated
SUBCON fixing	4-40 UNC 0.4 Nm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
D-SUB connector, with screw connection			
- 9-pos., socket	**SUBCON 9/F-SH**	**2761499**	1
- 9-pos., pin	**SUBCON 9/M-SH**	**2761509**	1
D-SUB connector, with screw connection			
- 15-pos., socket	**SUBCON 15/F-SH**	**2761596**	1
- 15-pos., pin	**SUBCON 15/M-SH**	**2761606**	1
D-SUB connector, with screw connection			
- 25-pos., socket	**SUBCON 25/F-SH**	**2761619**	1
- 25-pos., pin	**SUBCON 25/M-SH**	**2761622**	1

Accessories

Optional mounting screw, short (without knurl)	**SUBCON-SHORT-SCREW**	**2799694**	1
Screwdriver	**SZS 0,4X2,5 VDE**	**1205037**	10



Dimensional drawing SUBCON...-SH

Dimensions [mm] of the D-SUB plug-in connectors (SUBCON)

	A	B	C
9-pos.	44.5	36.0	56.4
15-pos.	44.5	44.3	64.7
25-pos.	49.5	58.0	78.7

V.24 (RS-232) cables

A permanent cause of annoyance are the two connection standards, 9 and 25-pin for the RS-232 interface. The plug-in "9 to 2-pos." D-SUB adapters solve the problem without complicated resoldering of the cable connections.

The 0.5 and 2 meter standard RS-232 cables can be used to connect the rail-mountable control cabinet modules. Individual lengths can be created quickly and simply with the screw-type D-SUB plug, SUBCON.

Null modem adapter

In order to connect two RS-232 interfaces of the same type, the zero modem connector crosses the data and control lines.

Thanks to the small "Gender Changer" type, it can be plugged at any interface directly and therefore does not change the existing connector design through the socket/connector combination.

V.24 (RS-232) connecting cable

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
RS-232-D-SUB cable, length: 0.5 m - 9-pos. socket on 9-pos. socket	PSM-KA9SUB9/BB/0,5METER	2708520	1
RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 9-pos. socket	PSM-KA9SUB9/BB/2METER	2799474	1
RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 25-pos. socket	PSM-KA 9 SUB 25/BB/2METER	2761059	1

Accessories

V.24 (RS-232) null modem adapter - 9-pos. socket to 9-pos. plug	PSM-AD-D9-NULLMODEM	2708753	1
D-SUB gender changer			
- 9-pos., pin/pin	VS-09-GC-ST/ST	1652651	10
- 9-pos., socket/socket	VS-09-GC-BU/BU	1688722	10
- 25-pos., pin/pin	VS-25-GC-ST/ST	1652693	10
- 25-pos., socket/socket	VS-25-GC-BU/BU	1652680	10

USB cable adapter

Two adapter cables with a length of 1 m and 3 m are available for connecting controllers, PCs, and other automation devices with Mini-USB-B connections.

USB cable (USB-A to mini-USB)

Ordering data

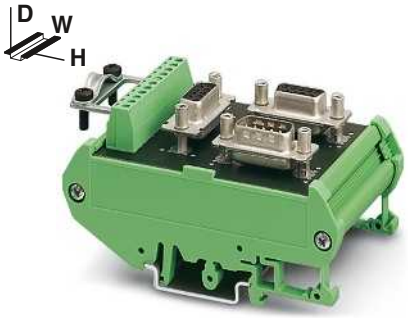
Description	Type	Order No.	Pcs. / Pkt.
USB cable, from USB-A to Mini-USB-B, 5-pos. - Length: 1 m	PSI-CA-USB A/MINI B/1METER	2313575	1
Connecting cable (single) for configuration of the PSR-TRISAFE system - Length: 3 m	CABLE-USB/MINI-USB-3,0M	2986135	1
USB cable, for diagnostics and extended configuration	RAD-CABLE-USB	2903447	1

RS-485 connection distributor

If spur connections or a star distribution are to be made in a bus system, the RS-485 connection distributors come to your aid.

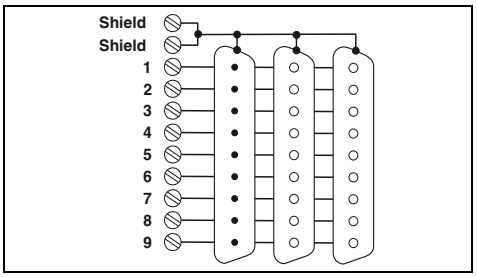
PSM-PTK, the DIN rail-mountable T-adapter equipped with three 9-pin 1:1 connected D-SUB connections, makes for clear and tidy wiring with just one spur connection.

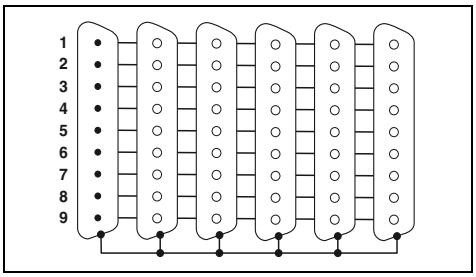
As many as four branch lines can be picked off from one bus line in the PSM-PTK 4 version. Here too, all six D-SUB connections (9-pos.) are connected through 1:1. Both versions are mounted by snapping them onto conventional EN DIN rails.



RS-485 T-distributor (4-way), D-SUB and screw connection

RS-485 T-distributor (6-way), D-SUB connection





Technical data

Plug connection	Incoming	D-SUB-9 plug
	Outgoing	D-SUB-9 socket
	Branching	D-SUB-9 socket
		1x 11-pos. PCB terminal block
Nominal voltage U_N		60 V AC/DC
Nominal current I_N		1 A
Test voltage		500 V AC (50 Hz, 1 min, rms)
Shield connection		D-SUB frame or shield connector
Screw connection	solid	0.14 mm² - 1 mm²
	stranded	0.14 mm² - 1.5 mm²
	AWG	26 - 16
Torque		0.4 Nm
Ambient temperature (operation)		-25 °C ... 70 °C
Housing material		PVC
Pin assignment		all 1:1
Dimensions W / H / D		56 mm / 89.6 mm / 48 mm

Technical data

Plug connection	Incoming	D-SUB-9 plug
	Outgoing	D-SUB-9 socket
	Branching	4 x D-SUB-9 socket
		-
Nominal voltage U_N		60 V AC/DC
Nominal current I_N		1 A
Test voltage		500 V AC (50 Hz, 1 min, rms)
Shield connection		D-SUB frame
Screw connection	solid	-
	stranded	-
	AWG	-
Torque		-
Ambient temperature (operation)		-25 °C ... 70 °C
Housing material		PVC
Pin assignment		all 1:1
Dimensions W / H / D		89.8 mm / 89.6 mm / 39 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Passive RS-485 T-distributor, fitted with a 9 pos. D-SUB pin strip and **two** 9-pos. D-SUB socket strips, as well as a 9-pos. PCB terminal block with shield connector	**PSM PTK**	**2760623**	1
Passive RS-485 T-distributor, fitted with one 9-pos. D-SUB pin strip and **five** 9-pos. D-SUB socket strips			

Accessories

Screwdriver	**SZS 0,4X2,5 VDE**	**1205037**	10

Ordering data

Type	Order No.	Pcs. / Pkt.
PSM PTK-4	**2799364**	1

Accessories

SZS 0,4X2,5 VDE	**1205037**	10

Wireless I/O (2400 MHz / 900 MHz)

	Radioline 2400 MHz	Radioline 900 MHz	Radioline I/O extension modules		
Type	**RAD-2400-IFS**	**RAD-900-IFS**	**RAD-DAIO6-IFS**	**RAD-DI4-IFS/RAD-DOR4-IFS RAD-DI8-IFS/RAD-DO8-IFS**	**RAD-AI4-IFS/RAD-AO4-IFS RAD-PT100-4-IFS**
Description	**Wireless transceiver,** for serial interfaces (RS-232, RS-485), can be extended with I/O extension modules	**Wireless transceiver,** for serial interfaces (RS-232, RS-485), can be extended with I/O extension modules	**Analog/digital I/O module,** 2 digital inputs/outputs and 1 analog input/output	**Digital I/O modules,** 4 inputs or 4 relay outputs 8 inputs or 8 transistor outputs	**Analog I/O modules,** 4 inputs or 4 outputs **Temperature I/O module** 4 Pt 100 inputs
Page	451	451	452	452	454

Wireless IO (2400 MHz)

WirelessHART

	Wireless MUX	Fieldline I/O			
Type	**ILB BT ADIO MUX-OMNI...**	**FLM BT...**	**ILB BT ADIO 2/2/16/16**	**RAD-WHG/WLAN-XD**	**RAD-WHA-1/2NPT**
Description	**Bluetooth multiplexer,** with omnidirectional antennae	**Fieldline Modular Bluetooth base station,** with up to three Wireless I/O devices	**Inline Block,** Bluetooth device	**WirelessHART gateway**	**WirelessHART adapter**
Page	456	457	457	458	459

Wireless Serial (2400 MHz / 900 MHz / GPRS/GSM)

Accessories

	Radioline	PSI-WL-...Bluetooth	PSI Modem Line	2400 MHz	900 MHz
Type	**RAD-2400-IFS RAD-900-IFS**	**PSI-WL-...**	**PSM-Modem...**		
Description	**Wireless transceiver,** for serial interfaces (RS-232, RS-485), can be extended with I/O extension modules	**Bluetooth converter,** for converting RS-232 (V.24), RS-422 or RS-485 2-wire to Bluetooth wireless transmission, e.g., Modbus, PROFIBUS	**Industrial GPRS/GSM modems,** for all GMS networks (850/900/1800/1900), switching inputs and outputs, password protection	**Antennae, adapters, extension cables** for 2400 MHz products	**Antennae, adapters, extension cables** for 900 MHz products
Page	451	460	422	462	474

Wireless IO (900 MHz)

	RAD-Line IO unidirectional		RAD-Line serial		
Type	**RAD-ISM-900-SET-UD-ANT**	**RAD-ISM-900-SET-...UD**	**RAD-ISM-900-DATA-BD-BUS**	**RAD-ISM-900-DATA-BD**	**RAD-ISM-900-DATA-BD-PLUS**
Description	**Unidirectional wireless system,** with Trusted Wireless, transmitter and receiver in IP20 housing	**Unidirectional wireless system,** with Trusted Wireless, transmitter (IP65) and receiver (IP20)	**Wireless transceiver,** with Trusted Wireless, for serial interfaces (RS-232, RS-422/RS-485), can be extended with IO extension modules	**Wireless transceiver,** with Trusted Wireless, for serial interfaces (RS-232, RS-422/RS-485)	**Wireless transceiver,** with Trusted Wireless, for serial interfaces (RS-232, RS-422/RS-485), with integrated inputs/outputs
Page	**466**	**467**	**469**	**468**	**469**

Wireless IO (900 MHz)

	RAD-Line IO extension modules				
Type	**RAD-IN-4A-I RAD-OUT-4A-I**	**RAD-IN-8D RAD-OUT-8D-REL**	**RAD-IN+OUT-2D-1A-I**	**RAD-IN-2D-CNT RAD-OUT-2D-CNT**	
Description	**Analog module,** for four inputs or four outputs	**Digital module,** for eight inputs or eight outputs	**Analog/digital module,** for two digital inputs/outputs and one analog input/output	**Digital module,** for two counter/frequency inputs or two counter/frequency outputs	
Page	**472**	**472**	**472**	**472**	

Wireless Ethernet (900 MHz/2400 MHz)

	RAD-Line Ethernet		WLAN COM server	Industrial WLAN	Industrial Bluetooth
Type	**RAD-ISM-900-EN-BD(-BUS)**	**RAD-80211-XD-HP(-BUS)**	**FL COMSERVER WLAN 232/422/485**		
Description	**Wireless transceiver,** with Trusted Wireless, for Ethernet (900 MHz), can be extended with IO extension modules	**Wireless transceiver,** with WLAN 802.11b/g, for Ethernet (2400 MHz), can be extended with IO extension modules	**Serial device server,** for serial interfaces (RS-232, RS-422/RS-485) on Wireless LAN	For further information on Industrial WLAN, see **Section: Ethernet networks**	For further information on Industrial Bluetooth, see **Section: Ethernet networks**
Page	**470**	**471**	**413**	**48**	**52**

Easy startup with I/O mapping - the Radioline wireless system

Radioline is the new wireless system for large systems and networks. Special features include extremely easy assignment of inputs and outputs by simply turning the thumbwheel - without any programming.

Radioline transmits I/O signals as well as serial data and is therefore very versatile. In addition, you can implement various network structures: from a simple point-to-point connection to complex mesh networks.

Thanks to the latest Trusted Wireless technology, Radioline is the ideal choice for industrial use.

Network applications

– I/O data mode: simple I/O signal distribution in the network
– PLC/Modbus RTU mode: I/O integration in the control level using the Modbus protocol
– Serial data mode: networking of controllers and serial I/O devices, simple RS-232/RS-485 cable replacement

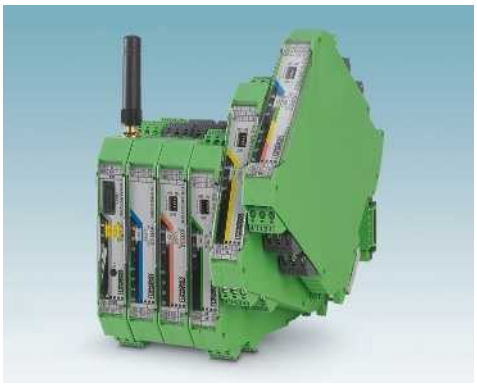
What advantages does I/O mapping offer?

I/O mapping makes it considerably easier to assign input and output signals in your systems. With a slight turn of the thumbwheel, you can distribute and multiply I/O signals freely in your network – without the need for any complex programming.

Trusted Wireless

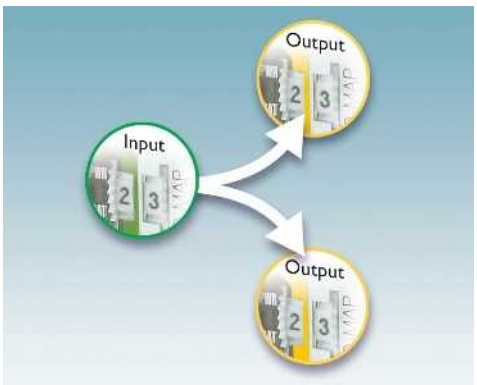
Trusted Wireless technology is specifically designed for the reliable transmission of data and signals over long distances.

The new Version 2.0 also offers functions such as adjustable data rates, encryption, extended diagnostics, and parallel operation of multiple networks.



Easy installation - Setting up, extending or replacing a wireless station in the control cabinet

Easy addressing -
Only one turn on the thumbwheel of the wireless station



Easy distribution -
Assigning inputs and outputs using the thumbwheel

N

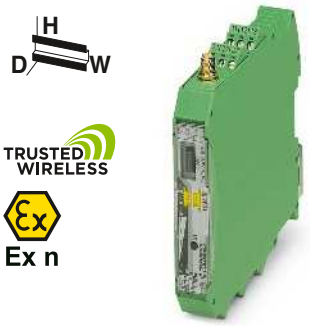
Radioline wireless modules 2.4 GHz and 900 MHz

- New Trusted Wireless 2.0 technology
- Distribute signals at the turn of a switch (I/O mapping)
- Unique network addressing via plug-in configuration memory for secure, parallel operation of multiple networks

Notes:

The latest country registrations for the relevant product can be found on the Internet at www.phoenixcontact.com.

1) EMC: Class A product, see page 553



2.4 GHz wireless transceiver, can be extended with I/O extension modules, for worldwide use

Ex:

Housing width 17.5 mm

900 MHz wireless transceiver, can be extended with I/O extension modules, for the US market

Housing width 35 mm

Technical data

Wireless path		
Direction	Bi-directional	
Frequency range	2.4002 GHz ... 2.4785 GHz	
Data rate (adjustable)	16 kbps / 125 kbps / 250 kbps	
Transmission power	max. 100 mW (adjustable)	
Number of channels	8 x 55	
Security	128-bit data encryption	
Connection method	RSMA (female)	
Serial port	RS-232	RS-485
Connection method	COMBICON plug-in screw terminal block	COMBICON plug-in screw terminal block
Serial transmission speed	0,3 ... 115,2 kbps	0,3...115,2 kbps
Termination resistor (switchable via DIP switches)	-	390 Ω / 150 Ω / 390 Ω
Analog output	RSSI voltage output	
Signal range	0 V ... 3 V	
Digital output	RF link relay output	
Contact type	PDT	
Switching voltage	30 V AC / 60 V DC	
Switching current	500 mA	
General data		
Supply voltage	19.2 V DC ... 30.5 V DC	
Current consumption	max. 65 mA (at 24 V DC, at 25°C)	
Degree of protection	IP20	
Ambient temperature range	-40 °C ... 70 °C	
Permissible humidity (operation)	20% ... 85%	
Housing material	PA 6.6-FR	
Dimensions W / H / D	17.5 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance / approvals		
Conformance	CE compliance (R&TTE directive 1999/5/EC) FCC Directive, Part 15.247 ISC Directive RSS 210	
ATEX	II 3 G Ex nA nC IIC T4 Gc X	
IECEx	Applied for	
UL, USA / Canada	UL applied for	

Technical data

Wireless path		
Direction	Bi-directional	
Frequency range	902 MHz ... 928 MHz	
Data rate (adjustable)	16 kbps / 125 kbps / 250 kbps / 500 kbps	
Transmission power	max. 1 W (adjustable)	
Number of channels	-	
Security	128-bit data encryption	
Connection method	RSMA (female)	
Serial port	RS-232	RS-485
Connection method	COMBICON plug-in screw terminal block	COMBICON plug-in screw terminal block
Serial transmission speed	0.3 ... 115.2 kbps	0.3...115.2 kbps
Termination resistor (switchable via DIP switches)	-	390 Ω / 150 Ω / 390 Ω
Analog output	RSSI voltage output	
Signal range	0 V ... 3 V	
Digital output	RF link relay output	
Contact type	PDT	
Switching voltage	30 V AC / 60 V DC	
Switching current	500 mA	
General data		
Supply voltage	19.2 V DC ... 30.5 V DC	
Degree of protection	IP20	
Ambient temperature range	-40 °C ... 70 °C	
Permissible humidity (operation)	20% ... 85%	
Housing material	PA 6.6-FR	
Dimensions W / H / D	35 / 99 / 114.5 mm	
Screw connection solid/stranded/AWG	0.2 ... 2.5 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance / approvals		
Conformance	FCC Directive, Part 15.247 ISC Directive RSS 210	
ATEX	-	
IECEx	-	
UL, USA / Canada	-	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Wireless module			
	RAD-2400-IFS[1])	**2901541**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-900-IFS	**2901540**	1

Accessories

Conf. stick, configuration memory for network addressing			
RF band 3	**RAD-CONF-RF3**	**2902814**	1
RF band 5	**RAD-CONF-RF5**	**2902815**	1
RF band 7	**RAD-CONF-RF7**	**2902816**	1
Memory stick, for saving custom configuration data	**RAD-MEMORY**	**2902828**	1
USB cable, for diagnostics and extended configuration	**RAD-CABLE-USB**	**2903447**	1

Accessories

	RAD-MEMORY	**2902828**	1
	RAD-CABLE-USB	**2903447**	1

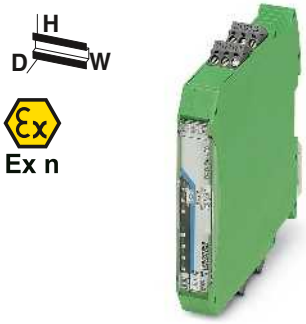
I/O extension modules

- Easy I/O mapping via thumbwheel
- Digital wide-range inputs (0...250 V AC/DC)
- 0 ... 100 Hz digital pulse inputs
- Relay or transistor outputs
- Easy module replacement even during operation (hot swap)
- Extended temperature range −40°C to +70°C

Notes:

1) EMC: Class A product, see page 553

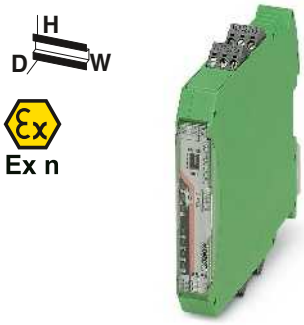
I/O extension module, 2 digital inputs/outputs and 1 analog input/output



I/O extension module, 4 digital inputs

		Ex: Ⓔx Housing width 17.5 mm	Ex: Ⓔx Housing width 17.5 mm
		Technical data	**Technical data**
Analog input			
Number of inputs		1	-
Resolution		16 (Bit)	-
Signal range (configurable using the DIP switch)		0 mA ... 20 mA / 4 mA ... 20 mA	-
Accuracy		≤ 0.02% (@25°C)	-
Supply voltage	for passive sensors (via terminal PWR1, +I1)	≥ 12 V DC	-
Digital input			
Number of inputs		2	4
Switching level	1 signal ("H")	10 V AC/DC ... 50 V AC/DC (low-voltage input) 50 V AC/DC ... 250 V AC/DC (high-voltage input)	10 V AC/DC ... 50 V AC/DC (low-voltage input) 50 V AC/DC ... 250 V AC/DC (high-voltage input)
Switching level	0 signal ("L")	0 V AC/DC ... 4 V AC/DC (low-voltage input) 0 V AC/DC ... 20 V AC/DC (high-voltage input)	0 V AC/DC ... 4 V AC/DC (low-voltage input) 0 V AC/DC ... 20 V AC/DC (high-voltage input)
Input frequency		≤ 2 Hz	≤ 2 Hz
Pulse input			
Number of inputs		-	-
Signal range		-	-
Input frequency		-	-
Pulse length		-	-
Analog output			
Number of outputs		1	-
Signal range		0 mA ... 20 mA 4 mA ... 20 mA 0 V ... 10 V	-
Accuracy		≤ 0.02% (@25°C) Typ. 0.5%	-
Load R_B		≤ 500 Ω ≥ 10 kΩ	-
Digital output			
Contact type		2 x relay output	-
Switching voltage		250 V AC 24 V DC	-
Switching current	min./max.	≥ 10 mA / 2 A	-
Switching frequency		2 Hz	-
General data			
Supply voltage		19.2 V DC ... 30.5 V DC (T-connector)	19.2 V DC ... 30.5 V DC (T-connector)
Current consumption		max. 95 mA (at 24 V DC, at 25°C)	max. 11 mA (at 24 V DC, at 25°C)
Degree of protection		IP20	IP20
Ambient temperature range		-40 °C ... 70 °C	-40 °C ... 70 °C
Housing material		PA 6.6-FR	PA 6.6-FR
Dimensions W / H / D		17.5 / 99 / 114.5 mm	17.5 / 99 / 114.5 mm
Conformance / approvals			
Conformance		CE-compliant	CE-compliant
ATEX		Ⓔx II 3 G Ex nA nC IIC T4 Gc X	Ⓔx II 3 G Ex nA IIC T4 Gc X
IECEx		Applied for	Applied for
UL, USA / Canada		UL applied for	UL applied for

		Ordering data			**Ordering data**	
Description		**Type**	**Order No.**	Pcs. / Pkt.	**Type**	**Order No.**	Pcs. / Pkt.
Analog/digital I/O module		**RAD-DAIO6-IFS[1])**	**2901533**	1			
Digital input module					**RAD-DI4-IFS[1])**	**2901535**	1
Digital relay output module							
Digital/pulse input module							
Digital transistor output module							
		Accessories			**Accessories**	
Analog/digital I/O module		**RAD-DAIO6-IFS[1])**	**2901533**	1			
Digital relay output module					**RAD-DOR4-IFS[1])**	**2901536**	1
Digital input module							
Digital transistor output module							
Digital/pulse input module							



I/O extension module,
4 digital relay outputs

Ex: Ex

Housing width 17.5 mm

Technical data	
-	
-	
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-	
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-	
4 x relay output	
250 V AC 24 V DC	
≥ 10 mA / 6 A (per channel)	
2 Hz	
19.2 V DC ... 30.5 V DC (T-connector)	
max. 55 mA (at 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
PA 6.6-FR	
17.5 / 99 / 114.5 mm	
CE-compliant Ex II 3 G Ex nA nC IIC T4 Gc X	
Applied for	
UL applied for	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-DOR4-IFS[1])	**2901536**	1

Accessories

RAD-DI4-IFS[1])	**2901535**	1

I/O extension module,
8 digital inputs and 2 pulse inputs

Housing width 17.5 mm

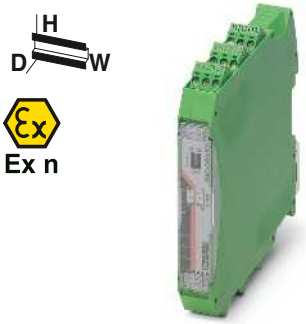
Technical data	
-	
-	
-	
-	
-	
-	
2	
10 V DC ... 30.5 V DC	
0 V DC ... 4 V DC	
≤ 10 Hz (static mode)	
-	
2	
0 V DC ... 30.5 V DC	
< 100 Hz (pulse counter mode)	
min. 5 ms	
-	
-	
-	
-	
-	
-	
19.2 V DC ... 30.5 V DC (T-connector)	
max. 18 mA (at 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
PA 6.6-FR	
17.5 / 99 / 114.5 mm	
CE-compliant Ex II 3 G Ex nA IIC T4 Gc X	
Applied for	
UL applied for	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-DI8-IFS	**2901539**	1

Accessories

RAD-DO8-IFS	**2902811**	1



I/O extension module,
8 digital transistor outputs

Housing width 17.5 mm

Technical data	
-	
-	
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-	
-	
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-	
8 x transistor output, active	
30.5 V DC	
- / 250 mA (per channel)	
10 Hz	
19.2 V DC ... 30.5 V DC (T-connector)	
max. 22 mA (at 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
PA 6.6-FR	
17.5 / 99 / 114.5 mm	
CE-compliant Ex II 3 G Ex nA IIC T4 Gc X	
Applied for	
UL applied for	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-DO8-IFS	**2902811**	1

Accessories

RAD-DI8-IFS	**2901539**	1

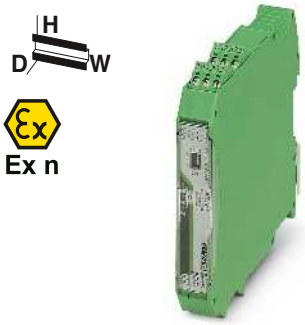
I/O extension modules

N

- Easy I/O mapping via thumbwheel
- Analog inputs (0/4 ... 20 mA)
- Temperature inputs for Pt 100 sensors
- Analog outputs (0/4 ... 20 mA or 0 ... 10 V)
- Easy module replacement even during operation (hot swap)
- Extended temperature range −40°C to +70°C

Notes:

1) EMC: Class A product, see page 553



I/O extension module, 4 analog current inputs

Temperature I/O extension module, 4 temperature inputs

		Ex: ⟨Ex⟩ Housing width 17.5 mm	Housing width 17.5 mm
		Technical data	**Technical data**
Analog input			
Number of inputs		4	-
Resolution		16 (Bit)	-
Signal range (configurable using the DIP switch)		0 mA ... 20 mA / 4 mA ... 20 mA	-
Accuracy		≤ 0.02% (@25°C)	-
Supply voltage	for passive sensors (via terminal PWR1, +I1)	≥ 12 V DC	-
Analog input			
Description of the input		-	Pt 100 input
Number of inputs		-	4
Temperature measuring range		-	-50 °C ... 250 °C
Analog output			
Number of outputs		-	-
Signal range		-	-
Accuracy		-	-
Load R_B		-	-
General data			
Supply voltage		19.2 V DC ... 30.5 V DC (T-connector)	19.2 V DC ... 30.5 V DC (T-connector)
Current consumption		max. 120 mA (at 24 V DC, at 25°C)	max. 45 mA (at 24 V DC, at 25°C)
Degree of protection		IP20	IP20
Ambient temperature range		-40 °C ... 70 °C	-40 °C ... 70 °C
Housing material		PA 6.6-FR	PA 6.6-FR
Dimensions W / H / D		17.5 / 99 / 114.5 mm	17.5 / 99 / 114.5 mm
Conformance / approvals			
Conformance		CE-compliant	CE-compliant
ATEX		⟨Ex⟩ II 3 G Ex nA IIC T4 Gc X	⟨Ex⟩ II 3 G Ex nA IIC T4 Gc X
IECEx		Applied for	Applied for
UL, USA / Canada		UL applied for	UL applied for

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Analog input module Temperature input module Analog output module	**RAD-AI4-IFS[1])**	**2901537**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-PT100-4-IFS	**2904035**	1

Accessories

Description	Type	Order No.	Pcs. / Pkt.
Analog output module Analog input module Temperature input module	**RAD-AO4-IFS[1])**	**2901538**	1

Accessories

Type	Order No.	Pcs. / Pkt.
RAD-AO4-IFS[1])	**2901538**	1

**I/O extension module,
4 analog current/voltage outputs**

Ex:
Housing width 17.5 mm

Technical data

-	
-	
-	
-	
-	
-	
-	
-	
-	
4	
0 mA ... 20 mA	0 V ... 10 V
4 mA ... 20 mA	
≤ 0.02% (@25°C)	Typ. 0.5%
≤ 500 Ω	≥ 10 kΩ
19.2 V DC ... 30.5 V DC (T-connector)	
max. 115 mA (at 24 V DC, at 25°C)	
IP20	
-40 °C ... 70 °C	
PA 6.6-FR	
17.5 / 99 / 114.5 mm	
CE-compliant	
II 3 G Ex nA IIC T4 Gc X	
Applied for	
UL applied for	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-AO4-IFS[1])	**2901538**	1

Accessories

RAD-AI4-IFS[1])	**2901537**	1
RAD-PT100-4-IFS	**2904035**	1

Wireless I/O

Wireless MUX - the wireless signal cable

The Wireless MUX transmits 16 digital and 2 analog signals bidirectionally. The Wireless MUX is supplied ready to use: unpack – connect – switch on – and you have a working wireless path.

– Range*:
With omnidirectional antenna, 50 m to 100 m in halls, up to 200 m outdoors.
With PANEL antennas, up to 400 m outdoors.

Fieldline I/O for wireless fieldbus extension

The Bluetooth I/O system integrates I/O signals into a fieldbus or an Ethernet network via Bluetooth.

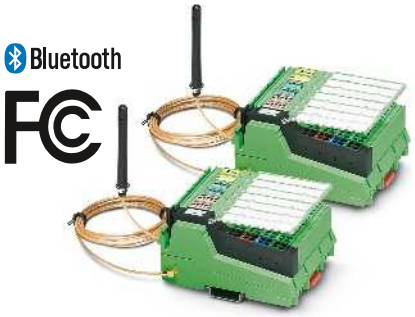
Advantages of Bluetooth technology:

– Extremely rugged and reliable
– Simple and fast commissioning
– WLAN coexistence functions AFH, LEM, black channel listing
– Parallel operation of several Bluetooth systems
– Range*:
20 m to 50 m in industrial halls, up to over 100 m outdoors.

Notes:

* The range may be significantly above or below that stated, and depends on the environment, antenna technology, and the product used.

1) EMC: Class A product, see page 553



Wireless set, including antennae

Technical data

Wireless interface	
Wireless standard	Bluetooth 1.2
Frequency range	2.402 GHz ... 2.48 GHz (ISM bandwidth)
Transmission power	16 dBm (40 mW, controlled automatically)
Wireless modules that can be connected	-
Antenna connection method	MCX (female)
Fieldbus interface	
Name	-
Transmission speed	-
Power supply for module electronics	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including ripple)
Digital inputs	
Connection technology	1-wire
Number of inputs	16
Digital outputs	
Connection technology	1-wire
Number of outputs	16
Analog inputs	
Number of inputs	2
Voltage input signal	0 V ... 10 V
Current input signal	0 mA ... 20 mA
Measured value resolution	12 bits
Analog outputs	
Number of outputs	2
Voltage output signal	0 V ... 10 V
Current output signal	0 mA ... 20 mA
DAC resolution	12 bit
General data	
Width	95 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Wireless MUX set, consisting of two modules including antennas, each with 16 digital and 2 analog inputs and outputs			
- With OMNI antennas, 16 dBm transmission power	**ILB BT ADIO MUX-OMNI**	**2884208**	1
- With OMNI antennas, 8 dBm transmission power, maritime approvals	**ILB BT ADIO MUX-OMNI 8/M[1])**	**2693185**	1
- With PANEL antennas, 12 dBm transmission power, 8 dBi antenna gain	**ILB BT ADIO MUX-PANEL**	**2884509**	1
Fieldline Modular Wireless IO base station for up to three wireless IO devices - Adjustable transmission power			
Fieldline Modular wireless I/O device - Adjustable transmission power - 16 inputs			
Inline Block wireless I/O device - Adjustable transmission power			

Fieldline local bus base station, Incl. OMNI antenna

I/O wireless module, incl. OMNI antenna

I/O wireless module, incl. OMNI antenna

Technical data

Bluetooth 1.2	
2.402 GHz ... 2.48 GHz (ISM bandwidth)	
8 dBm (6.3 mW, controlled automatically)	
Up to 3	
SMA (female)	
Fieldline Modular local bus	
500 kbaud / 2 Mbaud (data rate can be changed via pin 5 (voltage supply ULS)	
24 V DC	
19.2 V DC ... 30 V DC (including ripple)	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
70.5 mm	
IP65	
-25 °C ... 60 °C	

Technical data

	FLM BT DIO 8/8 M12[1])	FLM BT DI 16 M12[1])
Bluetooth 1.2		
2.402 GHz ... 2.48 GHz (ISM bandwidth)		
8 dBm (6.3 mW, controlled automatically)		
1 (FLM BT BS 3, FL BT MOD IO AP)		
SMA (female)		
-		
-		
24 V DC		
19.2 V DC ... 30 V DC (including ripple)		19.2 V DC ... 32 V DC
	2, 3-wire	2 or 3-wire (optionally 4-wire)
	8	16
	2, 3-wire	-
	8	-
	-	
	-	
	-	
	-	
	-	
	-	
	-	
	-	
70.5 mm		
IP65		
-25 °C ... 60 °C		

Technical data

Bluetooth 1.2
2.402 GHz ... 2.48 GHz (ISM bandwidth)
16 dBm (can be set between 0 dBm/1 mW and 16 dBm/39.8 mW in 4 dB increments)
1 (FLM BT BS 3, FL BT MOD IO AP)
SMA (female)
-
-
24 V DC
19.2 V DC ... 30 V DC (including ripple)
1-wire
16
1-wire
16
2
0 V ... 10 V
0 mA ... 20 mA
12 bits
2
0 V ... 10 V
0 mA ... 20 mA
12 bit
117 mm
IP20
-25 °C ... 60 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM BT BS 3[1])	**2736770**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
FLM BT DIO 8/8 M12[1])	**2736767**	1
FLM BT DI 16 M12[1])	**2693208**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
ILB BT ADIO 2/2/16/16[1])	**2884282**	1

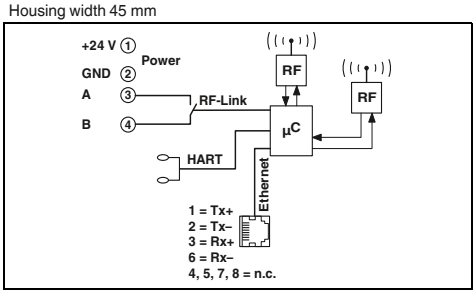
WirelessHART gateway

The **RAD-WHG/WLAN-XD** is a WirelessHART gateway with integrated 802.11b/g WLAN transceiver. It converts HART data to Modbus TCP for easy integration into almost any host system.

