# OMRON



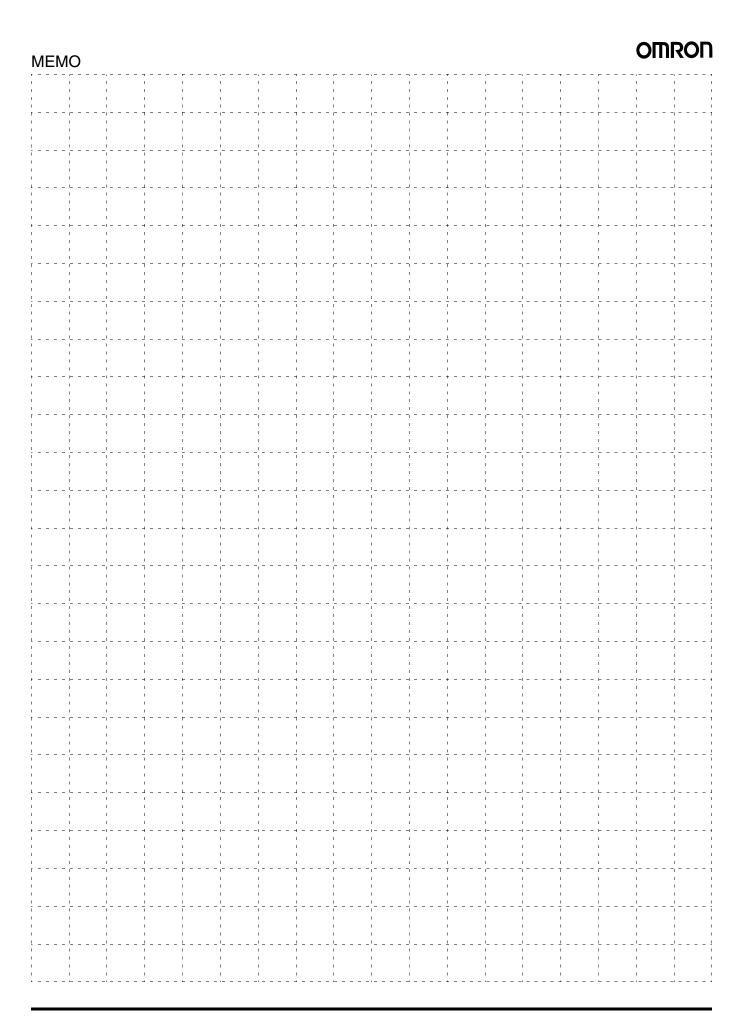
## **Communications Specifications**

Item	Specification			
Communications protocol	CompoNet Network protocol			
Types of communications	Remote I/O communications (programless, constant sharing of data with Slave Units) and message communications (explicit message communications as required with Slave Units and FINS message communications as required with controllers) *1			
Baud rate	4 Mbps *2, 3 Mbps, 1.5 Mbps, 93.75 kbps			
Modulation	Base-band			
Coding	Manchester code			
Error control	Manchester code rules, CRC			
Communications media *3	The following media can be used.  • Round cable I 2-wire 0.75 mm²  • Round cable II 4-wire 0.75 mm²  • Flat Cable I			
Communications distance and wiring	Refer to Cable Types, Baud Rates, and Maximum Distances in the Master Unit Operation Manual.			
Connectable Master Units	CompoNet Master Units			
Connectable Slave Units	CompoNet Slave Units			
Maximum I/O capacity	Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total) Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total)			
Maximum number of nodes	Word Slave Units: 64 input nodes and 64 output nodes Bit Slave Units: 128 input nodes and 128 output nodes Repeater Units: 64 nodes			
Bits allocated per node address	Word Slave Units: 16 bits Bit Slave Units: 2 bits			
Maximum number of nodes per trunk line or sub-trunk line	32 nodes (including Repeater Units)			
Applicable node addresses	Word Slave Units: IN0 to IN63 and OUT0 to OUT63 Bit Slave Units: IN0 to IN127 and OUT0 to OUT127 Repeater Units: 0 to 63			
Repeater Unit application conditions	Up to 64 Repeater Units can be connected per network (i.e., per Master Unit). Up to 32 Repeater Units can connected per trunk line or per sub-trunk line. When Repeater Units are connected in series from the Master Unit, up to two extra segment layers can be created (i.e., up to 2 Repeater Units are allowed between a Sla Unit and the Master Unit).			
Signal lines	Two lines: BDH (communications data high) and BDL (communications data low)			
Power lines	Two lines: BS+ and BS- (power for communications and internal Slave Unit circuits)  • Power is supplied from the Master Unit or Repeater Units.			
Communications power supply voltage	24 VDC ±10%			
Connection forms	Round cable II (4-wire) or Flat cable I at baud rate of 93.75 kbits/s: No restrictions Other cables or baud rates: Trunk line and branch lines			
	Connections for Slave Units and Repeater Units: T-branch or multidrop connections			

FINS message communications are supported by CJ-series Controllers only.

A baud rate of 4 Mbps is not supported for branch lines and thus cannot be used for Slave Units with Cables (i.e., Bit Slave Units).

Round cable I, round cable II and Flat Cable I are all different types of cable. To use more than one type of cable at a time, Repeater Units must be used to separate them on trunk lines and sub-trunk lines.



# **CompoNet Master Units**

CJ-series CompoNet Master Units	5
■CJ1W-CRM21	
CS-series CompoNet Master Units	6
■CS1W-CRM21	
CompoNet Master Board for PCI Bus/CompactPCI Bus	7
■3G8F7-CRM21/3G8F8-CRM21	

### **CJ/CS-series Master Unit Specifications**

Item Model	CJ1W-CRM21	CS1W-CRM21		
Applicable Controller	NJ *1 / CJ-series	CS-series CS-series		
Unit classification	CJ-series Special I/O Unit	CS-series Special I/O Unit		
Current consumption (Power supplied from Power Supply Unit)	400 mA max. at 5 VDC			
Communications power supply connector	One connector for the communications power supply is requi Round Cable II or Flat Cable I. *2	red for a Slave or Repeater Unit on the trunk line when using		
Communications power supply con- nector allowable current capacity	5 A max. (4 A max. for UL rating) When UL standards are being applied to your equipment, be	sure the maximum allowable current is 4 A.		
Maximum number of mountable Master Units	One word number assigned: 40 Units Two word numbers assigned: 40 Units Four word numbers assigned: 24 Units Eight word numbers assigned: 12 Units	One word number assigned: 80 Units Two word numbers assigned: 48 Units Four word numbers assigned: 24 Units Eight word numbers assigned: 12 Units		
Mounting location	According to NJ/CJ/CS-series Special I/O Unit specifications			
Communications power ON/OFF monitoring	The ON/OFF status of the communications power supply car	be detected at the communications power supply connector.		
Data stored in Master Unit (built-in EEPROM)	1) The following device parameters:  • Registration Table  • Registration Table Check Type  • Registered Slave Unit Participation Monitoring Time, Registered Slave Unit Participation Standby Mode, and Event Disable Setting  • Software Settings Table  • Manual I/O Communications Start Mode  • Communications Error Input Data Zero Clear Mode  • Network settings  2) Part of error history (depends on type of error; mainly serious error related to communications stopping)			
Noise immunity	Conforms to IEC 61000-4-4 2 kV (applied to power supply).			
Vibration resistance	10 to 61.2 Hz with single-amplitude of 0.1 mm, 61.2 to 150 Hz and 14.7 m/s² in X, Y, and Z directions for 80 min each (sweep time of 8 min × 10 sweeps = 80 min)			
Shock resistance	196 m/s <sup>2</sup> (3 times each in X, Y, and Z directions)			
Dielectric strength	500 VAC (between isolated circuits)			
Insulation resistance	20 MΩ min. (between isolated circuits)			
Ambient operating temperature	0 to 55°C			
Ambient operating humidity	10 to 90% (no condensation)			
Ambient operating atmosphere	No corrosive gases			
Storage temperature	−20 to 75°C			
Weight	130 g max. (Master Unit only) 190 g max. (Master Unit only)			

<sup>\*1</sup> Supported only CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.
\*2 Communications power does not need to be supplied to the Master Unit.

## **CJ-series CompoNet Master Units**

## CJ1W-CRM21

# NJ/CJ-series CompoNet Master Units Increase the Range of Applicability of Sensors and Actuators.

The NJ/CJ-series CompoNet Master Unit manages the CompoNet network, controls communications between the Controller and Slave Units, and handles I/O data and message data.

- Setup is simple. Make the master's mode settings and set the baud rate, and you're ready to go.
- Control up to 2,560 I/O points and 384 nodes with one Master Unit.
- Intuitive memory mapping with separate areas for Word Slave Units and Bit Slave Units.
- Seven-segment display helps with startup and enables prompt detection of problems.
- Collect information from Slave Units using message communications, or use message communications to set parameters.
- Inherits the ease of use of the CompoBus/S.
- Flexible I/O allocations with software setting function.



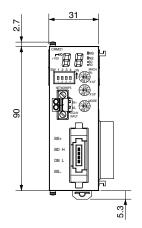
#### **Ordering Information**

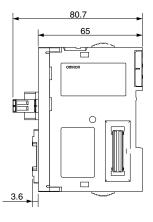
Specifications			Number of unit	Power consumption (A)			
Name	Types of communications	•		5-V system	24-V system	26-V system	Model
CJ1 Special I/O Unit *	Remote I/O communications     Message communications	Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total) Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total)	1, 2, 4, or 8	0.4			CJ1W-CRM21

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

Dimensions (Unit: mm)

#### CJ1W-CRM21





## **CS-series CompoNet Master Units**

## CS1W-CRM21

# CS-series CompoNet Master Units Increase the Range of Applicability of Sensors and Actuators.

The CS-series CompoNet Master Unit manages the CompoNet network, controls communications between the PLC and Slave Units, and handles I/O data and message data.

- Setup is simple. Make the master's mode settings and set the baud rate, and you're ready to go.
- Control up to 2,560 I/O points and 384 nodes with one Master Unit.
- Intuitive memory mapping with separate areas for Word Slave Units and Bit Slave Units.
- Seven-segment display helps with startup and enables prompt detection of problems.
- Collect information from Slave Units using message communications, or use message communications to set parameters.
- Inherits the ease of use of the CompoBus/S.
- Flexible I/O allocations with software setting function.

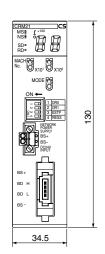


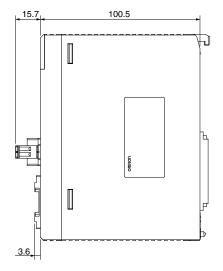
Specifications		Number of unit	Power consumption (A)				
Name	Types of communications	Maximum number of I/O points per Master Unit		5-V system	24-V system	26-V system	Model
CS1 Special I/O Unit *	Remote I/O communications     Message communications	Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total) Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total)	1, 2, 4, or 8	0.4			CS1W-CRM21

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

Dimensions (Unit: mm)

#### CS1W-CRM21



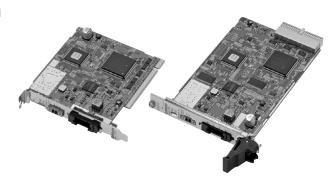




# CompoNet Master Board for PCI Bus/CompactPCI Bus 3G8F7-CRM21/3G8F8-CRM21

# CompoNet Master Board for PC which provides ultra-high speed control

- Two type product variation of PCI Bus type and Compact PCI Bus type
- Windows-base environment. Compatible with other OS, too when shared memory area is used.
- Combine PC with High-speed communication network
   "CompoNet" to achieve further fast communications.
- Familiar C/C++/VB based programming.



#### Ordering Information

Name	Specification	Model
CompoNet Master Board for PCI Bus	PCI bus Rev2.2 5V	3G8F7-CRM21
CompoNet Master Board for CompactPCI Bus	PICMG 2.0 R3.0 5V 32-Bit 3U	3G8F8-CRM21

#### **General Specifications**

	Specifi	cations	
Item	3G8F7-CRM21 (PCI)	3G8F8-CRM21 (CompactPCI)	
Bus specification	PCI bus Rev2.2 5 V	PICMG 2.0 R3.0 5 V 32-Bit 3U	
Number of mountable boards	4 pieces	7 pieces	
Compatible OS	Microsoft Windows 2000 / XP (32 Bit OS can be used, when the shared m	version) / Vista (32 Bit version) Other emory interface is directly accessed.	
Weight	90 g max.	150 g max.	
Operation voltage	Internal power supply: 5 VDC±5% 3.3 VDC is not used.		
Consumption current	Internal power supply: 5 VDC and 1.5 A max Communications power supply: 24 VDC and 80 mA max		
Vibration resistance	10 to 57 Hz, Amplitude 0.075 mm, 57 to 150 Hz Acceleration 9.8 m/s², 80 min in each direction of X, Y and Z (8 min of each sweep time × 10 sweeps = total 80 min)		
Shock resistance	147 m/s², 3 times in each direction of X, Y and Z.		
Ambient operating temperature	0 to 55°C		
Ambient operating humidity	0% to 80% RH (with no condensation) 0% to 90% RH (with no condensation)		
Ambient operating atmosphere	No corrosive gas		
Storage temperature	-20 to +60°C		

#### **Development Environment**

- Microsoft Visual C++ (Ver 6.0 to Ver 2008)
- Microsoft Visual Basic (Ver 6.0)
- CodeGear C++Builder (Ver 5 to Ver 2009)

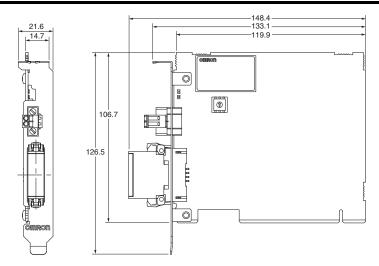
#### **Precautions for Correct Use**

When you use the Board in an OS other than Windows by directly accessing the shared memory interface, provide the development environment applicable for the OS.

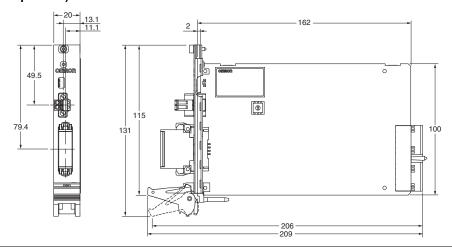


Dimensions (unit: mm)

#### 3G8F7-CRM21 (PCI)



#### 3G8F8-CRM21 (CompactPCI)

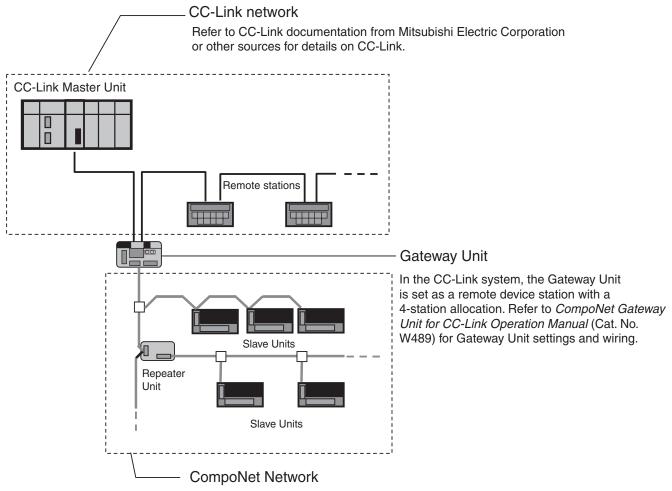


## CompoNetGatewayUnit

Overview of Gateway Unit	10
CompoNet Setting	
CompoNet Gateway Unit for CC-Link	
■GQ-CRM21	

#### **Overview of Gateway Unit**

The CompoNet Gateway Unit works as a converter to connect CompoNet with another network with different protocol. The GQ-CRM21 CompoNet Gateway Unit for CC-Link provides one CC-Link port and one CompoNet port. It cyclically transfers I/O data between the CompoNet Slave Units and the CC-Link Master Unit.



Refer to the *CompoNet Slave Unit and Repeater Unit Operation Manual* (Cat. No. W457) for the specifications of CompoNet networks. Refer to documentation for individual Slave Units and Repeater Units fordetails on those Units.

- "CC-Link" is a registered trademark of Mitsubishi Electric Corporation.
- "GX-Developer" is a registered trademark of Mitsubishi Electric Corporation.

#### **CompoNet Setting**

#### **■** Setting the Communications Mode

To use the Gateway Unit, select the communications mode with the setting switches on the Gateway Unit. The below table lists the number of Slave Units (Word Slave Units and Bit Slave Units) and Control Points (the range of buffer memory allocated to the Gateway Unit in the CC-Link Master Unit) in each communications mode. (Refer to *CompoNet Gateway Unit for CC-Link Operation Manual* (Cat. No. W489) for details.)

The expanded cyclic setting (a network parameter set with the GX-Developer) in the CC-Link station information must be changed according to the communications mode.

Mode number	Name	Connectable node addresses	Number of connected nodes	Control Points	CC-Link version and expanded cyclic setting
0	Communications mode 0	Word Slave Unit: IN 0 to IN 63 and OUT 0 to OUT 63 Bit Slave Unit: IN 0 to IN 127 and OUT 0 to OUT 127	Word Slave Unit IN 64/OUT 64 Bit Slave Unit IN 128/OUT 128	Word Slave Unit: 1,024 inputs and 1,024 outputs Bit Slave Unit: 256 inputs and 256 outputs	Version 2, octuple (default)
1	Communications mode 1	Word Slave Unit: IN 0 to IN 31 and OUT 0 to OUT 31 Bit Slave Unit: IN 0 to IN 95 and OUT 0 to OUT 95	Word Slave Unit IN 32/OUT 32 Bit Slave Unit IN 96/OUT 96	Word Slave Unit: 512 inputs and 512 outputs Bit Slave Unit: 192 inputs and 192 outputs	Version 2, quadruple
2	Communications mode 2	Word Slave Unit: IN 0 to IN 15 and OUT 0 to OUT 15 Bit Slave Unit: IN 0 to IN 47 and OUT 0 to OUT 47	Word Slave Unit IN 16/OUT 16 Bit Slave Unit IN 48/OUT 48	Word Slave Unit: 256 inputs and 256 outputs Bit Slave Unit: 96 inputs and 96 outputs	Version 2, double
3	Communications mode 3	Word Slave Unit: IN 0 to IN 7 and OUT 0 to OUT 7 Bit Slave Unit: IN 0 to IN 15 and OUT 0 to OUT 15	Word Slave Unit IN 8/OUT 8 Bit Slave Unit IN 16/OUT 16	Word Slave Unit: 128 inputs and 128 outputs Bit Slave Unit: 32 inputs and 32 outputs	Version 1
4	Communications mode 4	Word Slave Unit: IN 0 to IN 63 and OUT 0 to OUT 63 Bit Slave Unit: IN 0 to IN 127 and OUT 0 to OUT 127	Word Slave Unit IN 64/OUT 64 Bit Slave Unit IN 128/OUT 128	Word Slave Unit: 1,024 inputs and 1,024 outputs Bit Slave Unit: 256 inputs and 256 outputs	Version 2, quadruple
5	Communications mode 5	Word Slave Unit: IN 0 to IN 31 and OUT 0 to OUT 31 Bit Slave Unit: IN 0 to IN 95 and OUT 0 to OUT 95	Word Slave Unit IN 32/OUT 32 Bit Slave Unit IN 96/OUT 96	Word Slave Unit: 512 inputs and 512 outputs Bit Slave Unit: 192 inputs and 192 outputs	Version 2, double
6	Communications mode 6	Word Slave Unit: IN 0 to IN 15 and OUT 0 to OUT 15 Bit Slave Unit: IN 0 to IN 47 and OUT 0 to OUT 47	Word Slave Unit IN 16/OUT 16 Bit Slave Unit IN 48/OUT 48	Word Slave Unit: 256 inputs and 256 outputs Bit Slave Unit: 96 inputs and 96 outputs	Version 1
7 to 9	Reserved				

## **CompoNet Gateway Unit for CC-Link**

## GQ-CRM21

# "Easy" and "Flexible" system expansion with linked CC-Link and CompoNet.

- Branching is easily made with CompoNet. Wiring material cost can be reduced.
- Bit-level I/O distribution reduces wiring in the system.
- A wide variety of CompoNet Slave Units contribute to system size reduction.
- Seven-segment Display on the Gateway Unit helps to detect errors on site.
- The Participation Flags and Communications Error Flags can be checked at the Host Controller to detect the location and content of the error.