– Simple programming and diagnostics using an embedded web server or HART programmer
– WirelessHART gateway supports 250 WirelessHART devices
– 802.11b/g client can be used as WirelessHART backhaul connection with 802.11i (WPA2) 128-bit AES encryption
– Fully meshed routing (self-organizing and self-healing network) with WirelessHART
– WirelessHART uses "channel hopping" as a means of tolerating interference

WirelessHART gateway

Ex:
Housing width 45 mm

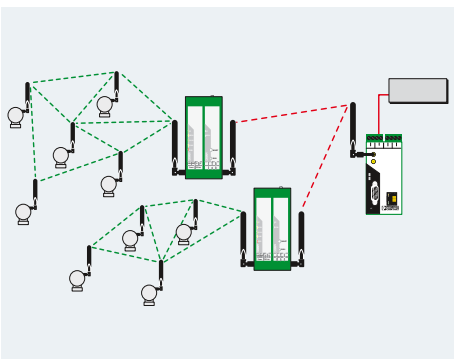


Technical data

Wireless path		
Interface description		WLAN as per IEEE 802.11 b/g
Direction		Bi-directional
Frequency range		2.4 GHz ... 2.472 GHz
Transmission power		0 ... 20 dBm
Number of channels		13
Connection method		Socket
Wireless path		
Interface description		WirelessHART
Frequency range		2.4 GHz ... 2.4835 GHz
Transmission power		0 ... 10 dBm
Number of channels		15
Connection method		Socket
Ethernet interface		
Connection method		RJ45
Transmission speed		10/100 Mbps
General data		
Supply voltage		9 V DC ... 30 V DC
Current consumption	typ. / max.	125 mA (at 24 V DC) / 300 mA (at 24 V DC)
Degree of protection		IP20
Ambient temperature range		-40 °C ... 70 °C
Housing material		Polyamide PA non-reinforced
Dimensions W / H / D		45 / 99 / 114.5 mm
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14
Conformance / approvals		
Conformance		CE-compliant FCC Directive, Part 15.247
CSA, USA		Class I, Zone 2, Group IIC ; AEx nA IIC T4
CSA, Canada		Class I, Division 2 Groups A,B,C,D Ex nA IIC T4

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
WirelessHART gateway	**RAD-WHG/WLAN-XD**	**2900178**	1



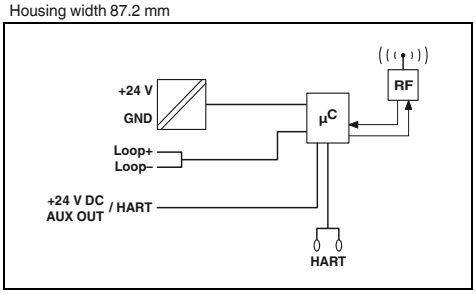
WirelessHART adapter

The **RAD-WHA-1/2NPT** is an adapter that allows up to 4 HART devices to be on a WirelessHART network.

– Allows wired HART devices to transfer data on a WirelessHART network
– Connect up to 4 HART device to one adapter
– Allows connection of one standard 4... 20 mA signal for easy integration of non-HART devices into a WirelessHART network
– 1/2-in. NPT fitting allows remote mounting or direct connection to instrument
– Removable antenna for connection of coaxial cable and high gain antenna

WirelessHART adapter

Housing width 87.2 mm



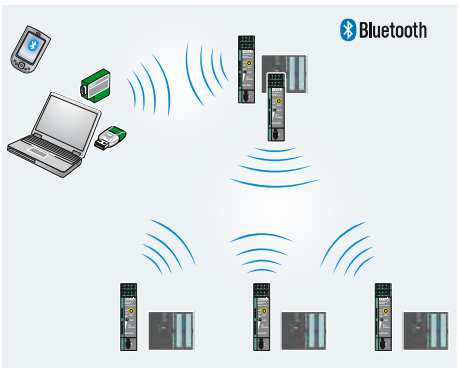
Technical data

Wireless path		
Interface description		WirelessHART
Direction		Bi-directional
Frequency range		2.4 GHz ... 2.4835 GHz
Transmission power		0 ... 10 dBm
Number of channels		15
Connection method		N (female)
Analog input		
Number of inputs		1
Signal range		4 mA ... 20 mA
General data		
Supply voltage		11 V DC ... 30 V DC
Current consumption	max.	95 mA
Degree of protection		IP67
Ambient temperature range		-40 °C ... 70 °C
Housing material		Aluminum, die-cast, corrosion resistant, powder-coated
Dimensions W / H / D		87.2 / 161 / 65.3 mm
Connection method		Flying leads, 20 AWG
Conformance / approvals		
Conformance		-

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
WirelessHART adapter	**RAD-WHA-1/2NPT**	**2900100**	1

Bluetooth interface converter for V.24 (RS-232), RS-422, RS-485 2-wire



Bluetooth converter, universal for V.24 (RS-232), RS-422, RS-485 2-wire

Applications:

The Bluetooth converter is used to convert V.24 (RS-232), RS-422, and RS-485 2-wire or USB interfaces to the licence-free Bluetooth wireless standard. It serves as a straightforward and flexible substitute for a cable in order, for example, to perform programming/diagnostics tasks via a notebook or as a cost-effective alternative to slip rings, drag chains or fieldbus cables, such as Modbus, PROFIBUS, etc.

Topology:

– Point-to-point
– Multipoint with up to seven slaves

Features:

Flexible parameterization/application options:

– Can be used for V.24 (RS-232)/RS-422/RS-485-2 2-wire interfaces up to 187.5 kbps
– Transceiver for distances of up to 150 m

High transmission reliability:

– Secure and tamper-proof data transmission thanks to password protection, encryption, plus fixed and invisible device pairing
– Coexistence with other wireless systems thanks to adaptive frequency hopping (AFH) method

Easy installation:

– Wireless path diagnostics based on integrated bar graphs and 2 digital outputs
– Installation of parallel wireless paths thanks to 24 V DC and RS-485 cross-wiring
– Local configuration via USB interface without separate power supply unit

Technical data

Supply	
Supply voltage	10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)
Supply voltage	19 V AC ... 29 V AC
Supply voltage	24 V DC ±20% (as an alternative or redundant, via backplane bus contact and system current supply)
Nominal current consumption	≤ 100 mA (24 V DC)
Serial port	
Connection method	D-SUB-9 plug Plug-in screw connection
Transmission speed	0.3 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 31.25 ; 38.4 ; 57.6 ; 75 ; 93.75 ; 115.2 kbps 0.3 ; 1.2 ; 2.4 ; 4.8 ; 7.2 ; 9.6 ; 19.2 ; 31.25 ; 38.4 ; 57.6 ; 75 ; 93.75 ; 115.2 ; 136 ; 187.5 kbps
Wireless interface	
Antenna connection	External
Transmission power	-28 dBm to 14 dBm (can be set via software)
Receiver sensitivity	-91.00 dBm
Frequencies	2.402 GHz ... 2.48 GHz (ISM bandwidth)
Range depending on spatial conditions	≤ 150 m (14 dBm)
Bluetooth Multidrop master / slave	1/7
General data	
Ambient temperature (operation)	-20 °C ... 60 °C
Electromagnetic compatibility	Conformance with R&TTE directive 1999/5/EC
Dimensions W / H / D	22.5 mm / 99 mm / 116 mm

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PSI Bluetooth converter, MCX connection for external antenna			
- Device with 2x diagnostic outputs	**PSI-WL-RS232-RS485/BT/2DO**	**2313805**	1
- Device with HazLoc approval	**PSI-WL-RS232-RS485/BT/HL**	**2313795**	1
PSI Bluetooth PROFIBUS-SET, supplied as standard: 2x PSI Bluetooth converters, 2x OMNI omnidirectional antennas			
PSI Bluetooth USB adapter, internal antenna			

Accessories

RS-232-D-SUB cable, length: 2 m - 9-pos. socket on 9-pos. socket	**PSM-KA9SUB9/BB/2METER**	**2799474**	1
Omnidirectional antenna	**RAD-ISM-2400-ANT-OMNI-2-1**	**2867461**	1
PANEL directional wireless antenna (without cable)	**RAD-ISM-2400-ANT-PAN- 8-0**	**2867610**	1
Antenna adapter cable	**RAD-PIG-EF316-MCX-SMA**	**2867678**	1
System power supply unit, primary-switched	**MINI-SYS-PS-100-240AC/24DC/1.5**	**2866983**	1
DIN rail connector	**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50

Bluetooth set
Pre-configured for PROFIBUS connections

Bluetooth USB adapter

Technical data	
10 V DC ... 30 V DC (via plug-in COMBICON screw terminal block)	-
19 V AC ... 29 V AC (via plug-in COMBICON screw terminal block)	-
24 V DC ±20% (as an alternative or redundant, via backplane bus contact and system current supply)	5 V DC (directly via the USB interface)
≤ 100 mA (24 V DC)	100 mA (5 V DC)
COMBICON screw terminal block	USB type A, plug
Preconfigured	Up to 2.1 Mbps
External 14 dBm	Internal 20 dBm
-91.00 dBm 2.402 GHz ... 2.48 GHz (ISM bandwidth) ≤ 150 m (14 dBm) -	-80.00 dBm 2.402 GHz ... 2.48 GHz (ISM bandwidth) 20 dBm (100 mW) = 80 m ... 150 m -
-20 °C ... 60 °C Conformance with R&TTE directive 1999/5/EC 22.5 mm / 99 mm / 116 mm	0 °C ... 70 °C Conformance with R&TTE directive 1999/5/EC 18 mm / 58 mm / 8 mm

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-WL-PROFIB/BT-SET/2DO	**2313876**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
PSI-WL-PLUG-USB/BT	**2313083**	1

Accessories

MINI-SYS-PS-100-240AC/24DC/1.5	**2866983**	1
ME 22,5 TBUS 1,5/ 5-ST-3,81 GN	**2707437**	50

Accessories

Accessories
Omnidirectional antennas

– For mobile or point-to-multipoint applications with a small range
– Version with higher impact strength that is not immediately recognizable as an antenna

2 dBi gain

3 dBi gain, higher impact strength

		Technical data	Technical data
General data			
Ambient temperature range		-20 °C ... 65 °C	-40 °C ... 80 °C
Degree of protection		IP65	IP55
Impact strength		-	IK08
Gain		2 dBi	3 dBi
Impedance		50 Ω	50 Ω
Acceptance angle	vertical / horizontal	75 ° / 360 °	85 ° / 360 °
Dimensions W / H		7.8 / 82.5 mm	86 / 43 mm
Frequency range		2.4 GHz	2.4 GHz
Scope of supply		Incl. mounting material	-

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
With connection MCX (male)	**RAD-ISM-2400-ANT-OMNI-2-1**	**2867461**	1	**RAD-ISM-2400-ANT-VAN- 3-1-MCX**	**2885702**	1
With connection RSMA (male)	**RAD-ISM-2400-ANT-OMNI-2-1-RSMA**	**2701362**	1	**RAD-ISM-2400-ANT-VAN-3-0-RSMA**	**2701358**	1
With SMA connection (male)				**RAD-ISM-2400-ANT-VAN- 3-0-SMA**	**2885867**	1
Mounting material for wall mounting				**RAD-ANT-VAN-MKT**	**2885870**	1

Omnidirectional Antennas

– For mobile applications with a longer range

6 dBi gain

Gain up to 6 dBi/8 dBi, Dual band

		Technical data	Technical data
General data			
Ambient temperature range		-40 °C ... 75 °C	-40 °C ... 80 °C
Degree of protection		IP55	IP68
Gain		6 dBi	6 dBi (2.4 GHz, when mounted on metal surface)
Impedance		50 Ω	50 Ω
Acceptance angle	vertical / horizontal	30 ° / 360 °	- / 360 °
Dimensions W / H		22 mm / 250 mm	92 mm / 51 mm
Frequency range		2.4 GHz	2.4 GHz
Scope of supply		Incl. mounting material	-

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
With connection N (female)	**RAD-ISM-2400-ANT-OMNI-6-0**	**2885919**	1			
With connection N (female), salt water resistant	**RAD-2400-ANT-OMNI-6-0-SW**	**2903219**	1			
Dual band omnidirectional antenna with vandalism protection						
With adapter cable N (male) -> SMA (male)				**RAD-ISM-2459-ANT-FOOD-6-0**	**2692526**	1
With adapter cable N (male) -> MCX (male)				**RAD-ISM-2459-ANT-FOOD-6-0-MCX**	**2700674**	1

Accessories
Directional wireless antennas

– For large distances with line of sight

8 dBi gain

19 dBi gain

	Technical data		Technical data
General data	ANT-DIR-2459-01	RAD-...PAN-8-0	
Ambient temperature range	-40 °C ... 80 °C	-40 °C ... 75 °C	-40 °C ... 70 °C
Degree of protection	IP67	IP55	IP65
Gain	9 dBi	8 dBi	19 dBi
Impedance	50 Ω	50 Ω	50 Ω
Acceptance angle vertical / horizontal	55 ° (at 2.4 GHz) / 75 ° (at 2.4 GHz)	70 ° / 75 °	11 ° / 17 °
Dimensions W / H	80 / 101 mm	80 / 100 mm	610 / 419 mm
Frequency range	2.4 GHz	2.3 GHz	2.4 GHz
Scope of supply	Incl. mounting material	Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
PANEL directional wireless antenna (without cable)						
With connection N (female)	**ANT-DIR-2459-01**	**2701186**	1			
With connection SMA (female)	**RAD-ISM-2400-ANT-PAN- 8-0**	**2867610**	1			
Parabolic antenna						
With connection N (female)				**RAD-ISM-2400-ANT-PAR-19-0**	**2867885**	1

Weather protection

Sealing tape

– Provides additional weather protection for adapters, splitters, cable connections, etc.
– Self-vulcanizing

	Technical data
General data	
Ambient temperature range	-40 °C ... 90 °C
Properties	Self-vulcanizing
Width	19 mm
Length	3 m
Thickness	0.75 mm

	Ordering data		
Description	Type	Order No.	Pcs. / Pkt.
Weather protection tape			
	RAD-TAPE-SV-19-3	**2903182**	1

Accessories

Antenna splitter
– For connecting two panel antennas for repeater applications

Surge protection
– For installing the antenna outside buildings from a cable length of 3 m

Antenna splitter, 2-way

Protection adapter for coaxial connections

Technical data		
General data		
Ambient temperature range	-40 °C ... 85 °C	-40 °C ... 90 °C
Degree of protection	IP20	IP68
Attenuation per branch (at 2400 MHz)	3 dB	Typ. 0.05 dB (≤ 0.15 dB)
Connection method	2x SMA (female), 1x SMA (male)	-
Frequency range	2.3 GHz ... 2.5 GHz	2.4 GHz ... 5.9 GHz
Scope of supply	2-way splitter, adapter from N (female) to SMA (female), 4 strips of self-vulcanizing weather protection tape	-

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna splitter			
Double	**RAD-ISM-2400-SPL-2-SMA**	**2885595**	1
COAXTRAB, protection adapter for antenna connections with Lambda/4 technology, 2.4 to 5.9 GHz			
N (female) -> N (female)			
N(male) -> N(female)			

Ordering data

Type	Order No.	Pcs. / Pkt.
CN-LAMBDA/4-5.9-BB	**2838490**	1
CN-LAMBDA/4-5.9-SB	**2800023**	1

Accessories

Adapter cable
– For adaptation of wireless module for antenna
– Attenuation:
Approximately 0.55 dB/m at 900 MHz
Approximately 0.80 dB/m at 2.4 GHz
Approximately 1.10 dB/m at 5 GHz

Adapter
– For installing the antenna inside buildings

Antenna adapter cable,
N (male) -> RSMA (male)

Adapter

Technical data		
General data		
Ambient temperature range	-40 °C ... 85 °C	-65 °C ... 165 °C
Degree of protection	-	IP20
Impedance	50 Ω	50 Ω

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna adapter cable			
0.5 m long	**RAD-PIG-RSMA/N-0.5**	**2903263**	1
1 m long	**RAD-PIG-RSMA/N-1**	**2903264**	1
2 m long	**RAD-PIG-RSMA/N-2**	**2903265**	1
3 m long	**RAD-PIG-RSMA/N-3**	**2903266**	1
Adapter			
N (female) -> N (female)			
N (male) -> SMA (female)			
RSMA (female) -> SMA (female)			
SMA (female) -> SMA (female)			
SMA (female) -> SMA (female), perpendicular			

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-ADP-N/F-N/F	**2867843**	1
RAD-ADP-N/M-SMA/F	**2917036**	1
RAD-ADP-RSMA/F-SMA/F	**2884538**	1
RAD-ADP-SMA/F-SMA/F	**2884541**	1
RAD-ADP-SMA/F-SMA/M-90	**2917324**	1

Accessories
Adapter/extension cables

– Extension or adaptation of wireless module for antenna

Notes:

Keep the connection from the wireless module to the antenna as short as possible, as every cable leads to attenuation.

Antenna adapter cable

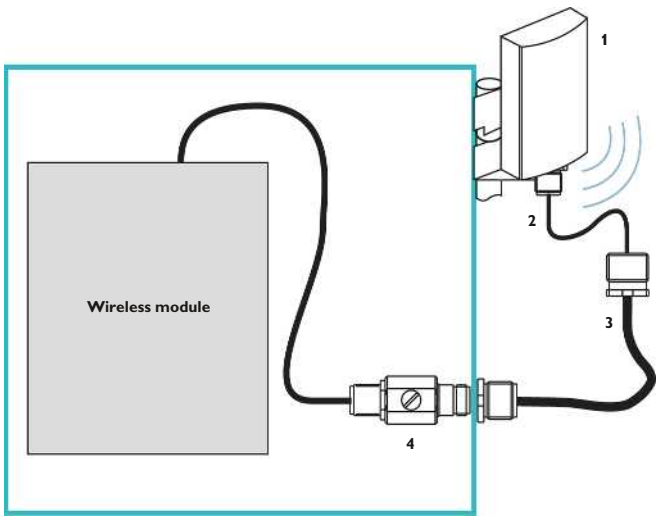
Antenna cable for longer connections

		Technical data	Technical data
General data			
Ambient temperature range		-40 °C ... 70 °C	-40 °C ... 105 °C
Attenuation / impedance	(at 2400 MHz)	approx. 1.5 dB/m / 50 Ω	approx. 0.27 dB/m for 900 MHz / 50 Ω

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Antenna adapter cable						
1 m long, MCX (male) -> SMA (male)	**RAD-PIG-EF316-MCX-SMA**	**2867678**	1			
50 cm long, MCX (male) -> N (male)	**RAD-PIG-EF316-MCX-N**	**2867681**	1			
30 cm long, N (female) -> SMA (male)	**RAD-PIG-EF316-N-SMA**	**2867694**	1			
50 m long, N (female) -> N (male)	**RAD-PIG-EF316-N-N**	**2867704**	1			
50 cm long, SMA (male) -> SMA (male)	**RAD-PIG-EF316-SMA-SMA**	**2885618**	1			
Antenna extension cable						
3 m long, N connection at both ends (male)				**RAD-CAB-EF393- 3M**	**2867649**	1
5 m long, N connection at both ends (male)				**RAD-CAB-EF393- 5M**	**2867652**	1
10 m long, N connection at both ends (male)				**RAD-CAB-EF393-10M**	**2867665**	1
15 m long, N connection at both ends (male)				**RAD-CAB-EF393-15M**	**2885634**	1
3 m long, SMA connection at both ends (male)				**RAD-CAB-EF142-3M**	**2884512**	1
5 m long, SMA connection at both ends (male)				**RAD-CAB-EF142-5M**	**2884525**	1

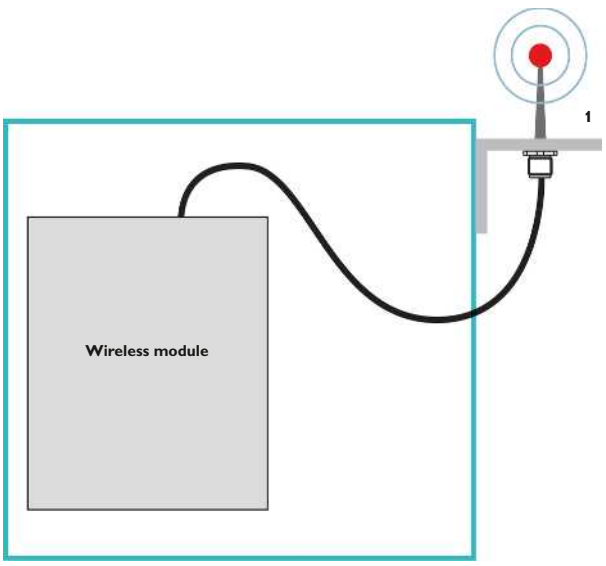
Control cabinet/switch box

– For antennas with extension cable, with surge protection



Control cabinet/switch box

– For antennas without extension cable, without surge protection



1 Antenna
2 Antenna adapter cable (pigtail)
3 Antenna extension cable
4 Surge protection

RAD-Line IO - UD wireless system with Trusted Wireless

The **RAD-ISM-900-SET...UD...** uni-directional wireless radio system consists of

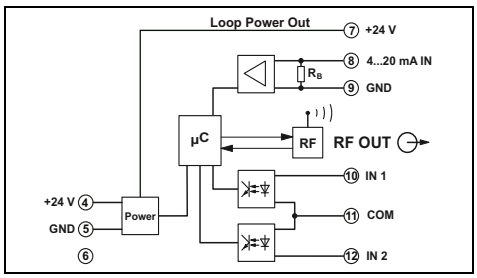
- Two transceivers preconfigured to communicate to one another
- Two omnidirectional antennas
- Operates in the license-free 902-928 MHz ISM band
- Frequency-hopping spread spectrum technology
- Transmitter can be DIN rail mounted ME housing or IP65 conduit style
- Conduit-style transmitters can be either 24 V DC or 120/240 V AC powered
- Receiver is DIN rail mounted ME housing, 24 V DC powered

- Integrated I/O allows connection directly to analog and digital inputs/outputs

Notes:

The products are offered exclusively for export outside the European Economic Area (EEA).

Set consisting of transmitter, receiver and two antennas with connecting cables



Technical data

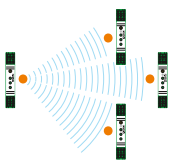
Wireless path		America	Australia	New Zealand
Direction		Uni-directional	Uni-directional	Uni-directional
Frequency range		902 ... 928	915.1 ... 927.8	921.4 ... 927.7 [MHz]
Transmission power		1 W	1 W	1 W
Number of channels		4 x 63	2 x 63	1 x 63
Analog input				
Number of inputs / signal range		1 x 4 mA ... 20 mA		
Input resistance		< 150 Ω		
Digital input				
Number of inputs / signal range		2 x 5 V AC/DC ... 30 V AC/DC		
Switching level	1 signal ("H")	min. 5 V DC		
	0 signal ("L")	max. 1.5 V DC		
Analog output				
Number of outputs / Signal range		1 x 4 mA ... 20 mA		
Load R_B		700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)		
Digital output		3 floating PDT contacts		
Switching voltage		30 V DC / 120 V AC		
Switching current		0.5 A		
General data		Transmitter (TX)	Receiver (RX)	
Supply voltage		12 V DC ... 30 V DC	12 V DC ... 30 V DC	
Current consumption	Typ./max.	75 mA / 350 mA	85 mA / 125 mA	
Degree of protection		-	-	
Ambient temperature range		-40 °C ... 70 °C	-40 °C ... 70 °C	
Housing material		Polyamide PA non-reinforced	Polyamide PA non-reinforced	
Dimensions W / H / D		17.5 / 99 / 114.5 mm	17.5 / 99 / 114.5 mm	
Conformance / approvals				
Conformance		FCC Directive, Part 15.247 ISC Directive RSS 210		
UL, USA / Canada		Class I, Div. 2, Groups A, B, C, D		

Ordering data

Description		Type	Order No.	Pcs. / Pkt.
Wireless set (transmitter, receiver, including antennas)				
	America	**RAD-ISM-900-SET-UD-ANT**	**2867102**	1
Receiver (individual)		**RAD-ISM-900-RX**	**2867047**	1
Wireless set (transmitter, receiver, including antennas)				
	Australia	**RAD-ISM-900-SET-UD-ANT-AU**	**2867416**	1
Receiver (individual)		**RAD-ISM-900-RX-AU**	**2867445**	1
Wireless set (transmitter, receiver, including antennas)				
	New Zealand	**RAD-ISM-900-SET-UD-ANT-NZ**	**2885029**	1
Receiver (individual)		**RAD-ISM-900-RX-NZ**	**2885058**	1

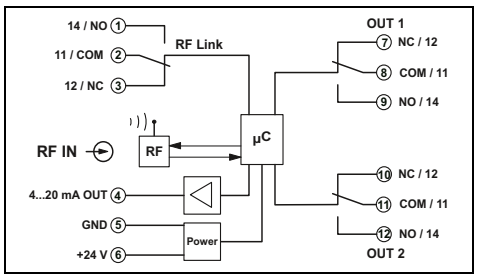
Point-to-point

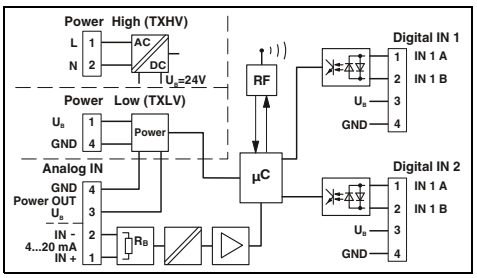
Point-to-multipoint



Set, consisting of transmitter for the mains connection (IP65) and receiver (IP20) including antennas

Set, consisting of transmitter for the low-voltage range (IP65) and receiver (IP20) including antennas





Technical data

America	Australia	New Zealand	
Uni-directional	Uni-directional	Uni-directional	
902 ... 928	915.1 ... 927.8	921.4 ... 927.7	[MHz]
1 W	1 W	1 W	
4 x 63	2 x 63	1 x 63	
1 x 4 mA ... 20 mA			
< 170 Ω			
2 x 85 V AC ... 240 V AC			
-			
-			
1 x 4 mA ... 20 mA			
700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)			
3 floating PDT contacts			
30 V DC / 120 V AC			
0.5 A			
Transmitter (TX)		Receiver (RX)	
100 V AC ... 240 V AC		12 V DC ... 30 V DC	
57 mA / 109 mA		85 mA / 125 mA	
-		-	
-40 °C ... 70 °C		-40 °C ... 70 °C	
5052H32AL PBT		Polyamide PA non-reinforced	
57 / 57 / 280 mm		17.5 / 99 / 114.5 mm	
FCC Directive, Part 15.247			
ISC Directive RSS 210			
Class I, Div. 2, Groups A, B, C, D			

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-ISM-900-SET-AC-UD	**2867021**	1
RAD-ISM-900-SET-AC-UD-AU	**2867429**	1
RAD-ISM-900-SET-AC-UD-NZ	**2885032**	1

Technical data

America	Australia	New Zealand	
Uni-directional	Uni-directional	Uni-directional	
902 ... 928	915.1 ... 927.8	921.4 ... 927.7	[MHz]
1 W	1 W	1 W	
4 x 63	2 x 63	1 x 63	
1 x 4 mA ... 20 mA			
< 170 Ω			
2 x 5 V AC/DC ... 30 V AC/DC			
min. 5 V DC			
max. 1.5 V DC			
1 x 4 mA ... 20 mA			
700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)			
3 floating PDT contacts			
30 V DC / 120 V AC			
0.5 A			
Transmitter (TX)		Receiver (RX)	
9 V DC ... 30 V DC		12 V DC ... 30 V DC	
75 mA / 350 mA		85 mA / 125 mA	
-		-	
-40 °C ... 70 °C		-40 °C ... 70 °C	
5052H32AL PBT		Polyamide PA non-reinforced	
57 / 57 / 280 mm		17.5 / 99 / 114.5 mm	
FCC Directive, Part 15.247			
ISC Directive RSS 210			
Class I, Div. 2, Groups A, B, C, D			

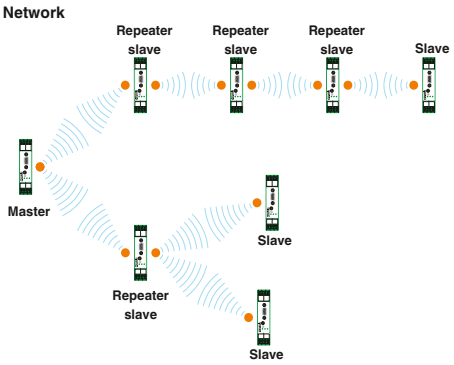
Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-ISM-900-SET-DC-UD	**2867034**	1
RAD-ISM-900-SET-DC-UD-AU	**2867432**	1
RAD-ISM-900-SET-DC-UD-NZ	**2885045**	1

RAD-Line Serial IO - BD wireless system for transmission of serial data and I/O signals

The **RAD-ISM-900-DATA-BD-BUS...** bi-directional wireless radio allows wireless connection of several decentralized controllers and the reception and output of I/O signals from the field to a central location (controller).

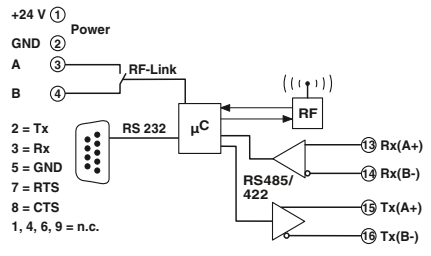
- Operates in the license-free 902-928 MHz ISM band
- Frequency-hopping spread spectrum technology
- Provides an interface for transfer of I/O data between 900 MHz wireless and RS-232, RS-422, and RS-485 interfaces
- Programmable for point-to-point, point-to-multipoint and multipoint-to-point configurations
- Integrated bus foot allows connection to additional I/O modules
- Individual modules can be configured as master, slave or repeater
- Up to 254 slaves may operate from a single master



Wireless transceiver for serial interfaces (RS-232, RS-422/RS-485)

Ex: cULus

Housing width 22.5 mm



Notes:

The basic software for the configuration and diagnostics of two network devices can be downloaded free of charge at www.phoenixcontact.com. A software license is required to perform the diagnostic functions for multiple network devices.

The products are offered exclusively for export outside the European Economic Area (EEA).

Technical data

Wireless path	America	Australia	New Zealand	
Direction	Bi-directional	Bi-directional	Bi-directional	
Frequency range	902 ... 928	915.1 ... 927.8	921.4 ... 927.7	[MHz]
Transmission power	1 W	1 W	1 W	
Number of channels	4 x 63	2 x 63	1 x 63	
Serial port	RS-232		RS-485/RS-422	
Connection method	9-pos. D-SUB (socket)		COMBICON plug-in screw terminal block	
Serial transmission speed	1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps		1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps	
Data format/coding	Asynchronous			
Data flow control/protocols	RTS/CTS			
Analog input				
Number of inputs	-			
Signal range	-			
Input resistance	-			
Digital input				
Number of inputs	-			
Switching level	1 signal ("H")	-		
	0 signal ("L")	-		
Pulse input				
Switching level	1 signal ("H")	-		
	0 signal ("L")	-		
Pulse time	-			
Digital output				
Switching voltage	-			
Switching current	-			
General data				
Supply voltage	9 V DC ... 30 V DC			
Current consumption	typ. / max.	110 mA / 180 mA		
Degree of protection	IP20			
Ambient temperature range	-40 °C ... 70 °C			
Housing material	Polyamide PA non-reinforced			
Dimensions W / H / D	22.5 / 99 / 114.5 mm			
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12			
Conformance / approvals				
Conformance	FCC Directive, Part 15.247 ISC Directive RSS 210			
UL, USA / Canada	Class I, Div. 2, Groups A, B, C, D			

Ordering data

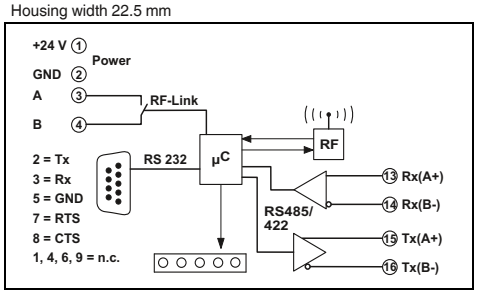
Description		Type	Order No.	Pcs. / Pkt.
Wireless module with serial interface	America	**RAD-ISM-900-DATA-BD**	**2867131**	1
Wireless module with serial interface	Australia	**RAD-ISM-900-DATA-BD-AU**	**2867953**	1
Wireless module with serial interface	New Zealand	**RAD-ISM-900-DATA-BD-NZ**	**2885155**	1

Wireless transceiver for serial interfaces (RS-232, RS-422/RS-485), can be extended

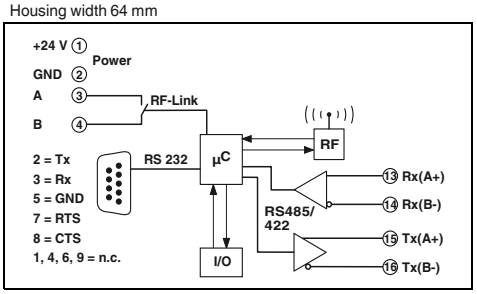
Wireless transceiver for serial interfaces (RS-232, RS-422/RS-485), with integrated inputs/outputs

Ex:

Housing width 22.5 mm



Housing width 64 mm



Technical data

America	Australia	New Zealand
Bi-directional	Bi-directional	Bi-directional
902 ... 928	915.1 ... 927.8	921.4 ... 927.7 [MHz]
1 W	1 W	1 W
4 x 63	2 x 63	1 x 63
RS-232		RS-485/RS-422
9-pos. D-SUB (socket)		COMBICON plug-in screw terminal block
1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps		1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps
Asynchronous		
RTS/CTS		
-		
-		
-		
-		
-		
-		
-		
-		
-		
-		
-		
9 V DC ... 30 V DC		
110 mA / 180 mA		
IP20		
-40 °C ... 70 °C		
Polyamide PA non-reinforced		
22.5 / 99 / 114.5 mm		
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 12		
FCC Directive, Part 15.247		
ISC Directive RSS 210		
Class I, Div. 2, Groups A, B, C, D		

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-ISM-900-DATA-BD-BUS	**2867296**	1
RAD-ISM-900-DATA-BD-BUS-AU	**2867996**	1
RAD-ISM-900-DATA-BD-BUS-NZ	**2885168**	1

Technical data

Bi-directional	
902 MHz ... 928 MHz	
1 W	
4 x 63	
RS-232	RS-485/RS-422
9-pos. D-SUB (socket)	COMBICON plug-in screw terminal block
1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps	1,2 / 2,4 / 9,6 / 19,2 / 38,4 kbps
Asynchronous	
RTS/CTS	
8	
0 V ... 5 V	
10 kΩ	
8	
≥ 2.6 V DC	
≤ 2.4 V DC	
≥ 2.6 V DC	
≤ 2.4 V DC	
5 ms (minimum)	
Digital outputs	
40 V DC	
500 mA (sinking)	
12 V DC ... 30 V DC	
- / 4.1 A	
IP20	
-40 °C ... 70 °C	
Polyamide PA non-reinforced with aluminum heatsink	
64 / 99 / 114.5 mm	
0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14	
FCC Directive, Part 15.247	
-	

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-ISM-900-DATA-BD-PLUS	**2902277**	1

RAD-Line Ethernet with Trusted Wireless

The **RAD-ISM-900-EN-BD...** industrial wireless radio allows a wireless connection of several decentralized controllers to a central location (controller) via an Ethernet or serial connection.

- Operates in the license-free 902-928 MHz ISM band
- Frequency-hopping spread spectrum technology
- Provides an interface for transfer of data between 900 MHz wireless and Ethernet, RS-232, RS-422 or RS-485 interfaces
- Contains an adjustable 10 mW... 1 W transmitter
- Supports TCP/IP, UDP and IP v4 protocols
- Programmable for point-to-point, point-to-multipoint and multipoint-to-point configurations
- Incorporates security using selectable 128/192/256-bit AES encryption
- **RAD-ISM-900-EN-BD-BUS** features an integrated bus foot to connect I/O modules (addressable via Modbus)
- Individual modules can be configured as master, slave or repeater using integrated web browser interface
- **RAD-ISM-900-EN-BD/B** is a dedicated slave radio with no Ethernet ports

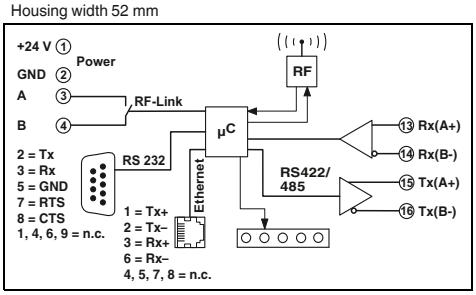
Notes:

The products are offered exclusively for export outside the European Economic Area (EEA).

Wireless transceiver for Ethernet and serial interfaces V.24 (RS-232, RS-422/RS-485)

Ex: cULus

Housing width 52 mm



Technical data

Wireless path		
Direction	Bi-directional	
Frequency range	902 MHz ... 928 MHz	
Transmission power	10 ... 30 dBm	
Serial port	RS-232	RS-485
Connection method	9-pos. D-SUB (socket)	COMBICON plug-in screw terminal block
Serial transmission speed	300 ... 57,6 kbps	
Data format/coding	Asynchronous	
Data flow control/protocols	RTS/CTS	
General data		
Supply voltage	11 V DC ... 30 V DC	
Current consumption	250 mA (at 24 V DC)	
Degree of protection	IP20	
Ambient temperature range	-40 °C ... 65 °C	
Housing material	Polyamide PA non-reinforced with aluminum heatsink	
Dimensions W / H / D	52 / 99 / 115 mm	
Screw connection solid/stranded/AWG	0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance / approvals		
Conformance	FCC Directive, Part 15.247 ISC Directive RSS 210	
UL, USA / Canada	Class I, Div. 2, Groups A, B, C, D	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Wireless module with optional Ethernet and serial interfaces			
Bus foot for I/O extension modules	**RAD-ISM-900-EN-BD-BUS**	**2900017**	1
Cannot be extended	**RAD-ISM-900-EN-BD**	**2900016**	1
Wthout serial ports	**RAD-ISM-900-EN-BD/B**	**2901205**	1

RAD-Line Ethernet with 400 mW WLAN

High-power Ethernet industrial wireless radio transceivers that conform to IEEE standard 802.11b/g.

- Operates in the license-free 2.4 GHz ISM band
- Features a 400 mW industrial radio transceiver
- Selectable 802.11i high security with 128/192/256-bit AES encryption and optional 802.1x authentication
- Supports TCP/IP, UDP, and IP v4 protocols
- Individual modules can be configured as point, bridge or client modes using integrated web browser interface
- Bridge mode allows for a network of up to 40 nodes on a single network resulting in a highly reliable network
- Provides an interface for transfer of data between legacy serial devices (RS-232, RS-422, RS-485 interfaces) onto an Ethernet network
- Programmable for point-to-point, point-to-multipoint and multipoint-to-point configurations
- Optional integrated bus foot for connection to RAD-Line extension modules
- Can be used as a Modbus RTU/TCP gateway

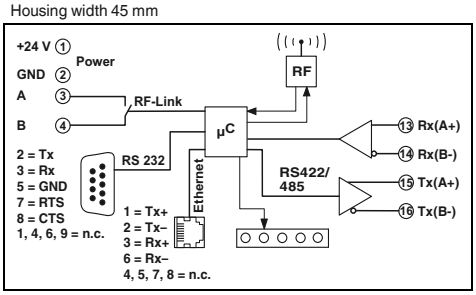
Notes:

The products are offered exclusively for export outside the European Economic Area (EEA).

WLAN wireless transceiver for Ethernet and serial interfaces (RS-232, RS-422/RS-485), can be extended with I/O extension modules

Ex: cULus

Housing width 45 mm



Technical data

Wireless path			
Direction		Bi-directional	
Frequency range		2.4032 GHz ... 2.4799 GHz	
Transmission power		400 mW	
Serial port		RS-232	RS-485/RS-422
Connection method		9-pos. D-SUB (socket)	COMBICON plug-in screw terminal block
Serial transmission speed		300 ... 57,6 kbps	300 ... 57,6 kbps
Data format/coding		Asynchronous	
Data flow control/protocols		RTS/CTS	
General data			
Supply voltage		12 V DC ... 30 V DC	
Current consumption	typ. / max.	230 mA / 280 mA	
Degree of protection		IP20	
Ambient temperature range		-40 °C ... 60 °C	
Housing material		Polyamide PA non-reinforced	
Dimensions W / H / D		45 / 99 / 115 mm	
Screw connection solid/stranded/AWG		0.2 ... 4 mm² / 0.2 ... 2.5 mm² / 24 - 14	
Conformance / approvals			
Conformance		FCC Directive, Part 15.247 ISC Directive RSS 210	
UL, USA / Canada		Class I, Div. 2, Groups A, B, C, D	

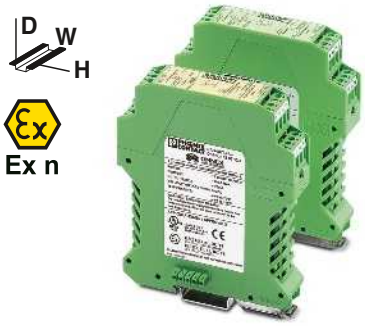
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
WLAN wireless module, high power transceiver with Ethernet and serial interface Bus foot for I/O extension modules	**RAD-80211-XD/HP-BUS**	**2900047**	1
Cannot be extended	**RAD-80211-XD/HP**	**2900046**	1

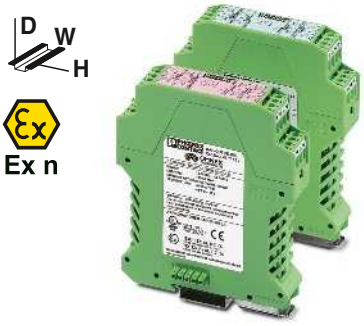
Extension modules

RAD-Line extension modules provide additional inputs and outputs for bi-directional RAD-Line IO and RAD-Line serial wireless systems.

– Easily installed via an integrated bus foot
– Bus provides power supply voltage
– Data transferred to transceiver module via bus
– Up to 8 modules can be connected to a single transceiver
– A maximum of 33 analog or 66 digital signals can be configured, depending on the selection of modules

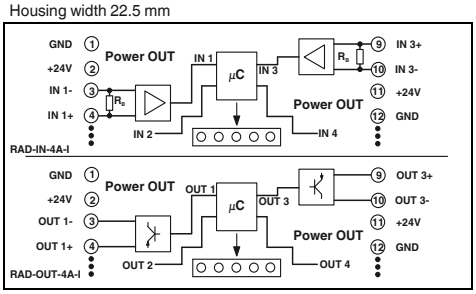


Analog components for 4 inputs or 4 outputs

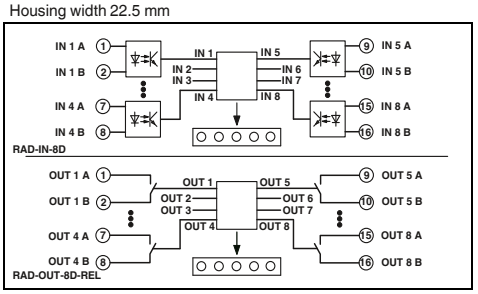


Digital components for 8 inputs or 8 outputs

Ex:
Housing width 22.5 mm



Ex:
Housing width 22.5 mm



Technical data

		RAD-IN-4A-I	RAD-OUT-4A-I
Analog input			
Number of inputs		4	-
Signal range		4 mA ... 20 mA	-
Input resistance		< 170 Ω	-
Digital input			
Number of inputs		-	-
Signal range		-	-
Switching level	1 signal (“H”)	-	-
	0 signal (“L”)	-	-
Input frequency			
Pulse length		-	-
Analog output			
Number of outputs		-	4
Signal range		-	-
Load R_B		-	700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)
Digital output			
Contact type		-	-
Switching voltage		-	-
Switching current		-	-
Clock frequency		-	-
Frequency output		-	-
General data			
Supply voltage		9 V DC ... 30 V DC (via bus foot)	9 V DC ... 30 V DC (via bus foot)
Current consumption	Typ./max.	100 mA / 130 mA	100 mA / 130 mA
Degree of protection		IP20	IP20
Ambient temperature range		-20 °C ... 65 °C	-20 °C ... 65 °C
Housing material		Polyamide PA non-reinforced	Polyamide PA non-reinforced
Dimensions W / H / D		22.5 / 99 / 114.5 mm	22.5 / 99 / 114.5 mm
Conformance / approvals			
Conformance		CE-compliant	
ATEX		II 3 G EEx nL IIC	
IECEx		Ex nL IIC	
UL, USA / Canada		Class I, Div. 2, Groups A, B, C, D	

Technical data

		RAD-IN-8D	RAD-OUT-8D-REL
Analog input			
Number of inputs		-	-
Signal range		-	-
Input resistance		-	-
Digital input			
Number of inputs		8	-
Signal range		5 V AC/DC ... 30 V AC/DC	-
Switching level	1 signal (“H”)	min. 5 V DC	-
	0 signal (“L”)	max. 1.5 V DC	-
Input frequency		max. 1 Hz	
Pulse length		-	-
Analog output			
Number of outputs		-	-
Signal range		-	-
Load R_B		-	-
Digital output			
Contact type		-	8 x relay output
Switching voltage		-	30 V AC/DC (EC Declaration of Conformity) 30 V DC (with UL approval) 250 V AC (with UL approval)
Switching current		-	0.5 A (EC Declaration of Conformity) 2 A (with UL approval)
Clock frequency		-	-
Frequency output		-	-
General data			
Supply voltage		9 V DC ... 30 V DC (via bus foot)	9 V DC ... 30 V DC (via bus foot)
Current consumption	Typ./max.	25 mA / 30 mA	100 mA / 160 mA
Degree of protection		IP20	IP20
Ambient temperature range		-20 °C ... 65 °C	-20 °C ... 65 °C
Housing material		Polyamide PA non-reinforced	Polyamide PA non-reinforced
Dimensions W / H / D			
Conformance / approvals			
Conformance		CE-compliant	
ATEX		II 3 G EEx nL IIC	
IECEx		Ex nL IIC	
UL, USA / Canada		Class I, Div. 2, Groups A, B, C, D	

Ordering data

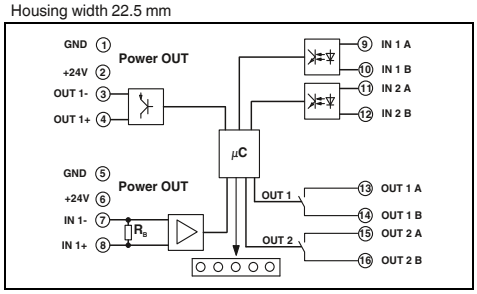
Description		Type	Order No.	Pcs. / Pkt.
Extension module	Analog IN	**RAD-IN-4A-I**	**2867115**	1
Extension module	Analog OUT	**RAD-OUT-4A-I**	**2867128**	1
Extension module	Digital IN			
Extension module	Digital OUT			
Extension module	Mixed I/O			

Ordering data

Type	Order No.	Pcs. / Pkt.
RAD-IN-8D	**2867144**	1
RAD-OUT-8D-REL	**2867157**	1

Analog/digital module for 2 digital inputs/outputs and 1 analog input/output

Ex: Ex, cULus, GOST
Housing width 22.5 mm

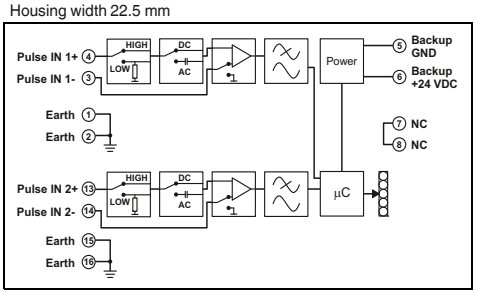


Technical data	
1	
4 mA ... 20 mA	
< 170 Ω	
2	
5 V AC/DC ... 30 V AC/DC	
min. 5 V DC	
max. 1.5 V DC	
-	
1	
4 mA ... 20 mA	
700 Ω (at U_B = 24 V, R_B = [U_B-10 V] / 20 mA)	
2 x relay output	
30 V AC/DC (EC Declaration of Conformity)	
30 V DC (with UL approval)	
250 V AC (with UL approval)	
0.5 A (EC Declaration of Conformity)	
2 A (with UL approval)	
-	
-	
9 V DC ... 30 V DC (via bus foot)	
70 mA / 110 mA	
IP20	
-20 °C ... 65 °C	
Polyamide PA non-reinforced	
CE-compliant	
Ex II 3 G EEx nL IIC	
Ex nL IIC T5	
Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
RAD-IN+OUT-2D-1A-I	**2867322**	1

Digital module for two counter/frequency inputs

Ex: cULus
Housing width 22.5 mm

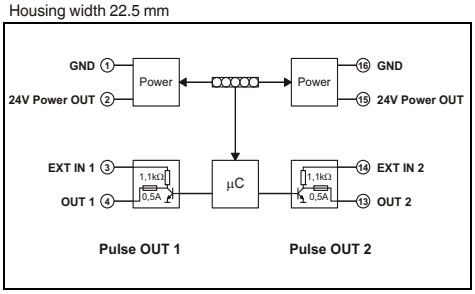


Technical data	
-	
-	
-	
2	
0.1 V AC/DC ... 30 V AC/DC	
(Common mode 3.6 V DC) / (differential mode 100 mV_{PP})	
-	
(0.1 Hz ... 10 kHz (50% Duty Cycle))	
(High time 50 µs)	
-	
-	
-	
-	
-	
-	
-	
9 V DC ... 30 V DC (via bus foot)	
35 mA / 45 mA	
IP20	
-20 °C ... 65 °C	
Polyamide PA non-reinforced	
CE-compliant	
Ex II 3 G EEx nL IIC	
-	
Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
RAD-IN-2D-CNT	**2885223**	1

Digital module for two counter/frequency outputs

Ex: cULus
Housing width 22.5 mm



Technical data	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
-	
Transistor output, passive	
-	
Approx. 27 mA (Terminal 3/14)	
Approx. 25 mA (Terminal 4/13)	
(High Speed 10 kHz with 50% Duty Cycle)	
(Low speed 10 Hz with 50% duty cycle)	
(0.1 Hz ... 10 kHz (50% Duty Cycle))	
9 V DC ... 30 V DC (via bus foot)	
90 mA / 115 mA	
IP20	
-20 °C ... 65 °C	
Polyamide PA non-reinforced	
CE-compliant	
Ex II 3 G EEx nL IIC	
-	
Class I, Div. 2, Groups A, B, C, D	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
RAD-OUT-2D-CNT	**2885236**	1

Accessories
Omnidirectional antennas

– Mobile or stationary applications
– Point-to-multipoint configurations
– Small antennas are suitable for applications with a shorter range
– Large antennas are suitable for applications requiring longer range

2.15 dBi gain

7 dBi gain

		Technical data	Technical data
General data			
Ambient temperature range		-40 °C ... 75 °C	-40 °C ... 80 °C
Degree of protection		IP65	IP65
Gain		2.15 dBi	7 dBi
Impedance		50 Ω	50 Ω
Connection method		MCX (male)	N (female)
Acceptance angle	vertical / horizontal	(N/A) / 360 °	17 ° / 100 °
Dimensions W / H		3 / 89 mm	3 / 609 mm
Frequency range		900 MHz	900 MHz
Scope of supply		Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
	RAD-ISM-900-ANT-OMNI-0-6	**2867160**	1	**RAD-ISM-900-ANT-OMNI-5**	**2867199**	1

Accessories
Omnidirectional antennas

– Mobile or stationary applications
– Point-to-multipoint configurations
– Small antennas are suitable for applications with a shorter range
– Large antennas are suitable for applications requiring longer range

5 dBi gain

8 dBi gain

		Technical data	Technical data
General data			
Ambient temperature range		-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection		IP65	IP65
Gain		5.15 dBi	8 dBi
Impedance		50 Ω	50 Ω
Connection method		N (female)	N (female)
Acceptance angle	vertical / horizontal	28 ° / 360 °	15 ° / 360 °
Dimensions W / H		60.452 / 1123.95 mm	60.5 / 1803.4 mm
Frequency range		902 MHz	900 MHz
Scope of supply		Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Omnidirectional antenna						
	RAD-ISM-900-ANT-OMNI-FG-3-N	**2867791**	1	**RAD-ISM-900-ANT-OMNI-FG-6-N**	**2885579**	1

Accessories
Directional (YAGI) antennas

– Stationary applications
– Point-to-point configurations for line of sight
– Longer ranges than omnidirectional antennas

5 dBi gain, with 0.6 m connecting cable

8.5 dBi gain, with 0.6 m connecting cable

		Technical data	Technical data
General data			
Ambient temperature range		-40 °C ... 80 °C	-40 °C ... 80 °C
Degree of protection		IP65	IP65
Gain		5 dBi	8.5 dBi
Impedance		50 Ω	50 Ω
Connection method		N (female) with cable (0.6 m)	N (female) with cable (0.6 m)
Acceptance angle	vertical / horizontal	78 ° / 168 °	62 ° / 100 °
Dimensions W / H		60 / 170 mm	60 / 170 mm
Frequency range		900 MHz	900 MHz
Scope of supply		Incl. mounting material	Incl. mounting material

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Directional antenna						
	RAD-ISM-900-ANT-YAGI-3-N	**2867801**	1	**RAD-ISM-900-ANT-YAGI-6.5-N**	**2867814**	1

Accessories
Surge protection

– For externally mounted installations
– Installed between antenna and radio for surge protection
– Replaceable, gas-filled arrestor

With N connector, grounded shield

		Technical data
General data		
Ambient temperature range		-40 °C ... 80 °C
Degree of protection		IP55
Attenuation	(at 900 MHz)	Typ. 0.2 dB (≤ 2.2 GHz)
Impedance		50 Ω

	Ordering data		
Description	Type	Order No.	Pcs. / Pkt.
COAXTRAB, attachment plug with surge protection for coaxial cables			
N connector, plug-socket	**CN-UB-280DC-SB**	**2818148**	1
N connector socket/socket	**CN-UB-280DC-BB**	**2818850**	1

Antenna splitter

– Allows multiple radios in an enclosure to share an antenna

Technical data

General data		
Ambient temperature range		-40 °C ... 85 °C
Degree of protection		IP20
Attenuation per branch	(at 900 MHz)	3 dB
Impedance		50 Ω
Connection method		Type MCX (female)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna splitter	**RAD-ISM-900-ANT-4**	**2867050**	1

Accessories
Adapter cable

– Various cables for connection of different antennas

Technical data

General data		
Ambient temperature range		-40 °C ... 75 °C
Attenuation	(at 900 MHz)	0.89 dB/m
Impedance		50 Ω
Conformance / approvals		
UL, USA / Canada		-

Technical data

General data		
Ambient temperature range		-40 °C ... 85 °C
Attenuation	(at 900 MHz)	approx. 1.5 dB/m
Impedance		50 Ω
Conformance / approvals		
UL, USA / Canada		Class I, Div. 1, 2, Groups A, B, C, D Class II, Div. 1, 2, Groups F, G

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna adapter cable			
1.2 m long, MCX (male) -> N (female)	**RAD-CON-MCX-N-SB**	**2867717**	1
1.2 m long, 90° MCX (male) -> N (female)	**RAD-CON-MCX90-N-SS**	**2885207**	1
1.2 m long, SMA (male) -> N (female)	**RAD-CON-SMA-N-SS**	**2867403**	1
30 cm long, MCX (male) -> MCX (male)	**RAD-CON-MCX-MCX-SS**	**2867607**	1
Antenna adapter cable for Ex-zone 1			
90 cm long, MCX (male) -> RPSMA (male)	**RAD-CON-MCX-RPSMA-EX**	**2885621**	1

Accessories
Adapter cable

– Various cables for connection of different antennas

Antenna adapter cable, N (male) -> RSMA (male)

Technical data

General data		
Ambient temperature range		-40 °C ... 85 °C
Attenuation	(at 900 MHz)	0.37 dB @ 915 MHz
Impedance		50 Ω

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna adapter cable			
0.5 m long	**RAD-PIG-RSMA/N-0.5**	**2903263**	1
1 m long	**RAD-PIG-RSMA/N-1**	**2903264**	1
2 m long	**RAD-PIG-RSMA/N-2**	**2903265**	1
3 m long	**RAD-PIG-RSMA/N-3**	**2903266**	1

Extension cable

– Various cables to extend distance between the radio and antenna
– Distance should remain as short as possible for reduced attenuation

Technical data

General data	
Ambient temperature range	-40 °C ... 75 °C
Impedance	50 Ω

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Antenna extension cable, N connection at both ends (male)			
3 m long, attenuation (at 900 MHz) 0.5 dB/m	**RAD-CAB-RG58-10**	**2867364**	1
6 m long, attenuation (at 900 MHz) 0.5 dB/m	**RAD-CAB-RG58-20**	**2867212**	1
7 m long, attenuation (at 900 MHz) 0.25 dB/m	**RAD-CAB-RG213-25**	**2867597**	1
12 m long, attenuation (at 900 MHz) 0.25 dB/m	**RAD-CAB-RG213-40**	**2867377**	1
15 m long, attenuation (at 900 MHz) 0.25 dB/m	**RAD-CAB-RG213-50**	**2867225**	1
18 m long, attenuation (at 900 MHz) 0.13 dB/m	**RAD-CAB-LMR400-60**	**2867380**	1
24 m long, attenuation (at 900 MHz) 0.13 dB/m	**RAD-CAB-LMR400-80**	**2867393**	1
30 m long, attenuation (at 900 MHz) 0.13 dB/m	**RAD-CAB-LMR400-100**	**2867238**	1
45 m long, attenuation (at 900 MHz) 0.08 dB/m	**RAD-CAB-LMR600-150**	**2885184**	1
60 m long, attenuation (at 900 MHz) 0.06 dB/m	**RAD-CAB-LMR900-200**	**2885197**	1

PHOENIX CONTACT
FB-9-SS
2316213

Process infrastructure

Process infrastructure connects the control level to the field level via modern fieldbuses, I/O modules, and wireless communication systems.

Modern process technology, including WirelessHART, FOUNDATION Fieldbus, PROFIBUS PA, and I/O solutions for potentially explosive areas can be used in numerous different industries, including mining, water/waste water, and oil and gas. Phoenix Contact offers flexible solutions for all applications and customer requirements.

– Process infrastructure is suitable for all applications and environments
– Failure times are reduced thanks to high integrity and hot swapping
– Multifunctional remote I/Os enable greater flexibility
– Remote access to error diagnostics means that hazardous areas do not have to be entered
– Approvals for all applications

Product overview	**480**
Process fieldbus	
Field connection boxes	**483**
Device couplers for the field	**485**
Power supply	**487**
Field diagnostic modules	**488**
Accessories	**489**
I/Os for the Ex area	**490**

Process fieldbus

Field connection boxes

Type	**FB-9-SS**	**FB-15-SS**	**FB-8-AL**	**FB-15-AL**	
Description	Field connection boxes in stainless steel 9 ports	Field connection boxes in stainless steel 15 ports	Field connection boxes in aluminum 8 ports	Field connection boxes in aluminum 15 ports	
Page	**483**	**483**	**483**	**483**	

Device couplers for the field

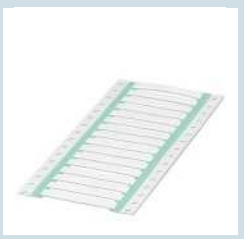
Type	**FB-ET**	**FB-2SP**	**FB-ISO**		
Description	Device coupler with TBUS for trunk connection and termination	Device coupler with TBUS for two spur connections	Device coupler with TBUS for an electrically isolated spur connection		
Page	**485**	**485**	**485**		

Power supply

Field diagnostics modules

Type	**FB-PS-PLUG-24DC/28DC/0.5/EX**	**FB-PS-BASE/EX**	**FB-PS-25/0.36A**	**FB-DIAG/FF/LI**	**FB-DIAG/FF/NC**
Description	Power supply plug	Power supply base	1-channel power supply	Field diagnostics module with connection for FF power supply and/or block coupler applications	Field diagnostics module for device coupler with TBUS
Page	**487**	**487**	**487**	**488**	**488**

Accessories

					
Type	**S-PT-EX-24DC PT ...**	**ME 22,5 TBUS 1,5/5-ST-3,81 GN**	**CLIPFIX 35 E-ME TBUS... / UT 2,5**	**WMS 9,5 (30X16)R UC-TM...16**	
Description	Double wire protection for floating signal circuits	TBUS plug	Terminals and terminal blocks	Marking materials	
Page	**489**	**489**	**489**	**489**	

I/Os for the Ex area

	Power	Digital I/O	Analog I/O	Temperature
Type	**IB IL EX-IS PWR IN-PAC**	**IB IL EX-IS DIO 4/NAM-PAC**	**IB IL EX-IS AIO 4/EF-PAC**	**IB IL EX-IS TEMP 4 RTD/TC-PAC**
Description	Intrinsically safe power supply terminal (Ex i)	Intrinsically safe digital I/O terminal (Ex i)	Intrinsically safe analog I/O terminal (Ex i)	Intrinsically safe temperature input terminal (Ex i)
Page	**490**	**491**	**492**	**493**

Wireless data communication

Type	**RAD-WHG/WLAN-XD**	**RAD-WHA-1/2NPT**	**RAD-...-IFS**	**RAD-ISM-900-EN-BD...**
Description	WirelessHART gateway	WirelessHART adapter	Radioline wireless modules 2.4 GHz and 900 MHz with I/O extension modules	RAD-Line Ethernet - with Trusted Wireless (900 MHz)
		See section: industrial communication technology		
Page	**458**	**459**	**451**	**470**

Surge protection

Isolating amplifiers

Type	**MCR-PLUGTRAB PT LINETRAB LIT**	**TERMITRAB**	**SURGETRAB**	**MACX Analog Ex**	**MCR-FL-(HT-)T(S)-(LP-)I-EX**
Description	Surge protection for Ex i circuits	Modular terminal blocks (intrinsically safe) with multi-stage surge protection	Surge protection field devices directly in the sensor head (intrinsically safe)	Ex-i isolating amplifiers with functional safety	Ex i 2-wire field devices
	Surge protection for measurement and control technology			**Measurement and control technology**	
Page	**See Catalog 6**			**See Catalog 7**	

The FB… line of modular fieldbus components offers connectivity from the process controller to the field devices. Together with redundant bulk power, surge protection, and cabling cordsets, a complete connection architecture is provided.

The line includes device couplers for use with both FOUNDATION Fieldbus and PROFIBUS PA. These couplers provide short-circuit protection to ensure that a fault on a spur does not disrupt the entire segment. They also offer energy limited outputs, intrinsic safety, and electrical isolation.

Also available are redundant and simplex power supplies. Each electrically isolated supply provides power while allowing digital communications to one segment. Passive power conditioning allows for high reliability, and high efficiency eliminates derating in any mounting configuration.

Field junction boxes provide a ready to install solution. These boxes, in either stainless steel or aluminum, are specifically designed to accommodate the modular device couplers and ease wiring considerations.

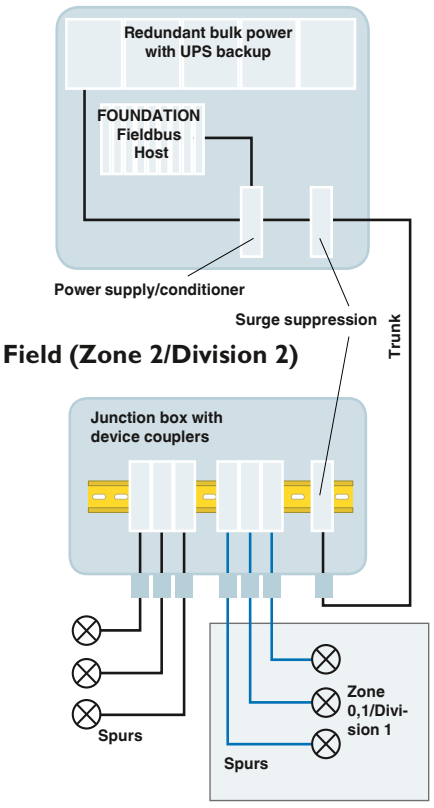
Based on the T-bus connection system, the field components are hot-swappable and allow easy system expansion. Single-loop-integrity can be achieved by connection of a single module to a single instrument. With the limited width on the rail, the size and weight of the associated field enclosure is minimized.

The FB… line was designed specifically to meet the tough requirements of the process environment. This includes various approvals for installation in Zone 2 or Division 2 hazardous locations.

All components include built-in status LEDs. Integrated terminators in the power supplies, together with a connector-mounted version in the field, reduce the opportunity for segment termination error.

Typical FOUNDATION Fieldbus H1-Segment

Control Cabinet



Field connection boxes

- Designed specifically for field device coupler systems
- Includes trunk module FB-ET and allows installation of additional couplers and PT plug
- Bus bar and shield clamps
- Entries for trunk in, out, and breather connections
- Each enclosure is equipped with M20 ports and can be configured as desired
- Cable glands, plugs, and breather ordered separately

Stainless steel enclosure

Aluminum enclosure

Technical data

General data		FB-9-SS	FB-15-SS
Housing material		Stainless steel, 316L, electropolished	
DIN rail, material		NS35, galvanized, passivated	
Weight		3500 g	4680 g
Dimensions	W / H / D	235 mm / 260 mm / 121 mm	325 mm / 300 mm / 121 mm
Mounting position		Vertical	
Degree of protection		IP66 / NEMA 4X	
Ambient temperature (operation)		-40 °C ... 85 °C	
Conformance / approvals			
ATEX		II 2 G/2 D	

Technical data

General data		FB-8-AL	FB-15-AL
Housing material		Aluminum, die-cast, corrosion resistant, powder-coated	
DIN rail, material		NS35, galvanized, passivated	
Weight		3220 g	4140 g
Dimensions	W / H / D	202 mm / 232 mm / 111 mm	330 mm / 230 mm / 111 mm
Mounting position		Vertical	
Degree of protection		IP66 / NEMA 4X	
Ambient temperature (operation)		-40 °C ... 85 °C	
Conformance / approvals			
ATEX		II 2 G/2 D	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Enclosure, stainless steel			
- 9 ports	**FB-9-SS**	**2316213**	1
- 15 ports	**FB-15-SS**	**2316190**	1
Enclosure, aluminum			
- 8 ports			
- 15 ports			

Ordering data

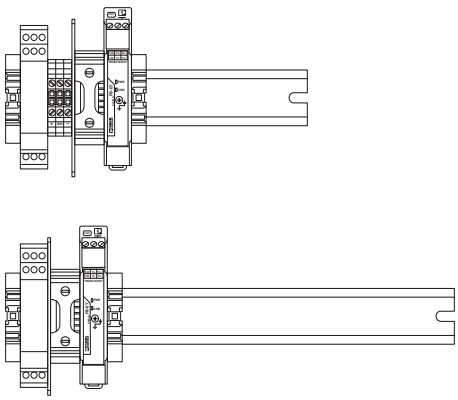
Type	Order No.	Pcs. / Pkt.
FB-8-AL	**2316200**	1
FB-15-AL	**2316187**	1

Accessories

	Type	Order No.	Pcs. / Pkt.
Cable gland, M20, includes nut	**FB-M-KV-M20-EX**	**2900197**	1
Stopping plug, M20, includes nut	**FB-M-BS-M20-EX**	**2900209**	10
Breather plug, M20, includes nut	**FB-M-BD-M20-EX**	**2901859**	1

Accessories

Type	Order No.	Pcs. / Pkt.
FB-M-KV-M20-EX	**2900197**	1
FB-M-BS-M20-EX	**2900209**	10
FB-M-BD-M20-EX	**2901859**	1



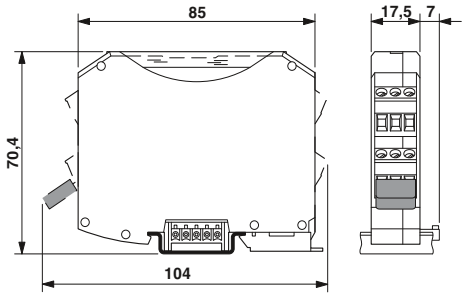
DIN rail components, small enclosure vs. large enclosure

The fieldbus device couplers are suitable for FOUNDATION Fieldbus and PROFIBUS PA. They provide an interface between the fieldbus trunk line and field devices. The compact width on the DIN rail reduces the required dimensions and weight of the field housing.

FB-ET
- Connects to the trunk and provides voltage limiting
- Includes a pre-installed external terminator, ensuring termination is always available
- A selector switch is provided to select the correct shield/ground connection
- Diagnostic LEDs include DC OK, low voltage warning, and communication on the segment. External terminator includes a connection LED

FB-2SP and FB-ISO
- Couple field devices and provide short-circuit current limiting with a user-selectable setpoint
- Voltage and communication are routed via the ME 17,5 TBUS… connectors installed on the DIN rail
- Provide non-incendive, FISCO ic and FNICO spur connections
- Hot-swappable and scalable
- Single-sided connector configuration simplifies wiring in field housing
- Can be installed together in the same field housing
- Diagnostic LEDs indicate DC OK and errors at the spur connection

FB-ISO only
- Comprehensive channel-to-channel electrical isolation
- Provides an intrinsically safe, FISCO connection
- Single-loop integrity is achieved by the connection of a single FB-ISO coupler to a single device. With dedicated circuitry for each device, the redundancy achieved by the segment power supply is not compromised



Supply	
Supply voltage range	
Rated current	
Nominal current consumption	
Fieldbus interface	
Rated voltage	
Rated current	
Electrical isolation	
Termination resistor	
Surge protection	
General data	
Screw connection solid/stranded/AWG	
Dimensions	W / H / D
Weight	
Degree of protection	
Ambient temperature (operation)	
Max. permissible relative humidity (operation)	
Conformance / approvals	
Conformance	
NE	
ATEX	
IECEx	
CSA, USA/Canada	
Fieldbus Foundation	

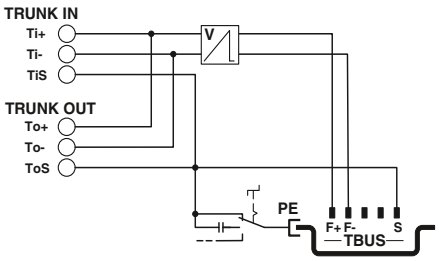
Description
Device coupler, for FOUNDATION Fieldbus and PROFIBUS PA

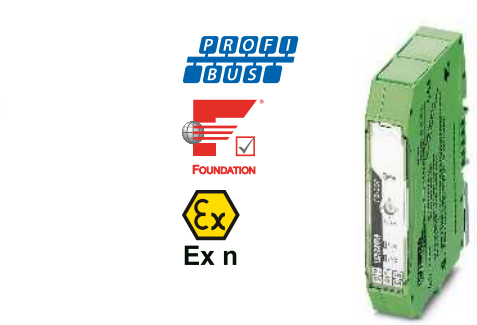
Device coupler with TBUS for trunk line connection and termination

Ex:

Technical data	
10.3 V DC ... 32 V DC (input on trunk line side)	
≤ 1 A (trunk line input side to TBUS)	
8 mA (without termination resistor)	
-	
-	
-	
100 Ω, external removable connector included Active if voltage exceeds 39 V (typ.) or 41 V (max.)	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12 17.5 mm / 99.1 mm / 70.4 mm 66 g IP20 -40 °C ... 85 °C	
95% (no condensation)	
CE-compliant, additionally EN 61326 NAMUR NE 21 Ex II 3 G Ex nA IIC T4 Gc	
Ex nA IIC T4 Gc	
Class I, Zone 2, AEx nA IIC T4 Class I, Division 2, Groups A,B,C,D FF-846	

Ordering data		
Type	Order No.	Pcs. / Pkt.
FB-ET	2316048	1



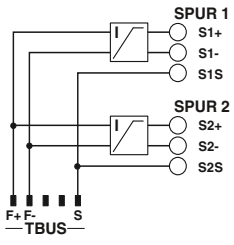


Device coupler with TBUS for 2 spurs

Ex:

Technical data	
10.3 V DC ... 32 V DC (input on trunk line side)	
-	
6 mA	
≤ 32 V (each spur)	
15 mA (each spur, adjustable via selector switch, -40…85°C) 25 mA (each spur, adjustable via selector switch, -40…80°C) 35 mA (each spur, adjustable via selector switch, -40…75°C) 45 mA (each spur, adjustable via selector switch, -40…70°C)	
-	
-	
-	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12 17.5 mm / 89.7 mm / 70.4 mm 64 g IP20 -40 °C ... 85 °C (depending on set rated current)	
95% (no condensation)	
CE-compliant, additionally EN 61326 NAMUR NE 21 Ex II 3(3) G Ex nA [nL Gc] IIB T4 Gc, FNICO spurs Ex II 3(3) G Ex nA [ic Gc] IIB T4 Gc, FISCO ic spurs	
Ex nA [nL Gc] IIB T4 Gc, FNICO spurs Ex nA [ic Gc] IIB T4 Gc, FISCO ic spurs	
Class I, Zone 2, AEx nA[nL] IIB T4 Class I, Division 2, Groups C, D FF-846	

Ordering data		
Type	Order No.	Pcs. / Pkt.
FB-2SP	2316051	1

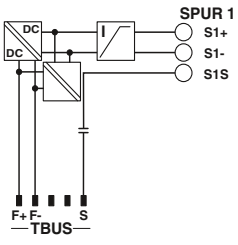


Device coupler with TBUS for 1 electrically isolated spur connection

Applied for:
ATEX

Technical data	
17 V DC ... 32 V DC (input on trunk line side)	
-	
10 mA	
≥ 10 V (each spur)	
15 mA (each spur, adjustable via selector switch) 25 mA (each spur, adjustable via selector switch) 35 mA (each spur, adjustable via selector switch)	
500 V AC (between input and output, routine test)	
-	
-	
0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12 17.5 mm / 89.7 mm / 70.4 mm 96 g IP20 -40 °C ... 70 °C	
95% (no condensation)	
CE-compliant, additionally EN 61326 NAMUR NE 21 Ex II 3(3) G Ex nA [nL Gc] IIC T4 Gc, FNICO power supply (spur) Ex II 3(1) GD Ex nA [ia Ga Da] IIC T4 Gc, FISCO power supply (spur)	
Ex nA [nL Gc] IIC T4 Gc, FNICO power supply (spur) Ex nA [ia Ga Da] IIC T4 Gc, FISCO power supply (spur)	
CSA applied for	
-	

Ordering data		
Type	Order No.	Pcs. / Pkt.
FB-ISO	2316064	1



Each DIN rail-mounted fieldbus power supply provides high-integrity power for one H1 segment. Built-in output impedance allows digital communication and DC power to co-exist on a pair of wires.