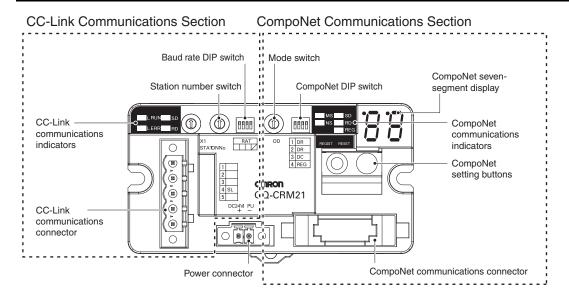
#### **Ordering Information**

	Specifications					
Name	CC-Link Communications Specification			CompoNet Co	Model	
	Station Type	Number of stations occupied	CC-Link Version	Types of communications	Maximum I/O capacity	
CompoNet Gateway Unit for CC-Link	Remote device stations	4	Version 1.10 or 2.00 (Selected using mode switch.)	Remote I/O Communications	Word Slave Units: 2,048 I/O points total (1,024 inputs and 1,024 outputs) Bit Slave Units: 512 I/O points total (256 inputs and 256 outputs)	GQ-CRM21

#### **Master Unit Specifications**

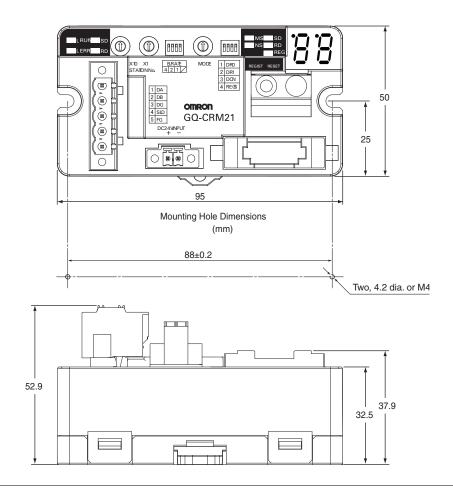
Item		Specification		
Unit power suppl	y voltage	21.6 to 26.4 VDC (24 VDC±10%) (Supplied from power supply connector.)		
Communications power supply		3.80 A at 24 VDC		
consumption	Internal current power consumption	0.13 A at 24 VDC		
Noise immunity		Conforms to IEC 61000-4-4, 2.0 kV		
Vibration resistance		Malfunction: 10 to 60 Hz with 0.7-mm double amplitude, 60 to 150 Hz, 50 m/s² for 80 min in X, Y, and Z directions		
Shock resistance		150 m/s², 3 times in 6 directions on 3 axes		
Dielectric strength		500 VAC		
Installation metho	bc	Mounted to DIN Track or by using M4 screws		
Ambient operatin	g temperature	0 to 55 °C		
Ambient operating humidity		10% to 90% (with no condensation)		
Ambient storage temperature		-25 to 65 °C		
Weight		110 g max.		
Ambient operating atmosphere		No corrosive gases		

#### **Component Names and Functions**



Dimensions (Unit: mm)

#### GQ-CRM21



## OMRON

## **CC-Link Communications Specifications**

Item	Specification	
Version	CC-Link version 1.10 or 2.00 (Selected using mode switch.)	
Baud rate	156 kbps, 625 kbps, 2.5 Mbps, 5 Mbps, or 10 Mbps	
Communications method	Broadcast polling	
Synchronization method	Frame synchronization	
Encoding	NRZI	
Transmission path	Bus (Conforms to RS-485.)	
Transmission format	Conforms to HDLC.	
Communications media	CC-Link cable (shielded, 3-core twisted-pair cable)	
Number of connected nodes	Depends on specifications of the CC-Link master station.	
Remote stations	1 to 61 (Four station numbers are allocated starting from the specified station number.)	
Error control	CRC (X16 + X12 + X5 + 1)	
RAS functions	Automatic recovery function, slave cutoff, data link status checks, offline testing	
Allocated station numbers	Allocated four stations numbers as a remote device station	

## **CompoNet Slave Unit**

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What Are Smart Functions?	
Basic Specification of Slave Units	
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Temperature Input Units	71
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Bit Slave Units with e-CON Connectors	
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Sensor Communications Unit	99
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#### **Smart Functions**

The Slave Units provide Smart Functions that powerfully aid in everything from building the system and initial system startup to preventive system maintenance. The Smart Functions include functions for monitoring the operation time, changes in operating values, and other values, as well as functions that provide warnings for maintenance based on ON/OFF counts, total operating time, and other counted values.

#### ■ CompoNet Slave Unit Functions

Yes: Supported, ---: Not supported

Unit	Digital I/O Slave Units	) Slave Units						
	2-tier Terminal block							
	CRT1-	D08(-1)		CRT1-□D16(-1)				
Function	Input Units	Output Units	Input Units	Output Units	I/O Units			
Operation Time Monitor			Yes					
Contact Operation Monitor*			Yes					
Total ON Time Monitor*			Yes					
Automatic Baud Rate Detection			Yes					
Unit Conduction Time Monitor			Yes					
Naming Units			Yes					
Naming Connected Devices			Yes					
Network Power Voltage Monitor			Yes					
I/O Power Status Monitor			Yes					
Communications Error History Monitor			Yes					
Input Filter	Yes		Yes		Yes			
Communications Error Output		Yes		Yes	Yes			
Preventing Malfunctions Caused by Inrush Current at I/O Startup	Yes		Yes		Yes			
Power Short-circuit Detection		ı						
Unconnected Line Detection								
Load Short-circuit Detection								
Disconnected Line Detection								
Removable Terminal Block Structure			Yes					
Expansion Using Expansion Units	=-		Y	es				
Scaling								
Last Maintenance Date			Yes					
Cumulated Count								
Moving Average								
Setting the Number of AD Conversion Points								
Rate of Change								
Comparator								
Peak/Bottom Hold								
Top/Valley Hold								
User Adjustment								
Top/Valley Count								
Temperature Range Total Time Count								
Input Temperature Variation Detection								
Input Error Detection Disable Function								

#### **Reducing System Startup Time**

- Network Power Voltage Monitor
- Input Filter
- Preventing Malfunctions Caused by Inrush Current at Startup
- · Automatic Baud Rate Detection
- Scaling
- · User Adjustment
- · Cumulative Counter
- Moving Average

- · Setting the Number of AD
- Conversion Point
- · Peak/Bottom Hold
- · Top/Valley Hold
- · Rate of Change

#### **Reducing Downtime**

- · Naming Units
- Naming Connected Devices
- · I/O Power Status Monitor
- · Power Short-circuit Detection
- · Unconnected Line Detection
- Disconnected Line Detection

#### **Improving Maintenance**

- Operation Time Monitor
- Contact Operation Monitor
- · Unit Conduction Time Monitor
- Total ON Time Monitor
- · Network Power Voltage Monitor
- · Communications Error History Monitor
- · Last Maintenance Date
- · Comparator
- · Communications Error Output

<sup>\*</sup> The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	Digital I/O Slave Units						
	2-tier Terminal block						
	CRT1-ROS08	CRT1-ROS16	CRT1-ROF08	CRT1-ROF16			
Function	Outp	ut Units	Output	Units			
Operation Time Monitor		Yes	Ye	s			
Contact Operation Monitor*		Yes	Ye	S			
Total ON Time Monitor*		Yes	Ye	S			
Automatic Baud Rate Detection		Yes	Ye	s			
Unit Conduction Time Monitor		Yes	Ye	S			
Naming Units		Yes	Ye	S			
Naming Connected Devices		Yes	Ye	S			
Network Power Voltage Monitor		Yes	Ye	S			
I/O Power Status Monitor				=			
Communications Error History Monitor		Yes	Ye	S			
Input Filter				=			
Communications Error Output		Yes	Yes				
Preventing Malfunctions Caused by Inrush Current at I/O Startup							
Power Short-circuit Detection							
Unconnected Line Detection							
Load Short-circuit Detection							
Disconnected Line Detection							
Removable Terminal Block Structure		Yes	Ye	s			
Expansion Using Expansion Units		Yes		Yes			
Scaling				-			
Last Maintenance Date		Yes	Ye	s			
Cumulated Count				-			
Moving Average				-			
Setting the Number of AD Conversion Points				-			
Rate of Change				-			
Comparator				-			
Peak/Bottom Hold				-			
Top/Valley Hold							
User Adjustment				-			
Top/Valley Count							
Temperature Range Total Time Count							
Input Temperature Variation Detection							
Input Error Detection Disable Function							

<sup>\*</sup> The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	Digital I/O Slave Units						
	3-tier Terminal block						
	(without Short-circuit	D08TA(-1) and Disconnected Line ction)	CRT1-□D08TAH(-1) (with Short-circuit and Disconnected Line Detection)				
Function	Input Units	Output Units	Input Units	Output Units			
Operation Time Monitor		Ye	es				
Contact Operation Monitor*		Ye	es				
Total ON Time Monitor*		Ye	es				
Automatic Baud Rate Detection		Ye	es				
Unit Conduction Time Monitor		Ye	es				
Naming Units		Ye	es				
Naming Connected Devices		Ye	es				
Network Power Voltage Monitor		Ye	es				
I/O Power Status Monitor		Ye	es				
Communications Error History Monitor		Ye	es				
Input Filter	Yes		Yes				
Communications Error Output		Yes		Yes			
Preventing Malfunctions Caused by Inrush Current at I/O Startup	Yes		Yes				
Power Short-circuit Detection	-		Yes				
Unconnected Line Detection	-		Yes				
Load Short-circuit Detection	-			Yes			
Disconnected Line Detection	-			Yes			
Removable Terminal Block Structure		Ye	es				
Expansion Using Expansion Units			-				
Scaling			-				
Last Maintenance Date		Ye	es				
Cumulated Count			-				
Moving Average			-				
Setting the Number of AD Conversion Points			-				
Rate of Change			-				
Comparator			-				
Peak/Bottom Hold			-				
Top/Valley Hold			-				
User Adjustment			-				
Top/Valley Count			-				
Temperature Range Total Time Count			-				
Input Temperature Variation Detection			-				
Input Error Detection Disable Function			_				

Input Error Detection Disable Function --
\* The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	Digital I/O Slave Units						
	3-tier Terminal block						
		CRT1-□D16TA(-1 t-circuit and Disc Detection)			CRT1-□D16TAH(-1) (with Short-circuit and Disconnected Line Detection)		
Function	Input Units	Output Units	I/O Units	Input Units	Output Units	I/O units	
Operation Time Monitor			Ye	es			
Contact Operation Monitor*			Ye	es			
Total ON Time Monitor*			Ye	es			
Automatic Baud Rate Detection			Ye	es			
Unit Conduction Time Monitor			Ye	es			
Naming Units			Ye	es es			
Naming Connected Devices			Ye	es			
Network Power Voltage Monitor			Ye	es			
I/O Power Status Monitor			Ye	es			
Communications Error History Monitor			Ye	es			
Input Filter	Yes		Yes	Yes		Yes	
Communications Error Output		Yes	Yes		Yes	Yes	
Preventing Malfunctions Caused by Inrush Current at I/O Startup	Yes		Yes	Yes		Yes	
Power Short-circuit Detection				Yes		Yes	
Unconnected Line Detection				Yes		Yes	
Load Short-circuit Detection					Yes	Yes	
Disconnected Line Detection					Yes	Yes	
Removable Terminal Block Structure			Ye	es	1		
Expansion Using Expansion Units			-				
Scaling			-				
Last Maintenance Date			Ye	es			
Cumulated Count			-				
Moving Average			-				
Setting the Number of AD Conversion Points			-				
Rate of Change			-				
Comparator			-				
Peak/Bottom Hold			-				
Top/Valley Hold			-				
User Adjustment			-				
Top/Valley Count			-				
Temperature Range Total Time Count			-				
Input Temperature Variation Detection			-				
Input Error Detection Disable Function			-				

<sup>\*</sup> The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	Unit Digital I/O Slave Units					
	Units with e-CON Connectors					
	CRT1-V	D08S(-1)				
Function	Input Units	Output Units				
Operation Time Monitor	Y	es				
Contact Operation Monitor*	Y	es				
Total ON Time Monitor*	Y	es				
Automatic Baud Rate Detection	Y	es				
Unit Conduction Time Monitor	Y	es				
Naming Units	Y	es				
Naming Connected Devices	Y	es				
Network Power Voltage Monitor	Y	es				
I/O Power Status Monitor		Yes				
Communications Error History Monitor	Y	es				
Input Filter	Yes					
Communications Error Output		Yes				
Preventing Malfunctions Caused by Inrush Current at I/O Startup	Yes					
Power Short-circuit Detection	-					
Unconnected Line Detection	-					
Load Short-circuit Detection	-	<del></del>				
Disconnected Line Detection	-					
Removable Terminal Block Structure	-					
Expansion Using Expansion Units	-					
Scaling	-					
Last Maintenance Date	Y	es				
Cumulated Count	-					
Moving Average	-					
Setting the Number of AD Conversion Points	-					
Rate of Change	-					
Comparator	-					
Peak/Bottom Hold	-					
Top/Valley Hold	-					
User Adjustment						
Top/Valley Count						
Temperature Range Total Time Count	-					
Input Temperature Variation Detection	-					
Input Error Detection Disable Function	-					

<sup>\*</sup> The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	t Digital I/O Slave Units					•••	
	Units with e-CON Connectors						
	(without Shor	CRT1-□D16S(-1) rt-circuit and Disco Detection)	onnected Line	CRT1-□D16SH(-1) (with Short-circuit and Disconnected Line Detection)			
Function	Input Units	Output Units	I/O Units	Input Units	Output Units	I/O units	
Operation Time Monitor			`	⁄es			
Contact Operation Monitor*			`	/es			
Total ON Time Monitor*			`	/es			
Automatic Baud Rate Detection			`	/es			
Unit Conduction Time Monitor			`	/es			
Naming Units			`	⁄es			
Naming Connected Devices			`	⁄es			
Network Power Voltage Monitor			`	⁄es			
I/O Power Status Monitor		Yes	Yes		Yes	Yes	
Communications Error History Monitor			`	/es	1		
Input Filter	Yes		Yes	Yes		Yes	
Communications Error Output		Yes	Yes		Yes	Yes	
Preventing Malfunctions Caused by Inrush Current at I/O Startup	Yes		Yes	Yes		Yes	
Power Short-circuit Detection				Yes		Yes	
Unconnected Line Detection				Yes		Yes	
Load Short-circuit Detection					Yes	Yes	
Disconnected Line Detection					Yes	Yes	
Removable Terminal Block Structure					1		
Expansion Using Expansion Units							
Scaling							
Last Maintenance Date			`	/es			
Cumulated Count							
Moving Average							
Setting the Number of AD Conversion Points							
Rate of Change							
Comparator							
Peak/Bottom Hold							
Top/Valley Hold							
User Adjustment							
Top/Valley Count							
Temperature Range Total Time Count							
Input Temperature Variation Detection							
Input Error Detection Disable Function							

<sup>\*</sup> The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	it Digital I/O Slave Units					
	Units with e-CON Connectors					
	(without Shor	CRT1-□D32S(-1) t-circuit and Disc Detection)	onnected Line	CRT1-□D32SH(-1) (with Short-circuit and Disconnected Line Detection)		
Function	Input Units	Output Units	I/O Units	Input Units	Output Units	I/O units
Operation Time Monitor			١	⁄es		
Contact Operation Monitor*			١	/es		
Total ON Time Monitor*			Υ	/es		
Automatic Baud Rate Detection			Υ	/es		
Unit Conduction Time Monitor			Υ	/es		
Naming Units			١	⁄es		
Naming Connected Devices			١	⁄es		
Network Power Voltage Monitor			١	⁄es		
I/O Power Status Monitor		Yes	Yes		Yes	Yes
Communications Error History Monitor			١	⁄es		
Input Filter	Yes		Yes	Yes		Yes
Communications Error Output		Yes	Yes		Yes	Yes
Preventing Malfunctions Caused by Inrush Current at I/O Startup	Yes		Yes	Yes		Yes
Power Short-circuit Detection			II.	Yes		Yes
Unconnected Line Detection				Yes		Yes
Load Short-circuit Detection					Yes	Yes
Disconnected Line Detection					Yes	Yes
Removable Terminal Block Structure						
Expansion Using Expansion Units						
Scaling						
Last Maintenance Date			١	⁄es		
Cumulated Count						
Moving Average			,			
Setting the Number of AD Conversion Points						
Rate of Change						
Comparator						
Peak/Bottom Hold						
Top/Valley Hold						
User Adjustment						
Top/Valley Count						
Temperature Range Total Time Count	-					
Input Temperature Variation Detection						
Input Error Detection Disable Function	-		,			