– Electrically isolated
– Integrated termination resistor
– Passive filtering allows for low heat dissipation and long service life
– Plug-in connectors and local diagnostic LEDs permit easy installation and troubleshooting

FB-PS… modular redundant power supply

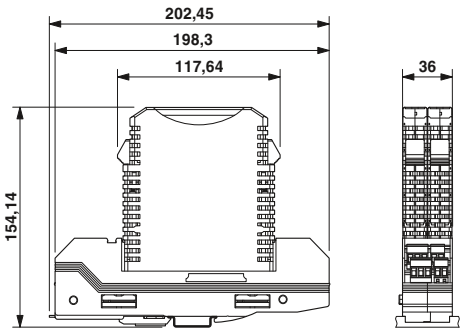
– Modular base, one per segment, eliminates unused capacity
– Swappable bases for increased plant integrity
– Compact width optimizes critical enclosure space
– Redundant power modules, with common conditioning in the base, provide maximum system performance and reliability
– Quick-latch modules and base
– Preventative function monitoring: self diagnostics with output relay integrated in each power module. Eliminates need for separate diagnostics and contact module
– Dedicated relay connection per base
– Bussable power and relay through plug-in side-base connectors
– Redundant host connections to common segment
– Redundant bult power connections feed each power module separately
– Auto Current Balance technology enhances product life by closely sharing power between modules
– High efficiency including MOSFET outputs

FB-PS… simplex power supply

– Connections for redundant bulk power
– Power is bussed to the power supply through the TBUS
– No space required between modules to optimize enclosure size

Notes:

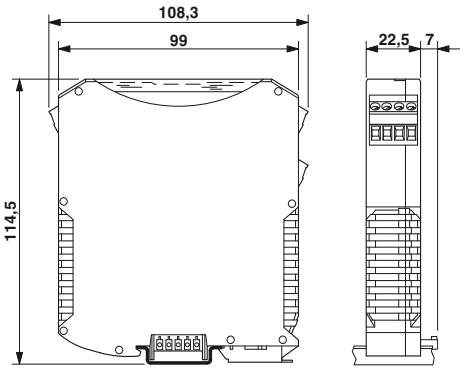
1) EMC: Class A product, see page 553



Input data	
DC input voltage range	
Nominal current range	
Output data	
Output voltage range	
Output current	
Can be connected in parallel / series	
Max. power dissipation	
Signaling	
Signaling DC OK	
Signaling alarm	
Signaling overload	
Redundancy indication OK	
General data	
Weight / Dimensions W x H x D	
Degree of protection / protection class	
Ambient temperature (operation)	
Ambient temperature (storage/transport)	
Max. permissible relative humidity (operation)	
Conformance / approvals	
ATEX	
UL, USA / Canada	
	NE
	EN
	Fieldbus Foundation

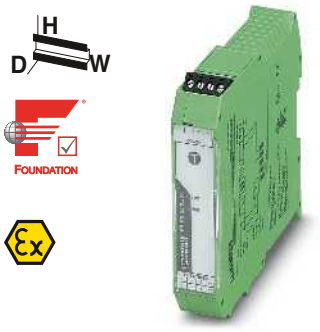
Description
Power supply, modular redundant
- Plug, 28 V DC, 500 mA
- Base
Power supply, simplex, with built-in 100 Ω termination
- 25 V DC, 360 mA

PCB connector, 5.0 mm pitch, color: black
PCB connector, 3.5 mm pitch, color: green
End cap



Power supply plug

Power supply base



Simplex power supply

Technical data		
18.5 V DC ... 30.5 V DC	- ... 30.5 V DC	19.2 V DC ... 35 V DC
700 mA ... 1100 mA	-	340 mA ... 630 mA
27 V DC ... 30 V DC (on the trunk)	-	25 V DC ... 27 V DC (on the trunk)
500 mA	-	360 mA
Yes / No	- / -	- / -
4 W (typical)	-	2 W (typical)
Green LED	-	Green LED
Yellow LED	-	-
-	-	Red LED
Green LED	-	-
181 g / 17.5 x 117.6 x 115 mm	259 g / 36 x 202.5 x 61.5 mm	210 g / 22.5 x 114.5 x 108.3 mm
IP20 / -	IP20 / -	IP20 / -
-40 °C ... 60 °C	-40 °C ... 70 °C	-40 °C ... 60 °C
-40 °C ... 85 °C	-40 °C ... 85 °C	-40 °C ... 85 °C
95% (no condensation)	95% (no condensation)	95% (no condensation)
-	-	Ⓔx II 3 G Ex nA II T4 X
-	-	Class I, Zone 2, Group IIC T4
		Class I, Div. 2, Groups A, B, C, D, T4
NAMUR NE 21	NAMUR NE 21	NAMUR NE 21
EN 61326	EN 61326	EN 61326, EN 60068-2-27, EN 60068-2-6
FF-831	FF-831	FF-831

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
FB-PS-PLUG-24DC/28DC/0.5/EX	**2316132**	1

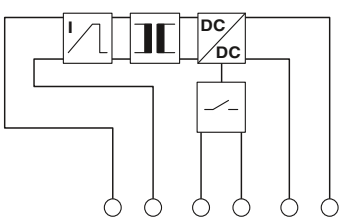
Ordering data		
Type	**Order No.**	Pcs. / Pkt.
FB-PS-BASE/EX[1])	**2316145**	1

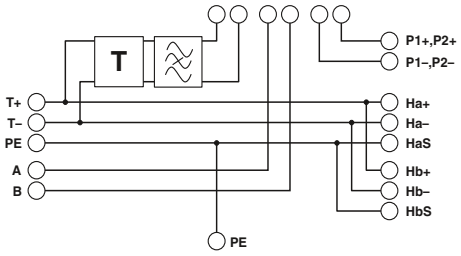
Ordering data		
Type	**Order No.**	Pcs. / Pkt.
FB-PS-25/0.36A	**2316035**	1

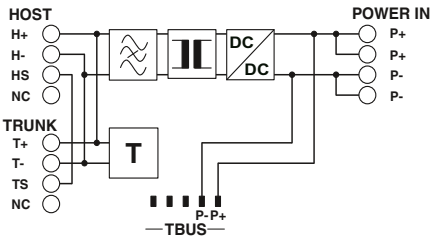
Accessories		

Accessories		
ZEC 1,5/ 4-LPV-5,0 C2,4 BK	**1793260**	50
ZEC 1,0/ 6-LPV-3,5 C1	**1915699**	50
D-FB-PS	**2316226**	10

Accessories		







Field diagnostic modules for FOUNDATION Fieldbus

- Reads physical layer diagnostics in the field
- Segment voltage, noise, and signal can be monitored
- Easy control system integration with DD and EDDL
- Adjustable alarm condition thresholds allow for precision monitoring and trending
- Diagnostics data for up to 24 field devices
- Two module types for easy integration across all system platforms

N

With terminal block for FF power supply and/or block coupler applications

N

For modular device couplers mounted on TBUS

	Technical data	Technical data
Supply		
Supply voltage range	9 V DC ... 32 V DC	9 V DC ... 32 V DC
Nominal current consumption	27 mA	27 mA
Fieldbus interface		
Rated voltage	≤ 32 V	≤ 32 V
Rated current	29 mA	29 mA
General data		
Screw connection solid/stranded/AWG	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12	0.2 - 2.5 mm² / 0.2 - 2.5 mm² / 24 - 12
Dimensions W / H / D	17.5 mm / 91.7 mm / 70.4 mm	17.5 mm / 85 mm / 70.4 mm
Weight	65.2 g	63.8 g
Degree of protection	IP20	IP20
Ambient temperature (operation)	-40 °C ... 85 °C	-40 °C ... 85 °C
Max. permissible relative humidity (operation)	95% (no condensation)	95% (no condensation)
Conformance / approvals		
Fieldbus Foundation	FF-830	FF-830

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Field diagnostic module, for FOUNDATION Fieldbus	**FB-DIAG/FF/LI**	**2316284**	1	**FB-DIAG/FF/NC**	**2316297**	1

Accessories

- Surge protection in input
- The ME 22.5 TBUS DIN rail connector bridges input power between several simplex power supplies (FB-PS-25/0.36A).
- Note: the modular device couplers already include the required ME 17.5 TBUS connector, so a separate order is not necessary.

Double conductor protection for floating signal circuits

TBUS connector

Description	Ordering data			Ordering data		
	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
SURGETRAB protective adapter for installation on measuring sensors for Ex protection zones Outer thread: M20 x 1.5	**S-PT-EX-24DC**	**2800034**	1			
PLUGTRAB, plug-in surge protection for FOUNDATION Fieldbus						
Protective plug	**PT 2X2-FF-ST**	**2800755**	10			
Base element with bridge between 3/4 (⏚) and 9/10	**PT 4-BE**	**2839402**	10			
Base element with gas-filled surge arrester between 3/4 (⏚) and 9/10	**PT 4+F-BE**	**2839415**	10			
DIN rail connector				**ME 22,5 TBUS 1,5/ 5-ST-3,81 GN**	**2707437**	50

Accessories

- End clamp, ground and shield clamps (CLIPLINE)
- Terminal block bases that can be lined up next to each other in order to set up any number of positions
- Marking material

Clamps and terminal blocks

Marking materials

Description	Color	Ordering data			Ordering data		
		Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
End clamp, to snap on NS 35, 9.5 mm wide, can be labeled with ZB 6, ZB 8/27, KLM...	gray	**CLIPFIX 35** **E/ME TBUS NS35 GY**	**3022218** **2713780**	50 50			
Terminal block, for mounting on NS 35...	gray	**UT 2,5**	**3044076**	50			
Cover, width 2.2 mm	gray	**D-UT 2,5/10**	**3047028**	50			
Shrink sleeve, for conductor diameters 3.2 - 9.5 mm 1 roll = 500 markers, each 30 mm long	white				**WMS 9,5 (30X16)R**	**0800377**	1
UniCard sheets, for labeling of terminal blocks with a zack marker strip groove, 32-section, can be labeled with the BLUEMARK and CMS–P1–PLOTTER	white				**UC-TM 16**	**0819217**	10
UniCard materials, for labeling terminal blocks with a flat marker groove, 32-section, can be labeled with BLUEMARK and CMS–P1–PLOTTER	white				**UC-TMF 16**	**0819262**	10

Power supply for intrinsically safe I/O terminals

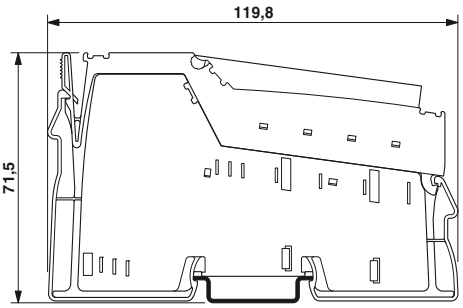
The Inline **IB IL EX-IS PWR IN-PAC** terminal allows the implementation of intrinsically safe I/O modules in the modular Inline I/O system. Intrinsically safe (blue) I/O terminals can only operate with the specific voltage levels provided by the IL EX-IS PWR IN-PAC terminal.

Features

- Provides electrical isolation between standard Inline I/O station and intrinsically safe I/O terminals
- Diagnostic LEDs (standard load, heavy load, overload) provide immediate user feedback regarding the loading
- Design incorporates required 50 mm spacing between intrinsically safe and non-intrinsically safe connections
- Electronically protected against overload
- 1000 mA for logic circuit supply (U_L)
- 1000 mA for I/O circuit supply (U_{EX})

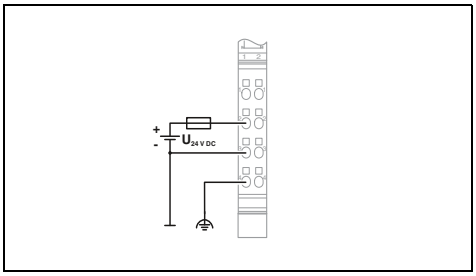
Notes:

1) EMC: Class A product, see page 553



Power terminal

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply for main circuit U_{Ex}	28 V DC ±5%
Power supply at U_{Ex}	1000 mA (max.)
Communications power U_L	5 V DC (via voltage jumper)
Power supply at U_L	1000 mA (max.)
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	292 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline power terminal for intrinsically safe terminals, complete with accessories (connector and marking field)	**IB IL EX-IS PWR IN-PAC[1])**	**2869910**	1

Intinsically safe digital I/O terminal (Ex-i)

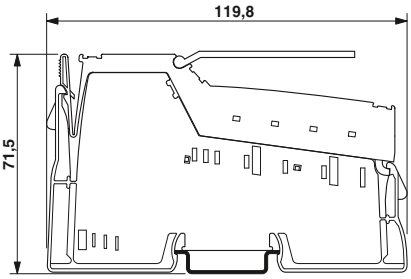
The **IB IL EX-IS DIO 4/NAM-PAC** terminal allows connection of intrinsically safe sensors/actuators as well as NAMUR sensors located in Zone 1 or Zone 0 Ex areas. The terminal has 4 channels that can be configured as either an input or output.

LEDs indicate the channel status, such as:
– Configuration (input or output)
– Activation (ON/OFF)
– Error (short-circuit, etc.)
– Logic state (high or low)

NAMUR sensor parameters can be read and transmitted as process data through the fieldbus network to the master.

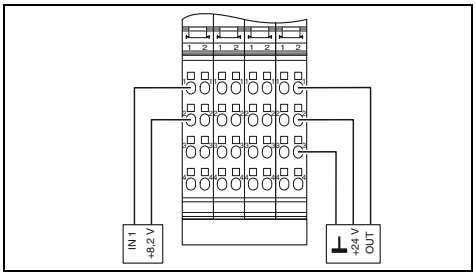
Features
– 4 configurable I/O channels
– NAMUR sensor support (EN 60947-5-6).
– Individual channel diagnostics
– 8.2 V sensor power supply.

Notes:
1) EMC: Class A product, see page 553



4 selectable channels, input (also NAMUR) or output

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply for main circuit U_{Ex}	28 V DC
Current consumption from U_{Ex}	max. 190 mA
Communications power U_L	5 V DC (via voltage jumper)
Current consumption from U_L	max. 50 mA
Digital inputs	
Connection technology	2-wire
Maximum number of inputs	4
Description of the inputs	Can be configured as input or output
Input circuit	Floating contacts and 2-wire NAMUR proximity sensor (EN 60947-5-6)
Protective circuit	Polarity protection, surge protection
Digital outputs	
Connection technology	3-wire
Maximum number of outputs	4
Description of the outputs	Digital passive output
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	204 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline digital I/O terminal, Ex-i, complete with accessories (connector and marking field)			
4-channel DIO	**IB IL EX-IS DIO 4/NAM-PAC**[1])	**2869911**	1

Intrinsically safe analog I/O terminal (Ex-i)

The **IB IL EX-IS AIO 4/EF-PAC** terminal allows connection of intrinsically safe analog sensors and actuators located in Ex areas like Zone 1 or Zone 0.
The terminal has 4 channels that can be configured as either an input or output.

All parameters can be read and transmitted using FDT technology across the fieldbus network to the master.

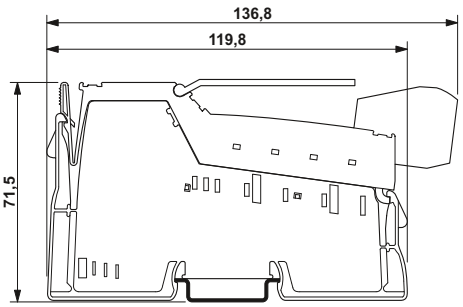
LEDs indicate the channel status, such as:
– Configuration (input or output)
– Activation (ON/OFF)
– Error (short-circuit, etc.)

Features:

– 4 configurable I/O channels
– Input: 0… 10 V ; 0/4… 20 mA
– Output: 0/4… 20 mA
– Optional passive output
– Module-based electrical isolation
– Individual channel diagnostics

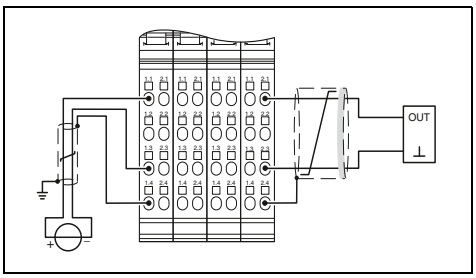
Notes:

1) EMC: Class A product, see page 553



4 selectable channels, input or output

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply for main circuit U_{Ex}	28 V DC
Current consumption from U_{Ex}	max. 187 mA
Communications power U_L	5 V DC (via voltage jumper)
Current consumption from U_L	max. 50 mA
Analog inputs	
Connection method	Inline shield connector
Connection technology	2, 3-wire
Number of inputs	4
Voltage input signal	0 V ... 10 V
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA
Analog outputs	
Connection method	Inline shield connector
Connection technology	2-wire
Number of outputs	4 (can be configured as input or output)
Current output signal	0 mA ... 20 mA / 4 mA ... 20 mA
Protective circuit	Polarity protection, surge protection
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	222 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline analog I/O terminal, Ex-i, complete with accessories (plug connector and marking field)			
4-channel AIO	**IB IL EX-IS AIO 4/EF-PAC[1])**	**2869912**	1

Intrinsically safe temperature input terminal (Ex-i)

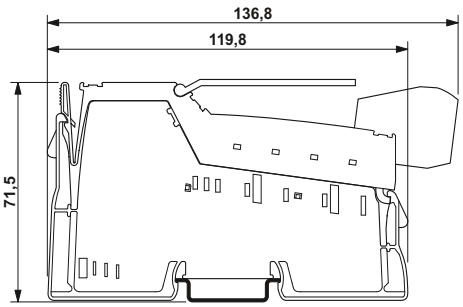
The **IB IL EX-IS TEMP 4 RTD/TCPAC** terminal allows connection of resistance temperature detectors (RTD) and thermocouples (TC) located in zone 1 or zone 0 Ex areas. The terminal has 4 channels that can be configured for either an RTD or TC sensor.

All parameters can be read and transmitted using FDT technology across the fieldbus network to the master.

LEDs indicate the channel status, such as:
– Configuration (RTD or TC)
– Activation (ON/OFF)
– Error (open circuit, etc.)

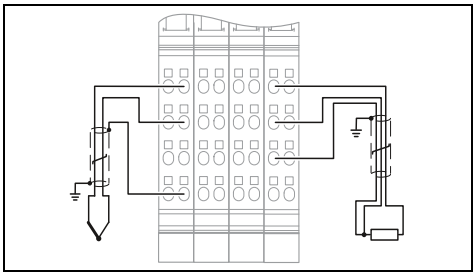
Features:
– 4 configurable I/O channels
– RTD inputs: PT100, etc.
– TC inputs: J, K, E, etc.
– 2 or 3-wire RTD sensors
– Module-based electrical isolation
– Individual channel diagnostics

Notes:
1) EMC: Class A product, see page 553



4 selectable inputs, RTD or TC

Ex:



Technical data

Local bus interface	
Connection method	Inline data jumper
Power supply for module electronics	
Supply for main circuit U_{Ex}	28 V DC
Current consumption from U_{Ex}	max. 80 mA
Communications power U_L	5 V DC (via voltage jumper)
Current consumption from U_L	max. 50 mA
Analog inputs	
Connection method	Inline shield connector
Connection technology	2, 3-wire
Number of inputs	4
Linear resistance measuring range	0 Ω ... 800 Ω / 0 Ω ... 5000 Ω
Sensor types (RTD) that can be used	2 and 3-wire, Pt, Ni (DIN 100, 200, 500, 1000)
Sensor types that can be used (TC)	J, K, E, R, S, T
Measured value resolution	16 bit (15 bit + sign bit)
Data formats	IB IL, S7-compatible
Protective circuit	Polarity protection, surge protection
General data	
Connection method	Spring-cage connection
Connection data solid/stranded/AWG	0.08 ... 1.5 mm² / 0.08 ... 1.5 mm² / 28 - 16
Weight	222 g
Width	48.8 mm
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline analog input terminal, Ex-i, complete with accessories (connector and marking field)			
4-channel temperature input	**IB IL EX-IS TEMP 4 RTD/TC-PAC[1])**	**2869913**	1

PC WORX
PLC Programming
PHOENIX CONTACT
INSPIRING INNOVATIONS
VISU+
SCADA Visualization
WEB VISIT
Web Visualization
CONFIG+
Network Configuration
Device
AX OPC SERVER
Communication Interface
RESY+
Remote Control

Software

Software is the key to more efficient automation. Phoenix Contact offers software from configuration to system operation – intelligent solutions that guide you through every stage of the value added chain of your automation solution. All products interact perfectly and impress with their innovative functions and intuitive, user-friendly operation. In addition, a wide range of ready-to-use block libraries is also available.

Programming
Software products for programming, from clear tasks with compact controllers to complex system automation with high-end PLCs.

Visualization
Intelligent tools for designing operation and monitoring interfaces – in the control room or directly in the machine.

Drivers and interfaces
Everything you need to connect additional systems to your automation solution.

Configuration, monitoring, diagnostics
Software tools for fast startup, constant monitoring, and reliable diagnostics.

Planning and configuration
Expert support with the planning and configuration of technical components. So that everything works together perfectly.

Remote control
Flexible solutions for controlling distributed automation units.

Device parameterization
Central and efficient – parameterize your field devices from the comfort of your PC.

System simulation
Startup and testing made easy – in a completely virtual environment.

Marking software
Software tools for efficient marking – even in series production.

Product overview	**496**
Programming	
PC Worx EXPRESS/PC Worx	**499**
Function blocks/libraries	**501**
nanoNavigator	**502**
Visualization	
WebVisit	**503**
Visu+	**505**
Drivers and interfaces	
OPC/ODP server	**506**
Configuration, monitoring, diagnostics	
Config+	**509**
Diag+	**511**
Device parameterization	
Startup+	**512**
AutomationXplorer+	**513**
Planning and configuration	
Project+	**514**
Remote control	
Portico	**515**
Resy+	**501**

Programming

	PC Worx	Steeplechase VLC	Function blocks	nanoNavigator	SAFETYPROG
Type	**PC Worx ...**	**VLC- ... -P/USB**	**...**	**NLC-NAV-...**	**SAFETYPROG ...**
Description	Software package for Phoenix Contact controllers programmed according to IEC 61131	Development environment with flowchart programming and hardware key	Function and industry-specific software and drivers	Programming software for the Nanoline product range	Programming software for INTERBUS-Safety systems and PROFIsafe controllers **See section: Functional safety**
Page	**499**	**www.phoenixcontact.net/products**	**501**	**502**	**111**

Visualization

Drivers and interfaces

	WebVisit	Visu+	OPC server	ODP server	SNMP OPC ...
Type	**WEBVISIT ...**	**VISU+ 2 ...**	**... OPC SERVER**	**AX ODP SERVER ... FU**	**FL SNMP OPC SERVER V3 FL SNMP OPC AGENT V3**
Description	Development software for web-based visualizations	SCADA visualization, development and runtime licenses	Communication interface for OPC-compatible visualizations	ODP communication interface for OPC-compatible visualizations	Monitoring/configuration of SNMP-compatible devices in HMI and SCADA systems / integration of OPC-based solutions in management systems
Page	**503**	**505**	**506**	**507**	**507**

Configuration, monitoring, diagnostics

	Config+	Diag+	Diag+ NetScan	FL VIEW
Type	**CONFIG+ ...**	**DIAG+ ...**	**DIAG+ NETSCAN ...**	**FL VIEW**
Description	Tool for fieldbus and network configuration	Diagnostics software for INTERBUS, PROFINET, and Ethernet networks	Diagnostics software for cyclic INTERBUS diagnostics	Network diagnostics software **See section: Ethernet networks**
Page	**509**	**511**	**511**	**44**

Device parameterization

	Startup+	AutomationXplorer+	SAFECONF	MGUARD DM
Type	**STARTUP+**	**AX+ BASIC**		**FL MGUARD DM ...**
Description	Software for starting up and parameterizing Axioline I/O stations	FDT application for device parameterization	Configuration software for SafetyBridge modules **See section: Functional safety**	Central management software for FL MGUARD devices **See section: Ethernet networks**
Page	**512**	**513**	**110**	**45**

Planning and configuration

	Project+	FL WST BASIC
Type	**PROJECT+**	**FL WST BASIC**
Description	Software for planning the I/O configuration	Simulation software for planning wireless systems in industrial environments **See section: industrial communication technology**
Page	**514**	**59**

Marking

	CLIP PROJECT
Type	**CLIP PROJECT ...**
Description	**See Catalog 3,** **Section: Marking**
Page	

Remote control

	Portico	Resy+
Type	**VL PORTICO SERVER ...**	**RESY+ ...**
Description	Remote control of networked IPCs	Function blocks for extending standard control and I/O components with remote control protocols
Page	**515**	**501**

System simulation

	Software	Hardware
Type	**WINMOD AX ...**	**IB EMULATOR**
Description	WinMOD system software including INTERBUS/PROFINET IO simulation software	Required in order to simulate INTERBUS configurations with the WinMOD software
Page	**www.phoenixcontact.net/products**	

PC Worx and PC WORX EXPRESS

Programming with PC Worx

PC Worx is the consistent engineering software for all controllers from Phoenix Contact. It combines programming according to IEC 61131, fieldbus configuration, and system diagnostics – in a single software solution. This provides optimum interaction between hardware and software.

The PC Worx engineering tool can be used in all areas of industry. From the outset the software has been developed and optimized as a uniform and user-friendly engineering environment for all controller classes.

The software includes all the programming languages defined in IEC 61131-3:
– Instruction List (IL)
– Function Block Diagram (FBD)
– Ladder Diagram (LD)
– Sequential Function Chart (SFC)
– Structured text (ST)

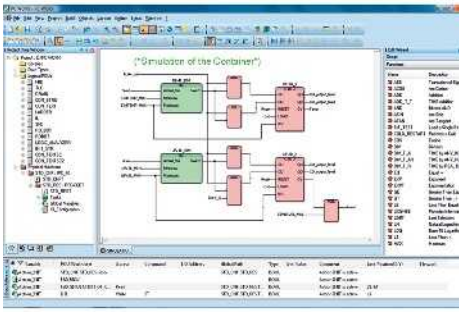
Efficient programming

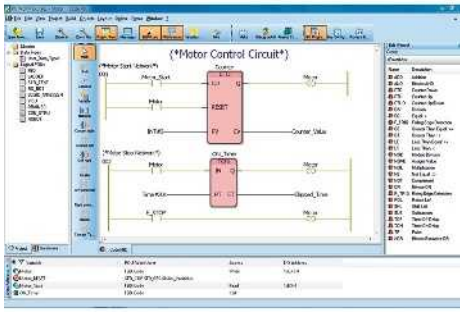
The PC Worx interface can be customized to your individual requirements with clearly arranged workspaces and toolbars. The basic languages of IEC 61131 (LD, FBD, and IL) can be directly and freely cross compiled. Structured text can be converted into any of the three basic languages.

All editors use assistants, which support and monitor the addition of data types, function blocks, operators, and variable declarations for quicker and more user-friendly editing. For text editors, another assistant is available for keywords and their command structures.

Startup and maintenance

During controller operation, the following functions round off IEC 61131 programming:
– Cross-references for editing
– Online and offline program comparison by all IEC editors and configuration data
– Startup functions
– Debug functions such as:
  - Logic analysis in realtime
  - Breakpoints
  - Address debugging
  - Step-by-step mode
  - Overwriting and forcing of variables





In order to test the program code, there is a powerful simulation tool for all INTEL®-compatible controllers. This shortens the startup times of the real system.

All data configured in PC Worx can be easily reused for visualization purposes via standard interfaces such as the AX OPC server or an integrated web server. The OPC and web server variables are selected by clicking with the mouse.

Worldwide use assured

You can switch between numerous languages in the interface. Program comments can be exported and imported for translation. You can therefore save projects together with their comments in various languages.

Integrated password handling supports various protection models, such as saving the project, protecting individual POUs (program organization units) against write or read access (expertise protection) or disabling actions such as controller start/stop.

I/O configuration

Network structures such as PROFINET, INTERBUS, PROFIBUS, and Modbus/TCP can be configured in PC Worx via an integrated bus configurator. A device catalog lists all components in clear groupings ; the components can be applied in the hardware configuration using drag & drop.

In connection view, the program variables are connected to the inputs and outputs of the network components. The variables are addressed automatically.

Diagnostics

The integrated Diag+ diagnostics tool is used to handle the diagnostics of all system components in the INTERBUS and PROFINET network. This tool enables precise error localization in the entire system.

Preventive diagnostic functions such as monitoring the transmission quality of fiber optic paths in INTERBUS systems increase system availability. Diagnostic data, causes of malfunctions, and solutions are displayed directly in plain text.

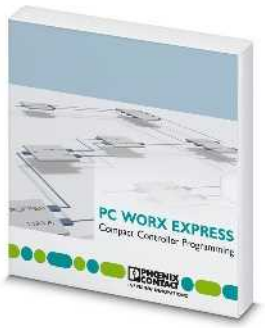
Programming environment for controller class 100

With PC Worx EXPRESS, Phoenix Contact provides a free engineering tool that can be used to easily program class 100 compact controllers. This is achieved, for example, thanks to an even clearer user interface.

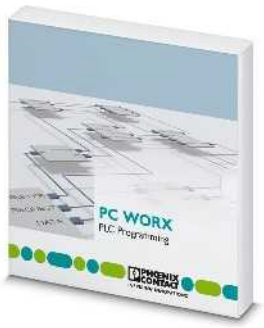
PC WORX EXPRESS offers numerous proven functions such as project creation, fast application development, plus easy download, monitoring, and startup of the PLC program. Intelligent automated functions such as the automatic insertion of program instances in the task or simplified variable handling speed up programming.

PC WORX EXPRESS can be downloaded free of charge:
www.phoenixcontact.net/products

If the application requires the advanced functions of PC Worx, the project created with PC WORX EXPRESS can be opened with the standard programming environment in order to transfer the created data to PC Worx - as a result no data is lost.



Free programming environment for the 100 series controller class



Software package for Phoenix Contact controllers programmed as per IEC 61131

	Technical data	Technical data
Hardware requirements		
CPU	Pentium 4/Celeron 1.6 GHz, minimum	Pentium 4/Celeron 1.6 GHz, minimum
Main memory (RAM)	min. 1 Gbyte (2 Gbyte for Windows Vista and Windows 7)	min. 1 Gbyte (2 Gbyte for Windows Vista and Windows 7)
Hard disk memory	min. 2 Gbyte	min. 2 Gbyte
Optical drive	DVD-ROM	DVD-ROM
Operating equipment	Keyboard, mouse	Keyboard, mouse
Monitor resolution	XGA (1024 x 768)	XGA (1024 x 768)
Software requirements		
Operating systems	MS Windows XP SP3, MS Windows Vista Business SP2, MS Windows 7 Professional (32/64-bit) SP1	MS Windows XP SP3, MS Windows Vista Business SP2, MS Windows 7 Professional (32/64-bit) SP1
Supported browsers	Internet Explorer Version 7 or later	Internet Explorer Version 7 or later
Basic functions		
	Configuring an automation system, parameterizing INTERBUS devices, operating INTERBUS, programming an automation system according to IEC 61131-3, communication according to IEC 61131-5	Planning an automation system, parameterizing the INTERBUS and PROFINET devices, operating INTERBUS and PROFINET, programming an automation system in acc. with IEC 61131-3. communication in acc. with IEC 61131-5
	IEC 61131 includes the following programming languages: - Function block diagram (FBD), - Ladder diagram (LD), - Structured text (ST)	IEC 61131 includes the following programming languages: -Instruction list (IL), -Function block diagram (FBD), -Ladder diagram (LD), -Structured text (ST), -Symbolic flowchart (SFC)
	Network configuration (functionality of Config+)	Add-on to IEC 61131: Fixed Format Ladder Editor (FFLD) and Machine Sequential Function Chart language MSFC (from the license PC Worx PRO LIC onwards)
	Network diagnostics (functionality of Diag+)	Network configuration (functionality of Config+)
	-	Network diagnostics (functionality of Diag+)
	128 kbytes of I/O data (mixed)	128 kbytes of I/O data (mixed) (full license)
Languages supported		
	German, English, French, Italian, Spanish, Chinese	German, English, French, Italian, Spanish, Chinese

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Free programming version without license mechanism **for controller class 100**, 128 Kbyte I/O data	**PC Worx EXPRESS**	**2988670**	1			
Demo software with Quick Start Guide, 16 byte input/output data, Diag+ limited to 5 devices				**PC Worx DEMO**	**2985725**	1
Basic license with 256 byte input/output data, without MSFC compiler				**PC Worx BASIC LIC**	**2985275**	1
Full license with 128 Kbyte input/output data, **with MSFC compiler included**				**PC Worx PRO LIC**	**2985385**	1
Low-cost upgrade of existing basic license to a full license				**PC Worx BASIC-PRO LIC**	**2985259**	1

Function blocks from Phoenix Contact can be used to integrate functions such as energy measurement or motor management quickly and easily in your system and so transform them into a fully-fledged part of your control system.

Block libraries – useful grouping of functions

Our function blocks are grouped by theme as libraries, e.g., for PC Worx and STEP 7, which are optimally tailored to the relevant development environment. Free blocks for parameterization, monitoring, and signal conditioning are available for connecting analog and digital I/O terminals. Blocks for function terminals contain control functions and communication options.

Technology blocks offer functions such as database access, network monitoring or ready-made applications for embedding the controller in its surroundings. Some of these blocks require a paid license, such as APPLIC A or PDPI, on the controller where the memory cards are located. All function blocks that require a license can also be used unrestricted for six hours without a license.

Your advantages:

– High quality for every application, thanks to documented and tested program parts
– Fast startup of I/O components and error-free configuration, thanks to specially adapted blocks
– Ready-made function blocks reduce programming effort and help prevent programming errors
– Function blocks even for complex applications such as controllers
– Unlimited communication, as network protocols can be accessed from the control program
– Easy infrastructure integration
– Maximum safety, thanks to the support and ongoing development of products by Phoenix Contact

Memory cards with and without license

Memory cards are used to configure the parameterization memory of controllers. You can choose between 512 MB or 2 GB for SD cards or between 256 MB and 2 GB for CF cards.

Furthermore, memory cards are also available in versions that come with a license ; these are indicated with the extension APPLIC A, PDPI BASIC or PDPI PRO. For blocks that require a license, use memory cards with the extension APPLIC A.

Control technology

The **ControlTechnology** library contains free function blocks and function blocks that require a license for control technology. For an overview of how to use the blocks, please refer to the documentation included in the library.

Network protocols

The blocks in the **IT** library support conventional protocols from the IT world. You can therefore integrate controllers into the IT environment for production and ensure consistent communication from field level to control level.

In addition, the library contains ready-made function blocks for the following protocols – as a client function:

– FTP (File Transfer Protocol)
– Dynamic Host Control Protocol (DHCP)
– Domain Name Service (DNS)
– Simple Network Time Protocol (SNTP)
– Simple Mail Transfer Protocol (SMTP)

IT security

The **IT-Security** library contains universal function blocks for protecting your data – when stored in a file system or while being transmitted in the network.

The integrity of data, i.e., the detection of corrupted data, can be ensured directly from the application thanks to the Secure Hash Algorithm (SHA). With the Keyed-Hash Message Authentication Code (HMAC) extension, SHA can also be used to authenticate your data.

In addition, you can protect data from being read without authorization using encryption methods such as the Advanced Encryption Standard (AES).

Network management

Here you'll find function blocks for all aspects of the Simple Network Management Protocol (SNMP). The SNMP library enables you to link your controllers to network management even deeper with SNMP Version v2c.

– The **SNMP Agent** block can be used to provide access to diagnostic messages, process values or control parameters from the control environment.
– The **SNMP Client** block enables access to the network components from the control program ; the controller can therefore request the status of a device or even change parameters.
– The **Trap Sender** block enables the controller to send event messages.
– To receive messages, use the **Trap Receiver** block.

The SNMP Agent, Trap Sender, and Trap Receiver blocks are also available for protocol Version 3. This means that you can also meet increased security requirements by authenticating or encrypting the user data that is to be transmitted.

Databases

The **SQL** block library enables you to transfer data directly from the controller to an MS SQL or MySQL database. With the aid of function blocks a database connection is established from the control program. The integrated user management of the database governs the assignment of access rights.
The application program uses standardized SQL commands to write to database tables directly or to query the database.

CAN bus

The **CAN-Technology** library contains function blocks for CAN bus. You can therefore integrate the IB IL CAN-MA Inline terminal in your control program.

In the library you have direct access to the messages of the serial fieldbus. In addition, ready-made blocks are available for higher-level application protocols such as CANopen®, J1939 or NMEA 2000.

CF and SD memory card
with function block licenses

Resy+ software

With the Resy+ remote control libraries from Phoenix Contact you can monitor and control system parts that are in separate locations, such as pumping stations or elevated tanks. You are therefore kept informed of all the generic measured values of your external stations at any given time.