<sup>\*</sup> The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	Digital I/O Slave Units							
-	Units with MIL Connectors							
	CRT1-V□D16ML(-1)							
Function	Input Units	Output Units	Input Units	Output Units	I/O Units			
Operation Time Monitor			Yes					
Contact Operation Monitor*			Yes					
Total ON Time Monitor*			Yes					
Automatic Baud Rate Detection			Yes					
Unit Conduction Time Monitor			Yes					
Naming Units			Yes					
Naming Connected Devices			Yes					
Network Power Voltage Monitor			Yes					
I/O Power Status Monitor			Yes					
Communications Error History Monitor			Yes					
Input Filter	Yes		Yes		Yes			
Communications Error Output		Yes		Yes	Yes			
Preventing Malfunctions Caused by Inrush Current at I/O Startup	Yes		Yes		Yes			
Power Short-circuit Detection		1						
Unconnected Line Detection								
Load Short-circuit Detection								
Disconnected Line Detection								
Removable Terminal Block Structure								
Expansion Using Expansion Units								
Scaling								
Last Maintenance Date			Yes					
Cumulated Count								
Moving Average								
Setting the Number of AD Conversion Points								
Rate of Change								
Comparator								
Peak/Bottom Hold								
Top/Valley Hold								
User Adjustment								
Top/Valley Count								
Temperature Range Total Time Count								
Input Temperature Variation Detection								
Input Error Detection Disable Function								

<sup>\*</sup> The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	Digital I/O Slave Units						
	Units with Screw-less Clamp Terminals						
	CRT1-□	D08SL(-1)	CRT1-□D16SL(-1)				
Function	Input Units	Output Units	Input Units	Output Units	I/O Units		
Operation Time Monitor		1	Yes				
Contact Operation Monitor*			Yes				
Total ON Time Monitor*			Yes				
Automatic Baud Rate Detection			Yes				
Unit Conduction Time Monitor			Yes				
Naming Units			Yes				
Naming Connected Devices			Yes				
Network Power Voltage Monitor			Yes				
I/O Power Status Monitor			Yes				
Communications Error History Monitor			Yes				
Input Filter	Yes		Yes		Yes		
Communications Error Output		Yes		Yes	Yes		
Preventing Malfunctions Caused by Inrush Current at I/O Startup	Yes		Yes		Yes		
Power Short-circuit Detection		1					
Unconnected Line Detection							
Load Short-circuit Detection							
Disconnected Line Detection							
Removable Terminal Block Structure			Yes				
Expansion Using Expansion Units							
Scaling							
Last Maintenance Date			Yes				
Cumulated Count							
Moving Average							
Setting the Number of AD Conversion Points							
Rate of Change							
Comparator							
Peak/Bottom Hold							
Top/Valley Hold							
User Adjustment							
Top/Valley Count							
Temperature Range Total Time Count							
Input Temperature Variation Detection							
Input Error Detection Disable Function							

Input Error Detection Disable Function --
\* The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	Analog I/O Slave Units						
	Units with 2-tier Terminal block  CRT1-AD04  CRT1-DA02		Units with e-CON Connectors  CRT1-VAD04S  CRT1-VDA02S		Units with MIL Connectors  CRT1-VAD04ML  CRT1-VDA02ML		
Function	Input Units	Output Units	Input Units	Output Units	Input Units	Output Units	
Operation Time Monitor			-				
Contact Operation Monitor*			-				
Total ON Time Monitor*			-				
Automatic Baud Rate Detection			Y	es			
Unit Conduction Time Monitor			Y	es			
Naming Units			Y	es			
Naming Connected Devices			Y	es			
Network Power Voltage Monitor			Y	es			
I/O Power Status Monitor			-				
Communications Error History Monitor			Y	es			
Input Filter			-				
Communications Error Output		Yes		Yes		Yes	
Preventing Malfunctions Caused by Inrush Current at I/O Startup		1	-			+	
Power Short-circuit Detection			-				
Unconnected Line Detection			-				
Load Short-circuit Detection			-				
Disconnected Line Detection	Yes		Yes		Yes		
Removable Terminal Block Structure			Y	es			
Expansion Using Expansion Units			-				
Scaling			Y	es			
Last Maintenance Date			Y	es			
Cumulated Count			Y	es			
Moving Average	Yes		Yes		Yes		
Setting the Number of AD Conversion Points	Yes		Yes		Yes		
Rate of Change	Yes		Yes		Yes		
Comparator	Yes		Yes		Yes		
Peak/Bottom Hold	Yes		Yes		Yes		
Top/Valley Hold	Yes		Yes		Yes		
User Adjustment		1	Y	es		1	
Top/Valley Count							
Temperature Range Total Time Count							
Input Temperature Variation Detection			-				
Input Error Detection Disable Function			-				

<sup>\*</sup> The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	An	Temperature Input Slave Units				
	Units with e-CON Connectors Units with MIL			IL Connectors		
	CRT1-VAD02SD CRT1-VDA02SD		CRT1-VAD02MLD CRT1-VDA02MLD		CRT1-TS04T CRT1-TS04P	
Function	Input Units	Output Units	Input Units	Output Units	Input Units	
Operation Time Monitor			-			
Contact Operation Monitor*			-			
Total ON Time Monitor*			-			
Automatic Baud Rate Detection		Ye	es		Yes	
Unit Conduction Time Monitor		Ye	es		Yes	
Naming Units		Ye	es		Yes	
Naming Connected Devices		Ye	es		Yes	
Network Power Voltage Monitor		Ye	es		Yes	
I/O Power Status Monitor			-			
Communications Error History Monitor		Ye	es		Yes	
Input Filter			-			
Communications Error Output		Yes		Yes		
Preventing Malfunctions Caused by Inrush Current at I/O Startup			-	1		
Power Short-circuit Detection			-			
Unconnected Line Detection			-			
Load Short-circuit Detection			-			
Disconnected Line Detection	Yes		Yes		Yes	
Removable Terminal Block Structure		Ye	es	!	Yes	
Expansion Using Expansion Units			-			
Scaling		Ye	es		Yes	
Last Maintenance Date		Ye	es		Yes	
Cumulated Count		Ye	es		Yes	
Moving Average	Yes		Yes		Yes	
Setting the Number of AD Conversion Points	Yes		Yes			
Rate of Change	Yes		Yes		Yes	
Comparator	Yes		Yes		Yes	
Peak/Bottom Hold	Yes		Yes		Yes	
Top/Valley Hold	Yes		Yes		Yes	
User Adjustment		Ye	es	1	Yes	
Top/Valley Count			·-		Yes	
Temperature Range Total Time Count			-		Yes	
Input Temperature Variation Detection			-		Yes	
Input Error Detection Disable Function			<del>-</del>		Yes	

Input Error Detection Disable Function --
\* The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Unit	SmartSlice GRT1 Series				Bit Slaves with Compact Connectors				Repeater Unit	Sensor Communication Unit	
		CRT1B-□D02S(-1)		) CRT1B-□D02JS(-1) CRT1B-□D04JS(-1)		S(-1)					
Function	GRT1-CRT	Input Units	Output Units	Input Units	Output Units	I/O units	Input Units	Output Units	I/O units	CRS1-RPT01	E3X-CRT
Operation Time Monitor		Υ	es								
Contact Operation Monitor*		Y	'es								
Total ON Time Monitor*		Υ	'es								
Automatic Baud Rate Detection	Yes	Y	'es		Yes			Yes		Yes	Yes
Unit Conduction Time Monitor	Yes	Y	'es							Yes	Yes
Naming Units	Yes	Y	'es							Yes	Yes
Naming Connected Devices		Y	'es								Yes
Network Power Voltage Monitor		Y	'es							Yes	Yes
I/O Power Status Monitor		-									
Communications Error History Monitor	Yes	Y	'es							Yes	Yes
Input Filter		Yes		Yes		Yes	Yes		Yes		
Communications Error Output			Yes		Yes	Yes		Yes	Yes		
Preventing Malfunctions Caused by Inrush Current at I/O Startup		Yes									
Power Short-circuit Detection		Yes									
Unconnected Line Detection		-									
Load Short-circuit Detection			Yes								
Disconnected Line Detection		-									
Removable Terminal Block Structure		-									
Expansion Using Expansion Units		-									
Scaling		-									
Last Maintenance Date		Y	'es							Yes	
Cumulated Count		-									
Moving Average Setting the Number of											
AD Conversion Points Rate of Change											
Comparator		_									
Peak/Bottom Hold											
Top/Valley Hold		-									
User Adjustment		-									
Top/Valley Count											
Temperature Range Total Time Count		-									
Input Temperature Variation Detection		-									
Input Error Detection Disable Function		-									

<sup>\*</sup> The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

#### What Are Smart Functions?

#### ■ Smart Functions

#### Network Power Voltage Monitor

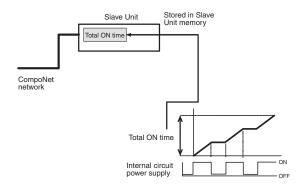
The Network Power Voltage Monitor function stores the present value, minimum value, and maximum value of the network power voltage in the Slave Unit memory. If a monitor voltage is set using the CX-Integrator, the monitor voltage is stored in the Slave Unit memory. (The default is 14 V.) If the voltage drops below the monitor voltage, a flag in a status area in the Slave Unit will turn ON to notify the Master Unit. The notification details can be read using the CX-Integrator or using explicit messages.

- Note 1. The minimum communications power voltage for the CompoNet network itself is 14 V, so if the network power voltage drops below 14 V, it may not be possible to read a measurement value using the CX-Integrator.
  - The maximum and minimum values of the network power voltage are cleared when the network power is turned OFF.

#### Unit Conduction Time Monitor

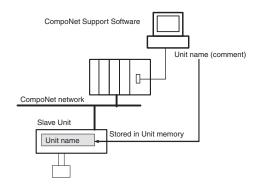
The cumulative time that power is ON to the Slave Unit's internal circuits can be stored in the Slave Unit memory. (This data can be read using the CX-Integrator or using explicit messages.)

The monitor value is also stored in the Slave Unit memory so once the total time reaches the monitor value, a flag in a status area in the Slave Unit turns ON to notify the Master Unit.



#### Naming Units

The user can set any name for each Unit (up to 32 characters) as a comment. The name is stored in the Slave Unit memory. The CX-Integrator or explicit messages can be used to read/write the name (i.e., the comment).

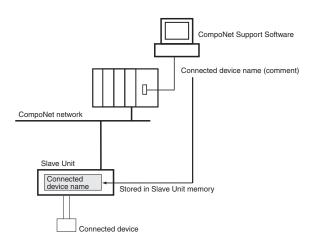


#### Naming Connected Devices

The user can set any name for each I/O contact in the Unit (up to 32 characters).

These names are stored in the Slave Unit memory. Connected devices can be checked for each I/O contact, which is useful for remote maintenance and other applications where, for example, devices with errors need to be identified.

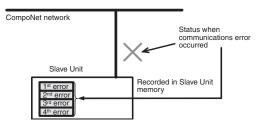
The CX-Integrator or explicit messages can be used to read/write the name (i.e., comment).



#### Communications Error History Monitor

Enables storing the error (communication failure details, the communications power supply voltage at the time of failure, and the Unit conduction time) for the most recent 4 communication failures within the slave unit.

The communications error history can be read using the CX-Integrator.



#### ● Last Maintenance Date

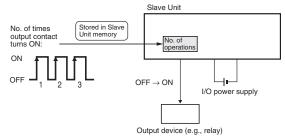
This function can be used to write the date maintenance was last performed in the Slave Unit memory. This makes it easier to decide when the next maintenance should be performed next. This maintenance date can be written using the CX-Integrator.

#### Contact Operation Monitor (Digital I/O Slave, Bit Slave Input Units Only)

The number of times each input contact or output contact is turned ON can be counted (resolution: 50 Hz max.) and stored in Slave Unit memory. (This data can be read using the CX-Integrator or using explicit messages.)

A monitor value can also be stored in the Slave Unit memory so once the number of contact operations reaches the monitor value, a flag in a status area in the Slave Unit turns ON to notify the Master Unit. The notification details can be read using the CX-Integrator or using explicit messages.

- No. of times measured: 0 to 4,294,967,295 (Stored data: 0000 0000 to FFFF FFFF hex)
- Measurement unit: No. of operations



**Note 1.** The contact operation monitor and the total ON time monitor cannot both be used for the same contact at the same time. Select only one of these functions under the *Detection Mode*.

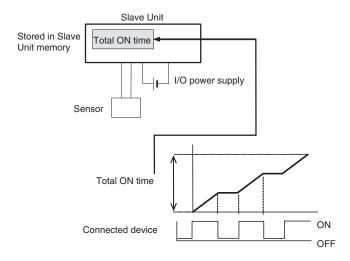
2. This function does not operate if the I/O power is not turned ON.

#### Total ON Time Monitor (Digital I/O Slave, Bit Slave Input Units Only)

This function totals the time that each input and output contact is ON (unit: s) and stores this total time in the Slave Unit memory. (This data can be read using the CX-Integrator or using explicit messages.)

A monitor value can also be stored in the Slave Unit memory so once the set total time has been reached, a flag in a status area in the Slave Unit turns ON to notify the Master Unit. The notification details can be read using the CX-Integrator or using explicit messages.

- Measurement time: 0 to 4,294,967,295 s (Stored data: 0000 0000 to FFFF FFFF Hex)
- Measurement unit: s



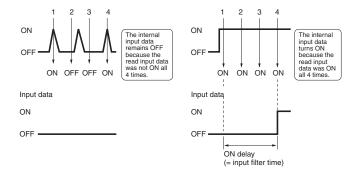
Note 1. The total ON time monitor and the contact operation monitor cannot both be used for the same contact at the same time. Select only one of these functions under the *Detection Mode*.

- 2. This function does not operate if the I/O power is not turned ON.
- The Total ON Time Monitor Function checks at 1 second intervals whether or not the connected device is turned ON.

#### Input Filter (Digital I/O Slave, Bit Slave Input Units Only)

An input value is read more than once during a set time interval. The input value can be set to be enabled only when all the read values are the same.

This function operates for all input points in one Slave Unit.



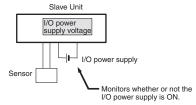
## ● Error Prevention for Surge Current at Startup (Digital I/O Slave Units and Bit Slave Input Units Only)

This function can be used to prevent reading inputs while the I/O power is OFF and for 100 ms after the I/O power is turned ON (i.e., until the Slave Unit stabilizes). It helps avoid input errors caused by inrush current from connected devices when the I/O power supply is turned ON. This function is enabled or disabled by the CX-Integrator or by explicit messages.

#### ● I/O Power Status Monitor (Digital I/O Slave Units Only)

The I/O power status monitor function can be used to detect whether the I/O power is ON.

When the I/O power is turned OFF, a flag in a status area in the Slave Unit turns ON to notify the Master Unit. The notification details can be read using the CX-Integrator or using explicit messages.



Note: A detection voltage cannot be set for the I/O power supply.

#### Sensor Power Short-circuit Detection (Bit Slave Units Only)

This function monitors the current in the sensor power supply section and detects a power supply short-circuit if the current per input contact exceeds a rated value. Power supply short-circuit detection functions in two different ways depending on Unit specifications. For some Units, the I/O power supply is turned OFF to the entire Unit if a short-circuit is detected for even one input.

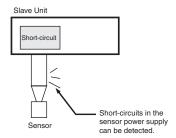
For other Units, the I/O power is turned OFF individually for each input.

For information on load short-circuit detection, refer to the power short-circuit protection and input device power supply specifications for the applicable Unit.

An indicator on the Slave Unit can be used to see if a power supply short-circuit has been detected. Also, if a short-circuit has been detected, an internal status bit will turn ON in the Slave Unit to inform the Master Unit. The current status can be read using the CX-Integrator or an explicit message. Once the cause of the short-circuit has been removed, operation will recover automatically and power will be output to the connector where the short-circuit was detected.

Note: Use a power supply device with a rating of 100 W or higher as the communications power supply for network power supply. A short-circuit is detected if a current that exceeds a specified value flows in the sensor power supply output of the Unit. Also, the communications power supply may temporarily turn OFF when a short circuit occurs. Operation will automatically be restored once the cause of the short circuit has been removed, but implement an external circuit so that the system operates safely while the outputs are turned OFF. Use the following formula as a quide for Sensor communications power supply capacity.

- Total network current = Total Unit current consumption + Total Sensor current consumption
- Communications power supply capacity used ≥ (Total network current + (Short-circuit detection current)) • (CompoNet network voltage used)

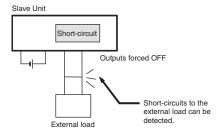


#### Load Short-circuit Detection (Output Only) (Bit Slave Units Only)

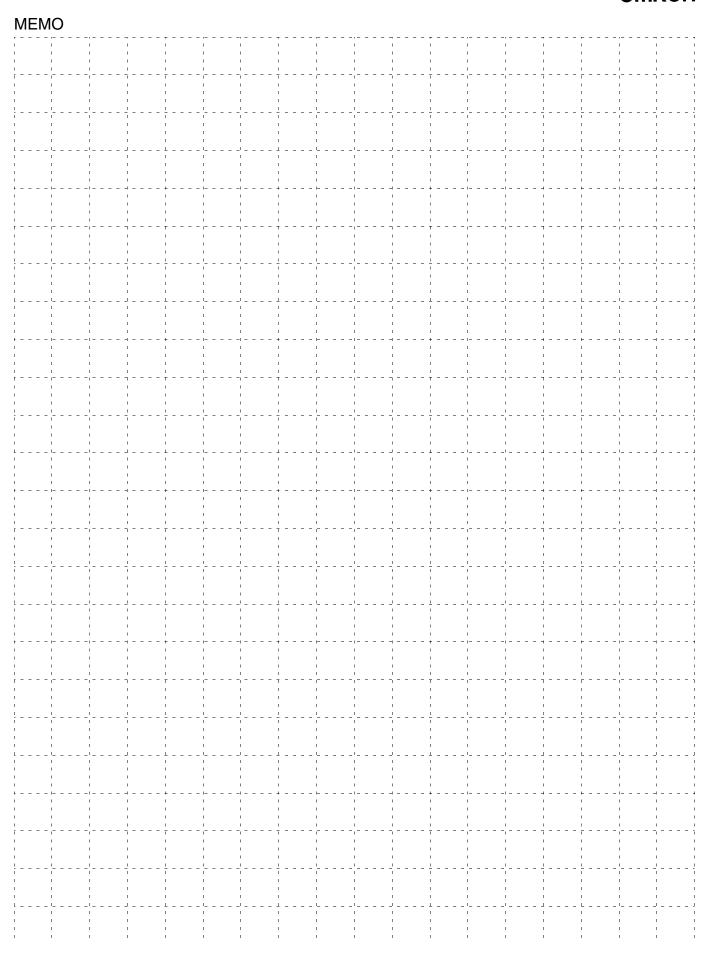
This function monitors the load current in the output section and detects a load short-circuit if the current per contact (or common) exceeds a rated value. If a load short-circuited is detected, the outputs are turned OFF to prevent damage to the Unit output circuits. Load short-circuit detection functions in two different ways depending on Unit specifications. For some Units, the outputs are turned OFF for the entire Unit if a short-circuit is detected for even one output. For other Units, the outputs are turned OFF individually. For information on load short-circuit detection, refer to the rated output current and internal circuits in the specifications for the applicable Unit.