The libraries contain preprogrammed examples which can be used directly. Otherwise you can combine ready-made blocks to create your own solution. Thanks to special remote control protocols such as ODP, IEC 60870-5-101 and -104, the control commands are sent directly from a central control room and process data is transmitted securely over wide area networks.

You can therefore design modern and efficient remote control technology: simply combine the Resy+ remote control software with our automation components.

Your advantages:

– Secure, event-oriented, and inexpensive monitoring of all distributed plants via Ethernet as well as via serial interfaces
– Standardized protocols – for integrating your remote control station into existing networks
– Versatile – data transmission via Ethernet, wireless technology, GSM, GPRS/EDGE/3G, and Industrial Wireless
– Highly modular – the stations can be created flexibly and you can combine various transmission paths, i.e., optimum adaptation

Controller function blocks with self-optimization: PDPI BASIC or PDPI PRO

Blocks for applications in control technology are grouped together in the **PDPI-BASIC** and **PDPI-PRO** libraries.

– Automatic identification of control parameters
– Control for binary, motor step, and continuous actuators
– Special functions for numerous areas of application, such as startup circuit, heating channel control or water cooling

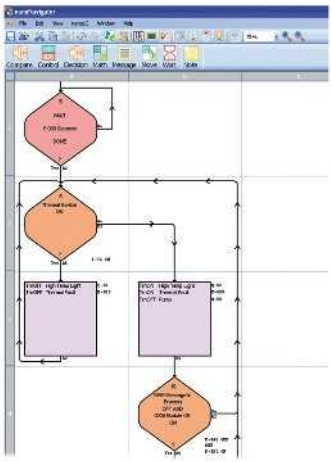
The block for the self-tuning controller for temperature control requires the PDPI Basic license:

The block for the self-tuning controller for special functions in process automation requires the PDPI Pro license.

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Parameterization memory, Flash card without license			
- 2 GB	**SD FLASH 2GB**	**2988162**	1
- 2 GB	**CF FLASH 2GB**	**2701185**	1
- 512 MB	**SD FLASH 512MB**	**2988146**	1
- 256 MB	**CF FLASH 256MB**	**2988780**	1
Function block libraries for IT applications, for MS SQL/MY SQL communication and for PID controllers, **Flash card with license for activation**			
- 2 GB, with license code	**SD FLASH 2GB APPLIC A**	**2701190**	1
- 2 GB	**CF FLASH 2GB APPLIC A**	**2701189**	1
- 512 MB, with license code	**SD FLASH 512MB APPLIC A**	**2701799**	1
- 256 MB	**CF FLASH 256MB APPLIC A**	**2988793**	1
Controller function blocks with self-optimization for temperature control, **Flash card with license for activation**			
- 512 MB	**SD FLASH 512MB PDPI BASIC**	**2701800**	1
- 256 MB	**CF FLASH 256MB PDPI BASIC**	**2700549**	1
Controller function blocks with self-optimization, extended with special functions for process automation, **Flash card with license for activation**			
- 512 MB	**SD FLASH 512MB PDPI PRO**	**2701801**	1
- 256 MB	**CF FLASH 256MB PDPI PRO**	**2700550**	1
License key function block library for **remote control technology**			
	RESY-DATA-A LIC	**2876847**	1

nanoNavigator

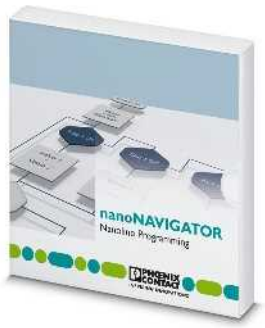


The nanoNavigator software is the ideal solution for all setup, programming, and maintenance tasks relating to the Nanoline programmable logic module and can be downloaded free of charge.

Connect your PC to the programmable logic module via one of the serial connections. It takes just four steps to create a control program with the software, which you can also start and stop from the PC. At the same time, you can monitor the progress of the program and data such as inputs, outputs, registers, flags or timers in online mode.

The programming languages offered by the software include flowchart and ladder diagram, which is used in electrical engineering in particular. In general, development tasks can be performed quickly with the nanoNavigator software, as you can also modify data elements and monitor their execution from the PC, and you also have the option of simulating the application.

nanoNavigator can be used intuitively and without detailed prior knowledge. Together with the Nanoline programmable logic module, the system represents a user-friendly and cost-effective solution for editing clear control tasks efficiently.



Software for programming and maintenance tasks relating to the Nanoline programmable logic module

Technical data

Hardware requirements	
CPU	Pentium > 400 MHz
Main memory (RAM)	512 Mbyte (1 GB for Windows Vista)
Hard disk memory	128 Mbyte
Optical drive	CD-ROM
Interfaces	COM port or USB port
Operating equipment	Keyboard, mouse
Monitor resolution	SVGA (800 x 600)
Software requirements	
Operating systems	MS Windows 2000, Windows XP, Windows Vista (32- and 64-bit), Windows 7 (32- and 64-bit)
Basic functions	
	Programming with flowcharts Programming with ladder diagram Project configuration Project simulation Execution monitoring
Languages supported	
	German, English, French, Spanish, Italian

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Programming software			
	NLC-NAV-01	**2701221**	1

WebVisit

You can now also benefit from the advantages of web-based visualization when controlling your automation systems. Visualize your networks, devices or processes with WebVisit – the inexpensive engineering tool from Phoenix Contact. With intuitive operation and without programming effort, you can create graphical interfaces for clear and straightforward work.

All Phoenix Contact controllers offer an integrated web server which forwards control data. Use this data and design visualization pages for your system using WebVisit. The big advantage for you is that WebVisit is a graphical editor – i.e., you do not need any Java or HTML programming knowledge.

WebVisit visualization pages can be displayed in any standard browser and on all of our web panels with integrated runtime environment. When you use WebVisit you only pay for the engineering once and create any number of pages.

Development software for web-based visualizations

Technical data

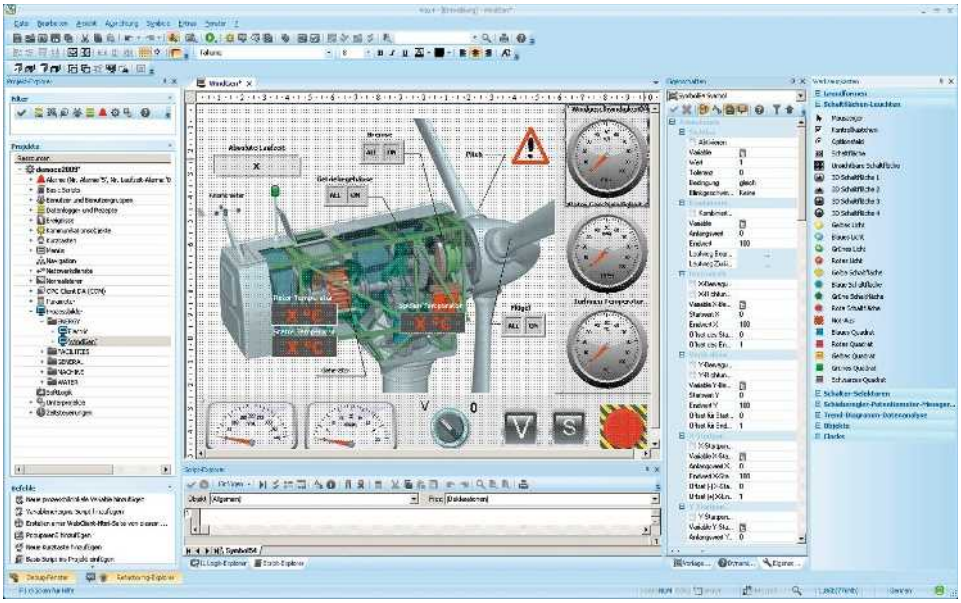
Hardware requirements	
CPU	Pentium 4/Celeron 1.6 GHz, minimum
Main memory (RAM)	min. 1 Gbyte (2 GB for Windows Vista and Windows 7)
Hard disk memory	min. 2 Gbyte
Optical drive	DVD-ROM
Operating equipment	Keyboard, mouse
Monitor resolution	XGA (1024 x 768)
Software requirements	
Operating systems	MS Windows XP SP3, MS Windows Vista Business SP2, MS Windows 7 Professional (32/64-bit) SP1
Supported browsers	Internet Explorer Version 7 or later
Basic functions	WebVisit is the engineering tool used to create web visualizations for all controllers with integrated web server. The user interface has a functional design and even the basic version offers numerous graphic basic elements and functions. The Pro version includes functions such as alarm lists, trends, a simple user management feature, URL jumps, and other popular functions. WebVisit enables you to create suitable user interfaces for your application quickly and easily.
Languages supported	
	English

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Development software for web-based visualizations	**WEBVISIT 6 BASIC**	**2700948**	1
WebVisit, development software for web-based visualisations, with alarming, trending and language selection	**WEBVISIT 6 PRO**	**2700949**	1
WebVisit, free development software for up to three web-based visualization pages	**WEBVISIT 6 EXPRESS**	**2700954**	1

Accessories

Upgrade license for upgrading from WEBVISIT 6 BASIC to WEBVISIT 6 PRO	**WEBVISIT 6 BASIC-PRO**	**2700950**	1



Visu+ is the visualization software with SCADA functionality for computer-aided control and monitoring of technical processes. Visu+ is suitable for any application: from a compact HMI device to an industrial PC.

Your advantages:

– Operation and monitoring of systems and machines
– Thanks to the central monitoring of a system, previously used indicators such as switches or signaling devices can be eliminated.
– Trending: e.g., for plotting curves with measured data
– Alarming: monitoring process values for permissible and impermissible states, and notification via modem or web link, plus SMS, voice, and fax messages
– Data logging: recording data in a database for later analysis or graphical representation
– User management: assignment and restriction of user rights
– Reporting: analysis of collected data and representation of data in the form of a report
– Optional web clients provide access to operational data via the Internet or Intranet

Visualization projects created with Visu+ can be used on all PCs with Windows operating systems as well as on Windows CE-based HMI devices from the TP and OT ranges. A runtime license is required for Windows 2000/XP/Vista.

Licenses

An engineering license is required in order to use Visu+. This license can be used to create projects for both HMI devices and PCs. A demo license is available for the initial steps. Unlike the PC runtime licenses, the runtime licenses for HMI devices are functionally restricted by Windows CE.

The runtime licenses for PCs (Windows) can be ordered individually. Two basic versions are available, Visu+ RT and Visu+ RT−D, where the number of I/O bytes can be selected in stages or as an unlimited option. These basic licenses can be extended individually with options such as networking, web clients or redundancy.

In addition to the OPC interface, the Visu+ RT-D licenses feature a direct driver connection to certain controllers, e.g., Siemens S7.

Phoenix Contact HMI devices already have a runtime license for Visu+. The visualization images are vector-based and stored in XML format. During runtime, only the file that is currently being displayed is disabled, all other screen pages can be replaced during project runtime. This means that in most cases, changes can be made to the project online.

Due to its Unicode capability, Visu+ can also display foreign character sets, such as Asian fonts. Machines that are designed for worldwide export, for example, benefit from this feature. Similarly, in multilingual projects, languages can be switched online.

Scripting similar to VBA (Visual Basic for Applications) is available for individual adjustments. Another version of scripting supports creation of a PLC-like instruction list (IL).

Visu+ options:

Combine options freely with a runtime license. Order numbers for your combination are available on request.

Visu+ 2 alarm statistics

– For statistical evaluations of alarms and their reports (reporting)

Visu+ 2 OPC server

– Operates as an OPC DA server or OPC XML DA server to connect OPC DA clients such as MES systems

Visu+ 2 redundancy

– For parallel operation on two PCs in order to enable continued operation in the event that one PC fails
– A license with redundancy function is required for each PC

Visu+ 2 alarm dispatcher

– For alarm distribution on various systems such as SMS, voice message, fax, modem or e-mail

Visu+ 2 networking

– For data exchange between multiple Visu+ runtime systems

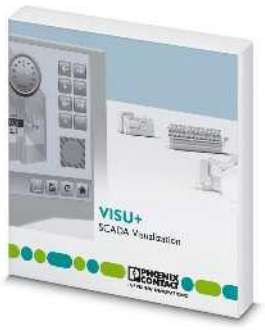
Visu+ 2 web client xx

– For using the Visu+ runtime as the server for the selected number of clients
– **xx** = number of web clients:
1, 2, 3, 4, 5, 10, 15, 20 up to a maximum of 64 web clients supported

Notes:

Further licenses can be found on the Internet at www.phoenixcontact.net/products.

[1]) Note:
Unlike version 1.xx, Visu+ 2 ... XT... products now no longer offer a web client function ; this can be purchased optionally.



Development and runtime licenses for Visu+ (without drivers)

Runtime licenses for Visu+ with 2 direct drivers

	Technical data	Technical data
Hardware requirements		
CPU	Pentium/Celeron, 1.6 GHz	Pentium/Celeron, 1.6 GHz
Main memory (RAM)	min. 1 Gbyte (2 GB for Windows Vista and Windows 7)	min. 1 Gbyte (2 GB for Windows Vista and Windows 7)
Hard disk memory	min. 1 Gbyte (recommended: 2 GB)	min. 1 Gbyte (recommended: 2 GB)
Optical drive	DVD-ROM	DVD-ROM
Operating equipment	Keyboard, mouse	Keyboard, mouse
Monitor resolution	XGA (1024 x 768)	XGA (1024 x 768)
Software requirements		
Operating systems	MS Windows XP SP3, MS Windows Vista Business SP2, MS Windows 7 Professional (32/64-bit) SP1	MS Windows XP SP3, MS Windows Vista Business SP2, MS Windows 7 Professional (32/64-bit) SP1
Supported browsers	Internet Explorer 5.5 or higher	Internet Explorer 5.5 or higher
Basic functions		
	Full SCADA (Supervisory Control And Data Acquisition) functionality with visualization, trending, and alarm management	Full SCADA (Supervisory Control And Data Acquisition) functionality with visualization, trending, and alarm management
	Multilingualism of software and projects (incl. Unicode support and online toggling)	Multilingualism of software and projects (incl. Unicode support and online toggling)
	Know-How protection and safety through coding of projects	Know-How protection and safety through coding of projects
	Control coupling with OPC	Control coupling with OPC and 2 direct drivers
	Access protection with user management	Access protection with user management
	Fully scalable process diagrams for using one design on different devices and monitor sizes	Fully scalable process diagrams for using one design on different devices and monitor sizes
	Realtime database coupling with ODBC to MS ACCESS, MS EXCEL, and SQL server	Realtime database coupling with ODBC to MS ACCESS, MS EXCEL, and SQL server
	Automatic data recording and recipe management	Automatic data recording and recipe management
	Scripts can be created in VBA and IL	Scripts can be created in VBA and IL
	FDA CFR 21 Part 11 compatible	FDA CFR 21 Part 11 compatible
Options		
	Statistical alarm function	Statistical alarm function
	Web client capability	Web client capability
	Redundancy function	Redundancy function
	Advanced alarm management with SMS, FAX, e-mail and voice mail function	Advanced alarm management with SMS, FAX, e-mail and voice mail function
	Networking	Networking
Languages supported		
	German, English, French, Italian	German, English, French, Italian

	Ordering data			Ordering data		
Description	**Type**	**Order No.**	Pcs. / Pkt.	**Type**	**Order No.**	Pcs. / Pkt.
Development license for **Visu+** projects						
	VISU+ 2	**2988544**	1			
Runtime license for **Visu+**, where the I/O data and variables in scripting are limited						
- Limited to 64 bytes	**VISU+ 2 RT 64**	**2988683**	1	**VISU+ 2 RT-D 64**	**2988751**	1
- Limited to 128 bytes	**VISU+ 2 RT 128**	**2988586**	1	**VISU+ 2 RT-D 128**	**2988696**	1
- Limited to 256 bytes	**VISU+ 2 RT 256**	**2988609**	1	**VISU+ 2 RT-D 256**	**2988719**	1
- Limited to 512 bytes	**VISU+ 2 RT 512**	**2988612**	1	**VISU+ 2 RT-D 512**	**2988722**	1
- Limited to 1024 bytes	**VISU+ 2 RT 1024**	**2988641**	1	**VISU+ 2 RT-D 1024**	**2988735**	1
- Limited to 2048 bytes	**VISU+ 2 RT 2048**	**2988528**	1	**VISU+ 2 RT-D 2048**	**2988764**	1
- Limited to 4096 bytes	**VISU+ 2 RT 4096**	**2988531**	1	**VISU+ 2 RT-D 4096**	**2988913**	1
- Limited to 8192 bytes	**VISU+ 2 RT 8192**	**2988557**	1	**VISU+ 2 RT-D 8192**	**2988573**	1
Runtime license for **Visu+**, without limitation for I/O data and variables in scripting						
	VISU+ 2 RT UNLIMITED	**2988654**	1	**VISU+ 2 RT-D UNLIMITED**	**2988748**	1
Runtime license for **Visu+**, including networking function where the I/O data and variables in scripting are limited						
- Limited to 2048 bytes	**VISU+ 2 RT 2048 NETWORKING**	**2701143**	1	**VISU+2 RT-D 2048 NETWORK**	**2701670**	1

OPC/ODP server

Implement data exchange quickly and reliably between the following devices using OPC servers:
– PC Worx programmable controllers and OPC-compatible devices
– SNMP-compatible devices

Your advantages:
– Flexible integration in numerous higher-level systems, thanks to open, standardized interfaces such as OPC or SNMP
– Fast parameterization of signals in the project only needs to be carried out once: the AX OPC server is configured automatically
– User-friendly communication with I/O devices from a high-level language application, thanks to the HFI driver interface

Using this Windows®-based, globally standardized technology, control hardware and visualization software can be easily combined, without the need for special drivers. Visualization software can therefore read or write data from a PLC without programming and represent this graphically.

AX OPC SERVER

The OPC interface is used for data exchange and offers a manufacturer-neutral way of connecting visualizations to the control technology.

AX ODP SERVER

The ODP (Open Data Port) server enables you to communicate openly with your Phoenix Contact controllers via Ethernet, DSL or GPRS.

SNMP OPC server V3

SNMP OPC servers gather device and network information, which can be read via SNMP. In this way, you can integrate your SNMP-compatible devices in OPC-based process control systems (SCADA) or in HMI systems.

SNMP OPC agent V3

The SNMP OPC agent enables seamless vertical integration. This means that OPC-based automation systems can be integrated into existing SNMP management structures. You can therefore monitor the operating states of Ethernet components with the central management system, for example.

Communication interface for OPC-capable visualization

Technical data

Hardware requirements	
CPU	Pentium 4/Celeron 1.6 GHz, minimum
Main memory (RAM)	min. 1 Gbyte (2 GB for Windows Vista and Windows 7)
Hard disk memory	min. 2 Gbyte
Optical drive	DVD-ROM
Operating equipment	Keyboard, mouse
Supported interface connections	Embedded Controller (INTERBUS controller boards are supported only by the IBS OPC SERVER.)
Software requirements	
Operating systems	MS Windows XP SP3, MS Windows Vista Business SP2, MS Windows 7 Professional (32/64-bit) SP1
Basic functions	
	Supports OPC standard functions and all the optional interfaces (in accordance with OPC spec. DA 1.0a and DA 2.04/2.05)
	Simultaneous support to several controllers
	Integrated OPC testing and diagnostics client
Languages supported	
	German, English

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1
INTERBUS OPC server, data interface between distributed INTERBUS and Ethernet networks and visualization systems	**IBS OPC SERVER**	**2729127**	1
AX ODP SERVER, Open Data Port server, communication interface for ODP-compatible visualization with PC Worx-based control systems.			
- For 5 remote control substations			
- For 8 remote control substations			
- For 10 remote control substations			
- For 15 remote control substations			
- For 20 remote control substations			
- For 25 remote control substations			
- For 30 remote control substations			
- For 50 remote control substations			
- For 75 remote control substations			
- For 100 remote control substations			
- For 150 remote control substations			
- For 200 remote control substations			
- For 250 remote control substations			
SNMP-OPC server, German and English, for monitoring and configuration of SNMP-capable equipment in HMI and SCADA systems			
- For a maximum of 100 devices			
SNMP-OPC agent, German and English, for integrating OPC-based automation solutions in company-wide network management systems			
- For a maximum of 100 devices			

Accessories

Extension license, for 100 additional devices			

GPRS-based communication for OPC-compatible visualization

Monitoring/configuration of SNMP-compatible devices in HMI and SCADA systems

Integration of OPC-based solutions in management systems

Technical data

Pentium 4/Celeron, 2 GHz	
1024 Mbyte	
2048 Mbyte (Recommended 1 Gbyte)	
DVD-ROM	
Keyboard, mouse	
ILC 1xx, ILC 3xx, RFC 470	
MS Windows XP, MS Windows 2003/2008 Server, MS Windows Vista	
The ODP (Open Data Port) server enables the user to communicate openly with supported controllers based on GPRS. Data is transmitted either online or as buffered historical values in the controller with time stamp.	
Upgrade licenses are available	
German, English	

Ordering data

Type	Order No.	Pcs. / Pkt.
AX ODP SERVER 5FU	**2700391**	1
AX ODP SERVER 8FU	**2700392**	1
AX ODP SERVER 10FU	**2700393**	1
AX ODP SERVER 15FU	**2700394**	1
AX ODP SERVER 20FU	**2700396**	1
AX ODP SERVER 25FU	**2700397**	1
AX ODP SERVER 30FU	**2700399**	1
AX ODP SERVER 50FU	**2700400**	1
AX ODP SERVER 75FU	**2700401**	1
AX ODP SERVER 100FU	**2700402**	1
AX ODP SERVER 150FU	**2700403**	1
AX ODP SERVER 200FU	**2700404**	1
AX ODP SERVER 250FU	**2700406**	1

Accessories

Technical data

PC Pentium > 266 MHz	
-	
min. 20 Mbyte	
CD-ROM	
Keyboard, mouse recommended	
-	
Windows XP SP3, Windows Vista, Windows 7, Windows 2003 Server SP1, Windows 2008 Server	
Monitoring and configuration of 100 SNMP-compatible devices in HMI/SCADA systems, SNMP Version v1 and v2c supported ; OPC clients OPC Data Access 1.0A/2.0 or OPC Alarm and Events supported, integrated MIB browser, import/export and creation of device profiles supported, online and remote configuration possible via remote PCs	
Network monitoring with HMI/SCADA systems	
German, English	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SNMP OPC SERVER V3	**2701139**	1

Accessories

FL SNMP OPC SERVER V3 LIC 100	**2701138**	1

Technical data

PC Pentium > 266 MHz	
min. 32 Mbyte	
min. 20 Mbyte	
CD-ROM	
Keyboard, mouse recommended	
-	
Windows XP SP3, Windows Vista, Windows 7, Windows 2003 Server SP1, Windows 2008 Server	
Monitoring of OPC server, access to OPC server, SNMP proxy agent, SNMP Version v1 and v2c supported	
Network monitoring with HMI/SCADA systems	
German, English	

Ordering data

Type	Order No.	Pcs. / Pkt.
FL SNMP OPC AGENT V3	**2701136**	1

Accessories

FL SNMP OPC AGENT V3 LIC 100	**2701135**	1

Config+

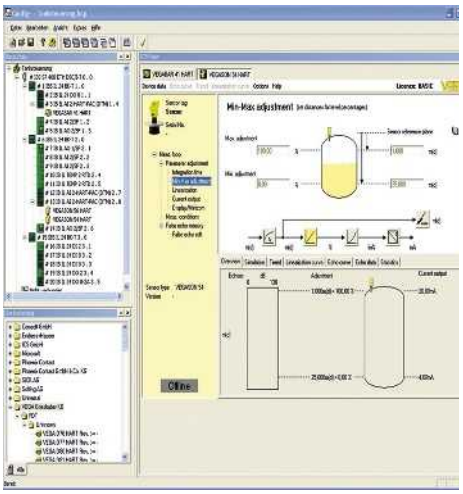
Config+ from Phoenix Contact is the ideal software solution for configuring INTERBUS networks.

The clear user interface allows you to assign addresses using drag & drop and to configure even complex topologies. In addition, the Ethernet devices used can also be mapped and diagnosed. For reliable troubleshooting in INTERBUS networks, the integrated Diag+ diagnostics tool can be used.

Numerous functions for efficient configuration

In Config+, you can use a wide range of functions to efficiently configure systems with INTERBUS networks.

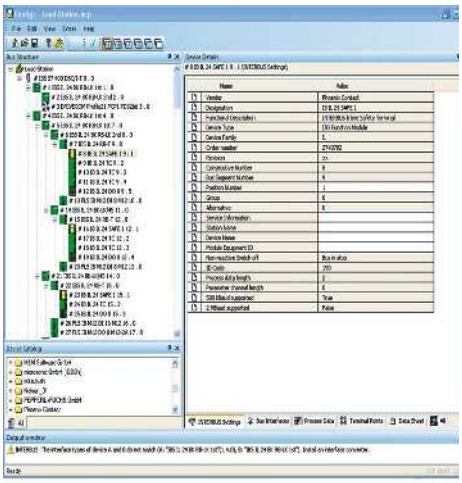
- Reading and comparing real and planned topology
- Address assignment via drag & drop or completely automatic
- Parameterization of several master boards and controller boards in one project
- Configuration of subsystems, e.g., lower-level robot systems
- Assignment and calling of external operating tools for intelligent devices
- Use of various (e.g., user-defined) device catalogs
- Import and export of device catalogs
- IP address assignment via BootP server
- Non-proprietary device parameterization using the FDT (field device technology) concept
- Parameterization of multiple devices with the MDC wizard (multiple device configuration assistant)
- Monitoring function for wiring checks
- Topology data transfer to the SAFETYPROG safe programming tool



Comprehensive diagnostics for INTERBUS networks

Reliable diagnostics are essential for high system availability. INTERBUS networks can be diagnosed reliably with the Diag+ diagnostics tool integrated in Config+.

- Graphical display of error location in the network topology
- Output of plain text messages with tips for error removal
- Online display of device statuses
- Evaluation of statistical data for transmission quality
- Saving comments about error messages



Integrated diagnostics for Ethernet devices

With Diag+, you can also view additional diagnostic information on the Ethernet devices used in the network.

- Receive traps by means of the integrated trap receiver
- Graphical display of the Ethernet topology (2D view) showing the availability of devices
- Display of port statistics, error information on the devices, as well as other properties that can be read via SNMP
- Calling of device web pages

Notes:
1) EMC: Class A product, see page 553

Tool for fieldbus and network configuration

Technical data

Hardware requirements	
CPU	Pentium 4/Celeron 1.6 GHz, minimum
Main memory (RAM)	min. 1 Gbyte (2 GB for Windows Vista and Windows 7)
Hard disk memory	min. 2 Gbyte
Optical drive	DVD-ROM
Interfaces	Serial interface, Ethernet, PCI
Operating equipment	Keyboard, mouse
Monitor resolution	XGA (1024 x 768)
Software requirements	
Operating systems	MS Windows XP SP3, MS Windows Vista Business SP2, MS Windows 7 Professional (32/64-bit) SP1
Supported browsers	Internet Explorer Version 7 or later
Termination boards supported	
	IBS S7 400 ETH SDSC/I-T 2819558
	IBS S7 400 ETH DSC/I-T[1]) 2731102
	IBS S7 400 DSC/I-T[1]) 2719962
	IBS S7 300 DSC-T[1]) 2719975
	IBS PCI SC/RI/I-T[1]) 2730080
	IBS PCI SC/RI-LK 2730187
	IBS PCI SC/I-T[1]) 2725260
	IBS PCI SC-LK[1]) 2700318
	FL IL 24 BK-B-PAC[1]) 2862327
	FL IL 24 BK-PAC[1]) 2862314
	FL NP PND-4TX IB[1]) 2985974
	FL NP PND-4TX IB-LK[1]) 2985929
	FLM BK ETH M12 DI 8 M12-2TX 2736916
	IL ETH BK DI8 DO4 2TX-PAC[1]) 2703981
Basic functions	
	Project transfer to SAFETYPROG (software tool for programming INTERBUS Safety)
	Project planning of Ethernet configurations
	Planning of the address assignment
	Transfer of the address settings (address ranges, assignment list) from STEP 7®
	Project planning of multimaster projects (several bus configurations in one project)
	Comparison between real and planned bus configuration
	Online display of device data sheets
	Comprehensive diagnostic functions, including optical diagnostics with Diag+
	Network diagnostics (functionality of Diag+)
Languages supported	
	German, English, French, Italian, Spanish, Chinese

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Config+ demo version with restricted range of functions (it is not possible to save projects)	**CONFIG+ DEMO**	**2868046**	1
Config + full version for configuration and diagnosis of networks	**CONFIG+**	**2868059**	1

Accessories

Copy license, allows you to install the software multiple times. A full version is also required. Please specify the number of licenses required when ordering.	**CONFIG+ CPY**	**2868062**	1

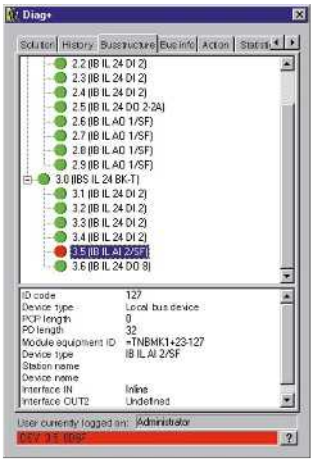
Diag+ – comprehensive diagnostics for PROFINET and INTERBUS networks

Diag+ is a special diagnostics software tool that has been adapted to PROFINET and INTERBUS and indicates both network errors and the current states of controllers and devices. Preventive diagnostic functions such as monitoring the transmission quality of fiber optic (FO) paths in PROFINET and INTERBUS increase system availability.

Wide range of functions for reliable diagnostics

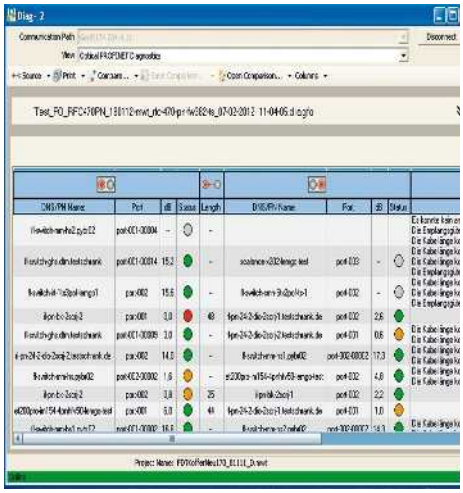
Status information, operating functions, plain text messages, and overviews ensure fast startup, error localization, and easy orientation in PROFINET and INTERBUS systems.

- Start and stop of INTERBUS data traffic
- Acknowledgment of INTERBUS error messages
- Bridging, switch on, and switch off of INTERBUS devices
- Display of error messages with tips for error removal and detailed information on the device type and device state
- Display of color symbols for errors and device states
- Preventive diagnostics such as monitoring transmission quality in FO paths
- Comparison and evaluation of FO diagnostic data records at varying times
- Generation of acceptance reports as PDF files
- Integration in other software tools such as visualizations
- Display of stored messages from the message archive of the controller
- Overview for the topology of Ethernet/PROFINET devices in a 2D graphic
- Specification of the accessibility of Ethernet/PROFINET devices
- Use of the configuration data and comments created with Config+ or PC Worx during the configuration phase (e.g., equipment IDs, station names)
- Management of individual rights of use for various users



Diag+ NetScan – software for cyclic INTERBUS network diagnostics

Diag+ NetScan enables simultaneous monitoring of INTERBUS networks with several controller boards/controllers. The transmission quality of all FO paths in an entire system is thereby monitored permanently. Even lower-level buses connected using system couplers can be included in monitoring.



Ordering example 1:

The Diag+ software is to be used on ten different PCs of a system for PROFINET/INTERBUS network diagnostics.

Items required:

- 1x DIAG+
- 9x DIAG+ CPY

Ordering example 2:

Ethernet-networked INTERBUS controller boards (x 60) are to be monitored from a control room. In the event of an error, detailed diagnostic data should be displayed.

Items required:

- 1 x DIAG+ NETSCAN

Diagnostics software for INTERBUS, PROFINET and Ethernet networks

Diagnostics software for cyclic INTERBUS diagnostics

	Technical data	Technical data
Hardware requirements		
CPU	Pentium 4/Celeron 1.6 GHz, minimum	Pentium 4/Celeron 1.6 GHz, minimum
Main memory (RAM)	min. 1 Gbyte (2 GB for Windows Vista and Windows 7)	min. 1 Gbyte (2 GB for Windows Vista and Windows 7)
Hard disk memory	min. 2 Gbyte	min. 2 Gbyte
Optical drive	DVD-ROM	DVD-ROM
Interfaces	Serial interface, Ethernet, PCI	Serial interface, Ethernet, PCI
Supported interface connections	INTERBUS controller board of the 4th generation, PROFINET I/O Controller (Phoenix Contact only)	INTERBUS Generation 4 controller board
Software requirements		
Operating systems	MS Windows XP SP3, MS Windows Vista Business SP2, MS Windows 7 Professional (32/64-bit) SP1	MS Windows XP SP3, MS Windows Vista Business SP2, MS Windows 7 Professional (32/64-bit) SP1
Basic functions		
	Executing important commands (start/stop/...)	Executing important commands (start/stop/...)
	Reading in the installed bus structure	Reading in the installed bus structure
	Detecting/representing error states (plain text from knowledge database)	Detecting/representing error states (plain text from knowledge database)
	Saving diagnostics data in flash memory or parameterizing memory of the controller board	Saving diagnostics data in flash memory or parameterizing memory of the controller board
	Diagnostics of INTERBUS FO paths (transmission quality)	Diagnostics of FO paths (transmission quality)
	Can be linked into other 32-bit applications as ActiveX Control including programming interface for further processing of all diagnostic data	Can be integrated into other 32-bit applications as ActiveX Control
	Configuration comparison of Ethernet topologies (parameterized with real topology)	-
	Reading out the Controller Diagnose Archive	-
Expanded functionality		
	-	Cyclical readout of diagnostic data from all INTERBUS controller boards/controllers in the network overview (the number of controller boards is not limited)
	-	Network overview: all INTERBUS controller boards/controllers in a system are clearly shown in a tree view ; detailed diagnostics can be called up by clicking on the corresponding item
	-	Monitoring function: simultaneous monitoring of up to 10 INTERBUS controller boards/controllers maximum
Languages supported		
	German, English, French, Italian, Spanish, Chinese	German, English, French, Italian, Spanish, Chinese

	Ordering data			Ordering data		
Description	Type	Order No.	Pcs. / Pkt.	Type	Order No.	Pcs. / Pkt.
Diag+ demo, limited scope of functions (only valid for the first five stations)	**DIAG+ DEMO**	**2730734**	1			
Diag+ full version, for INTERBUS diagnostics (ActiveX Control with programming interface)	**DIAG+**	**2730307**	1			
Diag+ NetScan-Demo, limited scope of functions (cannot open or save projects)				**DIAG+ NETSCAN DEMO**	**2868091**	1
Diag+ NetScan full version, for cyclic and simultaneous network diagnostics (ActiveX Control)				**DIAG+ NETSCAN**	**2868075**	1
	Accessories			**Accessories**		
Copy license, allows you to install the software multiple times. A full version is also required. Please specify the number of licenses required when ordering.	**DIAG+ CPY**	**2730404**	1	**DIAG+ NETSCAN CPY**	**2868088**	1

Startup+

Startup+ software is specifically tailored to the Axioline system. It can be used to test the wiring of I/O stations and parameterize the I/O modules used. Startup+ can be used to display and operate your Axioline station during startup without having to connect the station to a higher-level network.

Startup+ offers many useful functions for all aspects of the Axioline I/O system:

- Reading and writing input and output signals
- Comprehensive diagnostics during operation
- User-friendly connection of software to an Axioline I/O station via the fieldbus or service interface
- Support in connecting to the Axioline station by means of a wizard
- Software is open for connection to TCI interfaces – for DTM integration in engineering systems

Software for startup and parameterization of Axioline I/O stations

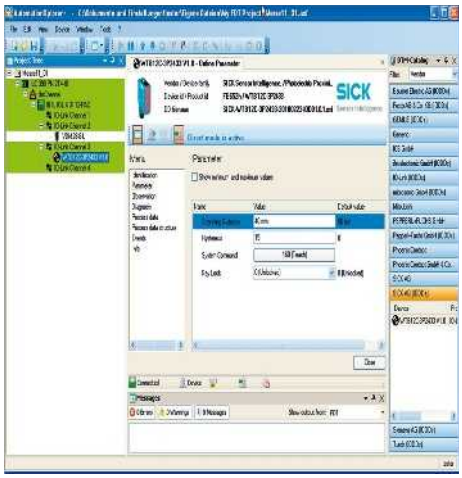
Technical data

Hardware requirements	
CPU	Pentium/Celeron, 1.6 GHz
Main memory (RAM)	1 Gbyte
Hard disk memory	100 Mbyte
Optical drive	DVD-ROM
Interfaces	Ethernet port
Operating equipment	Keyboard, mouse
Software requirements	
Operating systems	MS Windows XP SP3, MS Windows 7 (32 bit)
Basic functions	
	I/O check Diagnostics Offline/online parameterization Can be called via TCI interface
Languages supported	
	German, English, French, Spanish, Italian

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Startup+, for checking the wiring of Axioline stations and parameterizing devices	**STARTUP+**	**2700636**	1

AutomationXplorer+



Central and manufacturer-independent device parameterization is a crucial advantage in complex automation systems. Using AutomationXplorer+ for the parameterization of devices based on FDT (field device technology), you can easily set sensors and actuators remotely, for example. Devices no longer have to be parameterized locally, saving you time and money.