An indicator on the Slave Unit can be used to see if a load short-circuit has been detected. Also, if a short-circuit has been detected, an internal status bit will turn ON in the Slave Unit to inform the Master Unit. The current status can be read using the CX-Integrator or an explicit message. Once the cause of the short-circuit has been removed, operation will recover automatically and power will be output to the connector where the short-circuit was detected.

Note: An OMRON S82J-series Power Supply device is recommended for the I/O power supply. Load short-circuits may not be detected if a power supply with vertical-drop overcurrent protection characteristics is used. If a power supply device with vertical-drop overcurrent protection characteristics is used, use one with a rating of 100 W min.



## OMRON



## **Basic Specification of Slave Units**

#### **Performance Specifications**

Item	Specification	
Communications power supply voltage	14 to 26.4 VDC	
I/O power supply voltage *1	20.4 to 26.4 VDC (24 VDC -15%/+10%)	
Noise immunity	Conforms to IEC 61000-4-4, 2 kV (power line).	
Vibration resistance	10 to 60 Hz with double-amplitude of 0.7 mm, 60 to 150 Hz and 50 m/s <sup>2</sup> in X, Y, and Z directions for 80 mileach	
Shock resistance	150 m/s² (3 times each in 6 directions on 3 axes)	
Dielectric strength	500 VAC (between isolated circuits)	
Insulation resistance	20 MΩ min. (between isolated circuits)	
Ambient operating temperature	−10 to 55°C	
Ambient operating humidity	25% to 85% (with no condensation)	
Ambient operating atmosphere	No corrosive gases	
Storage temperature	-25 to 65°C	
Storage humidity	25% to 85% (with no condensation)	
Terminal block screw tightening torque *2	M3 wiring screws: 0.5 N·m M3 mounting screws: 0.5 N·m	
Installation  Mounted on 35-mm DIN Track or Mounting Bracket, or secured with M4 screws (depending on model)		

<sup>\*1</sup> The I/O power supply is called the sensor power supply in information for the CRT1-VAD04S.

Some of the specifications are different for the CRT1-ROS08/ROS16 (with relay outputs) and the CRT1-ROF08/ROF16 (with SSR outputs). Refer to the pages of specifications for individual Slaves for details.

<sup>\*2</sup> Applicable only to Slaves to which screw terminal blocks are mounted.

Digital I/O Slave Units with Screw Terminal Blocks (2-tier Terminal Block/Relay Output/SSR Output)

# $\mathsf{CRT1} ext{-}\square\mathsf{D}08(-1)/\square\mathsf{D}16(-1)/\mathsf{ROS}\square/\mathsf{ROF}\square$

# Visualize the actual worksite status! Simple and Intelligent I/O Slave Units.

In addition to the Digital I/O Slave Unit's basic digital ON/OFF signals, collect useful information from the Slave Unit to improve equipment operating rates and maintainability.

- Communications connector and removable I/O terminal block enable faster startup times and improved maintainability.
- One Expansion Unit can be added to each Digital I/O Slave Unit to increase system configuration flexibility.
- Collect various preventive maintenance data required to improve productivity, such as information on equipment deterioration due to aging and equipment operating time data.
- Simplify startup with the communications power supply monitoring function.



#### **Ordering Information**

Name		Specifications	s	Model
	Inputs	Q innuto	NPN	CRT1-ID08
		8 inputs	PNP	CRT1-ID08-1
	Outrouto	O outputo	NPN	CRT1-OD08
	Outputs	8 outputs	PNP	CRT1-OD08-1
Two-tier Screw Terminal Block	Innuto	16 inputo	NPN	CRT1-ID16 *
Two-tier Screw Terminal Block	Inputs	16 inputs	PNP	CRT1-ID16-1 *
	Outputs Inputs/Outputs	16 outputs	NPN	CRT1-OD16 *
			PNP	CRT1-OD16-1 *
		8 inputs/ 8 outputs	NPN	CRT1-MD16
			PNP	CRT1-MD16-1
Screw Terminal Block with Relay Outputs	Outputo	8 outputs	Contacts	CRT1-ROS08
Screw Terminal Block with Relay Outputs	Outputs	16 outputs	Contacts	CRT1-ROS16
Screw Terminal Block with SSR Outputs	Outputs	8 outputs	SSR	CRT1-ROF08
Screw Terminal Block with 33h Outputs	Outputs	16 outputs	3311	CRT1-ROF16

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

#### Expansion Units

One Expansion Unit can be combined with one Digital I/O Slave Unit (CRT1-ID16(-1), CRT1-OD16(-1), CRT1-ROS16, or CRT1-ROF16). The following Expansion Units are available. They can be combined in various ways for flexible I/O capacity expansion.

Model	I/O points	Input capacity	Output capacity
XWT-ID08	8 DC inputs (NPN)	8	0
XWT-ID08-1	8 DC inputs (PNP)	8	0
XWT-OD08	8 transistor outputs (NPN)	0	8
XWT-OD08-1	8 transistor outputs (PNP)	0	8
XWT-ID16	16 DC inputs (NPN)	16	0
XWT-ID16-1	16 DC inputs (PNP)	16	0
XWT-OD16	16 transistor outputs (NPN)	0	16
XWT-OD16-1	16 transistor outputs (PNP)	0	16



#### Performance Specifications for CRT1-ROS08/ROS16 (with relay outputs) and CRT1-ROF08/ROF16 (with SSR outputs)

For Basic Performance Specifications of Slave Units, refer to page 32.

#### Relay Output

Item	Specification
Communications power supply voltage	14 to 26.4 VDC
Noise immunity	Conforms to IEC 61000-4-4, 2 kV (power line).
Vibration resistance	10 to 55 Hz with double-amplitude of 0.7 mm
Shock resistance	100 m/s² (3 times in 6 directions on 3 axes)
Dielectric strength	500 VAC (between isolated circuits)
Insulation resistance	20 M $\Omega$ min. (between isolated circuits)
Ambient operating temperature	−10 to 55°C
Ambient operating humidity	25% to 85% (with no condensation)
Ambient operating atmosphere	No corrosive gases
Storage temperature	−25 to 65°C
Storage humidity	25% to 85% (with no condensation)
Terminal block screws tightening torque	M3 wiring screws: 0.5 N·m M3 mounting screws: 0.5 N·m

#### ● SSR Output

Item	Specification
Communications power supply voltage	14 to 26.4 VDC
Noise immunity	Conforms to IEC 61000-4-4, 2 kV (power line).
Vibration resistance	10 to 60 Hz with double-amplitude of 0.7 mm, 60 to 150 Hz and 50 m/s² in X, Y, and Z directions for 80 min each
Shock resistance	150 m/s² (3 times in 6 directions on 3 axes)
Dielectric strength	500 VAC (between isolated circuits)
Insulation resistance	20 $M\Omega$ min. (between isolated circuits)
Ambient operating temperature	-10 to 55°C
Ambient operating humidity	25% to 85% (with no condensation)
Ambient operating atmosphere	No corrosive gases
Storage temperature	−25 to 65°C
Storage humidity	25% to 85% (with no condensation)
Terminal block screws tightening torque	M3 wiring screws: 0.5 N·m M3 mounting screws: 0.5 N·m

#### **Input Section Specifications**

#### ● Eight-point Input Units (2-tier Terminal Block)

Item	Specif	ication	
Model	CRT1-ID08	CRT1-ID08-1	
I/O capacity	8 inputs		
Internal I/O common	NPN	PNP	
mornar ve commen	15 VDC min. (between each input	15 VDC min. (between each input	
ON voltage	terminal and the V terminal)	terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)	
OFF current	1.0 mA max.		
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input		
ON delay	1.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	8 inputs/common		
Isolation method	Photocoupler		
Input indicator	LED (yellow)		
Installation	DIN Track		
Power supply type	Multi-power supply		
Communications power supply current consumption	30 mA max. for 24-VDC power supply voltage 50 mA max. for 14-VDC power supply voltage		
I/O power supply current consumption	5 mA max. for 24-VDC power supply voltage		
Weight	160 g max.		

#### ● Sixteen-point Input Units (2-tier Terminal Block)

Item	Specif	ication	
Model	CRT1-ID16	CRT1-ID16-1	
I/O capacity	16 inputs		
Internal I/O common	NPN	PNP	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)	
OFF current	1 mA max.		
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA max./input		
ON delay	1.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	16 inputs/common		
Isolation method	Photocoupler		
Input indicator	LED (yellow)		
Installation	DIN Track mounting		
Power supply type	Multi-power supply		
Communications power supply current consumption	55 mA max. for 24-VDC power supply voltage 85 mA max. for 14-VDC power supply voltage		
I/O power supply current consumption	5 mA max. for 24-VDC	power supply voltage	
Weight	141 g max.		

### **Output Section Specifications**

#### ● Eight-point Output Units (2-tier Terminal Block)

Item	Specif	Specification		
Model	CRT1-OD08	CRT1-OD08-1		
I/O capacity	8 outputs			
Internal I/O common	NPN	PNP		
Rated output current	0.5 A/output, 2 A/con	nmon		
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)		
Leakage current	0.1 mA max.			
ON delay	0.5 ms max.			
OFF delay	1.5 ms max.			
Number of circuits per common	8 outputs/common			
Isolation method	Photocoupler			
Output indicators	LED (yellow)			
Installation	DIN Track			
Power supply type	Multi-power supply			
Communications power supply current consumption	35 mA max. for 24-V voltage 55 mA max. for 14-V voltage			
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage			
Output handling for communications errors	Select either hold or clear from CX-Integrator.			
Weight	160 g max.			

#### ● Sixteen-point Output Units (2-tier Terminal Block)

Item	Specif	ication	
Model	CRT1-OD16	CRT1-OD16-1	
I/O capacity	16 outputs		
Internal I/O common	NPN	PNP	
Rated output current	0.5 A/output, 4 A/con	nmon	
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	
Leakage current	0.1 mA max.		
ON delay	0.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	16 outputs/common		
Isolation method	Photocoupler		
Output indicators	LED (yellow)		
Installation	DIN Track mounting		
Power supply type	Multi-power supply		
Communications power supply current consumption	55 mA max. for 24-VDC power supply voltage 85 mA max. for 14-VDC power supply voltage		
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Hold or clear can be Integrator)	selected. (CX-	
Weight	141 g max.		

#### ● Eight-point Output Units (Relay Outputs)

Item	Specification
Model	CRT1-ROS08
I/O capacity	8 outputs
Mounted Relays	DRTA-NY5W-K (5 VDC)
Rated load	Resistive load 250 VAC, 2 A, common: 8 A 30 VDC, 2 A, common: 8 A
Rated ON current	3 A
Maximum contact voltage	250 VAC, 125 VDC
Maximum contact current	3 A
Maximum switching capacity	750 VA AC, 90 W DC
Minimum applicable load (reference value)	5 VDC, 1 mA
Mechanical service life	20,000,000 operations min.
Electrical service life	100,000 operations min.
Installation method	DIN Track
Communications power supply current consumption	95 mA max. for 24-VDC power supply voltage 150 mA max. for 14-VDC power supply voltage
Output hold for communications errors	Select either hold or clear from CX-Integrator.
Weight	170 g max.

#### ● Sixteen-point Output Units (Relay Outputs) (per Output)

Item	Specification
Model	CRT1-ROS16
I/O capacity	16 outputs
Mounted Relays	DRTA-NY5W-K (5 VDC)
Rated load	Resistive load 250 VAC, 2 A, common: 8 A 30 VDC, 2 A, common: 8 A
Rated ON current	3 A
Maximum contact voltage	250 VAC, 125 VDC
Maximum contact current	3 A
Maximum switching capacity	750 VA AC, 90 W DC
Minimum applicable load (reference value)	5 VDC, 1 mA
Mechanical service life	20,000,000 operations min.
Electrical service life	100,000 operations min.
Installation	DIN Track mounting
Communications power supply current consumption	155 mA max. for 24-VDC power supply voltage 255 mA max. for 14-VDC power supply voltage
Output hold for communications errors	Hold or clear can be selected. (CX-Integrator)
Weight	260 g max.

## OMROF

### ● Eight-point Output Units (SSR Outputs) (per Output)

Item	Specification
Model	CRT1-ROF08
I/O capacity	8 outputs
Load voltage	24 to 265 VAC
Load current	0.3 A
Inrush current resistivity	50 A (60 Hz)
Installation method	DIN Track
Communications power supply current consumption	60 mA max. for 24-VDC power supply voltage 90 mA max. for 14-VDC power supply voltage
Output hold for communications errors	Select either hold or clear from CX-Integrator.
Weight	160 g max.

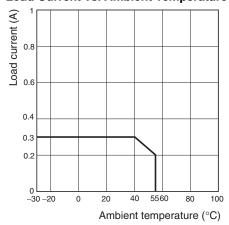
Note: The SSRs cannot be replaced.

### ● Sixteen-point Output Units (SSR Outputs) (per Output)

Item	Specification
Model	CRT1-ROF16
I/O capacity	16 outputs
Load voltage	24 to 265 VAC
Load current	0.3 A
Inrush current resistivity	50 A (60 Hz)
Installation	DIN Track mounting
Communications power supply current consumption	85 mA max. for 24-VDC power supply voltage 130 mA max. for 14-VDC power supply voltage
Output hold for communications errors	Hold or clear can be selected. (CX-Integrator)
Weight	250 g max.

Note: The SSRs cannot be replaced.

### Load Current vs. Ambient Temperature



## **Input and Output Section Specifications**

● Eight-point Input and Eight-point Output Units (2-tier Terminal Block)
CRT1-MD16/CRT1-MD16-1

#### **Common Specifications**

Item	Specification		
Model	CRT1-MD16	CRT1-MD16-1	
Installation	DIN Track		
Communications power supply current consumption	35 mA max. for 24-VI voltage 60 mA max. for 14-VI voltage	,	
Weight	170 g max.		

#### **Input Section Specifications**

Item	Specif	ication	
Model	CRT1-MD16	CRT1-MD16-1	
I/O capacity	8 inputs		
Internal I/O common	NPN	PNP	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)	
OFF current	1.0 mA max.		
Input current	At 24 VDC: 6.0 mA n At 17 VDC: 3.0 mA n	•	
ON delay	1.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	8 inputs/common		
Isolation method	Photocoupler		
Input indicator	LED (yellow)		
Power supply type	Multi-power supply		
I/O power supply current consumption	5 mA max. for 24-VD0	power supply voltage	

## **Output Section Specifications**

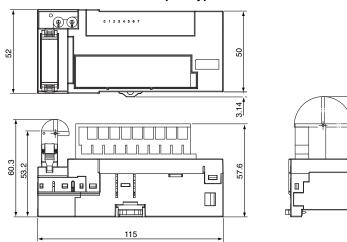
Item	Specif	ication	
Model	CRT1-MD16	CRT1-MD16-1	
I/O capacity	8 outputs		
Internal I/O common	NPN	PNP	
Rated output current	0.5 A/output, 2A/com	nmon	
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	
Leakage current	0.1 mA max.	•	
ON delay	0.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	8 outputs/common		
Isolation method	Photocoupler		
Output indicators	LED (yellow)		
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Select either hold or Integrator.	clear from CX-	



Dimensions (Unit: mm)

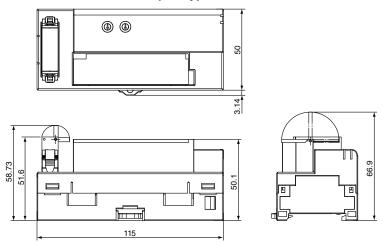
CRT1-ID08 (-1) CRT1-OD08 (-1)

### When a DCN4-TB4 Open Type Connectors Is Mounted



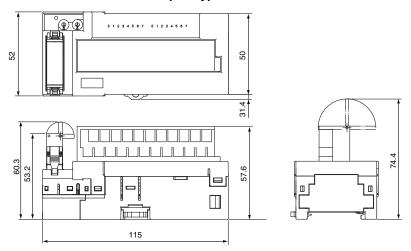
CRT1-ID16 (-1) CRT1-OD16 (-1)

### When a DCN4-TB4 Open Type Connectors Is Mounted



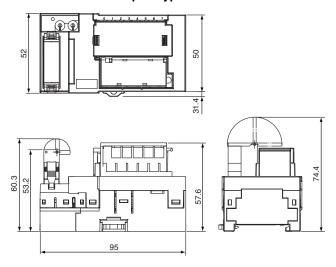
CRT1-MD16 (-1)

#### When a DCN4-TB4 Open Type Connectors Is Mounted



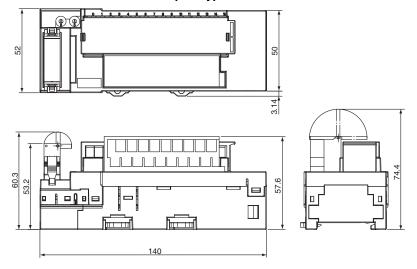
CRT1-ROS08 CRT1-ROF08

When a DCN4-TB4 Open Type Connectors Is Mounted



CRT1-ROS16 CRT1-ROF16

When a DCN4-TB4 Open Type Connectors Is Mounted



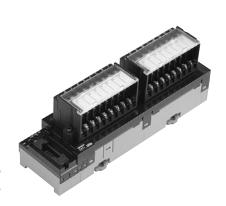
Digital I/O Slave Units with Screw Terminal Blocks (3-tier Terminal Block)

# CRT1- $\square$ D08TA(-1)/ $\square$ D16TA(-1)/ $\square$ D08TAH(-1)/ $\square$ D16TAH(-1)

With the relay terminal blocks, doubling up wires on terminals is not necessary!
Smart Slave Units with Easy-to-understand Wiring Locations with One Common for Every Point.

Doubling up wires on terminals is unnecessary and wiring locations are easy to understand with these Smart Slaves with 3-tier Terminal Blocks.

- Easy-to-understand wiring. No doubling up of wires. Easy-to-understand wiring locations.
- Simplify startup with the communications power supply monitor (Smart function).
- Collect various preventive maintenance data required to improve productivity, such as information on equipment deterioration due to aging and equipment operating time data (Smart function).
- The communications baud rate is set without using switches and addresses are set using rotary switches, so setting errors are reduced.
- Communications connector and removable I/O terminal block enable maintenance without disconnecting wiring.



## **Ordering Information**

Name			ons	Model	
	Innuto	8 inputs	NPN		CRT1-ID08TA
	Inputs	8 inputs	PNP		CRT1-ID08TA-1
	Outputs	8 outputs	NPN		CRT1-OD08TA
	Outputs	o outputs	PNP		CRT1-OD08TA-1
	Inputs	16 inputs	NPN	Without Short-circuit and	CRT1-ID16TA
	inputs	10 inputs	PNP	Disconnected Line Detection	CRT1-ID16TA-1
	Outputs	16 outputs	NPN		CRT1-OD16TA
	Outputs	16 outputs	PNP		CRT1-OD16TA-1
	Inputs/	8 inputs/	NPN		CRT1-MD16TA
	Outputs	8 outputs	PNP		CRT1-MD16TA-1
Three-tier Screw Terminal Block	Inputs	8 inputs	NPN		CRT1-ID08TAH
	inputs	o inputs	PNP		CRT1-ID08TAH-1
	Outputs	8 outputs	NPN		CRT1-OD08TAH
	Outputs	o outputs	PNP	With Short-circuit and Disconnected Line Detection	CRT1-OD08TAH-1
	Inputs	16 inputs	NPN		CRT1-ID16TAH
	iriputs	16 inputs	PNP		CRT1-ID16TAH-1
	Outputs	16 outputs	NPN		CRT1-OD16TAH
	Outputs	10 outputs	PNP		CRT1-OD16TAH-1
	Inputs/	8 inputs/	NPN		CRT1-MD16TAH
	Outputs	·			CRT1-MD16TAH-1

## Performance Specifications

## ● Eight-point Input Units (3-tier Terminal Block)

Item	Specification				
Model	CRT1-ID08TA	CRT1-ID08TA-1	CRT1-ID08TAH-1	CRT1-ID08TAH-1	
I/O capacity	8 inputs				
Internal I/O common	NPN	PNP	NPN	PNP	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)			
OFF current	1.0 mA max.	1	l	1	
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input				
ON delay	1.5 ms max.				
OFF delay	1.5 ms max.				
Power supply short-circuit detection			Operates at 50 mA/point min.	min.	
Disconnection detection			Operates at 0.3 mA/point max.		
Number of circuits per common	8 inputs/common	8 inputs/common			
Isolation method	Photocoupler	Photocoupler			
Input indicator	LED (yellow)				
Installation	DIN Track				
Power supply type	Multi-power supply				
Current supplied to input devices	100 mA/point		50 mA/point		
Communications power supply current consumption	30 mA max. for 24-VDC power supply voltage 50 mA max. for 14-VDC power supply voltage		35 mA max. for 24-VDC power supply voltage 60 mA max. for 14-VDC power supply voltage		
I/O power supply current consumption	5 mA max. for 24-VDC power su	upply voltage	25 mA max. for 24-VDC power	supply voltage	
Weight	190 g max.		200 g max.		

### ● Sixteen-point Input Units (3-tier Terminal Block)

Item	Specification				
Model	CRT1-ID16TA	CRT1-ID16TA-1	CRT1-ID16TAH	CRT1-ID16TAH-1	
I/O capacity	16 inputs				
Internal I/O common	NPN	PNP	NPN	PNP	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)			
OFF current	1.0 mA max.				
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input				
ON delay	1.5 ms max.	1.5 ms max.			
OFF delay	1.5 ms max.				
Power supply short-circuit detection			Operates at 50 mA/point min.		
Disconnection detection	Operates at 0.3 mA/point max.				
Number of circuits per common	8 inputs/common	8 inputs/common			
Isolation method	Photocoupler				
Input indicator	LED (yellow)				
Installation	DIN Track				
Power supply type	Multi-power supply				
Communications power supply current consumption	40 mA max. for 24-VDC power supply voltage 55 mA max. for 14-VDC power supply voltage 70 mA max. for 14-VDC power supply voltage				
I/O power supply current consumption	5 mA max. for 24-VDC power supply voltage 25 mA max. for 24-VDC power supply voltage			supply voltage	
Weight	330 g max. 340 g max.				

## ● Eight-point Output Units (3-tier Terminal Block)

Item	Specification				
Model	CRT1-OD08TA	CRT1-OD08TA-1	CRT1-OD08TAH	CRT1-OD08TAH-1	
I/O capacity	8 outputs				
Internal I/O common	NPN	PNP	NPN	PNP	
Rated output current	0.5 A/output, 2 A/common		ı		
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	
Leakage current	0.1 mA max.				
ON delay	0.5 ms max.				
OFF delay	1.5 ms max.				
Load short-circuit detection			Supported.		
Disconnection detection			Operates at 3 mA/point max. (Does not operate at over 3 mA.)		
Number of circuits per common	8 outputs/common	8 outputs/common			
Isolation method	Photocoupler				
Output indicators	LED (yellow)				
Installation	DIN Track				
Power supply type	Multi-power supply				
Current supplied to output devices	100 mA/point				
Communications power supply current consumption	35 mA max. for 24-VDC power supply voltage 55 mA max. for 14-VDC power supply voltage				
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage  15 mA max. for 24-VDC power supply voltage  35 mA max. for 24-VDC power supply voltage			35 mA max. for 24-VDC power supply voltage	
Output handling for communications errors	Select either hold or clear from CX-Integrator.				
Weight	190 g max.				

### ● Sixteen-point Output Unit (3-tier Terminal Block)

Item	Specification				
Model	CRT1-OD16TA	CRT1-OD16TA-1	CRT1-OD16TAH	CRT1-OD16TAH-1	
I/O capacity	16 outputs				
Internal I/O common	NPN	PNP	NPN	PNP	
Rated output current	0.5 A/output, 2 A/common				
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	
Leakage current	0.1 mA max.				
ON delay	0.5 ms max.				
OFF delay	1.5 ms max.				
Number of circuits per common	8 outputs/common				
Load short-circuit detection			Supported.		
Disconnection detection			Operates at 3 mA/point max. (Does not operate at over 3 mA.)		
Isolation method	Photocoupler				
Output indicators	LED (yellow)				
Installation	DIN Track				
Power supply type	Multi-power supply				
Communications power supply current consumption	45 mA max. for 24-VDC power supply voltage 65 mA max. for 14-VDC power supply voltage 70 mA max. for 14-VDC power supply voltage				
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage			35 mA max. for 24-VDC power supply voltage	
Output handling for communications errors	Select either hold or clear from CX-Integrator.				
Weight	330 g max.				

## **Input and Output Section Specifications**

## ● 8-point Input and 8-point Output Units (3-tier Terminal Block) Common Specifications

Item	Specification			
Model	CRT1-MD16TA	CRT1-MD16TA-1	CRT1-MD16TAH	CRT1-MD16TAH-1
Installation	DIN Track			
Communications power supply current consumption	40 mA max. for 24-VDC power supply voltage 60 mA max. for 14-VDC power supply voltage		40 mA max. for 24-VDC powers 70 mA max. for 14-VDC powers	
Weight	330 g max.		340 g max.	

### **Input Section Specifications**

Item		Specification			
Model	CRT1-MD16TA	CRT1-MD16TA-1	CRT1-MD16TAH	CRT1-MD16TAH-1	
I/O capacity	8 inputs				
Internal I/O common	NPN	PNP	NPN	PNP	
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)			
OFF current	1.0 mA max.				
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input				
ON delay	1.5 ms max.				
OFF delay	1.5 ms max.				
Power supply short-circuit detection		Operates at 50 mA/point min.			
Disconnection detection			Operates at 0.3 mA/point max.		
Number of circuits per common	8 inputs/common	8 inputs/common			
Isolation method	Photocoupler	Photocoupler			
Input indicator	LED (yellow)				
Power supply type	Multi-power supply				
I/O power supply current consumption	5 mA max. for 24-VDC power si	5 mA max. for 24-VDC power supply voltage 25 mA max. for 24-VDC power supply voltage			

### **Output Section Specifications**

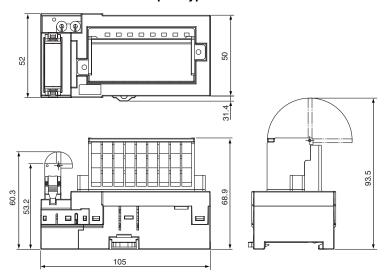
Item		Specia	fication			
Model	CRT1-MD16TA	CRT1-MD16TA-1	CRT1-MD16TAH	CRT1-MD16TAH-1		
I/O capacity	8 outputs	3 outputs				
Internal I/O common	NPN	PNP	NPN	PNP		
Rated output current	0.5 A/output, 2 A/common					
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)		
Leakage current	0.1 mA max.					
ON delay	0.5 ms max.					
OFF delay	1.5 ms max.	1.5 ms max.				
Load short-circuit detection			Supported.			
Disconnection detection			Operates at 3 mA/point max. (Does not operate at over 3 mA.)			
Number of circuits per common	8 outputs/common					
Isolation method	Photocoupler					
Output indicators	LED (yellow)	LED (yellow)				
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage  35 mA max. for 24-VDC supply voltage			35 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Select either hold or clear from	Select either hold or clear from CX-Integrator.				



Dimensions (Unit: mm)

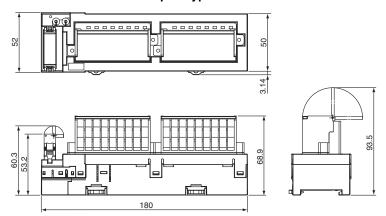
CRT1-ID08TA (-1) CRT1-OD08TA(-1)

### When a DCN4-TB4 Open Type Connectors Is Mounted



CRT1-ID16TA(-1) CRT1-OD16TA(-1 CRT1-MD16TA(-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



Digital I/O Slave Units with e-CON Connectors

# CRT1-\( \Bigcup D16S(-1)\( \Bigcup D32S(-1)\( \Bigcup D16SH(-1)\( \Bigcup D32SH(-1)\)

## Industry-standard Sensor Connectors for Easy Connection to Pre-wired Sensors without Special Tools.

- A digital I/O terminal with industry-standard e-CON connectors.
- Easy to install without the use of special tools. Reduces wiring work.
- Equipped with load short-circuit detection.



## **Ordering Information**

Name			Specifications		Model
	Innuta	16 inputs	NPN		CRT1-ID16S
	Inputs	16 ilipuis	PNP		CRT1-ID16S-1
	Outputs	1C autouta	NPN		CRT1-OD16S
	Outputs	16 outputs	PNP		CRT1-OD16S-1
	Inputs/	8 inputs /	NPN		CRT1-MD16S
	Outputs	8 outputs	PNP	Without Short-circuit and Disconnected	CRT1-MD16S-1
	Inputs	32 inputs	NPN	Line Detection	CRT1-ID32S
	iriputs	32 iliputs	PNP		CRT1-ID32S-1
	Outputs	32 outputs	NPN		CRT1-OD32S
	Outputs	32 outputs	PNP		CRT1-OD32S-1
	Inputs/	16 inputs /	NPN		CRT1-MD32S
e-CON Connectors	Outputs	16 outputs	PNP		CRT1-MD32S-1
e-CON Connectors	Inputs 16 i	16 inputs	NPN		CRT1-ID16SH
		10 inputs	PNP		CRT1-ID16SH-1
	0	16 outputs	NPN		CRT1-OD16SH
	Outputs	10 outputs	PNP		CRT1-OD16SH-1
	Inputs/	8 inputs /	NPN		CRT1-MD16SH
	Outputs	8 outputs	PNP	With Short-circuit and Disconnected	CRT1-MD16SH-1
	Inputs	32 inputs	NPN	Line Detection	CRT1-ID32SH
	inputs	32 Iliputs	PNP		CRT1-ID32SH-1
	Outputs	32 outputs	NPN		CRT1-OD32SH
	Outputs	32 Outputs	PNP		CRT1-OD32SH-1
	Inputs/	16 inputs /	NPN		CRT1-MD32SH
	Outputs	16 outputs	PNP		CRT1-MD32SH-1

Note. Output power supply connectors (Phoenix Contact K.K.) are provided with Output Units and I/O Units.

Slave External I/O Connections in the appendix for applicable connectors.

#### **Performance Specifications**

## ● Sixteen-point Input Units

Item	Specification				
Model	CRT1-ID16S	CRT1-ID16S-1	CRT1-ID16SH	CRT1-ID16SH-1	
I/O capacity	16 inputs				
Internal I/O common	NPN	PNP	NPN	PNP	
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	
OFF current	1 mA max.	mA max.			
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input	· ·			
ON delay	1.5 ms max.	5 ms max.			
OFF delay	1.5 ms max.	.5 ms max.			
Power supply short-circuit detection			Operates at 50 mA/point min.		
Disconnection detection			Operates at 0.3 mA/point max.		
Number of circuits per common	16 inputs/common				
Isolation method	Photocoupler				
Input indicator	LED (yellow)				
Installation	DIN Track				
Power supply type	Network power supply				
Power short-circuit protection	Operates at 50 mA/point min.	Operates at 50 mA/point min.			
Current supplied to input devices	50 mA/input				
Communications power supply current consumption	110 mA max. for 24-VDC power 125 mA max. for 14-VDC power		125 mA max. for 24-VDC power supply voltage 145 mA max. for 14-VDC power supply voltage		
Weight	110 g max.				

## ● Thirty-two-point Input Units

Item		Specif	ication			
Model	CRT1-ID32S	CRT1-ID32S-1	CRT1-ID32SH	CRT1-ID32SH-1		
I/O capacity	32 inputs	1				
Internal I/O common	NPN	PNP	NPN	PNP		
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)		
OFF current	1.0 mA max.	.0 mA max.				
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input					
ON delay	1.5 ms max.	5 ms max.				
OFF delay	1.5 ms max.	.5 ms max.				
Power supply short-circuit detection			Operates at 50 mA/point min.			
Disconnection detection			Operates at 0.3 mA/point max.			
Number of circuits per common	32 inputs/common					
Isolation method	Photocoupler					
Input indicator	LED (yellow)					
Installation	DIN Track					
Power short-circuit protection	Operates at 50 mA/point min.					
Power supply type	Network power supply					
Current supplied to input devices	50 mA/input					
Communications power supply current consumption	195 mA max. for 24-VDC power 200 mA max. for 14-VDC power		210 mA max. for 24-VDC power 235 mA max. for 14-VDC power	11,		
Weight	180 g max.					

### ● Sixteen-point Output Unit

Item		Specif	fication			
Model	CRT1-OD16S	CRT1-OD16S-1	CRT1-OD16SH	CRT1-OD16SH-1		
I/O capacity	16 outputs	1				
Internal I/O common	NPN	PNP	NPN	PNP		
Rated output current	0.5 A/output, 4 A/common	0.5 A/output, 4 A/common				
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)		
Leakage current	0.1 mA max.	.1 mA max.				
ON delay	0.5 ms max.					
OFF delay	1.5 ms max.	5 ms max.				
Load short-circuit detection	Supported.					
Disconnection detection	Operates at 3 mA/point max. (Does not operate at over 3 mA.					
Number of circuits per common	16 outputs/common					
Isolation method	Photocoupler					
Output indicators	LED (yellow)					
Installation	DIN Track					
Power supply type	Multi-power supply					
Current supplied to output devices	100 mA/output					
Communications power supply current consumption	40 mA max. for 24-VDC powers 60 mA max. for 14-VDC powers		40 mA max. for 24-VDC power s 65 mA max. for 14-VDC power s			
I/O power supply current consumption	20 mA max. for 24-VDC power supply voltage		15 mA max. for 24-VDC power supply voltage	60 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Select either hold or clear from CX-Integrator.					
Weight	110 g max.					

#### ● Thirty-two-point Output Unit

Item		Specif	fication		
Model	CRT1-OD32S	CRT1-OD32S-1	CRT1-OD32SH	CRT1-OD32SH-1	
I/O capacity	32 outputs	1		I.	
Internal I/O common	NPN	PNP	NPN	PNP	
Rated output current	0.5 A/output, 4 A/common	0.5 A/output, 4 A/common			
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	
Leakage current	0.1 mA max.	1 mA max.			
ON delay	.5 ms max.				
OFF delay	1.5 ms max.				
Load short-circuit detection	Supported.				
Disconnection detection			Operates at 3 mA/point max. (Does not operate at over 3 mA.)		
Number of circuits per common	16 outputs/common	16 outputs/common			
Isolation method	Photocoupler				
Output indicators	LED (yellow)				
Installation	DIN Track				
Power supply type	Multi-power supply				
Current supplied to output devices	100 mA/output				
Communications power supply current consumption	50 mA max. for 24-VDC power s 80 mA max. for 14-VDC power s		50 mA max. for 24-VDC power 90 mA max. for 14-VDC power		
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage			60 mA max. for 24-VDC power supply voltage	
Output handling for communications errors	Select either hold or clear from CX-Integrator.				
Weight	170 g max.				

## **Input and Output Section Specifications**

## ● 8-point Input and 8-point Output Units

#### **Common Specifications**

Item	Specification			
Model	CRT1-MD16S	CRT1-MD16S-1	CRT1-MD16SH	CRT1-MD16SH-1
Installation	DIN Track			
Communications power supply current consumption	75 mA max. for 24-VDC power supply voltage 95 mA max. for 14-VDC power supply voltage		95 mA max. for 24-VDC power s 115 mA max. for 14-VDC power	
Weight	120 g max.			

### **Input Section Specifications**

Item		Specification				
Model	CRT1-MD16S	CRT1-MD16S-1	CRT1-MD16SH	CRT1-MD16SH-1		
I/O capacity	8 inputs	inputs				
Internal I/O common	NPN	PNP	NPN	PNP		
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)		
OFF current	1.0 mA max.					
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input					
ON delay	1.5 ms max.					
OFF delay	1.5 ms max.					
Power supply short-circuit detection			Operates at 50 mA/point min.			
Disconnection detection			Operates at 0.3 mA/point max.			
Number of circuits per common	8 inputs/common					
Isolation method	Photocoupler					
Input indicator	LED (yellow)					
Power supply type	Network power supply					
Power short-circuit protection	Operates at 50 mA/point min.					
Current supplied to input devices	50 mA/input					

## **Output Section Specifications**

Item		Specif	ication			
Model	CRT1-MD16S	CRT1-MD16S-1	CRT1-MD16SH	CRT1-MD16SH-1		
I/O capacity	8 outputs	outputs				
Internal I/O common	NPN	PNP	NPN	PNP		
Rated output current	0.5 A/output, 2 A/common					
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)		
Leakage current	0.1 mA max.	).1 mA max.				
ON delay	0.5 ms max.					
OFF delay	1.5 ms max.					
Load short-circuit detection			Supported.			
Disconnection detection			Operates at 3 mA/point max. (Does not operate at over 3 mA.)			
Number of circuits per common	8 outputs/common					
Isolation method	Photocoupler					
Output indicators	LED (yellow)					
Power supply type	Multi-power supply					
Current supplied to output devices	100 mA/output	100 mA/output				
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage  35 mA max. for 24-VDC supply voltage			35 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Select either hold or clear from (	CX-Integrator.				