FDT specifies a uniform, standardized interface between software interfaces and communication drivers for various network protocols. FDT represents a control or engineering system that integrates device user interfaces – so-called DTMs (Device Type Managers).

AutomationXplorer+ is a type of FDT framework application in which DTMs from various manufacturers can be integrated freely. Point-to-point communication, even beyond network boundaries, enables user-friendly parameterization of devices as well as sensors and actuators. This takes place, for example, via several protocols used in a system, such as Ethernet, PROFINET, INTERBUS, and the IO-Link protocol. Changes do not have to be made to the installed basic devices.

AutomationXplorer+ can be called via the TCI interface (tool calling interface) to connect device-specific user interfaces as a DTM to an engineering system without FDT interface, e.g., to the Siemens engineering system. AutomationXplorer+ handles the integration of the DTM instead of the engineering system. Device-specific user interfaces can therefore be started directly from the engineering system.

Notes:

AutomationXplorer+ can be downloaded free of charge, including a selection of different communication and device DTMs for Ethernet and INTERBUS (PROFINET IO available on request) from the Phoenix Contact homepage at www.phoenixcontact.com.

FDT frame application for device parameterization

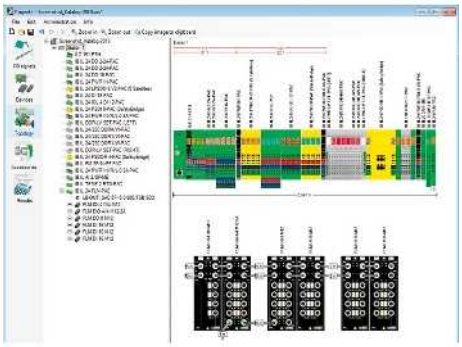
Technical data

Hardware requirements	
CPU	Pentium 4/Celeron, 1 GHz
Main memory (RAM)	1 Gbyte
Hard disk memory	50 Mbyte (without DTM)
Optical drive	CD-ROM
Operating equipment	Keyboard, mouse
Monitor resolution	1024x768
Software requirements	
Operating systems	MS Windows XP SP3, MS Windows 7 (32 bit)
Basic functions	
	Integration and call up of DTM
	Can be called up via TC interface with assistant support for automatic creation of projects
Languages supported	
	German, English, French, Spanish, Italian

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
FDT container for integrating DTM devices			
	AX+ BASIC	**2985068**	1

Project+



License-free software for planning Inline and Fieldline I/O stations

Project+ is a tool that provides support when planning and configuring an I/O station as part of the automation setup of a system, machine or property. With no training required, you can create a functional I/O station according to your specifications very quickly with Project+. The station provides functions for connecting sensors and actuators and corresponds to the technical configuration rules of the selected I/O system.

Workflow: enter the required I/O signals for connecting sensors and actuators in your application. Project+ then determines the optimum product selection from the Inline and Fieldline product ranges from Phoenix Contact - the selected devices are combined to create a station according to the configuration rules. You are immediately provided with a graphical structure plan and a parts list including item descriptions.

Thanks to various export functions, the configured I/O stations can be implemented directly for the subsequent engineering process.

Your advantages:

– Automated creation of the I/O station in accordance with the technical configuration rules
– Representation of the configured I/O station as a graphical structure plan
– Extension of your automation setup using additional items from the Phoenix Contact product range
– Option of data export to CLIP PROJECT, PC Worx, Excel, and Word
– Full version can be downloaded for free www.phoenixcontact.net/products

Technical data

Hardware requirements	
CPU	Pentium/Celeron, 1.6 GHz
Main memory (RAM)	1 Gbyte (1 GB for Windows Vista)
Hard disk memory	min. 300 Mbyte
Optical drive	DVD-ROM
Operating equipment	Keyboard, mouse
Software requirements	
Operating systems	MS Windows® 7 Home Premium (32-bit/64-bit) / MS Windows® 7 Professional (32-bit/64-bit) / MS Windows® Vista Business / MS Windows® XP Professional (SP-4 recommended)
Software requirements	MS WORD 2003 or a higher version
Basic functions	
	Automated structure of the Inline and Fieldline I/O stations
	Consideration of technical configuration rules
	Automatic addition of accessories required by the system
	Graphical representation of the planned station structure as a structure plan
	Phoenix Contact complete catalog as accessories
	Project report via MS WORD
	Export functions for ClipProject and PC Worx
	Consideration of release lists
Languages supported	
	German, English, Spanish, French, Italian, Dutch, Russian

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Software for planning the I/O configuration			
	PROJECT+	**2988667**	1

Portico

N

Optimally tailor your operating concept to the requirements of your system. With the Portico software, you can install up to 16 thin clients exactly where you need them. If multiple employees based in various locations need to access the machine, you can design individual solutions in this way.

Portico is a remote control software tool that allows you to view and fully interact with the desktop of another industrial PC over a network. The software uses a client/server architecture that either supports point-to-point connection between a server and client or allows communication to be established between a server and multiple clients. Thanks to the unique assignment of access rights, your system is also protected against unauthorized access.

Portico can also be used in a production environment to visualize or control a machine or process at a remote location in the system.

Your advantages:

– Individual operation and monitoring concepts with up to 16 clients
– Simultaneous display of IPC screen information at several operating stations without server operating system
– Inexpensive, thanks to the use of thin clients
– Configuration tool for user-friendly management of access rights
– Fast screen and input response, thanks to communication via TCP/IP network protocol
– Low memory usage by server and client

System requirements:

– CPU type/class: x86
– Minimum CPU clock rate: 1.0 GHz
– Minimum RAM: 512 MB
– Minimum memory required for server: 100 MB
– Minimum memory required for client: 100 MB
– LAN rate: 100 Mbps
– Graphics requirements: unlimited

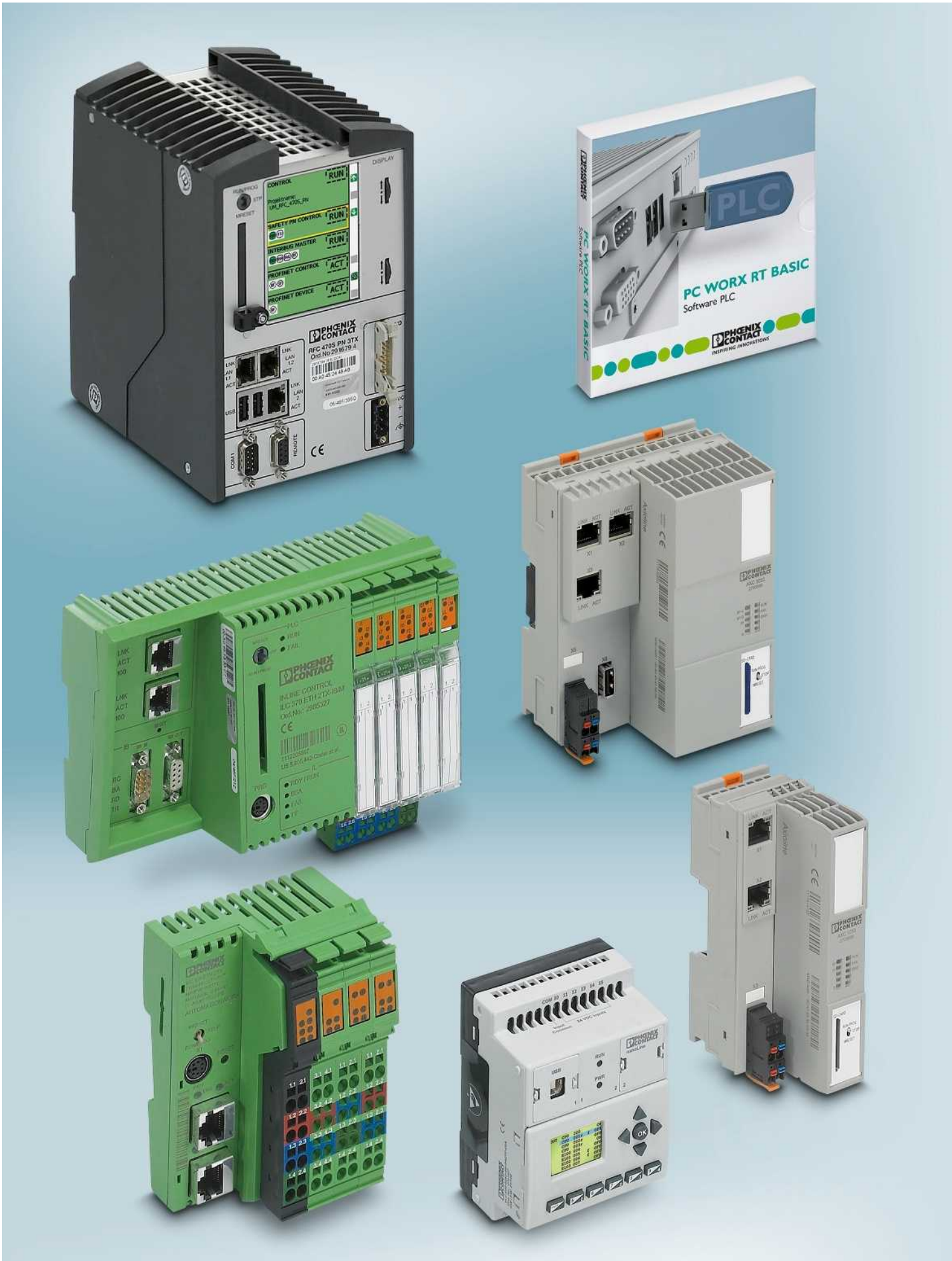
Remote control software

Technical data

Hardware requirements	
CPU	Atom™ or above
Main memory (RAM)	≥ 512 MB (minimum)
Hard disk memory	≥ 100 MB (minimum (client and server))
Software requirements	
Operating systems	Windows XP SP3 / WIndows 7
Basic functions	
	Remote control software
Languages supported	
	German, English, French, Spanish, Italian

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Remote control			
- 1 client	**VL PORTICO SERVER 1 CLIENT**	**2701453**	1
- 4 clients	**VL PORTICO SERVER 4 CLIENT**	**2701455**	1
- 16 clients	**VL PORTICO SERVER 16 CLIENT**	**2701456**	1


PC WORX RT BASIC
Software PLC
PLC
PHOENIX CONTACT
INSPIRING INNOVATIONS

Controllers

Suitable for all requirements

From distributed water supply to highly complex painting lines in the automotive industry – reliable and cost-effective automation with controllers from Phoenix Contact. The broad spectrum offers innovative control solutions from programmable logic modules to high-end controllers.

Programmable logic modules

Minimal effort with maximum benefits – for Nanoline programmable logic modules the focus is on simplicity and flexibility. Control basic applications reliably with Nanoline.

Compact controllers

Class 100 programmable logic controllers impress with their high function density at low prices. They support all common communication paths and can be easily extended. In short, they are ideal for simple requirements, even in distributed systems.

Axiocontrol controllers

Axiocontrol controllers are fast, robust, and user-friendly, i.e., they are all designed for maximum performance, easy handling, and use in harsh industrial environments.

High-performance controllers

Automation at the highest level: class 300 and 400 PLCs are high-performance high-end controllers for moderate to demanding tasks.

Software PLC

Two devices in one: utilize the available resources of your industrial PC and transform it into a powerful controller using the software PLC.

Compact controller system - Easy Automation

Product overview **518**

Controllers

Product overview **520**
Programmable logic modules **524**
Compact controllers **532**
Axiocontrol controllers **536**
High-performance controllers **538**
Software PLC **542**
Starter kits **544**

Services for automation **546**

Class 100 compact controllers

Type **Order No.**	**ILC 131 ETH** **2700973**	**ILC 151 ETH** **2700974**	**ILC 171 ETH 2TX** **2700975**	**ILC 191 ETH 2TX** **2700976**	**ILC 151 GSM/GPRS** **2700977**	**ILC 131 STARTERKIT** **2701835**
Description	Class 100 compact controllers are at the heart of the Easy Automation system from Phoenix Contact. As the interface between the control center and I/O level, they efficiently control the data flow within your system.					Starter kit for easy entry into the world of automation
Page	**532**	**533**	**533**	**533**	**534**	**544**

Software

Type **Order No.**	**PC Worx EXPRESS** **2988670**	**PROJECT+** **2988667**	**WEBVISIT 6 EXPRESS** **2700954**	**SAFECONF** **2986119**	**SD FLASH 2GB APPLIC A** **2701190**	**SD FLASH 256MB PDPI BASIC** **2700551**
Type **Order No.**					**SD FLASH 2GB** **2988162**	**SD FLASH 256MB PDPI PRO** **2700552**
Description	Engineering software, for programming according to IEC 61131	Software for I/O configuration	Software for web-based visualizations	Configuration software for SafetyBridge modules	SD card with license for IT and controller function blocks	SD card with license for controller function blocks with self-optimization
Page	**499**	**514**	**503**	**110**	**501**	**501**

Industrial network technology

Type **Order No.**	**FL SWITCH SFN 5TX** **2891152**	**FL SWITCH SFN 4TX/FX** **2891851**	**FL BT EPA AIR SET** **2693091**	**FL WLAN EPA** **2692791**	**PSI-MODEM/ETH** **2313300**	**PSI-MODEM-3G/ROUTER** **2314008**
Type **Order No.**	**FL SWITCH SFN 8TX** **2891929**	**FL SWITCH SFN 6TX/2FX** **2891314**				
Description	Standard switches	Standard switches with fiber optics	Bluetooth transmission of an Ethernet connection	WLAN transmission of an Ethernet connection	Connection via a telephone line	Connection via a mobile phone network
Page	**8**	**9**	**53**	**51**	**428**	**423**

Panels for operation and monitoring

Type **Order No.**	**TD 1030T** **2701257**	**WP 04T** **2913632**	**WP 06T** **2913645**	**WP 07T/WS** **2700307**	**WP09T/WS** **2700309**
Description	4:3 7.1 cm (2.8") display	4:3 8.9 cm (3.5") display	4:3 14.5 cm (5.7") display	Widescreen 17.8 cm (7") display	Widescreen 22.9 cm (9") display
Page	**120**	**120**	**120**	**121**	**121**

I/O systems for the control cabinet (IP20)

Digital input

1 channel	2 channels	4 channels	8 channels	16 channels	32 channels
IB IL 120 DI 1-PAC 2861917	IB IL 24 DI 2-PAC 2861221	IB IL 24 DI 4-PAC 2861234	IB IL 24 DI 8-PAC 2861247	IB IL 24 DI 16-PAC 2861250	IB IL 24 DI 32/HD-PAC 2862835
IB IL 230 DI 1-PAC 2861548	IB IL 24 DI 2-NPN-PAC 2861483	IB IL 24 DI 4-ME 2863928	IB IL 24 DI 8/T2-PAC 2862204	IB IL 24 DI 16-NPN-PAC 2863520	IB IL 24 DI 32/HD-NPN-PAC 2878243
			IB IL 24 DI8/HD-PAC 2700173	IB IL 24 DI 16-ME 2897156	
From page 204	From page 200	From page 200	From page 201	From page 200	From page 201

Digital output

1 channel	2 channels	4 channels	8 channels	16 channels	32 channels
IB IL DO 1 AC-PAC 2861920	IB IL 24 DO 2-PAC 2861276	IB IL 24 DO 4-PAC 2861276	IB IL 24 DO 8-PAC 2861289	IB IL 24 DO 16-PAC 2861292	IB IL 24 DO 32/HD-PAC 2862822
	IB IL 24 DO 2-2A-PAC 2861263	IB IL 24 DO 4-ME 2863931	IB IL 24 DO 8-2A-PAC 2861603	IB IL 24 DO 16-ME 2897253	IB IL 24 DO 32/HD-NPN-PAC 2878340
	IB IL 24 DO 2-NPN-PAC 2861496	IB IL DO 4-AC-1A-PAC 2861658	IB IL 24 DO 8-NPN-PAC 2863546		
			IB IL 24 DO8/HD-PAC 2700172		
From page 210	From page 206	From page 206	From page 206	From page 206	From page 207

Security

See section: functional safety

From page 105

Relay output terminals (PDT contacts)

1 PDT	2 PDTs	4 PDTs
IB IL 24/230 DOR1/W-PAC 2861881	IB IL 24/48 DOR 2/W-PAC 2863119	IB IL 24/230 DOR4/W-PAC 2861878
IB IL 24/230 DOR1/W-PC-PAC 2862178		IB IL 24/230 DOR4/W-PC-PAC 2862181
		IB IL 24/230 DOR4/HC-PAC 2897716
From page 211	From page 211	From page 211

Analog input

2 channels	8 channels
IB IL AI 2/SF-PAC 2861302	IB IL AI 8/SF-PAC 2861412
IB IL AI 2/SF-ME 2863944	IB IL AI 8/IS-PAC 2861661
From page 212	From page 213

Analog output

1 channel	4 or 8 channels
IB IL AO 1/SF-PAC 2861315	IB IL AO 4/8/U/BP-PAC 2878036
IB IL AO 1/U/SF-PAC 2861399	
From page 220	From page 221

Strain gauge

2 channels	2 channels
IB IL SGI 2/F-PAC 2878638	IB IL SGI 2/P-PAC 2884907
From page 216	From page 216

Temperature recording

1 channel	2 channels	2 channels	4/8 channels
IB IL 24 TC-PAC 2861360	IB IL TEMP 2 UTH-PAC 2861386	IB IL TEMP 2 RTD-PAC 2861328	IB IL TEMP 4/8 RTD/EF-PAC 2897402
			IB IL TEMP 4/8 RTD-PAC 2863915
From page 219	From page 218	From page 219	From page 219

Communication

IB IL RS 232-PAC 2861357	IBS IL 24 RB-T-PAC 2861441	From page 228
IB IL RS 232-PRO-PAC 2878722	IB IL 24 IOL 4 DI 12-PAC 2692717	From page 226
IB IL RS 485/422-PAC 2861933	IB IL IFS-MA-PAC 2692720	

Position detection

IB IL INC-IN-PAC 2861755

From page 238

Function

IB IL PWM/2-PAC 2861632

IB IL CNT-PAC 2861852

From page 234

Motor starter

IB IL 400 ELR 1-3A 2727352

IB IL 400 MLR 1-8A 2727365

IB IL 400 ELR R-3A 2727378

From page 242

Intrinsically safe I/Os for Ex applications

IB IL EX-IS PWR IN-PAC 2869910	IB IL EX-IS AIO 4/EF-PAC 2869912
IB IL EX-IS DIO 4/NAM-PAC 2869911	IB IL EX-IS TEMP 4 RTD/TC-PAC 2869913
From page 490	From page 492

I/O systems for field installation (IP65/IP67)

Digital input

8 channels	16 channels
FLM DI 8 M12 2736288	FLM DI 16 M12 2736835
From page 298	From page 298

Digital input/output

4/4 channels	8/8 channels	16/16 channels
FLM DIO 4/4 M12-2A 2736369	FLM DIO 8/8 M12 2736848	FLM DIO 16/16 M12/8-DIAG 2736738
From page 299	From page 299	From page 299

Digital output terminals

8 channels
FLM DO 8 M12 2736291
From page 299

Analog input

4 channels
FLM AI 4 SF M12 2736453
From page 301

Temperature recording

4 channels
FLM TEMP 4 RTD M12 2736819
From page 301

Wireless

Base station	8/8 channels	16 channels
FLM BT BS 3 2736770	FLM BT DIO 8/8 M12 2736767	FLM BT DI 16 M12 2693208
From page 457	From page 457	From page 457

Digital input

8 channels
FLM DI 8 M8 2773348
From page 302

Digital input/output

4(8)/4 channels
FLM DIO 8/4 M8 2773351
From page 303

Digital output terminals

4 channels	8 channels
FLM DO 4 M8-2A 2736932	FLM DO 8 M8 2736893
From page 303	From page 303

Programmable logic modules

Type	**NLC-055-...**	**NLC-IO-...**	**NLC-COM-...**	**NLC-OP1-...**	**NLC-MOD-...**
Description	Basic unit with digital inputs and outputs	I/O extension modules with digital inputs and outputs, relay outputs, and analog inputs	Communication extension modules for Ethernet and GSM networks	Control panel for interactions with the Nanoline system	Slot 1 option module, extension modules for serial communication
Page	**524**	**526**	**528**	**529**	**530**

Programmable logic modules

Steeplechase VLC

Type	**NLC-MOD-...**	**NLC-START-...**		**ILC 150 VLC**	**ILC 350 VLC**
Description	Slot 2 option module, Realtime clock, memory module	Starter kit, for easy entry into the Nanoline controller range		Steeplechase VLC offers a scalable solution for controlling your applications. The ILC 150 VLC and ILC 350 VLC are cost-effective PLCs with integrated VLC runtime and easy-to-operate onboard I/Os	
Page	**531**	**526**		**www.phoenixcontact.net/products**	

Compact controllers

Class 100

Type	**ILC 131/151 ...**	**ILC 171/191 ...**	**ILC 131/151 XC**	**ILC 151 GSM/GPRS**	**ILC 191 ME/INC, .../AN**
Description	Class 100 compact controllers impress thanks to their high function density at low prices		Class 100 compact controller with extended temperature range	Class 100 compact controller with integrated GSM/GPRS modem	Class 100 compact controller for easy drive control
Page	**532**	**533**	**532**	**534**	**535**

Class 100

Class 200

Type	**ILC 131 STARTERKIT**	**PSK DL ...**		**ILC 200 UNI-PAC**	**ILC 200 IB-PAC**
Description	Starter kit for easy entry into the world of automation	Complete packages for data logging **See section: Monitoring**		Class 200 rounds off the controller hardware within the compact controller class with integrated special functions, tailored to machine building applications	
Page	**544**	**See Catalog 7**		**www.phoenixcontact.net/products**	

Axiocontrol controllers

Class 1000

Type	AXC 1050
Description	Axiocontrol compact controllers with particularly robust housing and integrated UPS
Page	536

Class 3000

Type	AXC 3050
Description	Axiocontrol high-performance controllers for the automation of challenging applications
Page	537

High-performance controllers

Class 300

Type	ILC 330/350 ...
Description	Class 300 high-performance controllers offer significantly higher performance thanks to more powerful hardware
Page	538

Type	ILC 370/390 ...
Page	539

Type	PROFINET STARTERKIT 3.0
Description	Find out how is easy it is to create and start up PROFINET IO networks
Page	545

Class 400

Type	RFC 470(S) PN 3TX
Page	540

Type	RFC 460R PN 3TX
Page	541

Type	RFC 430/450 ETH-IB
Description	Powerful class 400 high-performance controllers offer maximum performance and functionality
Page	www.phoenixcontact.net/products

Type	S-MAX 400 CE PN ...

Type	S-MAX 41x CE PN

Software PLC

Type	PC Worx SRT
Description	Software PLC without realtime extension
Page	542

Type	PC Worx RT BASIC
Description	Software PLC with realtime extension
Page	543

Box PCs

Type	Valueline IPC
Description	See section: HMIs and industrial PCs
Page	130

System cabling

Description	See section: System cabling for controllers
Page	See Catalog 7

Memory card

Type	SD FLASH... / CF FLASH...
Description	See section: Software
Page	501

Services for automation

Service

Description	Hotline Onsite service Startup support Professional workshops

Training

Description	Individual training concepts Training
Page	546

Engineering

Description	Configuration Programming Visualization Coaching

Software for control technology

Type	PC Worx EXPRESS

Type	PC Worx
Description	See section: Software
Page	499

Nanoline logic module

Minimal effort with maximum benefits – for Nanoline programmable logic modules the focus is on simplicity and flexibility. This means a modular and adaptable design with optimum networking options. For tailored use, optionally connect a logic module to other modules: I/O expansion module, communication module, operator panel, realtime clock.

Your advantages:

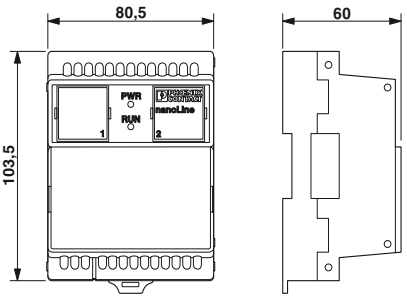
– Save time – by intelligently controlling basic tasks
– Easy use without prior knowledge, thanks to intuitive programming with flowcharts
– Versatile communication with numerous integration and networking options
– Maximum flexibility, thanks to the modular design

Additional features:

– Modules for different operating voltages, available in 24 V DC, 12 V DC or 110 ... 240 V AC
– Supports 4 mathematical functions and includes 2 high-speed counters and 2 analog inputs.
– Integrated digital I/Os
– Add up to 3 additional digital and analog I/O expansion modules for a maximum of 44 I/O points
– An operator panel can be optionally integrated in the logic module or installed remotely on a panel
– Integrated realtime clock (RTC)
– Optional USB, RS-232 or RS-485 modules for connection to a PC for configuration download
– Optional RS-232 and RS-485 allow you to use your logic module as a Modbus/RTU server
– Intuitive programming language with options for flowcharts and ladder diagrams.

Notes:

1) EMC: Class A product, see page 553



24 V DC, 8 digital inputs, 2 analog inputs and 4 relay outputs

Technical data

Power supply	
Supply voltage	24 V DC (power available to the I/O and communications modules)
Supply voltage range	19.2 V DC ... 30 V DC
Typical current consumption	150 mA
Max. current consumption	250 mA
Digital inputs	
Number of inputs	8
Description of the inputs	EN 61131-2 type 1 NPN/PNP
Typical response time	20 ms (on)
Digital outputs	
Number of outputs	4
Description of the outputs	Relay output
Maximum output current per channel	5 A
Maximum output current per module / terminal block	20 A
Protective circuit	External protection required
Analog_Input	
Number of inputs	2
Voltage input signal	0 V DC ... 10 V DC
Counter input	
Number of inputs	2
Input frequency	6 kHz
Software interfaces	
Programming tool	nanoNavigator 3 or above
Realtime clock	Yes (battery-backed)
Precision	±2 s/day @ 25°C ±4 s/day @ -20°C… +60°C
General data	
Connection method	Screw connection
Weight	262 g
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Nanoline controller, requires nanoNavigator 3 or above - 8 digital inputs, 2 analog inputs, 4 DC relay outputs - 8 digital inputs, 2 analog inputs and 4 PNP digital outputs - 8 digital inputs and 4 relay outputs	**NLC-055-024D-08I-04QRD-05A**	**2700464**	1

Accessories

Cover, replacement Operator panel	**NLC-OP1-COVER**	**2701276**	1
Cap, replacement Slot 1	**NLC-MOD-CAP**	**2701289**	1
Cap, replacement Slot 2	**NLC-MOD-CAP-PXC**	**2701292**	1

**12 V DC, 8 digital inputs,
2 analog inputs and 4 relay outputs**

**24 V DC, 8 digital inputs,
2 analog inputs and 4 PNP digital outputs**

**100…240 V AC, 8 digital inputs
and 4 relay outputs**

Technical data

12 V DC (power available to the I/O and communications modules)	
9 V DC ... 15 V DC	
250 mA	
400 mA	
8	
EN 61131-2 type 1 NPN/PNP	
20 ms (on)	
4	
Relay output	
5 A	
20 A	
External protection required	
2	
0 V DC ... 10 V DC	
2	
6 kHz	
nanoNavigator 3 or above	
Yes (battery-backed)	
±2 s/day @ 25°C	
±4 s/day @ -20°C… +60°C	
Screw connection	
248 g	
IP20	
-25 °C ... 60 °C	

Technical data

24 V DC (power available to the I/O and communications modules)	
19.2 V DC ... 30 V DC	
100 mA	
250 mA	
8	
EN 61131-2 type 1 NPN/PNP	
60 µs (on)	
4	
PNP outputs	
500 mA	
2 A	
Short-circuit and overload protection	
2	
0 V DC ... 10 V DC	
2	
6 kHz	
nanoNavigator 3 or above	
Yes (battery-backed)	
±2 s/day @ 25°C	
±4 s/day @ -20°C… +60°C	
Screw connection	
178 g	
IP20	
-25 °C ... 60 °C	

Technical data

240 V AC (power available to the I/O and communications modules)	
-	
50 mA (at 230 V AC)	
70 mA (at 110 V AC)	
8	
EN 61131-2 type 1 NPN/PNP	
20 ms (on)	
4	
Relay output	
5 A	
20 A	
External protection required	
-	
-	
-	
-	
nanoNavigator 3 or above	
Yes (battery-backed)	
±2 s/day @ 25°C	
±4 s/day @ -20°C… +60°C	
Screw connection	
150 g	
IP20	
-25 °C ... 60 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
NLC-055-012D-08I-04QRD-05A	**2700486**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
NLC-055-024D-08I-04QTP-00A[1])	**2700453**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
NLC-055-100A-08I-04QRA-05A	**2700487**	1

Accessories

NLC-OP1-COVER	**2701276**	1
NLC-MOD-CAP	**2701289**	1
NLC-MOD-CAP-PXC	**2701292**	1

Accessories

NLC-OP1-COVER	**2701276**	1
NLC-MOD-CAP	**2701289**	1
NLC-MOD-CAP-PXC	**2701292**	1

Accessories

NLC-OP1-COVER	**2701276**	1
NLC-MOD-CAP	**2701289**	1
NLC-MOD-CAP-PXC	**2701292**	1

Nanoline logic module

Minimal effort with maximum benefits – for Nanoline programmable logic modules the focus is on simplicity and flexibility. This means a modular and adaptable design with optimum networking options. For tailored use, optionally connect a logic module to other modules: I/O expansion module, communication module, operator panel, realtime clock.

Your advantages:

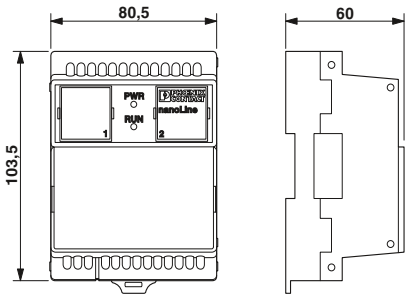
- Save time – by intelligently controlling basic tasks
- Easy use without prior knowledge, thanks to intuitive programming with flowcharts
- Versatile communication with numerous integration and networking options
- Maximum flexibility, thanks to the modular design

Additional features:

- Modules for different operating voltages, available in 24 V DC, 24 V AC/DC or 110 ... 240 V AC
- Integrated digital I/Os
- Add up to 3 additional digital and analog I/O extension modules for a maximum of 42 I/O points
- An operator panel can be optionally integrated in the logic module or installed remotely on a panel
- Integrated realtime clock (RTC)
- Optional USB, RS-232 or RS-485 modules for connection to a PC for configuration download
- Optional RS-232 and RS-485 allow you to use your logic module as a Modbus/RTU server
- Intuitive programming language with options for flowcharts and ladder diagrams.

Notes:

1) EMC: Class A product, see page 553



24 V DC, 6 digital inputs and 4 NPN/PNP outputs

Technical data

	NLC-050-024D-06I-04QTN-00A[1])	NLC-050-024D-06I-04QTP-00A
Power supply		
Supply voltage	24 V DC (power available to the I/O and communications modules)	
Supply voltage range	19.2 V DC ... 30 V DC	
Typical current consumption	92 mA	
Max. current consumption	250 mA	
Digital inputs		
Number of inputs	6	
Description of the inputs	EN 61131-2 type 1 NPN/PNP	
Typical response time	60 µs (on)	
Digital outputs		
Number of outputs	4	
Description of the outputs	NPN outputs	PNP outputs
Maximum output current per channel	500 mA	
Maximum output current per module / terminal block	2 A	
Protective circuit	Short-circuit and overload protection	
Software interfaces		
Programming tool	nanoNavigator 1 or 2	
Realtime clock	Optional module	
Precision		
General data		
Connection method	Screw connection	
Weight	240 g	
Degree of protection	IP20	
Ambient temperature (operation)	-25 °C ... 60 °C	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Nanoline controller, requires nanoNavigator 1 or 2			
- 6 digital inputs, 4 NPN outputs	**NLC-050-024D-06I-04QTN-00A[1])**	**2701030**	1
- 6 digital inputs, 4 PNP outputs	**NLC-050-024D-06I-04QTP-00A**	**2701027**	1
- 6 digital inputs, 4 DC relay outputs			
- 8 digital inputs, 4 AC/DC relay outputs			
- 8 digital inputs, 4 AC/DC relay outputs			

Accessories

Cover, replacement Operator panel	**NLC-OP1-COVER**	**2701276**	1
Cap, replacement Slot 1	**NLC-MOD-CAP**	**2701289**	1
Cap, replacement Slot 2	**NLC-MOD-CAP-PXC**	**2701292**	1

24 V DC, 6 digital inputs and 4 relay outputs

24 V AC/DC, 8 digital inputs and 4 relay outputs

100 - 240 V AC, 8 digital inputs and 4 relay outputs

Technical data

24 V DC (power available to the I/O and communications modules)	
19.2 V DC ... 30 V DC	
150 mA	
250 mA	
6	
EN 61131-2 type 1 NPN/PNP	
60 µs (on)	
4	
Relay output	
5 A	
20 A	
Short-circuit and overload protection	
nanoNavigator 1 or 2	
Optional module	
-	
Screw connection	
260 g	
IP20	
-25 °C ... 60 °C	

Technical data

24 V AC/DC (power available to the I/O and communications modules)	
19 V DC ... 30 V DC	
150 mA (@ 24 V AC/DC)	
250 mA	
8	
EN 61131-2 type 1 NPN/PNP	
20 ms	
4	
Relay output	
5 A	
20 A	
Short-circuit and overload protection	
nanoNavigator 1 or 2	
Optional module	
-	
Screw connection	
248 g	
IP20	
-25 °C ... 60 °C	

Technical data

100 V AC 240 V AC (power available to the I/O and communications modules)	
100 V AC ... 240 V AC	
70 mA (@ 230 V AC)	
-	
8	
EN 61131-2 type 1 NPN/PNP	
20 ms	
4	
Relay output	
5 A	
20 A	
Short-circuit and overload protection	
nanoNavigator 1 or 2	
Optional module	
-	
Screw connection	
268 g	
IP20	
-25 °C ... 55 °C	

Ordering data

Type	Order No.	Pcs. / Pkt.
NLC-050-024D-06I-04QRD-05A[1])	**2701043**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
NLC-050-024X-08I-04QRX-05A	**2701056**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
NLC-050-100A-08I-04QRA-05A	**2701069**	1

Accessories

NLC-OP1-COVER	**2701276**	1
NLC-MOD-CAP	**2701289**	1
NLC-MOD-CAP-PXC	**2701292**	1

Accessories

NLC-OP1-COVER	**2701276**	1
NLC-MOD-CAP	**2701289**	1
NLC-MOD-CAP-PXC	**2701292**	1

Accessories

NLC-OP1-COVER	**2701276**	1
NLC-MOD-CAP	**2701289**	1
NLC-MOD-CAP-PXC	**2701292**	1

Nanoline starter kits

The Nanoline starter kit provides everything needed to get started with the Nanoline controller:
– Logic module
– Operator panel
– Input simulator
(24 V AC or 24 V DC versions available)
– Output simulator
(24 V AC or 24 V DC versions available)
– Serial USB module
– USB cable
– Quick start guide

Nanoline starter kit

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Starter kit, consisting of: Base unit, operator panel, USB serial module and USB cable, input and output simulators - Logic module (2701030 NLC-050-024D-06I-04QTN-00A) with 6 digital inputs and 4 NPN digital outputs	**NLC-START-01**	**2701399**	1
- Logic module (2701027 NLC-050-024D-06I-04QTP-00A) with 6 digital inputs and 4 PNP digital outputs	**NLC-START-02**	**2701425**	1
- Logic module (2700464 NLC-055-024D-08I-04QRD-05A) with 8 digital inputs, 2 analog inputs and 4 relay outputs	**NLC-START-03**	**2701467**	1
Deluxe starter kit, consisting of: Logic module (2700453 NLC-055-024D-08I-04QTP-00A) with 8 digital inputs, 2 analog inputs and 4 PNP digital outputs, operator panel, USB serial module and USB cable, input and output simulators, PNP digital expansion, I/O module, Ethernet module, STEP POWER power supply unit	**NLC-START-04**	**2701483**	1

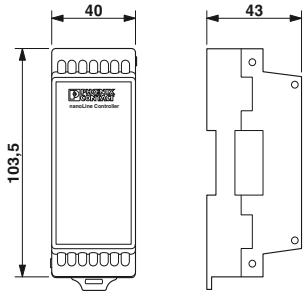
Nanoline digital I/O expansion module

Depending on the required I/Os, you can extend your Nanoline logic module with additional I/O expansion modules. The combination of digital and analog I/Os may vary.

Digital I/O expansion modules provide additional inputs and outputs beyond what is available on the logic module:
– Up to 3 modules can be added to the right side of a logic module
– Automatically recognized by nanoNavigator
– I/O modules are electrically isolated
– Can be powered from a secondary power supply

Notes:

1) EMC: Class A product, see page 553



3/6 inputs, 4 PNP/NPN outputs

Technical data

	NLC-IO-06I-04QTP-01A	NLC-IO-03I-04QRD-05A
Power supply for module electronics		
Supply voltage	24 V DC	24 V AC/DC
Digital inputs		
Maximum number of inputs	6	3
Description of the inputs	PNP/NPN	
Digital outputs		
Maximum number of outputs	4	
Maximum output current per channel	500 mA	5 A
Maximum output current per module / terminal block	2 A	20 A

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Nanoline controllers, I/O expansion module			
- 6 digital inputs, 4 PNP outputs	**NLC-IO-06I-04QTP-01A**	**2701072**	1
- 6 digital inputs, 4 NPN outputs	**NLC-IO-06I-04QTN-01A[1])**	**2701085**	1
- 3 digital inputs, 4 DC relay outputs	**NLC-IO-03I-04QRD-05A**	**2701328**	1

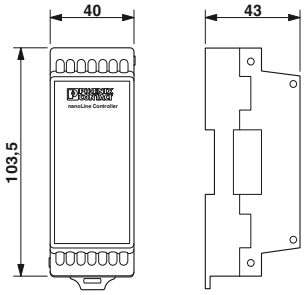
Nanoline
analog I/O expansion module

Analog I/O expansion modules provide additional inputs and outputs beyond what is available on the logic module:

- A system may have up to 8 analog inputs and 8 analog outputs.
- Configuration options for 0 ... 10 V DC, ±10 V DC, 4 ... 20 mA, and 0 ... 20 mA inputs.
- Configuration options for 0 ... 10 V DC, 4 ... 20 mA, and 0 ... 20 mA outputs.
- Up to 3 modules can be added to the right side of a logic module
- Automatically recognized by nanoNavigator
- I/O modules are electrically isolated
- Can be powered from a secondary power supply

Notes:

1) EMC: Class A product, see page 553



Analog I/O extension module

Technical data

	NLC-IO-2AI-2AO-01[1])	NLC-IO-4AI[1])
Power supply for module electronics		
Supply voltage	24 V DC	
Analog inputs		
Connection method	Screw connection	
Number of inputs	2 (voltage or current can be chosen separately)	4 (voltage or current can be chosen separately)
Description of the input	Single ended	
Precision	1%	
Voltage input signal	0 V ... 10 V / -10 V ... 10 V	
Current input signal	0 mA ... 20 mA / 4 mA ... 20 mA	
Resolution A/D	12 bit	
Limit frequency (3 dB)	5 Hz	
Analog outputs		
Connection method	Screw connection	-
Number of outputs	2	-
Precision	1%	-
D/A resolution	12 bit	-
Voltage output signal	0 V ... 10 V	-
Load/output load voltage output	1000 Ω	-
Current output signal	0 mA ... 20 mA / 4 mA ... 20 mA	-
Load/output load current output	500 Ω	-
General data		
Connection method	Screw connection	
Ambient temperature (operation)	-25 °C ... 60 °C	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Nanoline controllers, I/O expansion module			
2 analog inputs, 2 analog outputs	**NLC-IO-2AI-2AO-01[1])**	**2701040**	1
4 analog inputs	**NLC-IO-4AI[1])**	**2701098**	1

Nanoline Ethernet communication expansion module

The Ethernet expansion module enables optimum integration of Nanoline in your network. In combination with the Ethernet expansion module, you can also use your Nanoline logic module as a Modbus/TCP server.

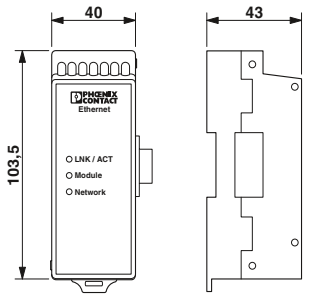
You can therefore read and write I/O points, registers, timers, counters, and program and system flags – independently of the program and from any location.

– Read only or read/write access control
– Watchdog timer monitors communication, providing either a warning or fault

Note: one of the serial connection option modules is required to configure and program the Nanoline controller.

Notes:

1) EMC: Class A product, see page 553



10/100 Mbps, Modbus TCP server

Technical data

Interface	
Interface	Ethernet 10/100Base T
Connection method	RJ45
Transmission speed	10/100 Mbps (autonegotiation)
Transmission length	100 m
Signal LEDs	LNK/ACT; module; network
Power supply for module electronics	
Supply voltage	24 V DC (Power available via logic module)
Typical current consumption	110 mA

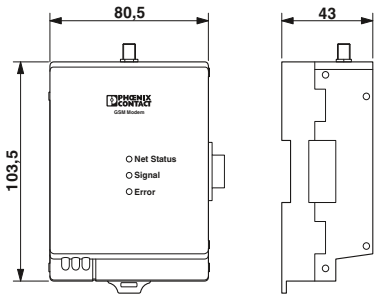
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Nanoline controllers, communication module Ethernet module for Modbus® TCP Server functionality	**NLC-COM-ENET-MB1[1])**	**2701124**	1

Nanoline communication expansion module

The GSM module provides remote access to the Nanoline controller through SMS messaging:

– Allows access to read and write registers, flags, timers and counters.
– Switch outputs on and off
– Read inputs
– Sends system faults and warning messages
– Password protected to allow selective access or broadcast to an onboard address book



GSM communication

Technical data

Wireless interface	
Wireless standard	GSM-SMS
Frequency band	850/900/1800/1900 MHz
Antenna connection method	SMA (female)
Power supply for module electronics	
Supply voltage range	12 V DC ... 24 V DC (9.6…28.8 V DC)
General data	
Wireless licenses	R&TTE, FCC, AT&T, PTCRB

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
GSM communication expansion module	**NLC-COM-GSM**	**2701344**	1

Accessories

Multi-band antenna for UMTS and quad band GSM, with omnidirectional characteristics	**PSI-GSM/UMTS-QB-ANT**	**2313371**	1

Nanoline operator panel

The operator panel is your interface for interacting with the Nanoline system. Read the status of all I/O points, registers, timers, counters, and program and system flags directly. In addition, the application program sends prompts and instructions to the display.

Unique feature: the operator panel offers numerical (0 - 9), direction (up, down, left, right), and input keys. In addition, each of the 14 keys on the operator panel can be used to create user-specific menus in a flowchart.

Additional features:

– The operator panel can be integrated in the logic module or installed remotely on a panel (1 m distance)
– The hot-swappable design enables use as a service tool
– Variable text sizes for enhanced readability of custom messages (4 x 20 or 2 x 10 or a combination)

Notes:

1) EMC: Class A product, see page 553

User interface for Nanoline controllers

Technical data

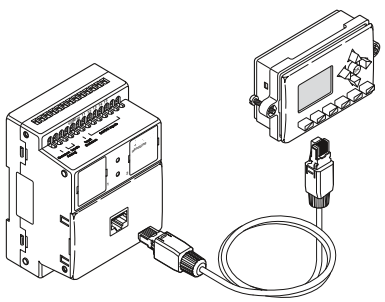
Display data	
Display	Backlit LC display, monochrome, 4 lines with 20 characters or 2 lines with 10 characters
Interfaces	
Operator Panel	RJ45
Transmission length	max. 1 m
Power supply for module electronics	
Supply voltage	(Power available via logic module)
Connection method	RJ45
Typical current consumption	32 mA
Max. current consumption	50 mA
General data	
Programming tool	nanoNavigator
Mounting type	In logic module or with remote mounting kit
Keys	11
Height	46 mm
Width	76 mm
Depth	31.5 mm
Degree of protection	IP67/IP20
Ambient temperature (operation)	0 °C ... 50 °C
Ambient temperature (storage/transport)	0 °C ... 60 °C

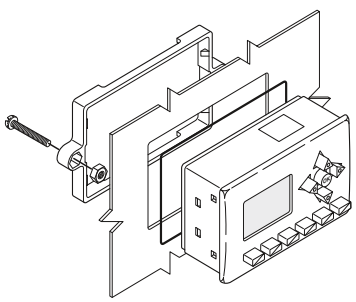
Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Operator panel			
	NLC-OP1-LCD-032-4X20[1])	**2701137**	1

Accessories

Remote mounting kit, for Operator panel	**NLC-OP1-MKT[1])**	**2701140**	1
Base module for remote mounting Operator panel (included in nLC-OP1-MKT)	**NLC-OP1-MKT-BASE**	**2701250**	1
Bracket for remote mounting Operator panel (included in nLC-OP1-MKT)	**NLC-OP1-MKT-BRACKET**	**2701263**	1
Cable, RJ45 to RJ45	**NLC-OP1-MKT-CBL**	**2701438**	1





Serial Nanoline RS-232/RS-485 and USB connection modules

With its serial communication modules, the Nanoline system sets new standards in connectivity. This results in easy integration and distributed monitoring and control.

Read and write I/O points, registers, timers, counters, and program and system flags
– With the RS-232 module, you can use your Nanoline logic module as a Modbus/RTU server.
– Password control can limit access (read only or read/write)
– Watchdog timer monitors communication, providing either a warning or fault

Note: one of the serial connection option modules is required to configure and program the Nanoline controller.

Use the RS-232 or USB module to connect the logic module to your PC. From here you can carry out configuration with the nanoNavigator software.

Notes:

1) EMC: Class A product, see page 553

Serial connection for data transmission or software configuration

Technical data

Connection data	
Connection method	Installs in slot 1 of logic module
Power supply for module electronics	
Supply voltage	24 V DC (Power available via logic module)
Typical current consumption	10 mA
Max. current consumption	18 mA
General data	
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Serial connection module, for data transfer			
RS-232 layer, USB Type B connector	**NLC-MOD-USB**	**2701195**	1
RS-232 layer, RJ11 connector	**NLC-MOD-RS232[1])**	**2701179**	1
RS-485 layer, RJ11 connector	**NLC-MOD-RS485**	**2701182**	1

Accessories

Serial cable, USB Type A to Type B	**NLC-PC/USB-CBL 2M**	**2701247**	1
Serial cable, DB-9 to RJ11/12	**NLC-PC/SERIAL-CBL 1M**	**2701234**	1
RS-485 cable, RJ11 to open cable end	**NLC-RS485-CBL-5M**	**2701073**	1

Nanoline realtime clock

For applications that require time or date functions, you can extend your Nanoline logic module with a realtime clock.

Configuration is via the nanoNavigator software or operator panel. In this way, you can integrate numerous functions into your Nanoline system:

– Optional on NLC-050… logic modules, standard on NLC-055… logic modules
– Compare time and date information in flowcharts
– Calculate even and odd days
– Adjust the time and date with other time components in the system

The realtime clock supports the following date formats:

– North American (month-day-year)
– European (day-month-year)
– International (year-month-day)

Notes:

1) EMC: Class A product, see page 553

Realtime clock for Nanoline controllers

Technical data

Power supply	
Supply voltage	24 V DC (Power available via logic module)
Typical current consumption	4 mA
Max. current consumption	10 mA
Realtime clock	
Realtime clock	Yes (battery-backed)
Precision	2 s/day at 25 °C 4.5 s/day overall (60ºC)
Battery	Life 5 years
General data	
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Realtime clock	**NLC-MOD-RTC[1])**	**2701153**	1

Nanoline memory module

Use the memory module to transmit projects:

– From a PC to one or more Nanoline controllers without a direct connection
– From one controller to another without a direct connection
– From a controller to a replacement controller

Memory module for Nanoline controllers

Technical data

Power supply	
Supply voltage	-
Typical current consumption	15 mA
Max. current consumption	20 mA
General data	
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Memory module, for data transfer	**NLC-MOD-MEM 032K**	**2701166**	1

Class 100 controllers

Class 100 programmable logic controllers impress with their high function density at low prices. They support all common communication paths, such as Ethernet, mobile phone or fixed-line network.

The controllers can be easily extended with Inline I/O modules and offer an integrated web server. As the interface between the control center and I/O level, they efficiently control the data flow of your system. In short, they are ideal for small to medium-sized applications, even in distributed systems.

Your advantages:

- Maximum flexibility - numerous I/Os and special function modules can be mounted side by side
- Cost-effective solution, thanks to the excellent price/performance ratio with high function density
- Optimum communication - with integrated, freely programmable web server for visualization with the WebVisit software
- Versatile use, as all common IT protocols are supported

Additional features:

- Modbus/TCP is integrated in the firmware - this increases performance and simplifies configuration. This makes communication with other Modbus devices even easier
- SD card slot: for quick memory expansion and easy enabling of software blocks
- FTP server
- Flash file system
- Complete fieldbus master (4096 I/O points)
- Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
- Intuitive programming using PC Worx or using the free PC Worx EXPRESS software
- The XC versions are also suitable for increased temperature requirements (-40°C to +60°C)

Notes:

1) EMC: Class A product, see page 553

Compact controller – basic device

Ex:

Technical data

	ILC 131 ETH[1])	ILC 131 ETH/XC[1])
Interfaces		
INTERBUS local bus (master)	Inline data jumper	
Ethernet	RJ45 socket	
Parameterization/operation/diagnostics	RS-232-C, 6-pos. MINI-DIN socket (PS/2), Ethernet 10/100 (RJ45)	
INTERBUS master		
Number of possible parameter channels	max. 8	
Number of I/O nodes	max. 4096	
Number of supported devices	max. 63	
Direct I/Os		
Number of inputs	8	
Number of outputs	4	
IEC-61131 runtime system		
Programmable under	PC WorX in IEC 61131	
Processing speed	1.7 ms (1 K mix instructions) 90 µs (1 K bit instructions)	
Program memory	192 kbyte (16 K instructions (IL))	
Data memory	192 kbyte	
Retentive data memory	8 kbyte (NVRAM)	
Number of data blocks	(depends on data memory)	
Number of timers, counters	(depends on data memory)	
Number of control tasks	8	
Realtime clock	Yes	
Power supply		
Supply voltage	24 V DC	
Supply voltage range	19.2 V DC ... 30 V DC	
Typical current consumption	210 mA	
General data		
Width	80 mm	
Height	119.8 mm	
Depth	71.5 mm	
Degree of protection	IP20	
Ambient temperature (operation)	-25 °C ... 55 °C	-40 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Compact controller, complete with accessories (connector plug and marking field)			
	ILC 131 ETH[1])	**2700973**	1
	ILC 131 ETH/XC[1])	**2701034**	1

Accessories

Programming cable			
	PRG CAB MINI DIN	**2730611**	1
Parameterization memory, replaceable			
- 256 MB			
- 2 GB	**SD FLASH 2GB**	**2988162**	1
- 512 MB	**SD FLASH 512MB**	**2988146**	1
- 2 GB, with license code	**SD FLASH 2GB APPLIC A**	**2701190**	1
- 512 MB, with license code	**SD FLASH 512MB APPLIC A**	**2701799**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers			
	AX OPC SERVER	**2985945**	1

Compact controller with remote bus support

Compact controller with two Ethernet ports

High-performance compact controller with integrated floating-point arithmetic

Ex:

Technical data

	ILC 151 ETH[1])	ILC 151 ETH/XC[1])
	Inline data jumper RJ45 socket RS-232-C, 6-pos. MINI-DIN socket (PS/2), Ethernet 10/100 (RJ45)	
	max. 16 max. 4096 max. 128	
	8 4	
	PC WorX in IEC 61131 1.5 ms (1 K mix instructions) 90 µs (1 K bit instructions) 256 kbyte (21 K instructions (IL)) 256 kbyte 8 kbyte (NVRAM) (depends on data memory) (depends on data memory) 8 Yes	
	24 V DC 19.2 V DC ... 30 V DC 210 mA	
	80 mm 119.8 mm 71.5 mm IP20	
	-25 °C ... 55 °C	-40 °C ... 60 °C

Technical data

Inline data jumper RJ45 socket RS-232-C, 6-pos. MINI-DIN socket (PS/2), Ethernet 10/100 (RJ45)
max. 24 max. 4096 max. 128
8 4
PC WorX in IEC 61131 1.5 ms (1 K mix instructions) 90 µs (1 K bit instructions) 512 kbyte (43 K instructions (IL)) 512 kbyte 48 kbyte (NVRAM) (depends on data memory) (depends on data memory) 8 Yes
24 V DC 19.2 V DC ... 30 V DC 210 mA
80 mm 119.8 mm 71.5 mm IP20
-25 °C ... 55 °C

Technical data

Inline data jumper RJ45 socket RS-232-C, 6-pos. MINI-DIN socket (PS/2), Ethernet 10/100 (RJ45)
max. 24 max. 4096 max. 128
8 4
PC WorX in IEC 61131 1.3 ms (1 K mix instructions) 90 µs (1 K bit instructions) 1 Mbyte (86 K instructions (IL)) 1 Mbyte 48 kbyte (NVRAM) (depends on data memory) (depends on data memory) 8 Yes
24 V DC 19.2 V DC ... 30 V DC 210 mA
80 mm 119.8 mm 71.5 mm IP20
-25 °C ... 55 °C

Ordering data

Type	Order No.	Pcs. / Pkt.
ILC 151 ETH[1])	**2700974**	1
ILC 151 ETH/XC[1])	**2701141**	1

Accessories

PRG CAB MINI DIN	**2730611**	1
SD FLASH 2GB	**2988162**	1
SD FLASH 512MB	**2988146**	1
SD FLASH 2GB APPLIC A	**2701190**	1
SD FLASH 512MB APPLIC A	**2701799**	1
AX OPC SERVER	**2985945**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
ILC 171 ETH 2TX	**2700975**	1

Accessories

PRG CAB MINI DIN	**2730611**	1
SD FLASH 256MB	**2988120**	1
SD FLASH 2GB	**2988162**	1
SD FLASH 512MB	**2988146**	1
SD FLASH 2GB APPLIC A	**2701190**	1
SD FLASH 512MB APPLIC A	**2701799**	1
AX OPC SERVER	**2985945**	1

Ordering data

Type	Order No.	Pcs. / Pkt.
ILC 191 ETH 2TX	**2700976**	1

Accessories

PRG CAB MINI DIN	**2730611**	1
SD FLASH 256MB	**2988120**	1
SD FLASH 2GB	**2988162**	1
SD FLASH 512MB	**2988146**	1
SD FLASH 2GB APPLIC A	**2701190**	1
SD FLASH 512MB APPLIC A	**2701799**	1
AX OPC SERVER	**2985945**	1

Class 100 controllers with integrated modem

These compact controllers offer all the functions of our 1x1 controllers.

In addition, they have an integrated mobile phone modem and more memory. This makes them the ideal solution for remote control and remote maintenance. The corresponding remote control software is: Resy+.

N

Compact controller with integrated GSM/GPRS modem

Technical data

Interfaces	
INTERBUS local bus (master)	Inline data jumper
Ethernet	RJ45 socket
Parameterization/operation/diagnostics	Ethernet 10/100 (RJ45)
INTERBUS master	
Number of possible parameter channels	max. 16
Number of I/O nodes	max. 4096
Number of supported devices	max. 128
Direct I/Os	
Number of inputs	16
Number of outputs	4
IEC-61131 runtime system	
Programmable under	PC WorX in IEC 61131
Processing speed	1.5 ms (1 K mix instructions) 90 µs (1 K bit instructions)
Program memory	512 kbyte (43 K instructions (IL))
Data memory	512 kbyte
Retentive data memory	48 kbyte (NVRAM)
Number of data blocks	(depends on data memory)
Number of timers, counters	(depends on data memory)
Number of control tasks	8
Realtime clock	Yes
Power supply	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC
Typical current consumption	210 mA
General data	
Width	85 mm
Height	119.8 mm
Depth	71.5 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Compact controller, complete with accessories (connector plug and marking field)	**ILC 151 GSM/GPRS**	**2700977**	1

Accessories

Parameterization memory, Flash card without license			
- 2 GB	**SD FLASH 2GB**	**2988162**	1
- 512 MB	**SD FLASH 512MB**	**2988146**	1
- 2 GB, with license code	**SD FLASH 2GB APPLIC A**	**2701190**	1
- 512 MB, with license code	**SD FLASH 512MB APPLIC A**	**2701799**	1
Programming cable	**PRG CAB MINI DIN**	**2730611**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1

Class 100 controllers for machine building

The ME versions of our compact controllers have been specifically developed for the requirements of machine building. For example, for addressing drives via step motor drivers or frequency inverters.

The compact controllers offer all the functions of the ILC 1x1 and come with preinstalled functions for machine building. This means that various drive types can be controlled and sensors can be connected without any additional external modules.

Depending on the version, analog or incremental input channels can be used for position detection.

N

Compact controller
For easy drive control

Technical data

	ILC 191 ME/AN	ILC 191 ME/INC
Interfaces		
INTERBUS local bus (master)	Inline data jumper	
Ethernet	RJ45 socket	
Parameterization/operation/diagnostics	RS-232-C, 6-pos. MINI-DIN socket (PS/2), Ethernet 10/100 (RJ45)	
INTERBUS master		
Number of possible parameter channels	max. 24	
Number of I/O nodes	max. 4096	
Number of supported devices	max. 128	
Direct I/Os		
Number of inputs	8	
Number of outputs	4	
Analog inputs/outputs		
Number of inputs	2	-
Number of outputs	2	-
Counter inputs		
Number of inputs	-	2
Input frequency	-	200 kHz
IEC-61131 runtime system		
Programmable under	PC WorX in IEC 61131	
Processing speed	1.3 ms (1 K mix instructions) 90 µs (1 K bit instructions)	
Program memory	1 Mbyte (86 K instructions (IL))	
Data memory	1 Mbyte	
Retentive data memory	48 kbyte (NVRAM)	
Number of data blocks	(depends on data memory)	
Number of timers, counters	(depends on data memory)	
Number of control tasks	8	
Realtime clock	Yes	
Power supply		
Supply voltage	24 V DC	
Supply voltage range	19.2 V DC ... 30 V DC	
Typical current consumption	310 mA	350 mA
General data		
Width	164 mm	
Height	119.8 mm	
Depth	71.5 mm	
Degree of protection	IP20	
Ambient temperature (operation)	-25 °C ... 55 °C	

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Compact controller, complete with accessories (connector plug and marking field)			
- Analog inputs/outputs	**ILC 191 ME/AN**	**2700074**	1
- Counter inputs	**ILC 191 ME/INC**	**2700075**	1

Accessories

Parameterization memory, Flash card without license			
- 2 GB	**SD FLASH 2GB**	**2988162**	1
- 512 MB	**SD FLASH 512MB**	**2988146**	1
- 2 GB, with license code	**SD FLASH 2GB APPLIC A**	**2701190**	1
- 512 MB, with license code	**SD FLASH 512MB APPLIC A**	**2701799**	1
Programming cable	**PRG CAB MINI DIN**	**2730611**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1

Class 1000 controllers

N

The AXC 1050 Axiocontrol controllers are fast, robust, and user-friendly, i.e., they are all designed for maximum performance, easy handling, and use in harsh industrial environments.

Together with the Axioline I/O systems they form a high-performance, flexible, and particularly resistant automation system for every requirement.

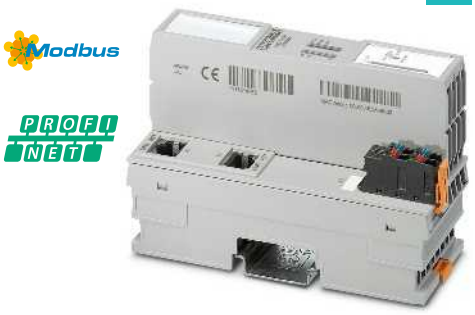
Thanks to the integrated UPS, you can respond promptly to any voltage failures. Push-in connection technology simplifies wiring noticeably and also saves time.

Your advantages:

– Maximum flexibility - numerous I/Os and special function modules can be mounted side by side
– Cost-effective solution, thanks to the excellent price/performance ratio with high function density
– Optimum communication - with integrated, freely programmable web server for visualization with the WebVisit software
– Versatile use, as all common IT protocols are supported

Additional features:

– Continuous shock-resistant up to 10g
– Increased EMC robustness
– Micro USB interface: for fast startup or changing the PLC settings without knowing the IP address
– Modbus/TCP is integrated in the firmware - this increases performance and simplifies configuration. This makes communication with other Modbus devices even easier
– SD card slot: for quick memory expansion and easy enabling of software blocks
– FTP server
– Flash file system
– Complete Axiobus master
– Integration of IT standards such as FTP, HTTP, SNMP, SMTP, SQL, ODP, OPC, and many more
– Intuitive programming using PC Worx or using the free PC WORX EXPRESS software (IEC 61131−3)
– The XC versions are also suitable for increased temperature requirements (-40°C to +60°C)



Axiocontrol compact controller

Technical data

	AXC 1050	AXC 1050/XC
Interfaces		
AXIOBUS local bus	Bus base module	
Ethernet	RJ45 socket	
Parameterization/operation/diagnostics	Micro USB type B	
AXIOBUS master		
Number of supported devices	max. 63	
IEC-61131 runtime system		
Programmable under	PC WorX in IEC 61131	
Processing speed	1.3 ms (1 K mix instructions) 90 µs (1 K bit instructions)	
Program memory	1 Mbyte	
Data memory	2 Mbyte	
Retentive data memory	48 kbyte (NVRAM)	
Number of data blocks	(depends on data memory)	
Number of timers, counters	(depends on data memory)	
Number of control tasks	16	
Realtime clock	Yes	
Power supply		
Supply voltage	24 V DC	
Supply voltage range	19.2 V DC ... 30 V DC	
Typical current consumption	125 mA	
General data		
Width	45 mm	
Height	125.9 mm	
Depth	74 mm	
Degree of protection	IP20	
Ambient temperature (operation)	-25 °C ... 60 °C	-40 °C ... 60 °C

Ordering data

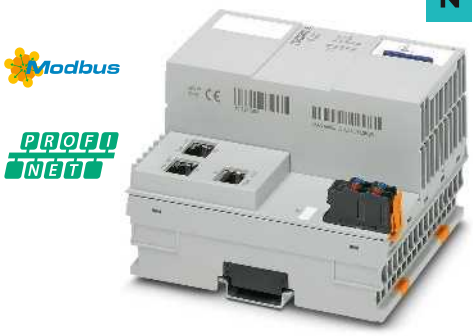
Description	Type	Order No.	Pcs. / Pkt.
Axiocontrol, complete with accessories (connector plug and marking field)			
	AXC 1050	**2700988**	1
	AXC 1050/XC	**2701295**	1

Accessories

Parameterization memory, Flash card without license			
- 2 GB	**SD FLASH 2GB**	**2988162**	1
- 512 MB	**SD FLASH 512MB**	**2988146**	1
- 2 GB, with license code	**SD FLASH 2GB APPLIC A**	**2701190**	1
- 512 MB, with license code	**SD FLASH 512MB APPLIC A**	**2701799**	1
Programming cable			
	CAB-USB A/MICRO USB B/2,0M	**2701626**	1

Class 3000 controllers

N



Axiocontrol high-performance controller

The AXC 3050 is the high-end controller in the Axiocontrol range. It offers all the EMC, shock, and vibration properties of the AXC 1050, as well as push-in connection technology and intelligent functions for sophisticated automation.

Thanks to the powerful processor and technology functions such as fast counters and event tasks, you can even implement complex applications reliably and efficiently.

Your advantages:

– Highly flexible, thanks to expansion with numerous I/O modules
– Communication in realtime via PROFINET
– Optimum connection, with integrated web server and support for all common IT standards
– Maximum performance, thanks to high processor speed

Additional features:

– Micro USB interface: for fast startup or changing the PLC settings without knowing the IP address
– 3 integrated Ethernet interfaces for implementing different topologies
– Modbus/TCP is integrated in the firmware - this increases performance and simplifies configuration. This makes communication with other Modbus devices even easier
– USB A interface for easy firmware update using a USB stick
– Integrated web server for visualization with WebVisit
– FTP server
– Flash file system
– Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
– Complete Axiobus master
– Integrated PROFINET IO controller and integrated PROFINET IO device

Technical data

Interfaces	
AXIOBUS local bus	Bus base module
Ethernet	RJ45 socket
Parameterization/operation/diagnostics	Micro USB type B
AXIOBUS master	
Number of supported devices	max. 63
IEC-61131 runtime system	
Programmable under	PC WorX in IEC 61131
Processing speed	0.01 ms (1 K mix instructions)
Program memory	4 Mbyte
Data memory	8 Mbyte
Retentive data memory	128 kbyte
Number of data blocks	(depends on data memory)
Number of timers, counters	(depends on data memory)
Number of control tasks	16
Realtime clock	Yes
Power supply	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC
Typical current consumption	480 mA
General data	
Width	100 mm
Height	125.9 mm
Depth	74 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 60 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Axiocontrol, complete with accessories (connector plug and marking field)			
	AXC 3050	**2700989**	1

Accessories

Parameterization memory, Flash card without license			
- 2 GB	**SD FLASH 2GB**	**2988162**	1
- 512 MB	**SD FLASH 512MB**	**2988146**	1
- 2 GB, with license code	**SD FLASH 2GB APPLIC A**	**2701190**	1
- 512 MB, with license code	**SD FLASH 512MB APPLIC A**	**2701799**	1
Programming cable			
	CAB-USB A/MICRO USB B/2,0M	**2701626**	1

Class 300 controllers

Class 300 high-performance controllers can be used in complex applications where a high level of performance is required.

Thanks to consistent PROFINET connection and expansion with Inline I/O modules, the controllers are particularly flexible.

Your advantages:

– Highly flexible, thanks to expansion with numerous I/O modules
– Communication in realtime via PROFINET
– Optimum connection, with integrated web server and support for all common IT standards

Additional features:

– Integrated Ethernet interface
– Integrated web server for visualization with WebVisit
– FTP server
– Flash file system
– Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
– Complete fieldbus master (8192 I/O points)
– Integrated PROFINET IO controller and integrated PROFINET IO device
– Engineering with PC Worx (IEC 61131-3)

Notes:

1) EMC: Class A product, see page 553

High-performance controller – basic device

Technical data

Interfaces	
INTERBUS (master)	Inline data jumper
Higher-level INTERBUS (slave)	-
Ethernet	RJ45 socket
Parameterization/programming/diagnostics	RS-232-C, 6-pos. MINI-DIN socket (PS/2), Ethernet 10/100 (RJ45)
INTERBUS master	
Number of possible parameter channels	max. 62
Number of I/O nodes	max. 8192
Number of supported devices	max. 512 (in total, of which 254 are remote bus devices/bus segments)
INTERBUS slave	
Amount of process data	-
Direct I/Os	
Number of inputs	12
Description of the input	Eight fast inputs, interrupt input
Number of outputs	4
IEC-61131 runtime system	
Processing speed	0.7 ms (1 K mix instructions) 11 µs (1 K bit instructions)
Program memory	Typ. 750 kbyte (64 K instructions (IL))
Data memory	1.5 Mbyte
Retentive data memory	64 kbyte (NVRAM)
Number of data blocks	(depends on data memory)
Number of timers, counters	(depends on data memory)
Number of control tasks	16
Realtime clock	Integrated (battery backup)
Power supply	
Supply voltage	24 V DC ±5%
Supply voltage range	20.4 V DC ... 30 V DC
Typical current consumption	250 mA (no local bus device connected during idling, bus inactive)
General data	
Width	182 mm
Height	140.5 mm
Depth	71.5 mm
Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 55 °C

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Inline controller, complete with accessories (connector and marking field) and PROFINET I/O controllers			
- PROFINET IO controller	**ILC 330 PN**	**2988191**	1
- PROFINET IO controller, GL rating			

Accessories

Parameterization memory			
- 256 MB	**CF FLASH 256MB**	**2988780**	1
- 2 GB	**CF FLASH 2GB**	**2701185**	1
Programming cable	**PRG CAB MINI DIN**	**2730611**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1

High-performance controller with larger memory capacity

Ex:

Technical data	
Inline data jumper	
-	
RJ45 socket	
RS-232-C, 6-pos. MINI-DIN socket (PS/2), Ethernet 10/100 (RJ45)	
max. 62	
max. 8192	
max. 512 (in total, of which 254 are remote bus devices/bus segments)	
-	
12	
Eight fast inputs, interrupt input	
4	
0.5 ms (1 K mix instructions)	
9 µs (1 K bit instructions)	
Typ. 1 Mbyte (85 K instructions (IL))	
2 Mbyte	
64 kbyte (NVRAM)	
(depends on data memory)	
(depends on data memory)	
16	
Integrated (battery backup)	
24 V DC ±5%	
20.4 V DC ... 30 V DC	
250 mA (no local bus device connected during idling, bus inactive)	
182 mm	
140.5 mm	
71.5 mm	
IP20	
-25 °C ... 55 °C	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
ILC 350 PN	**2876928**	1

Accessories		
CF FLASH 256MB	**2988780**	1
CF FLASH 2GB	**2701185**	1
PRG CAB MINI DIN	**2730611**	1
AX OPC SERVER	**2985945**	1

High-performance controller with INTERBUS slave interface

Technical data	
Inline data jumper	
D-SUB-9 female/D-SUB-9 male	
RJ45 socket	
RS-232-C, 6-pos. MINI-DIN socket (PS/2), Ethernet 10/100 (RJ45)	
max. 62	
max. 8192	
max. 512 (in total, of which 254 are remote bus devices/bus segments)	
0...32 words (configurable)	
12	
Eight fast inputs, interrupt input	
4	
0.3 ms (1 K mix instructions)	
7 µs (1 K bit instructions)	
Typ. 2 Mbyte (170 K instructions (IL))	
4 Mbyte	
96 kbyte (NVRAM)	
(depends on data memory)	
(depends on data memory)	
16	
Integrated (battery backup)	
24 V DC ±5%	
20.4 V DC ... 30 V DC	
250 mA (no local bus device connected during idling, bus inactive)	
182 mm	
140.5 mm	
71.5 mm	
IP20	
-25 °C ... 55 °C	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
ILC 370 PN 2TX-IB	**2876915**	1
ILC 370 PN 2TX-IB/M	**2985576**	1

Accessories		
CF FLASH 256MB	**2988780**	1
CF FLASH 2GB	**2701185**	1
PRG CAB MINI DIN	**2730611**	1
AX OPC SERVER	**2985945**	1

Maximum performance high-performance controller with INTERBUS slave interface

Technical data	
Inline data jumper	
D-SUB-9 female/D-SUB-9 male	
RJ45 socket	
RS-232-C, 6-pos. MINI-DIN socket (PS/2), Ethernet 10/100 (RJ45)	
max. 62	
max. 8192	
max. 512 (in total, of which 254 are remote bus devices/bus segments)	
0...32 words (configurable)	
12	
Eight fast inputs, interrupt input	
4	
0.2 ms (1 K mix instructions)	
6 µs (1 K bit instructions)	
Typ. 2 Mbyte (170 K instructions (IL))	
4 Mbyte	
96 kbyte (NVRAM)	
(depends on data memory)	
(depends on data memory)	
16	
Integrated (battery backup)	
24 V DC ±5%	
20.4 V DC ... 30 V DC	
250 mA (no local bus device connected during idling, bus inactive)	
182 mm	
140.5 mm	
71.5 mm	
IP20	
-25 °C ... 55 °C	

Ordering data		
Type	**Order No.**	Pcs. / Pkt.
ILC 390 PN 2TX-IB[1])	**2985314**	1

Accessories		
CF FLASH 256MB	**2988780**	1
CF FLASH 2GB	**2701185**	1
PRG CAB MINI DIN	**2730611**	1
AX OPC SERVER	**2985945**	1

Class 400 controllers

More memory, more speed, more power. The class 400 PROFINET-compatible controllers are the most powerful embedded PLCs from Phoenix Contact. Control demanding automation tasks with maximum performance and intelligent features.

Your advantages:
- Highly flexible, thanks to expansion with numerous I/O modules
- Communication in realtime via PROFINET
- Optimum connection, with integrated web server and support for all common IT standards
- Maximum performance, thanks to high processor speed

Additional features:
- Control and fieldbus system status messages are easily read via the diagnostics display
- Thanks to the powerful processor, comprehensive automation tasks can be processed at maximum speed
- Integrated Ethernet interface
- Integrated web server for visualization with WebVisit
- FTP server
- Flash file system
- Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
- Integrated INTERBUS master
- Integrated PROFINET IO controller and PROFINET device
- Engineering with PC Worx (IEC 61131-3)

The **safety version** offers all the properties of the RFC 470 PN controller and also has an integrated safety controller. This combination can be used to integrate safety functions up to SIL 3 into existing systems.