## ● 16-point Input and 16-point Output Units

### **Common Specifications**

Item	Specification			
Model	CRT1-MD32S	CRT1-MD32S-1	CRT1-MD32SH	CRT1-MD32SH-1
Installation	DIN Track			
Communications power supply current consumption	120 mA max. for 24-VDC power supply voltage 140 mA max. for 14-VDC power supply voltage		135 mA max. for 24-VDC power 155 mA max. for 14-VDC power	
Weight	180 g max.			

#### **Input Section Specifications**

Item		Specif	ication		
Model	CRT1-MD32S	CRT1-MD32S-1	CRT1-MD32SH	CRT1-MD32SH-1	
I/O capacity	16 inputs	1	1		
Internal I/O common	NPN	PNP	NPN	PNP	
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	
OFF current	1.0 mA max.				
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input				
ON delay	1.5 ms max.				
OFF delay	1.5 ms max.				
Power supply short-circuit detection			Operates at 50 mA/point min.		
Disconnection detection			Operates at 0.3 mA/point max.		
Number of circuits per common	16 inputs/common				
Isolation method	Photocoupler				
Input indicator	LED (yellow)				
Power supply type	Network power supply				
Power short-circuit protection	Operates at 50 mA/point min.				
Current supplied to input devices	50 mA/input				

### **Output Section Specifications**

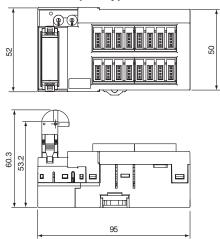
Item		Specif	fication			
Model	CRT1-MD32S	CRT1-MD32S-1	CRT1-MD32SH	CRT1-MD32SH-1		
I/O capacity	16 outputs		1	1		
Internal I/O common	NPN	PNP	NPN	PNP		
Rated output current	0.5 A/output, 4 A/common	1	ı	ı		
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)		
Leakage current	0.1 mA max.	0.1 mA max.				
ON delay	0.5 ms max.					
OFF delay	1.5 ms max.					
Load short-circuit detection			Supported.			
Disconnection detection			Operates at 3 mA/point max. (Does not operate at over 3 mA.)			
Number of circuits per common	16 outputs/common		ı			
Isolation method	Photocoupler					
Output indicators	LED (yellow)					
Power supply type	Multi-power supply					
Current supplied to output devices	100 mA/output					
I/O power supply current consumption	20 mA max. for 24-VDC power supply voltage  15 mA max. for 24-VDC power supply voltage 60 mA max. for 24 supply voltage			60 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Select either hold or clear from CX-Integrator.					



Dimensions (Unit: mm)

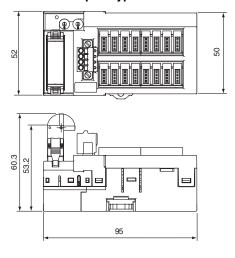
CRT1-ID16S (-1) CRT1-ID16SH (-1)

### When a DCN4-TB4 Open Type Connectors Is Mounted



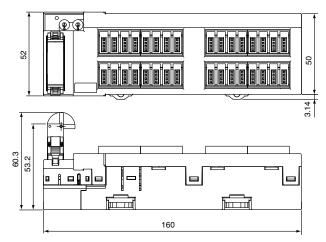
CRT1-MD16S (-1) CRT1-MD16SH (-1) CRT1-OD16S (-1) CRT1-OD16SH (-1)

#### When a DCN4-TB4 Open Type Connectors Is Mounted



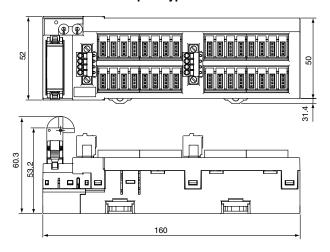
CRT1-ID32S (-1) CRT1-ID32SH (-1)

## When a DCN4-TB4 Open Type Connectors Is Mounted



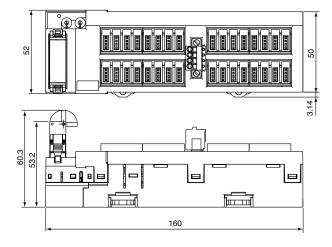
CRT1-OD32S (-1) CRT1-OD32SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



CRT1-MD32S (-1) CRT1-MD32SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



Digital I/O Slave Units with e-CON Connector (Vertical type)

## CRT1-VID08S(-1)/VOD08S(-1)

## A vertical slave unit of little wiring and size

Industrial standard e-CON connectors allow direct connection of the unit to sensing devices without use of terminal blocks. This minimizes requirement in installation space and wiring work.

- Industrial standard e-CON connectors require less wiring work.
- Connector interface of input and output sections can downsize the unit.
- Various data such as network status at start-up, equipment operation and deterioration can be provided.
- DIN tracks and metal fixtures allow flexible installation.



## **Ordering Information**

Name	Specifications			Model	
	Inputs	8 inputs	NPN		CRT1-VID08S
e-CON Connectors *	Inputs	8 inputs	PNP	Without Short-circuit and Disconnected Line	CRT1-VID08S-1
	Outrot	0	NPN		CRT1-VOD08S
	Outputs 8 outputs		PNP		CRT1-VOD08S-1
Mounting Bracket	Unit with e-CON Connectors CRT1-V□D08S(-1)			CRT1-ATT02	

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

Slave External I/O Connections in the appendix for applicable connectors.

#### **Performance Specifications**

## OMRON

## **Input Section Specifications**

Item	Specification		
Model	CRT1-VID08S	CRT1-VID08S-1	
I/O capacity	8 inputs		
Internal I/O common	NPN	PNP	
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)	
OFF current	1.0 mA max.		
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input		
ON delay	1.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	8 inputs/common		
Isolation method	Photocoupler		
Input indicator	LED (yellow)		
Installation	DIN Track or Mounting Bracket		
Power supply type	Network power supply		
Power short-circuit protection	Operates at 50 mA/point min.		
Current supplied to input devices	50 mA/input		
Communications power supply current consumption	35 mA max. for 24-V voltage 50 mA max. for 14-V voltage	,	
Weight	80 g max.		

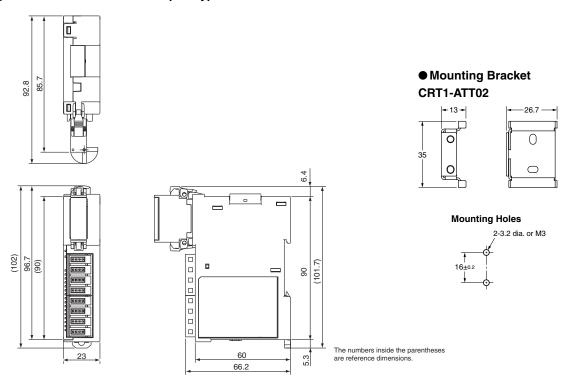
## **Output Section Specifications**

Item	Specification		
Model	CRT1-VOD08S CRT1-VOD08S		
I/O capacity	8 outputs		
Internal I/O common	NPN	PNP	
Rated output current	0.3 A/output, 2 A/con	nmon	
Residual voltage	1.2 V max. (0.3 A DC, between each output terminal and the G terminal)  1.2 V max. (0.3 DC, between eoutput terminal the V terminal)		
Leakage current	0.1 mA max.		
ON delay	0.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	8 outputs/common		
Isolation method	Photocoupler		
Output indicators	LED (yellow)		
Installation	DIN Track or Mountin	ng Bracket	
Power supply type	Multi-power supply		
Current supplied to output devices	100 mA/output		
Communications power supply current consumption	40 mA max. for 24-VDC power supply voltage 60 mA max. for 14-VDC power supply voltage		
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Select either hold or clear from CX-Integrator.		
Weight	80 g max.		

Dimensions (Unit: mm)

CRT1-VID08S (-1) CRT1-VOD08S (-1)

#### When a DCN4-TB4 Open Type Connectors Is Mounted



Digital I/O Slave Units with MIL Connector (Vertical type)

# CRT1-VID16ML(-1)/VOD16ML(-1)

## Thinnest in the industry!

## Ultimately little space and wiring are required.

MIL connectors expand I/O interface options to include direct connection to actuators and to terminal block conversion units.

- Super thin width of 15 mm could downsize the control panel.
- Connector interface between the communications unit and the I/O units can reduce startup time and raise maintenance ability.
- Various maintenance data such as operation status and deterioration of equipment can be collected to improve productivity.
- DIN tracks and metal fixtures allow flexible installation.
- Wide range of connection styles are available including direct connection to actuators and to terminal block conversion units.



## **Ordering Information**

Name	Specifications		Model	
	Inputs	16 inputs	NPN	CRT1-VID16ML
MIL Connector *			PNP	CRT1-VID16ML-1
WIL Connector	Outputs	16 outputs	NPN	CRT1-VOD16ML
			PNP	CRT1-VOD16ML-1
Mounting Bracket	Unit with MIL Connectors		CRT1-ATT01	

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well

Slave External I/O Connections in the appendix for applicable connectors.

## **Performance Specifications**

Item	Specification		
Model	CRT1-VID16ML CRT1-VID16ML-		
I/O capacity	16 inputs		
Internal I/O common	NPN	PNP	
ON voltage	17 VDC min. (between each input terminal and the V terminal)	17 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)	
OFF current	1.0 mA max.		
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input		
ON delay	1.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	16 inputs/common		
Isolation method	Photocoupler		
Input indicator	LED (yellow)		
Installation	DIN Track or Mounting Bracket		
Power supply type	Multi-power supply		
Communications power supply current consumption	40 mA max. for 24-VDC power supply voltage 60 mA max. for 14-VDC power supply voltage		
I/O power supply current consumption	5 mA max. for 24-VDC power supply voltage		
Weight	80 g max.		

## **Output Section Specifications**

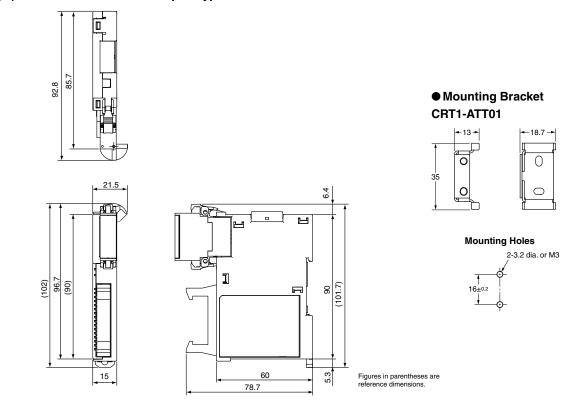
Item	Specification			
Model	CRT1-VOD16ML CRT1-VOD16ML-			
I/O capacity	16 outputs			
Internal I/O common	NPN	PNP		
Rated output current	0.3 A/output, 2 A/con	nmon *		
Residual voltage	1.2 V max. (0.3 A DC, between each output terminal and the G terminal)  1.2 V max. (0.3 DC, between each output terminal the V terminal)			
Leakage current	0.1 mA max.			
ON delay	0.5 ms max.			
OFF delay	1.5 ms max.	ms max.		
Number of circuits per common	16 outputs/common			
Isolation method	Photocoupler			
Output indicators	LED (yellow)			
Installation	DIN Track or Mountin	ng Bracket		
Power supply type	Multi-power supply	Multi-power supply		
Communications power supply current consumption	45 mA max. for 24-VDC power supply voltage 65 mA max. for 14-VDC power supply voltage			
I/O power supply current consumption	15 mA max. for 24-VDC power suppolar			
Output handling for communications errors	Select either hold or clear from CX-Integrator.			
Weight	70 g max.			

<sup>\*</sup> Do not use a total external load current of more than 2 A, and do not use more than 1 A per V terminal or G terminal.

Dimensions (Unit: mm)

CRT1-VID16ML (-1) CRT1-VOD16ML (-1)

#### When a DCN4-TB4 Open Type Connectors Is Mounted



Digital I/O Slave Units with MIL Connector (Vertical type)

# CRT1-VID32ML(-1)/VOD32ML(-1)/VMD32ML(-1)

## Aggregation of multi-I/O points!

## A compact and little wiring slave with 32 points and MIL connector

MIL connectors expand I/O interface options to include collective connection of multiple I/O points to boards as well as direct connection to actuators via branching cables.

- Super compact slave with 32 points and MIL connector (35 mm wide x 60 mm deep x 80 mm high)
- Aggregation of multi I/O points enables connection to actuators and boards.
- Connector interface between the communications unit and the I/O units greatly reduces wiring man-hour.
- DIN tracks and metal fixtures allow flexible installation.
- Various maintenance data such as operation status and deterioration of equipment can be collected to improve productivity.



## **Ordering Information**

Name	Specifications			Model
	Inputs	32 inputs	NPN	CRT1-VID32ML
			PNP	CRT1-VID32ML-1
MII Connector *	Outputs	32 outputs	NPN	CRT1-VOD32ML
MIL Connector *			PNP	CRT1-VOD32ML-1
	1 -	10 inputs/	NPN	CRT1-VMD32ML
			PNP	CRT1-VMD32ML-1
Mounting Bracket	Unit with MIL Connectors CRT1-V□D32ML(-1)		SRT1-ATT02	

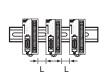
<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

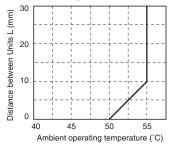
Slave External I/O Connections in the appendix for applicable connectors.

### **Performance Specifications**

Item	Specification		
Model	CRT1-VID32ML CRT1-VID32ML-		
I/O capacity	32 inputs		
Internal I/O common	NPN	PNP	
ON voltage	17 VDC min. (between each input terminal and the V terminal)	17 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)	
OFF current	1.0 mA max.		
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input		
ON delay	1.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	32 inputs/common		
Number of simultaneous inputs	32 max. *		
Isolation method	Photocoupler		
Input indicator	LED (yellow)		
Installation	DIN Track or Mounting Bracket		
Power supply type	Multi-power supply		
Communications power supply current consumption	40 mA max. for 24-VDC power supply voltage 60 mA max. for 14-VDC power supply voltage		
I/O power supply current consumption	2 mA max. for 24-VDC power supply voltage		
Weight	120 g max.	·	

\* When Units Are Mounted Facing Upwards:
If 16 points may be turned ON simultaneously, the distance between the Units must be restricted depending on the ambient operating temperature, as shown in the following graph. For example, when the ambient operating temperature is 55°C, a space of at least 10 mm is required between Units.





## **Output Section Specifications**

Item	Specification		
Model	CRT1-VOD32ML CRT1-VOD32ML-		
I/O capacity	32 outputs		
Internal I/O common	NPN PNP		
Rated output current	0.3 A/output, 4 A/con	nmon *	
Residual voltage	1.2 V max. (0.3 A DC, between each output terminal and the G terminal)  1.2 V max. (0.3 DC, between each output terminal and the V terminal)		
Leakage current	0.1 mA max.		
ON delay	0.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	32 outputs/common		
Isolation method	Photocoupler		
Output indicators	LED (yellow)		
Installation	DIN Track or Mounting Bracket		
Power supply type	Multi-power supply		
Communications power supply current consumption	50 mA max. for 24-VDC power supply voltag 80 mA max. for 14-VDC power supply voltag		
I/O power supply current consumption	6.5 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Select either hold or clear from CX-Integrator.		
Weight	100 g max.		

<sup>\*</sup> Do not use a total external load current of more than 4 A, and do not use more than 1 A per V terminal or G terminal.

## **Input and Output Section Specifications**

## ● Sixteen-point Input and Sixteen-point Output Units **Common Specifications**

Item	Specification		
Model	CRT1-VMD32ML CRT1-VMD32ML-		
Installation	DIN Track or Mounting Bracket		
Communications power supply current consumption	45 mA max. for 24-VDC power supply voltage 70 mA max. for 14-VDC power supply voltage		
Weight	110 g max.		

## OMRON

#### **Input Section Specifications**

Item	Specification		
Model	CRT1-VMD32ML	CRT1-VMD32ML-1	
I/O capacity	16 inputs		
Internal I/O common	NPN	PNP	
ON voltage	17 VDC min. (between each input terminal and the V terminal)	17 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC min. (between each input terminal and the V terminal)	5 VDC min. (between each input terminal and the G terminal)	
OFF current	1.0 mA max.		
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input		
ON delay	1.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	16 inputs/common		
Number of simultaneous inputs	16 max. *		
Isolation method	Photocoupler		
Input indicator	LED (yellow)		
Power supply type	Multi-power supply		
I/O power supply current consumption	2 mA max.		

<sup>\*</sup> When Slave Units are mounted facing upwards, and 16 inputs may all turn ON, leave the specified distance between Units according to the ambient temperature.

#### **Output Section Specifications**

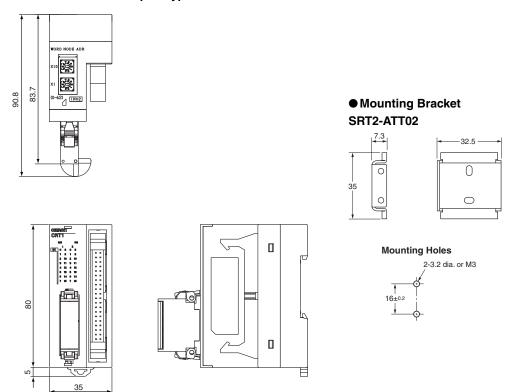
Item	Specification			
Model	CRT1-VMD32ML	CRT1-VMD32ML-1		
I/O capacity	16 outputs	16 outputs		
Internal I/O common	NPN	PNP		
Rated output current	0.3 A/output, 2 A/con	nmon *		
Residual voltage	1.2 V max. (0.3 A DC, between each output terminal and the G terminal)	1.2 V max. (0.3 A DC, between each output terminal and the V terminal)		
Leakage current	0.1 mA max.	.1 mA max.		
ON delay	0.5 ms max.			
OFF delay	1.5 ms max.			
Number of circuits per common	16 outputs/common			
Isolation method	Photocoupler			
Output indicators	LED (yellow)			
Power supply type	Multi-power supply			
I/O power supply current consumption	6.5 mA max. for 24-VDC power supporting			
Output handling for communications errors	Select either hold or clear from CX-Integrator.			

<sup>\*</sup> Do not use a total external load current of more than 2 A, and do not use more than 1 A per V terminal or G terminal.

Dimensions (Unit: mm)

CRT1-VID32ML (-1) CRT1-VOD32ML (-1) CRT1-VMD32ML (-1)

#### When a DCN4-TB4 Open Type Connectors Is Mounted

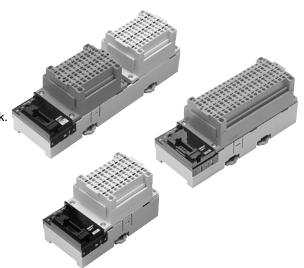


**Digital I/O Slaves Units with Clamp Terminals** 

# CRT1- $\square$ D08SL(-1)/ $\square$ D16SL(-1)

# Screw-less Terminal Wiring Further Reduces Wiring Work and Saves Labor at the Production Site.

- Screw-less (M3) design reduces the need for extra tightening.
- Removable terminal block gives powerful support to maintenance work.
- One-step wiring. Wire simply by inserting the ferrules.
- Applicable wire: AWG24 to AWG16 (cross-section: 0.2 to 1.25 mm²)



## **Ordering Information**

Name		Specification	Model	
	lanuta	Q innute	NPN	CRT1-ID08SL
	Inputs	8 inputs	PNP	CRT1-ID08SL-1
	Outrouto	O custoute	NPN	CRT1-OD08SL
Clamp Terminals	Outputs	8 outputs	PNP	CRT1-OD08SL-1
	Innuta	16 inputs	NPN	CRT1-ID16SL
	inputs	16 inputs	PNP	CRT1-ID16SL-1
	Outouto	Outrotte 16 outrotte	NPN	CRT1-OD16SL
	Outputs	16 outputs	PNP	CRT1-OD16SL-1
	Inputs/	8 inputs/	NPN	CRT1-MD16SL
	8 outputs	PNP	CRT1-MD16SL-1	

Slave External I/O Connections in the appendix for applicable ferrules.

## **Performance Specifications**

### ● Eight-point Input Units

Item	Specification	
Model	CRT1-ID08SL CRT1-ID08SL-	
I/O capacity	8 inputs	
Internal I/O common	NPN	PNP
ON voltage	15 VDC min. (between each input terminal and the V terminal)  15 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal) 5 VDC max. (between each input terminal ard the G terminal)	
OFF current	1 mA max.	
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA min./input	
ON delay	1.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	8 inputs/common	
Isolation method	Photocoupler	
Input indicator	LED (yellow)	
Installation	DIN Track	
Power supply type	Multi-power supply	
Current supplied to input devices	100 mA/input	
Communications power supply current consumption	30 mA max. for 24-VDC power supply voltage 50 mA max. for 14-VDC power supply voltage	
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage	
Weight	170 g max.	

### ● Sixteen-point Input Units

Item	Specification	
Model	CRT1-ID16SL	CRT1-ID16SL-1
I/O capacity	16 inputs	
Internal I/O common	NPN	PNP
ON voltage	15 VDC min. (between each input terminal and the V terminal)  15 VDC min. (between each input terminal and the G terminal)	
OFF voltage	5 VDC max. (between each input terminal and the V terminal) 5 VDC max. (between each input terminal and the G terminal)	
OFF current	1.0 mA max.	
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA max./input	
ON delay	1.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	16 inputs/common	
Isolation method	Photocoupler	
Input indicator	LED (yellow)	
Installation	DIN Track mounting	
Power supply type	Multi-power supply	
Communications power supply current consumption	35 mA max. for 24-VDC power supply voltage 55 mA max. for 14-VDC power supply voltage	
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage	
Weight	250 g max.	

## **Output Section Specifications**

## ● Eight-point Output Units

Item	Specification		
Model	CRT1-OD08SL CRT1-OD08SL		
I/O capacity	8 outputs		
Internal I/O common	NPN PNP		
Rated output current	0.5 A/output, 2 A/con	nmon	
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)  1.2 V max. (0.5 A DC, between each output terminal at the V terminal)		
Leakage current	0.1 mA max.		
ON delay	0.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	8 outputs/common		
Isolation method	Photocoupler		
Output indicators	LED (yellow)		
Installation	DIN Track		
Power supply type	Multi-power supply		
Current supplied to output devices	100 mA/output		
Communications power supply current consumption	35 mA max. for 24-VDC power supply voltage 55 mA max. for 14-VDC power supply voltage		
I/O power supply current consumption	25 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Select either hold or clear from CX-Integrator.		
Weight	170 g max.		

### ● Sixteen-point Output Unit

Item	Specification		
Model	CRT1-OD16SL CRT1-OD16SL		
I/O capacity	16 outputs		
Internal I/O common	NPN PNP		
Rated output current	0.5 A/output, 4 A/con	nmon	
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)  1.2 V max. (0.5 A Dc, between each output terminal and the V terminal)		
Leakage current	0.1 mA max.		
ON delay	0.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	16 outputs/common		
Isolation method	Photocoupler		
Output indicators	LED (yellow)		
Installation	DIN Track mounting		
Power supply type	Multi-power supply		
Communications power supply current consumption	35 mA max. for 24-VDC power supply voltage 60 mA max. for 14-VDC power supply voltage		
I/O power supply current consumption	30 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Hold or clear can be selected. (CompoNet Support Software)		
Weight	250 g max.		

## **Input and Output Section Specifications**

## ● Eight-point Input and Eight-point Output Units Common Specifications

Item	Specification	
Model	CRT1-MD16SL CRT1-MD16SL-	
Installation	DIN Track	
Communications power supply current consumption	35 mA max. for 24-VDC power supply voltage 60 mA max. for 14-VDC power supply voltage	
Weight	290 g max.	

### **Input Specifications**

Item	Specification	
Model	CRT1-MD16SL	CRT1-MD16SL-1
I/O capacity	8 inputs	
Internal I/O common	NPN	PNP
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC min. (between each input terminal and the V terminal)	5 VDC min. (between each input terminal and the G terminal)
OFF current	1.0 mA max.	
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input	
ON delay	1.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	8 inputs/common	
Isolation method	Photocoupler	
Input indicator	LED (yellow)	
Power supply type	Multi-power supply	
Current supplied to input devices	100 mA/input	
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage	

## **Output Specifications**

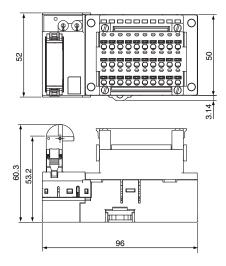
Item	Specification	
Model	CRT1-MD16SL CRT1-MD16SL	
I/O capacity	8 outputs	
Internal I/O common	NPN	PNP
Rated output current	0.5 A/output, 2 A/con	nmon
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)  1.2 V max. (0.5 A DC, between each output terminal at the V terminal)	
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	8 outputs/common	
Isolation method	Photocoupler	
Output indicators	LED (yellow)	
Power supply type	Multi-power supply	
Current supplied to output devices	100 mA/output	
I/O power supply current consumption	25 mA max. for 24-VDC power supply voltage	
Output handling for communications errors	Select either hold or clear from CX-Integrator.	



Dimensions (Unit: mm)

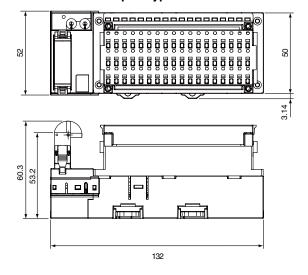
CRT1-ID08SL (-1) CRT1-OD08SL (-1)

### When a DCN4-TB4 Open Type Connectors Is Mounted



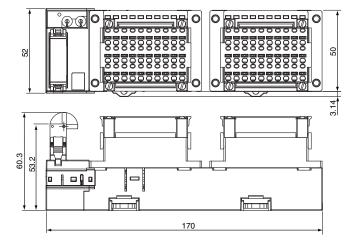
CRT1-ID16SL (-1) CRT1-OD16SL (-1)

#### When a DCN4-TB4 Open Type Connectors Is Mounted



CRT1-MD16SL (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



## **Analog I/O Slave Units**

## CRT1-AD04/DA02

# **Convert to Smart for Smarter Processing! Simple and Intelligent Analog I/O Slaves**

In addition to analog data input and output, Analog I/O Slave Units can use a variety of functions internally, such as scaling, that previously required processing in ladder programming at the host PLC.

- Analog processing equivalent to digital panel meters is supported, such as with the scaling function.
- Use deviation and cumulative counter functions for analog calculations, such as for equipment error prediction and flow rate applications.
- The user adjustment function can be used to compensate offsets in inputs or outputs
- Easily change the input or output range with a switch setting.



### **Ordering Information**

Name	Specifications		Model
Analog I/O Slave Units *	Analog inputs	4 inputs	CRT1-AD04
Arialog 1/O Slave Offics	Analog outputs	2 outputs	CRT1-DA02

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

## **Performance Specifications**

Item		Specification		
		Voltage input	Current input	
Model		CRT1-AD04		
Input signal ranges		0 to 5 V 1 to 5 V 0 to 10 V -10 to 10 V	0 to 20 mA 4 to 20 mA	
Maximum sign	al input	±15 V	±30 mA	
Input impedance	ce	1 M Ω min.	Approx. 250 $\Omega$	
Resolution		1/6,000 (full scale)		
Overall	25°C	±0.3% FS	±0.4% FS	
accuracy	−10 to 55°C	±0.6% FS	±0.8% FS	
Conversion cyc	cle	1 ms/1 points		
AD conversion data		-10 to 10 V range: F4-scale (-3,000 to 3,000 Other ranges: 0000 to (0 to 6,000) AD conversion range: data ranges.	) 1770 hex full scale	
Isolation method		Photocoupler isolation (between input and communications lines) No isolation between input signal wires		
Mounting		DIN Track mounting		
Power supply type		Multi-power supply		
Communications power current consumption		110 mA max. for 24-VDC power supply 175 mA max. for 14-VDC power supply		
Weight		153 g		

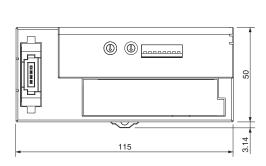
## **Output Section Specifications**

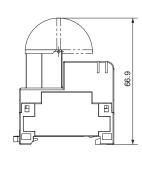
Item		Specification		
		Voltage output	Current output	
Model	Model			
Output signal ranges		0 to 5 V 1 to 5 V 0 to 10 V -10 to 10 V	0 to 20 mA 4 to 20 mA	
External outpu load resistance		1 kΩ min.	600 Ω max.	
Resolution		1/6,000 (full scale)		
Overall	25°C	±0.4% FS	±0.4% FS *	
accuracy	−10 to 55°C	±0.8% FS	±0.8% FS *	
Conversion cyc	cle	2 ms/2 points		
DA conversion data		-10 to 10 V range: F448 to 0BB8 hex full scale (-3,000 to 3,000) Other ranges: 0000 to 1770 hex full scale (0 to 6,000) AD conversion range: ±5% FS of the above data ranges.		
Isolation method		Photocoupler isolation (between output and communications lines) No isolation between output signal wires.		
Mounting		DIN Track mounting		
Power supply type		Multi-power supply		
Communications power current consumption		125 mA max. for 24-VDC power supply 205 mA max. for 14-VDC power supply		
Weight		155 g		

<sup>\*</sup> The specified accuracy does not apply below 0.2 mA when using the 0 to 20 mA range.

Dimensions (Unit: mm)

CRT1-AD04 CRT1-DA02





## Analog I/O Slave Units with MIL Connectors/e-CON Connectors 1-VAD04

## **Analog Slave Units with the Industry's** Narrowest Width Help Save Space in **Equipment and Panels**

- The series includes Slave Units with a width of only 15 mm, the narrowest in the industry. Models with e-CON connectors boast a width of only 23 mm, making them the smallest in their class to save even more space.
- I/O interface wiring can be performed easily with either MIL connectors or e-CON connectors.
- Just make a few switch settings to complete Unit setup.
- Enhanced Smart functions in a slim body. Reduce your total cost of operation by collecting maintenance data by using only the Slave Unit.







## Ordering Information

Name	Specif	Model	
	Input/Output	Points	Model
MIL Connector Type	Analog Inputs	4 inputs	CRT1-VAD04ML
	Analog Outputs	2 outputs	CRT1-VDA02ML
e-CON Connector Type	Analog Inputs	4 inputs	CRT1-VAD04S
	Analog Outputs	2 outputs	CRT1-VDA02S
Mounting Bracket	Unit with MIL Connectors		CRT1-ATT01
Woulding Blacket	Unit with e-CON Connectors		CRT1-ATT02

Slave External I/O Connections in the appendix for applicable connectors.

## **Performance Specifications**

#### ● Four-point Analog Input Unit (with MIL Connectors) CRT1-VAD04ML

Item		Specification		
		Voltage input	Current input	
Input signal ranges		0 to 5 V 1 to 5 V 0 to 10 V -10 to 10 V	0 to 20 mA 4 to 20 mA	
Maximum si	gnal input	±15 V	±30 mA	
Input impeda	ance	1 MΩ min.	Approx. 250 Ω	
Resolution		1/6,000 (full scale)		
Overall	25°C	±0.3% FS	±0.4% FS	
accuracy	−10 to 55°C	±0.6% FS	±0.8% FS	
Conversion cycle		1 ms/ 1 point		
AD conversion data		-10 to 10 V range: F448 to 0BB8 hex full scale (-3,000 to 3,000)  Other ranges: 0000 to 1770 hex full scale (0 to 6,000)  AD conversion range: ±5% FS of the above data ranges.		
Isolation method		Photocoupler isolation (between input and communications lines) No isolation between input signal wires		
Mounting		DIN Track mount or mount for Mounting Bracket		
Power supply type		Multi-power supply		
Communications power current consumption		75 mA max. for 24-VDC power supply 115 mA max. for 14-VDC power supply		
Weight		70 g max.		

#### ● Four-point Analog Input Unit (with e-CON Connectors) CRT1-VAD04S

Item		Specification		
		Voltage input	Current input	
Input signal ranges		0 to 5 V 1 to 5 V 0 to 10 V -10 to 10 V	0 to 20 mA 4 to 20 mA	
Maximum si	gnal input	±15 V	±30 mA	
Input imped	ance	1 M $\Omega$ min.	Approx. 250 Ω	
Resolution		1/6,000 (full scale)	1/6,000 (full scale)	
Overall	25°C	±0.3% FS	±0.4% FS	
accuracy	-10 to 55°C	±0.6% FS	±0.8% FS	
Conversion cycle		1 ms/ 1 point		
AD conversion data		-10 to 10 V range: F448 to 0BB8 hex full scale (-3,000 to 3,000)  Other ranges: 0000 to 1770 hex full scale (0 to 6,000)  AD conversion range: ±5% FS of the above data ranges.		
Isolation method		Photocoupler isolation (between input and communications lines) No isolation between input signal wires		
Mounting		DIN Track mount or mount for Mounting Bracket		
Power supply type		Multi-power supply		
Communications power current consumption		75 mA max. for 24-VDC power supply 115 mA max. for 14-VDC power supply		
Sensor power supply current *		Less than 200 mA (for each CH)		
Weight		85 g max.		

<sup>\*</sup> In order to provide power to the sensor through the I/O connector, a 24-VDC power supply must be connected to the sensor power supply connector.

## **Output Section Specifications**

### ● Two-point Analog Output Unit (with MIL Connectors) CRT1-VDA02ML

Item		Specification		
		Voltage Output	Current Output	
Output signal ranges		0 to 5 V 1 to 5 V 0 to 10 V -10 to 10 V	0 to 20 mA 4 to 20 mA	
External out load resistar	put allowable nce	1 kΩ min.	600 Ω max.	
Resolution		1/6,000 (full scale)		
Overall	25°C	±0.4% FS	±0.4% FS *	
accuracy	-10 to 55°C	±0.8% FS	±0.8% FS *	
Conversion	cycle	2 ms/ 2 points		
DA conversion data		-10 to 10 V range: F448 to 0BB8 hex full scale (-3,000 to 3,000)  Other ranges: 0000 to 1770 hex full scale (0 to 6,000)  DA conversion range: ±5% FS of the above data ranges.		
Isolation method		Photocoupler isolation (between output and communications lines) No isolation between output signal wires.		
Mounting		DIN Track mount or mount for Mounting Bracket		
Power supply type		Multi-power supply		
Communications power current consumption		105 mA max. for 24-VDC power supply 170 mA max. for 14-VDC power supply		
Weight		75 g max.		

 $<sup>^{\</sup>star}\,$  The specified accuracy does not apply below 0.2 mA when using the 0 to 20 mA range.

#### ● Two-point Analog Output Unit (with e-CON Connectors) CRT1-VDA02S

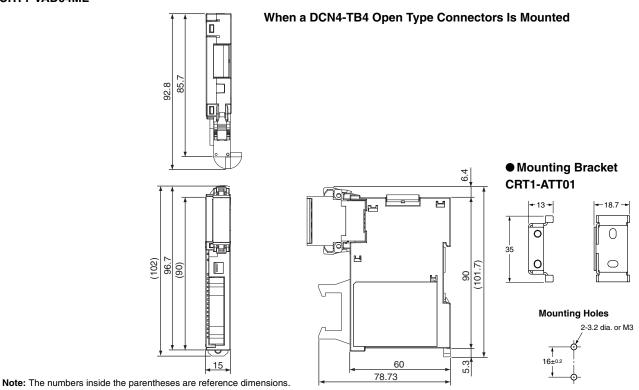
Item		Specification		
		Voltage Output	Current Output	
Output signal ranges		0 to 5 V 1 to 5 V 0 to 10 V -10 to 10 V	0 to 20 mA 4 to 20 mA	
External out load resistar	out allowable nce	1 kΩ min.	600 Ω max.	
Resolution		1/6,000 (full scale)		
Overall	25°C	±0.4% FS	±0.4% FS *	
accuracy	−10 to 55°C	±0.8% FS	±0.8% FS *	
Conversion	cycle	2 ms/ 2 points		
DA conversion data		-10 to 10 V range: F448 to 0BB8 hex full scale (-3,000 to 3,000)  Other ranges: 0000 to 1770 hex full scale (0 to 6,000)  DA conversion range: ±5% FS of the above data ranges.		
Isolation method		Photocoupler isolation (between output and communications lines) No isolation between output signal wires.		
Mounting		DIN Track mount or mount for Mounting Bracket		
Power supply type		Multi-power supply		
Communications power current consumption		105 mA max. for 24-VDC power supply 170 mA max. for 14-VDC power supply		
Weight		85 g max.		

<sup>\*</sup> The specified accuracy does not apply below 0.2 mA when using the 0 to 20 mA range.