The use of PROFIsafe reduces wiring effort and installation time.

Notes:
Further information on safety versions can be found in the "Functional safety" section on page 113
1) EMC: Class A product, see page 553

PLC,
with optional integrated safety controller

Technical data

Interfaces	
INTERBUS (master)	D-SUB-9 socket
Ethernet	3x RJ45 sockets
Parameterization/operation/diagnostics	V.24 (RS-232-C), D-SUB plug, 10/100 Ethernet (RJ45), 2x USB
INTERBUS master	
Number of possible parameter channels	max. 126
Number of I/O nodes	max. 8192
Number of supported devices	512 (of which 254 are remote bus devices/bus segments)
Direct I/Os	
Connection method	14-pos. FLK pin strip
Number of inputs	5
Number of outputs	3
IEC-61131 runtime system	
Processing speed	0.005 ms (1 K mix instructions) 1 µs (1 K bit instructions)
Program memory	Typ. 8 Mbyte (680 K instructions (IL))
Data memory	16 Mbyte
Retentive data memory	240 kbyte (NVRAM)
Number of data blocks	(depends on data memory)
Number of timers, counters	(depends on data memory)
Number of control tasks	16
Realtime clock	Integrated (battery backup)
Power supply	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including ripple)
Typical current consumption	1 A
General data	
Width	124 mm
Height	185 mm
Depth	190 mm
Degree of protection	IP20
Ambient temperature (operation)	0 °C ... 55 °C (from 45°C only with fan module)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Remote Field Controller with INTERBUS master - 3 x 10/100 Ethernet, PROFINET IO controller	**RFC 470 PN 3TX**[1]	**2916600**	1
Safety controller	**RFC 470S PN 3TX**[1]	**2916794**	1

Accessories

Parameterization memory - 256 MB - 2 GB	**CF FLASH 256MB** **CF FLASH 2GB**	**2988780** **2701185**	1 1
Programming cable, to connect the controller boards to the PC (V.24 (RS-232-C)), length 3 m	**IBS PRG CAB**	**2806862**	1
USB memory stick, USB 2.0 IP20	**VS-04-MS-IP20**	**1402490**	1
V.24 (RS-232) null modem adapter - 9-pos. socket to 9-pos. plug	**PSM-AD-D9-NULLMODEM**	**2708753**	1
Fan module for Remote Field Controller	**RFC DUAL-FAN**[1]	**2730239**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1

Class 400 controllers

Uninterrupted processes are vital in complex systems and large plants. Ensure the continuous operation of your automation - with the PROFINET redundancy controllers from Phoenix Contact.

The high-performance PLCs establish a redundant system automatically thanks to AutoSync technology.

Your advantages:

- Fast startup and automatic configuration of all redundancy functions, thanks to AutoSync technology
- Uninterrupted process in the event of failure or when a controller is replaced
- Optimum device integration, thanks to PROFINET standards ; redundancy for your future-proof Ethernet network
- A distance of up to 80 km between the controllers via fiber optics ; cost-optimized thanks to plug-in SFP modules
- High-resolution display for displaying status and error messages in plain text
- Uninterrupted visualization - thanks to redundancy-capable OPC server

Notes:

1) EMC: Class A product, see page 553

Redundancy PLC

Technical data

Interfaces	
Ethernet	3x RJ45 sockets
Synchronization interface	SFP port
Other interfaces	2 x USB
IEC-61131 runtime system	
Processing speed	0.007 ms (1 K mix instructions) 2 µs (1 K bit instructions)
Program memory	Typ. 8 Mbyte (680 K instructions (IL))
Data memory	16 Mbyte
Retentive data memory	120 kbyte (NVRAM)
Number of data blocks	(depends on data memory)
Number of timers, counters	(depends on data memory)
Number of control tasks	16
Realtime clock	Integrated (battery backup)
Power supply	
Supply voltage	24 V DC
Supply voltage range	19.2 V DC ... 30 V DC (including ripple)
Typical current consumption	1 A
General data	
Width	124 mm
Height	185 mm
Depth	190 mm
Degree of protection	IP20
Ambient temperature (operation)	0 °C ... 55 °C (from 45°C only with fan module)

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
High-availability **remote field controller,** thanks to redundancy function - 3 x 10/100 Ethernet, PROFINET IO controller	**RFC 460R PN 3TX[1])**	**2700784**	1

Accessories

Parameterization memory			
- 256 MB	**CF FLASH 256MB**	**2988780**	1
- 2 GB	**CF FLASH 2GB**	**2701185**	1
USB memory stick, USB 2.0 IP20	**VS-04-MS-IP20**	**1402490**	1
Slot module for synchronization port			
- Distances of up to 550 m	**FL SFP SX**	**2891754**	1
- Distances of up to 30 km	**FL SFP LX**	**2891767**	1
- Distances of up to 80 km	**FL SFP LH**	**2989912**	1
Synchronization cable for FL SFP SX			
- Length 1 m	**FL MM PATCH 1,0 LC-LC**	**2989158**	1
- Length 2 m	**FL MM PATCH 2,0 LC-LC**	**2989255**	1
- Length 5 m	**FL MM PATCH 5,0 LC-LC**	**2901799**	1
Fan module for Remote Field Controller	**RFC DUAL-FAN[1])**	**2730239**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1

PC Worx SRT

N

PC Worx SRT is a software PLC that can be installed directly on a Windows PC.

It only makes low demands on the PC hardware profile and can therefore be installed on almost all Windows PCs.
PC WORX SRT is therefore the ideal solution for small to medium-sized automation tasks without realtime requirements.

Programming is quick and easy using the PC Worx or PC Worx EXPRESS software.

Your advantages:
- Save costs, as separate PLC hardware is not required
- Easy and inexpensive visualization, thanks to integrated web server
- Maximum Ethernet openness, as all common protocols are supported

Additional features:
- Modbus/TCP is integrated in the firmware - this increases performance and simplifies configuration. This makes communication with other Modbus devices even easier.
- OPC support using AX OPC server
- FTP server
- Integrated PROFINET IO controller and PROFINET device

Software PLC without realtime extension

Technical data

Hardware requirements	
CPU	x86 architecture
Main memory (RAM)	min. 512 Mbyte
Hard disk memory	min. 1 Gbyte
Optical drive	-
Interfaces	Ethernet port
Operating equipment	Keyboard, mouse recommended
Monitor resolution	XGA (1024 x 768)
Software requirements	
Operating systems	MS Windows XP Professional SP3, MS Windows 7 (32/64-bit), MS Windows Embedded 2009, MS Windows Embedded Standard 7
Basic functions	
	Complete PLC Non-realtime-capable software PLC for installation on a standard PC with integrated Modbus TCP, plus PROFINET IO controller and device functionality
IEC-61131 runtime system	
Programmable under	PC WorX in IEC 61131
Processing speed	(depends on PC processor and settings)
Program memory	1 Mbyte
Data memory	1 Mbyte
Retentive data memory	48 kbyte
Number of data blocks	(depends on data memory)
Number of timers, counters	(depends on data memory)
Number of control tasks	8

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Software PLC, without realtime extension	**PC Worx SRT**	**2701680**	1

Accessories

Industrial computer	**VALUELINE IPC**	**2913108**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1

PC Worx RT BASIC

Make use of the available resources of your industrial PC and transform it into a fully-fledged PLC.

The PC Worx RT BASIC software PLC system is as reliable and stable as a traditional PLC and can be used in applications where a medium to high level of performance is required.

Your advantages:

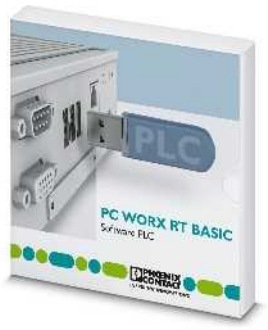
– Save costs, as separate PLC hardware is not required
– Stable and reliable, thanks to operating system extension
– Easy and inexpensive visualization, thanks to integrated web server
– Maximum Ethernet openness, as all common protocols are supported

Additional features:

– Optimally integrated into the PROFINET system
– Easy installation on Valueline industrial PCs
– Modbus/TCP is integrated in the firmware - this increases performance and simplifies configuration. This makes communication with other Modbus devices even easier
– OPC support using AX OPC server
– FTP server
– Numerous protocols supported such as: HTTP, FTP, SNTP, SNMP, SMTP, SQL, MySQL, etc.
– Integrated PROFINET IO controller and PROFINET device
– INTERBUS connection via PC controller board
– Engineering with PC Worx (IEC 61131-3)

Notes:

1) EMC: Class A product, see page 553



Software PLC with realtime extension

Technical data

Hardware requirements	
CPU	INTEL Core2™ Duo 1.5 GHz recommended
Main memory (RAM)	min. 2 Gbyte
Hard disk memory	min. 1 Gbyte
Optical drive	DVD-ROM
Interfaces	Ethernet port, USB port
Operating equipment	Keyboard, mouse recommended
Monitor resolution	XGA (1024 x 768)
Software requirements	
Operating systems	MS Windows XP SP3, MS Windows 7 (32 bit)
Supported browsers	Internet Explorer 5.5 or higher
Basic functions	
	Complete PLC PROFINET IO controller and device functionality only in conjunction with a Valueline PC INTERBUS functionality only in conjunction with an INTERBUS master controller board
IEC-61131 runtime system	
Programmable under	PC WorX in IEC 61131
Processing speed	0.001 ms (1 K mixed instructions, Core2™ Duo 1.5 GHz) 0.7 µs (1 K bit instructions, Core2™ Duo 1.5 GHz)
Program memory	8 Mbyte
Data memory	16 Mbyte
Retentive data memory	240 kbyte
Number of data blocks	(depends on data memory)
Number of timers, counters	(Depends on data memory)
Number of control tasks	16

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
Software PLC, with realtime extension	**PC Worx RT BASIC**	**2700291**	1

Accessories

Industrial computer	**VALUELINE IPC**	**2913108**	1
PC controller board	**IBS PCI SC/I-T**[1])	**2725260**	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1

ILC 131 starter kit

The ILC 131 starter kit provides an easy introduction to our controllers. Learn about control technology with the aid of a pre-assembled test structure with programmed examples. Then use the PC WORX EXPRESS programming software to create custom solutions.

Begin by starting up the controller, configuring it, and parameterizing the bus structure. With the test structure, enter the world of IEC 61131−3-compliant programming.

Controller performance data at a glance:

– Supply voltage: 24 V DC
– Integrated inputs /outputs: 8 / 4
– Processing time per 1000 instructions: 90 µs (bit data types), 1.7 ms (mixed data types)
– Program / data memory: 192 kB / 192 kB
– Remanent data memory: 8 kB

Pre-assembled test structure for quick entry

Technical data

See ILC 131 ETH on page 532

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
ILC 131 starter kit, incl. ILC 131 ETH, analog input module, control panel, power supply unit, plus accessories and cables with test application set up	ILC 131 STARTERKIT	2701835	1

Accessories

Programming cable	PRG CAB MINI DIN	2730611	1
AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	AX OPC SERVER	2985945	1

PROFINET starter kit

Try out the reliable operation, easy handling, and high performance of PROFINET. With the new PROFINET starter kit 3.0, Phoenix Contact provides a system with all the necessary components for creating a test application.

In order to provide a quick and easy introduction, we have created a pre-configured project based on the current version of our PC Worx software.

Controller performance data at a glance:

– Supply voltage: 24 V DC
– Integrated I/Os: 12/4
– Operating time per 1000 instructions: 0.5 ms
– Program/data memory: 1 MB/2 MB
– Retentive data memory: 64 KB

PROFINET starter kit

Technical data

See ILC 350 PN on page 539

Ordering data

Description	Type	Order No.	Pcs. / Pkt.
PROFINET starter kit 3.0, includes a PROFINET IO controller, bus terminal modules, I/O modules, managed switch, power supply unit, plus accessories and cables for creating a PROFINET test application. An example project and PC Worx 6 license key are also included.	**PROFINET STARTERKIT 3.0**	**2988395**	1

Accessories

AX OPC SERVER, communication interface for OPC-compatible visualization with PC Worx-based controllers	**AX OPC SERVER**	**2985945**	1

Whatever your automation task: our specialists in the AUTOMATIONWORX Competence Center are available to answer any questions you may have. This is made possible by our flexible service concept.

Based on the typical phases of a project, we work with you at each stage. With our expertise and years of experience we provide support that is tailored to your industry and the specific phase of your project.

Your advantages:

– Save time by transferring automation tasks to Phoenix Contact
– Optimum automation solution thanks to comprehensive technology and product expertise
– Sophisticated process management thanks to the consistent consideration of all requirements
– Target-oriented project management with optimally coordinated process steps
– Traceable, legal protection thanks to consistent documentation

Services for functional safety can be found on page 114.

Services for Industrial Ethernet can be found on page 46.

Service

You can rely on our support for the smooth operation of your application. Our experts deal with queries encountered in practical applications every day. They draw on their experience of all sectors and knowledge of the components and technologies used.

Our service specialists will be happy to support you with the following services:
– Hotline
– On-site service
– Startup support
– Professional workshops

If queries arise during startup and operation, in addition to your local specialists you can also contact our free 24-hour hotline at any time (+ 49 5281 9-462888) or e-mail us on automation-service@phoenixcontact.com.

We will be happy to answer general questions regarding the functionality of individual components or the system. If this is not sufficient, our startup support team and on-site service will be there to provide assistance.

Training

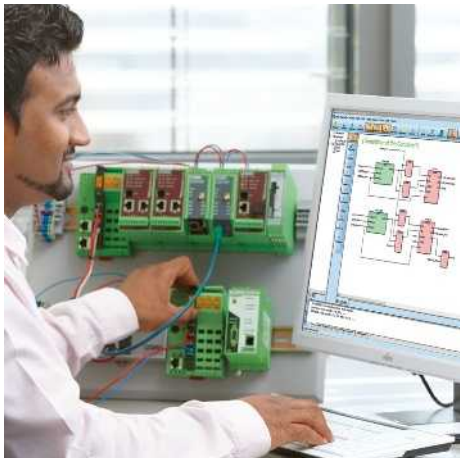
Discover the added value our individual training concepts and training services offer.

With our tailor-made concepts, we help you and your employees to make optimum use of the control and I/O systems from Phoenix Contact.

With our free consultation service, you can arrange the content, duration, location, and date of your individual training session with us.

Should you have any queries regarding our training services and qualification concepts, please contact your local contact person or contact our Back Office Training team directly (+ 49 5281 9-462161 or e-mail us on automation-training@phoenixcontact.com).

We will happily advise you on the implementation of your qualification requirements and work with you to create your own individual training program.



Engineering

Whatever your automation task: our engineering specialists are available to answer any questions you may have. Based on the typical phases of a project, we work with you at each stage.

With our expertise and years of experience we provide support that is tailored to your industry and the specific phase of your project.

Simply give us an outline of the applications you would like to implement and we will provide you with a technical concept that includes suitable hardware and software.
– Configuration
– Programming
– Visualization
– Coaching

If queries arise in the run-up to or during a project, in addition to your local specialists you can also contact us at any time on + 49 5281 9-462166 or e-mail us on projectconsulting@phoenixcontact.com.

Quality in quantity

Integrated management system

The aim of the Phoenix Contact integrated management system is to coordinate all the requirements regarding products, processes, and organization.

Statutory and regulatory requirements, as well as those of international standards and our customers, are met and, in some cases, even exceeded in all phases of the product lifecycle.

In the Phoenix Contact management system, the integration of quality, environmental protection, and safety in the workplace is monitored each year for conformance by internationally recognized independent bodies. Certification in accordance with international standards ISO 9001, ISO 14001, and BS OHSAS 18001 is the result of our corporate philosophy of meeting the needs of our customers, staff, and environment as best as possible. They serve as the basis for innovative products with the familiar high Phoenix quality standard, actively practiced environmental protection, and responsibility in the field of occupational health and safety. Of course, we integrate all further requirements of standards, international approvals or special customer requirements into company processes.

This system provides a building block for the success of the Phoenix Contact Group and its products and services.

CE marking

The CE mark was introduced as an important instrument for the free movement of goods and services within the single European market. By attaching the mark to a product, the manufacturer confirms that it complies with all applicable European Union (EU) directives. EC directives describe the product properties with regard to device safety and avoiding danger. These are legally binding regulations of the European Union (EU). In other words, compliance with the requirements is a **statutory condition for marketing the product within the EU**.

Where applicable, the products that our company currently manufactures fall within the scope of the following directives:

- 2006/95/EC
  Electrical equipment designed for use within certain voltage limits (Low Voltage Directive)
- 2004/108/EC
  Electromagnetic compatibility (EMC Directive)
- 2006/42/EC
  Safety of machinery (Machinery Directive)
- 94/9/EC
  Equipment and protective systems intended for use in potentially explosive areas (ATEX Directive 100a)
- 1999/5/EC
  Radio and telecommunications terminal equipment (R&TTE)

The standards upon which the specified directives are based have been part of our standard of development for a long time. This guarantees conformance with European directives. The numbers of the directives indicate their version at the time of publication. In the event of changes to directives and/or standards, our products will undergo conformity assessment again in good time and a new declaration of conformity will be issued promptly. The current declarations for each product can also be found in our Download Center.

The EMC Directive occupies a special place among the European directives listed. It defines electromagnetic compatibility as a fundamental property of devices based on mandatory guidelines. European Law therefore acknowledges the electromagnetic compatibility of devices and systems as an important condition for error-free operation of machinery and systems. Phoenix Contact is one of the leading international companies in surge protection, and therefore possesses broad expertise in EMC. This expertise and the experience gained over years of developing and applying industrial interface and communication technology have resulted in our products having an extremely high standard of quality with regard to electromagnetic compatibility. It was with a view to providing other companies with this expertise that our associate company, Phoenix Testlab, was founded. Phoenix Testlab GmbH is an independent, accredited service provider offering EMC testing that conforms to European standards. At Phoenix Testlab, devices are also tested with regard to their electrical safety, mechanical influences, and their behavior in relation to environmental influences. Furthermore, Phoenix Testlab is a "Notified Body" in accordance with EMC Directive 2004/108/EC and according to R&TTE Directive 1999/5/EC for radio and telecommunications terminal equipment. As a "Telecom Certification Body" (TCB), Phoenix Testlab may also approve these products for markets in the USA, Canada, and Japan.

Standards and regulations

All relevant standards and regulations are used as the basis for the development and maintenance of our products.

International standards are subject to continuous changes as a result of harmonization and new developments. In line with this process, the current version of all standards that are relevant to our products is documented in the product area on our website at **www.phoenixcontact.net/products**.

Online product information service on the web

Phoenix Contact's product range is growing constantly.

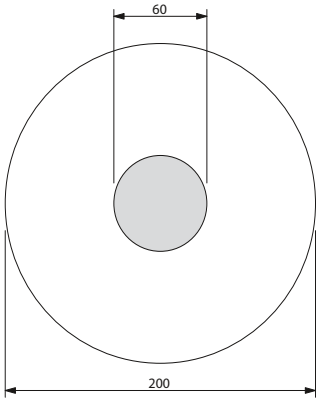
Due to our commitment to product monitoring, all products are subject to improvement.

The Internet is an ideal platform to quickly communicate new product developments and improvements to the market.

You can quickly access the relevant Phoenix Contact website for your region via www.phoenixcontact.com. Here, you will always find the latest overview of products, solutions, and services from Phoenix Contact. This includes technical documents, such as data sheets and user manuals, the latest driver and demo software, plus a means of contacting the appropriate contact person directly.

Shock protection

Touch proof



Back of hand safety

Example: pressure actuation

The accident prevention regulations BGV A 2 issued by the German employer's liability insurance association for precision mechanics and electrical engineering apply to the operators of electrical systems and are aimed at the prevention of electrical accidents by means of special safety requirements.

These regulations contain specifications regarding the safety distances for work, operation, and occasional handling in the proximity of "live parts" in low-voltage systems up to 1000 V ~ or 1500 V –.

- Work with live parts is only permitted once they have been de-energized. Operational activities are only permitted in the vicinity of live parts if these parts are de-energized or are protected against direct contact (§ 6). The following safety measures apply when working in the vicinity of active components:
- Provision of the de-energized state for the duration of the work
- Ensure shock protection is in place in the form of covers or barriers during the work
- Assurance that proximity limits will not be violated (§ 7)

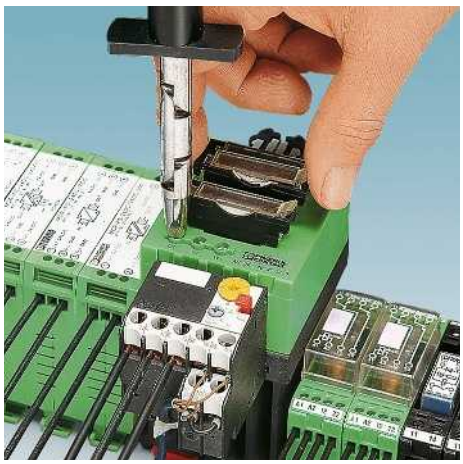
The term "occasional handling" has been introduced for the operation of elements such as pushbuttons, rocker arms or rotary buttons in the proximity of live parts.

In VDE 0105-1, this is covered by "operation with partial protection against direct contact".

Detailed specifications for "occasional handling" can be found in DIN VDE 0106-100. This specifies to what degree live parts in the proximity of operating elements are to be protected against contact. The basis for this is the definition of a "protection area for occasional handling" ; this is the area into which the user must reach in order to handle the machine.

The most important thing is that an area formed by an even envelope curve 30 mm in radius must surround the live parts. This area must be **touch proof**, i.e., the live parts of the electrical device must not be within reach of the VDE test finger in accordance with IEC 60529/DIN VDE 0470-1 (test finger).

Back of hand safety is specified for the "rest of the area" up to 100 mm around the operating element. **Back of hand safety** means that when a force of 50 N is applied to a ball with a diameter of 50 mm, this does not come into contact with the live parts of the



equipment. No special measures for shock protection are provided outside this area.

Note: systems and equipment that are operated with SELV up to 25 V ~ or 60 V – are considered to be protected against direct contact.

According to § 5, Subsection 4 of the BGV A 2 regulations, there is no need to test the condition of the system prior to initial startup if the company has confirmation from the manufacturer or installer that the electrical

systems and equipment conform to BGV A 2. The confirmation required relates to systems and equipment that have been installed and are ready for operation and can only be issued by the installer or installation company. The manufacturer of the electrical equipment can only issue a confirmation that products have been produced in accordance with the relevant electrotechnical DIN VDE regulations stipulated in BGV A 2. The installer must bear this in mind when selecting the equipment to be used.

In the field of connection technology, Phoenix Contact offers a wide range of products that are touch proof or that can be protected against contact using covers. Depending on the conditions, all of this must be taken into account when selecting the individual types of terminal block and accessories.

Quality features of insulating housing

Thermoplastics

The majority of our insulating housing is made from thermoplastic materials. Roughly speaking, these can be divided into amorphous and semi-crystalline substances. Thermoplastics are processed using the efficient and environmentally-friendly injection molding process. They have good recycling properties and can be re-used. We use many materials that are modified in different ways to meet the demanding requirements that electrical and electronic modules, devices, and systems have to meet with regard to their mechanical, thermal, and electrical properties.

Behavior of plastics under the influence of temperature (operating temperatures, mechanical influences)

All plastics undergo a process referred to as thermal aging when they are subjected to heat over long periods. This process causes changes in the mechanical and electrical properties of the material. External influences, e.g., radiation, additional mechanical, chemical or electrical stresses, amplify this effect. Special tests on samples can yield characteristic data which provides a good means of drawing comparisons between different plastics. However, applying these characteristics to an evaluation of molded plastic parts is only possible to a limited extent, and can only give the designer a rough guide when it comes to selecting a plastic material. This catalog uses the following assessment criteria: the **RTI value** according to UL746B/ANSI 746 B (elec. based on dielectric strength) and the **Ti value** according to IEC 60216-1 (based on a 50% reduction in tensile strength after 20,000 hours).

IEC 60947-7-1/EN 60947-7-1 specifies a permissible temperature increase of 45 K for modular terminal blocks under nominal load. Phoenix Contact terminal blocks meet this requirement.

The properties of plastics are not only affected by the influence of heat as described above ; they also undergo changes as a result of cold influences. When subjected to cold as well as low levels of humidity, plastics become increasingly brittle with the result that they are no longer capable of withstanding the same mechanical loads. As the table on the right shows, the plastics concerned can be used down to a temperature of -40°C, but only without a mechanical load. As far as the products presented in the catalog are concerned, it is the ambient temperature specified in each case that is to be regarded as definitive for operation. Regardless of the plastics used, this may be subject to further restrictions (e.g., limited to -20°C) as a result of the components used or other restrictive parameters.

At very low temperatures, this means that any form of mechanical load on the plastic components must be avoided (e.g., mounting of products on/removal of products from the DIN rail, actuation of terminal points, locking/ejection of relays from bases, prizing out of plug-in bridges, bending of cables and lines, etc.), as there is always an associated risk of damage. Unless otherwise indicated, it is recommended that you carry out the specified mounting/operational tasks in a temperature range from -10°C to +40°C.

Inflammability characteristics of plastics (UL 94)

Inflammability tests for plastics have been defined by Underwriters Laboratories (USA) in regulation UL 94. This applies to all areas of application, but in particular to electrical engineering. A horizontal or vertical test is carried out at the test laboratory to determine the inflammability of the plastic material with a naked flame. In order of increasing resistance to combustion, the evaluation classes are HB, V2, V1, V0, and 5V. Test results are recorded on "yellow cards" and are published annually in the **Recognized Component Directory.**

Thermoplastics: non-reinforced polyamide, PA

We use the modern, semi-crystalline polyamide insulation material, which has now become an essential component in electrical engineering and electronics. It has long occupied a leading position and is authorized for use by the relevant approval authorities such as the CSA, NEMKO, KEMA, PTB, SEV, UL, VDE, etc.

Polyamide also has excellent electrical, mechanical, chemical, and other properties, even at high operating temperatures. Brief peak temperatures up to approximately 200°C are permitted as a result of heat aging stabilization. Depending on the type (PA 4.6, 6.6, 6.10, etc.), its melting point is in the region of 215°C to 295°C.

Polyamide absorbs moisture from its surroundings, on average 2.8%. However, this moisture is not in the form of crystallization water in the plastic itself, but chemically bonded H_2O groups in the molecule structure. This makes the plastic flexible and resistant to breakage, even at temperatures as low as -40°C. According to UL 94, PA belongs to inflammability class V2 to V0.

Thermoplastics: polyester, PBT

We use the semi-crystalline thermoplastic polyester in non-reinforced and fiberglass-reinforced variants for special applications which require increased dimensional and form stability.

In addition to the high operating temperature, the material is characterized by excellent mechanical strength and hardness, and does not absorb moisture from its surroundings. PBT is therefore particularly suitable for strips, for example, which are soldered onto PCBs and subsequently have to pass a burn-in test while they are subjected to heat. According to UL 94, PBT belongs to inflammability class V2 to V0.

Thermoplastics: polycarbonate, PC

Polycarbonate combines many advantages such as rigidity, impact strength, transparency, dimensional stability, good insulation properties, and resistance to heat.

This amorphous material only absorbs moisture to a very limited degree, and is used for items such as large, rigid electronic component housing.

In its transparent form, polycarbonate is particularly suitable for use as cover profiles or marking materials.

PC has good resistance properties against mineral acids, saturated aliphatic hydrocarbons, gasoline, greases, and oils.

The material is less resistant to solvents, benzene, lyes, acetone, and ammonia. Strain cracks may result from contact with certain chemicals.

According to UL 94, PC belongs to inflammability class V2 to V0.

Thermoplastics: polycarbonate fiber-reinforced, PC-F

Compared to non-reinforced materials, fiber-reinforced polycarbonates feature greater rigidity, impact strength, and operating temperature. In other respects, their properties are largely identical to those of non-reinforced polycarbonate.

Thermoplastics: ABS

We use the thermoplastic molding compound ABS for products which must have good impact and notched impact properties in addition to high mechanical stability and rigidity. The products are resistant to chemicals and stress cracking due to their special surface quality and hardness.

The characteristic thermal properties provide good dimensional stability at both low and high temperatures. Products made from ABS can be coated with metallic surfaces, e.g., nickel.

According to UL 94, the molding compound used belongs to inflammability class HB to V0.

Dimensions: width / height / depth

The dimensions for "width / height / depth" are defined as follows for all DIN-rail-mountable products in the INTERFACE range:

- Width: measurement taken along the DIN rail
- Height: measurement taken across the DIN rail
- Depth: measurement taken starting from the mounting plate and including the NS 35/7,5 DIN rail (EN 60715)

The width, height, and depth never change, even if the products shown in this catalog happen to be photographed from two different perspectives (horizontal or vertical).

To make things easier for you, one of the following two symbols has been included next to each product photo:

Properties	Unit/level	Polyamide PA	Polyester PBT	Polycarbonate PC	Polycarbonate PC-F	ABS
Operating temperature RTI */**	°C	≤ 105	≤ 105	≤ 125	≤ 120	≤ 80
Minimum temperature (without mechanical load)	°C	-40	-40	-40	-40	-40
Dielectric strength acc. to IEC 60243-1/DIN VDE 0303-21	kV/cm	600	400	> 300		850
Creep resistance	CTI...M	550	225	175		200
IEC 60112/DIN VDE 0303-1	CTI...	600	225	175	175	600
Tropical and termite resistance		Good	Good	Good		
Specific contact resistance IEC 60093/VDE 0303 Part 30 ; IEC 60167/VDE 0303 Part 31	Ω cm	10^{12}	10^{16}	> 10^{16}	> 10^{14}	10^{14}
Surface resistance IEC 60093/VDE 0303 Part 30 ; IEC 60167/VDE 0303 Part 31	Ω	10^{10}	10^{13}	> 10^{14}		10^{13}
Inflammability class according to UL 94		V2 - V0	V0	V2 - V0	V0	HB - V0

* According to UL 746 B/ANSI 746 B (elec.)

** Minimum value

Connection cross section

The rated cross section of modular terminal blocks must be specified by the manufacturer in accordance with IEC 60947-7-1. The rated cross section is the maximum conductor cross section that can be connected in single-, multi- or fine-strand versions subject to specific thermal, mechanical, and electrical requirements.

The manufacturer must also specify the **rated connection capacity**, i.e., the area of the conductor that can be connected, as well as the number of conductors that can be connected simultaneously and the necessary preparation of the conductor ends. The conductors can be **solid (single or multi-strand)** or **stranded (fine-strand)**.

These values can be found in the product-specific technical data.

The rated connection capacity of Phoenix Contact modular terminal blocks usually exceeds standard requirements, which specify that it must only be possible to connect one conductor with one of the two next smallest cross sections, excluding the rated cross section (standardized for the cross section range from 0.2 to 35 mm²).

In addition, conductors with a rated cross section can usually be wired with ferrules with plastic sleeve.

Phoenix Contact modular terminal blocks are designed to allow copper conductors to be connected to them untreated. "Special treatment" or the use of ferrules – both permitted according to IEC 60947-7-1 – is not required. If ferrules are nevertheless used to protect stranded conductors against splicing, the connection capacity of the stranded conductor is generally reduced by one level.

Structure and dimensions of connecting cables

Cross section	Single-strand		Multi-strand		Fine-strand		American Wire Gauge [AWG]						
	Diameter max. dimension	Number of wires	Diameter max. dimension	Number of wires (minimum number)	Diameter max. dimension	Number of wires (guide value)	Gauge No.	Solid wires			Stranded wires		
[mm²]							AWG	[Ø mm]	[circ. mils]	[mm²]	[Ø mm]	[circ. mils]	[mm²]
0.2	0.5	1	–	–	–	–	24	0.51	404	0.21	–	–	–
0.5	0.9	1	1.1	7	1.1	16	20	0.81	1022	0.52	0.97	1111	0.56
0.75	1.0	1	1.2	7	1.3	24	18	1.02	1620	0.82	1.16	1600	0.82
1	1.2	1	1.4	7	1.5	32	(17)	1.15	2050	1.04			
–	–	–	–	–	–	–	16	1.29	2580	1.31	1.50	2580	1.32
1.5	1.5	1	1.7	7	1.8	30	(15)	1.45	3260	1.65			
–	–	–	–	–	–	–	14	1.63	4110	2.08	1.85	4100	2.09
2.5	1.9	1	2.2	7	2.3	50	(13)	1.83	5180	2.63			
–	–	–	–	–	–	–	12	2.05	6530	3.31	2.41	6500	3.32
4	2.4	1	2.7	7	2.9	56	(11)	2.30	8230	4.17			
–	–	–	–	–	–	–	10	2.59	10380	5.26	2.95	10530	5.37
6	2.9	1	3.3	7	3.9	84	(9)	2.91	13100	6.63			
–	–	–	–	–	–	–	8	3.26	16510	8.37	3.73	16625	8.48

Tightening torque of terminal block screws

IEC 60947-1/EN 60947-1, modified, Table 4 specifies tightening torques for screw connections based on the screw size for electrical and mechanical type tests.

Extract from IEC 60 947-1/EN 60 947-1, Table 4
The torque according to IEC and the recommended tightening torque for Phoenix Contact terminal blocks are specified.

Thread	Head screw with slot	
	Torque [Nm]	Recommended tightening torque [Nm]
M2.5 (M2.6)	0.4	0.4 - 0.5
M3	0.5	0.5 - 0.6
M3.5	0.8	0.8 - 1.0
M4	1.2	1.2 - 1.5

Current carrying capacity

Standard IEC 60947-7-1/ EN 60947-7-1/DIN VDE 0611-1 specifies the test currents for the individual conductor cross sections listed in the adjacent table. The corresponding currents are listed with the connection data for the individual terminal blocks. The type tests for modular terminal blocks are based on this data.

Test currents according to IEC 60947-7-1/EN 60947-7-1, Table 5

Rated cross section	[mm²]	0.2	0.5	0.75	1.0	1.5	2.5	4	6	10	16
Test current	[A]	4	6	9	13.5	17.5	24	32	41	57	76

Overview of certification bodies and safety marks

Certification bodies and approvals		Country code
CB scheme	IECEE CB Scheme (in combination with certifying body)	Interna-tional
CCA	CENELEC Certification Agreement (CCA inspection report) (in combination with certifying body)	EU
	Canadian Standards Association (CSA)	CA
	Underwriters Laboratories Inc. (UL)	US
	Underwriters Laboratories Inc. (UL) - UL approval for Canada -	CA
	Underwriters Laboratories Inc. (UL) Combined logo - UL approval for the USA and Canada -	US CA
	INSIEME PER LA QUALITA'E LA SICUREZZA	IT
	Gosudarstvenne Komitet Standartov (GOST)	RU
KEMA KEUR	DEKRA Certification B.V.	NL
ÖVE	Österreichischer Verband für Elektrotechnik	AT
SABS	South African Bureau of Standards	ZA
SEV	electrosuisse SEV Verband für Elektro-, Energie- und Informationstechnik	CH
VDE	Verband Deutscher Elektrotechniker e.V.(VDE) – Approval of drawings – Reports with production monitoring	DE
GS	Berufsgenossenschaft (BG) GS - Geprüfte Sicherheit	DE
TÜV	TÜV Rheinland Industrie Service GmbH	DE

Explosion protection		Country code
FM APPROVED	FM Approvals	US
DEKRA	DEKRA Certification B.V.	NL
PTB	Physikalisch-Technische Bundesanstalt	DE
QS International	QS Schaffhausen	CH
VTT	VTT Expert Services Oy	FI
IBExU	IBExU Institut für Sicherheitstechnik GmbH	DE
	TÜV Rheinland do Brasil	BR
	Underwriters Laboratories Inc. (UL)	US
TÜV NORD	TÜV Nord	DE
DEKRA	DEKRA EXAM GmbH	DE

Ship classification societies		Country code
	Bureau Veritas	FR
GL	Germanischer Lloyd AG	DE
Lloyds Register	Lloyd's Register EMEA	GB
ClassNK	Nippon Kaiji Kyokai	JP
	Det Norske Veritas	NO
	Polski Rejestr Statków	PL
	Russian Maritime Register of Shipping	RU
KR	Korean Register of Shipping	KR
ABS	American Bureau of Shipping	US

EMC: Class A product:

In accordance with statutory regulations, our products are indicated with this footnote if they are intended for use in industrial environments. This means that the permissible limit values for residential applications may be exceeded in the event of conducted and emitted interference. In such cases, the operator may have to take additional safety measures in order to ensure electromagnetic compatibility in residential applications.

Note:

Subject to changes that serve the purpose of technical progress.

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