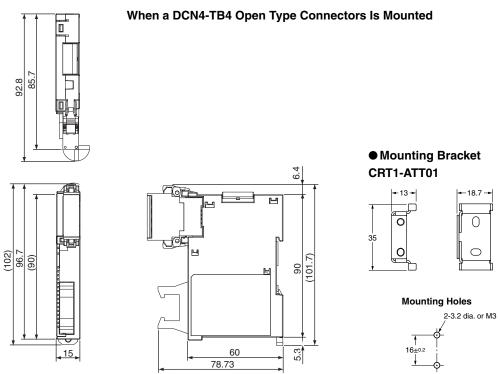


**Dimensions** (Unit: mm)

#### ● Four-point Analog Input Unit (with MIL Connectors) CRT1-VAD04ML



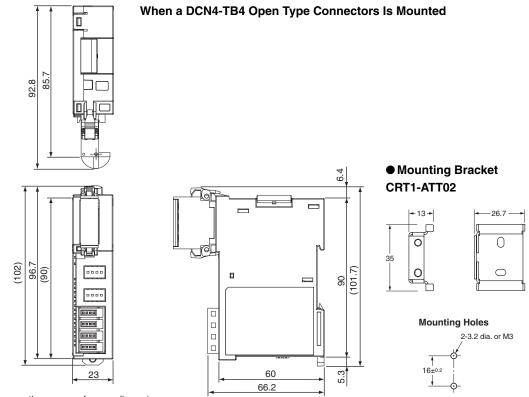
#### ● Two-point Analog Output Unit (with MIL Connectors) CRT1-VDA02ML



Note: The numbers inside the parentheses are reference dimensions.

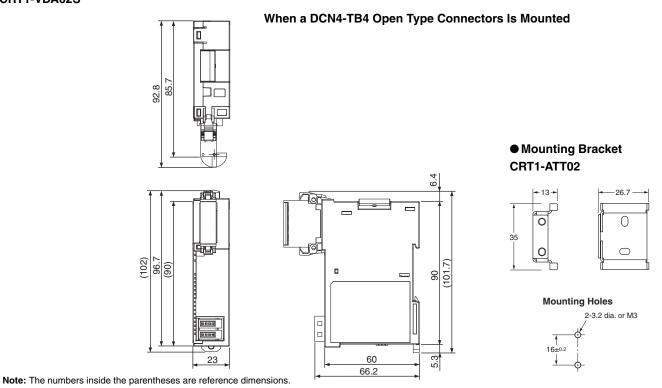


#### ● Four-point Analog Input Unit (with e-CON Connectors) CRT1-VAD04S



**Note:** The numbers inside the parentheses are reference dimensions.

#### ● Two-point Analog Output Unit (with e-CON Connectors) CRT1-VDA02S



## **Analog I/O Slave Units (Numerical indicator type)** D/-VDA02 CRT1-VAD02

## Analog slave unit with numerical indicator! **Ensure easy setting in system start-up**

- Numerical indicator facilitates system start-up and maintenance work
- Ladder-free simple local control if combined with expansion unit (option)
- MIL connector and e-CON connector
- Testing function addition for system start-up





## Ordering Information

Name	Specifications		Model	
Name	Input/Output	Points	Model	
Analog I/O Slave Units (Numerical indicator type) MIL Connector Type	Analog inputs (Channel Insulation)	2 inputs	CRT1-VAD02MLD	
Will Connector Type	Analog outputs	2 outputs	CRT1-VDA02MLD	
Analog I/O Slave Units (Numerical indicator type) e-CON Connector Type	Analog inputs (Channel Insulation)	2 inputs	CRT1-VAD02SD	
e-con connector type	Analog outputs	2 outputs	CRT1-VDA02SD	

Slave External I/O Connections in the appendix for applicable connectors.

## **Performance Specifications**

Items	Specifications
Communications power voltage	14.0 to 26.4 VDC
Noise immunity	Conform to IEC61000-4-4, 2 kV (power line)
Vibration resistance	10 to 150 Hz, double amplitude 0.7 mm or 50 m/s <sup>2</sup>
Shock resistance	150 m/s² (three times each in 6 directions of 3 axes)
Dialectic resistance	500 VAC (between insulated circuits)
Insulation resistance	20 M $\Omega$ min (between insulated circuits)
Ambient operating temperature	-10 to +55 °C
Ambient operating humidity	25 to 85 % (with no condensation)
Ambient operating atmosphere	No corrosive gas
Storage temperature	-25 to +65 °C
Storage humidity	25 to 85 % (with no condensation)
Installation method	DIN Track 35 mm or Mounting Bracket (for Expansion Units excluded)

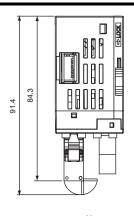
Item		Specification and Performance		
		Voltage input	Current input	
Input range (signal)		0 to 5 V 1 to 5 V 0 to 10 V -10 to +10 V	0 to 20 mA 4 to 20 mA	
Maximum	signal input	±15 V	±30 mA	
Input impe	dance	1MΩ min	approx. 250 Ω	
Resolution		1/6000 (full scale)	1/6000 (full scale)	
Overall	25 °C	±0.3%FS	±0.4%FS	
accuracy	-10 to + 55°C	±0.6%FS	±0.8%FS	
Conversion	n cycle	2 ms per two points		
		-10 to +10 V range: F448 to 0BB8 hex full scale (-3000 to +3000)		
AD conver	sion data	Others: 0000 to 1770 he	ex full scale (0 to 6000)	
		AD conversion range: $\pm 5$ % FS of the above data range.		
Insulation method		Photocoupler isolation (between inputs and communications lines or input signals)		
Communications power consumption		70 mA max. for 24-VDC power supply 105 mA max. for 14-VDC power supply		
Weight		CRT1-VAD02SD: 109 g CRT1-VAD02MLD: 113 g		

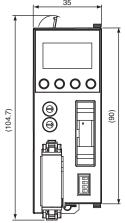
## **Output Section Specifications**

		Specification and Performance		
	Item	Voltage output	Current output	
Output ran	ge (signal)	0 to 5 V 1 to 5 V 0 to 10 V -10 to +10 V	0 to 20 mA 4 to 20 mA	
External ou load resista	tput permissible ince	5 kΩ min	600 Ω max	
Resolution		1/6000 (full scale)		
Overall	25 °C	±0.4%FS	±0.4%FS *	
accuracy	-10 to + 55°C	±0.8%FS	±0.8%FS *	
Conversion	n cycle	2 ms per two points		
		-10 to +10 V range: F448 to 0BB8 hex full scale (-3000 to +3000)		
DA convers	sion data	Others: 0000 to 1770 hex full scale (0 to 6000)		
		DA conversion range: $\pm 5\%$ FS of the above data range.		
Insulation method		Photocoupler isolation (between output and communications lines) No isolation between output signal wires		
Communications power consumption		125 mA max. for 24-VDC power supply 195 mA max. for 14-VDC power supply		
Weight		CRT1-VDA02SD: 106 g CRT1-VDA02MLD: 112 g		

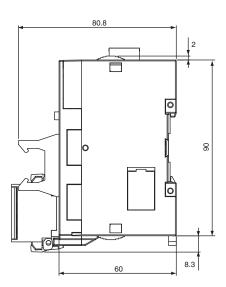
<sup>\*</sup> In current input mode of 0 to 20 mA, accuracy below 0.2 mA is not

**Dimensions** (Unit: mm)





Note: The numbers inside the parentheses are reference dimensions.



**Temperature Input Units** 

# CRT1-TS04T/-TS04P

# **High-speed Transfer of Temperature Data** with CompoNet.

## **Enhanced Smart Functions.**

You can use either of two types of temperature input sensors: Thermocouple and resistance thermometer.

Each Unit provides four temperature inputs. Plus, the Units support scaling, comparators, and other data processing, reducing the processing load on the ladder program.

- Product lineup includes models with thermocouple inputs and models with resistance thermometer inputs.
- The node address, input types, and other settings can all be made using the switches on the Slave. (No Support Software is required.)
- Detachable terminal blocks enable easy maintenance without the need to remove wiring.
- Smart functions in the Slave reduce ladder programming and make maintenance easier.
   For example, scaling to convert input data to desired values, comparators to compare process values with preset upper and lower limits, and integrator to calculate the heat values of equipment or Sensors by from the temperature and measurement time.
- The Sensor open-circuit detection function reduces wiring errors.



## **Ordering Information**

Name	Specifications			Model
Input/Output		Points	Specifications	Wodei
Temperature Input Unit	Thermocouple Input		Switchable between R, S, K, J, T, E, B, N, L, U, W, and PL2	CRT1-TS04T
	Platinum-resistance thermometer input	4 inputs	PT100 (-200 to 850°C) PT100 (-200 to 200°C)	CRT1-TS04P

## **Performance Specifications**

# **Specifications**

Item model		CRT1-TS04T	CRT1-TS04P
Input type	Switchable between R, S, K, J, T, E, B, N, L, U, W, and PL2 When set with CX-Integrator: Input types can be set individually for each input.  Wen set with DIP switch: The same input type setting applies to all 4 inputs.		Switchable between PT100 (-200 to 850°C) and PT100 (-200 to 200°C) When set with CX-Integrator: Input types can be set individually for each input. When set with DIP switch: The same input type setting applies to all 4 inputs.
	max.	or ±1°C, whichever is larger) ±1 digit y in Exceptional Cases	
	Input type and temperature range	Input accuracy	
	K, T, and N below -100°C	±2°C ±1 digit max.	-200 to 850°C input range: (±0.3% of indication value or ±0.8°C, whichever is larger) ±1
Indiantar annual	U and L	±2°C ±1 digit max.	digit max.
Indicator accuracy	R and S below 200°C	±3°C ±1 digit max.	-200 to 200°C input range: (±0.3% of indication value or ±0.5°C, whichever is larger) ±1
	B below 400°C	Not specified.	digit max.
	w	±0.3% of indication value or ±3°C (whichever is larger) ±1 digit max.	
	PL2	±0.3% of indication value or ±2°C (whichever is larger) ±1 digit max.	
Conversion cycle	250 ms/4 points		
Temperature conversion data	Binary data (4-digit hexadecimal when Normal Display Mode is selected or 8-digit hexadecimal when 1/100 Display Mode is selected.)		
Isolation method	Between input and communication lines: Photocoupler isolation Between temperature input signals: Photocoupler isolation		
Mounting method	35-mm DIN track mounting		
Communications power supply current	75 mA max. at 24 VDC 110 mA max. at 14 VDC		75 mA max. at 24 VDC 110 mA max. at 14 VDC
Weight	148 g max.		147 g max.

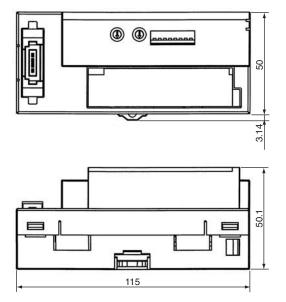
#### **Effects of Mounting Direction on Accuracy**

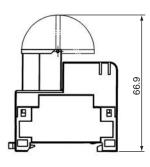
A cold junction compensator is included in the Terminal Block of the CRT1-TS04T. The input accuracy depends on the mounting direction if only the Unit is replaced.

Input accuracy			
As specified in the Performance Sp	As specified in the Performance Specifications.		
±0.3% of indication value or ±2°C (whichever is larger) ±1 digit max.  Indicator Accuracy in Exceptional Cases			
Input type and temperature range	Input accuracy		
K, T, and N below –100°C	±3°C ±1 digit max.		
U and L	±3°C ±1 digit max.		
R and S below 200°C	±4°C ±1 digit max.		
B below 400°C	Not specified.		
w	±0.3% of indication value or ±4°C (whichever is larger) ±1 digit max.		
PL2	±0.3% of indication value or ±3°C (whichever is larger)		
	±0.3% of indication value or ±2°C Indicator Accuracy in Exc Input type and temperature range K, T, and N below –100°C U and L R and S below 200°C B below 400°C W		



CRT1-TS04T CRT1-TS04P





# **Expansion Units**

# XWT-ID08(-1)/OD08(-1)/ID16(-1)/OD16(-1)

# Expansion I/O Units make expansion easy!

One Expansion Unit can be added to each Digital I/O Slave Unit.

This makes a variety of I/O combinations possible, such as 16 inputs + 8 outputs, extending the range of possible system configurations.

- Flexible expansion with many different combinations.
- Removable I/O terminal block enables faster startup time and improved maintainability.
- Collect various preventive maintenance data required to improve productivity, such as information on equipment deterioration due to aging and equipment operating time data.



#### **Ordering Information**

Name		Specifications			Model
	In		NPN		XWT-ID08
	Inputs	8 inputs	PNP		XWT-ID08-1
	0	O outputo	NPN		XWT-OD08
Outputs  Expansion Units	8 outputs	PNP	One Expansion Unit can be mounted to one CRT1-	XWT-OD08-1	
	40 innuts	NPN	ID16(-1), CRT1-OD16(-1), CRT1-ROS16, or CRT1-ROF16 Digital I/O Slave.	XWT-ID16	
	Inputs 16 in	Inputs 16 inputs PNP	PNP	, and the second	XWT-ID16-1
	Out-ut-	Outputs 16 outputs NPN	NPN		XWT-OD16
	Outputs		PNP		XWT-OD16-1

#### **Performance Specifications**

For Basic Performance Specifications of Slave Units, refer to page 32.

#### **Input Section Specifications**

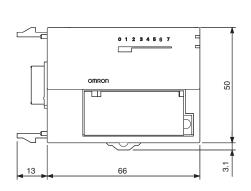
Item		Specification		
Model	XWT-ID08	XWT-ID08-1	XWT-ID16	XWT-ID16-1
Internal I/O common	NPN	PNP	NPN	PNP
I/O capacity	8 inputs	ı	16 inputs	1
ON voltage	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)	15 VDC min. (between each input terminal and the V terminal)	15 VDC min. (between each input terminal and the G terminal)
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)
OFF current	1.0 mA max.		•	-
Input current	At 24 VDC: 6.0 mA max./input At 17 VDC: 3.0 mA max./input			
ON delay	1.5 ms max.			
OFF delay	1.5 ms max.			
Number of circuits per common	8 inputs/common 16 inputs/common			
Communications power supply current consumption	5 mA 10 mA			
Weight	80 g max.		120 g max.	

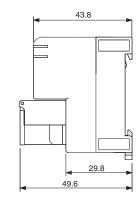
# **Output Section Specifications**

Item	Specification			
Model	XWT-OD08	XWT-OD08-1	XWT-OD16	XWT-OD16-1
Internal I/O common	NPN	PNP	NPN	PNP
I/O capacity	8 outputs		16 outputs	
Rated output current	0.5 A/output, 2.0 A/common		0.5 A/output, 4.0 A/common	
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.			
ON delay	0.5 ms max.	0.5 ms max.		
OFF delay	1.5 ms max.			
Number of circuits per common	8 outputs/common		mon 16 outputs/common	
Communications power supply current consumption	5 mA		10 mA	
Weight	80 g max.		120 g max.	

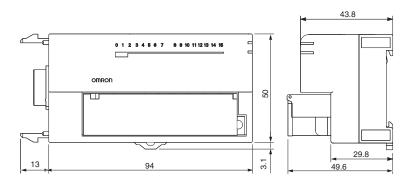
Dimensions (Unit: mm)

XWT-ID08 (-1) XWT-OD08 (-1)





#### XWT-ID16 (-1) XWT-OD16 (-1)



### **Expansion Units**

# XWT-VOD08S(-1)/VMD08S(-1)/VOD16ML(-1)/VMD16ML(-1)

# Easy expansion!

# Expansion Digital Input/Output Units connectable to Analog I/O Slave Unit (Numerical indicator type)

- Easy ladder-free local control can be performed if connected with Analog I/O slaves (Numerical indicator type).
- One touch I/O interface connection with MIL Connector and e-CON Connector.
- Comes with testing function which facilitates system start-up.



#### Ordering Information

Name		Specifications		
	Digital outputs NPN	8 outputs		XWT-VOD08S
Expansion Units e-CON Connector type	Digital outputs PNP	8 outputs		XWT-VOD08S-1
	Digital inputs and outputs NPN	4 inputs/4 outputs	One Expansion Unit can be mounted to one CRT1-VDA02□□D or CRT1-VDA02□□D Analog I/O Slave Unit.	XWT-VMD08S
	Digital inputs and outputs PNP	4 inputs/4 outputs		XWT-VMD08S-1
	Digital outputs NPN	16 outputs		XWT-VOD16ML
	Digital outputs PNP	16 outputs		XWT-VOD16ML-1
Expansion Units MIL Connector type	Digital inputs and outputs NPN	8 inputs/8 outputs		XWT-VMD16ML
	Digital inputs and outputs PNP	8 inputs/8 outputs		XWT-VMD16ML-1

Slave External I/O Connections in the appendix for applicable connectors.

#### **Expansion Unit Functions**

The addition Expansion Units to Analog I/O Units (Numerical indicator type) provides these functions.

#### **Local Control (for Analog Input Units)**

You can combine the digital output of the Expansion Unit with the Comparator function of Analog Input Slave Unit, and have the ON/OFF control.

#### Extended Allocation of Digital Data to I/O Memory

The bits on the connected Expansion Unit can be allocated together with analog data of the Slave Unit to the I/O memory of the Master Unit.

# Setting the Input Time Constant (for Input/Output Expansion Units)

You can select a time period to check the on/off status of inputs to the Expansion Unit. The input values are read several times in the set time period. The inputs are regarded valid only when all read values are consistent, i.e., either they are all on or all off.

# Holding or Clearing the Outputs at Errors (for Input/Output Expansion Units,Output Expansion Units)

You can select holding or clearing the output values when there is a communications error.

#### **Performance Specifications**

For Basic Performance Specifications of Slave Units, refer to page 32.

# **Output Section Specifications**

#### ● e-CON connector type 8-output Expansion Unit

Item Specification		
	-	1
Model	XWT-VOD08S	XWT-VOD08S-1
Internal I/O common	NPN	PNP
Number of I/O points	8 outputs	
I/O power supply voltage	20.4 to 26.4 VDC (24	VDC -15% to +10%)
I/O consumption current	10 mA max for 24-VD	C power supply
Rated output current	0.3 A per point, 2.0 A	per common
Residual voltage	1.2 VDC max (DC at 0.3 A, between each output terminal and G terminal)	1.2 VDC max (DC at 0.3 A, between each output terminal and V terminal)
Leakage voltage	0.1 mA max	
Current supply for connected output devices	100 mA per point	
ON delay time	0.5 ms max	
OFF delay time	1.5 ms max	
Number of circuits per common	8 points	
Insulation method	Photocoupler insulation	on
Output indication	Indicator (yellow)	
Power supply type	Multi-power supply	
Communications power consumption	10 mA max. for 24-VE 15 mA max. for 14-VE	
Weight	63 g	

#### ● MIL connector type 16-output Expansion Unit

Item	Specif	ication
Model	XWT-VOD16ML	XWT-VOD16ML-1
Internal I/O common	NPN	PNP
Number of I/O points	16 outputs	
I/O power supply voltage	20.4 to 26.4 VDC (24	VDC -15% to +10%)
I/O consumption current	10 mA max for 24-VD	C power supply
Rated output current	0.3 A per point, 2.0 A	per common
Residual voltage	1.2 VDC max (DC at 0.3 A, between each output terminal and G terminal)	1.2 VDC max (DC at 0.3 A, between each output terminal and V terminal)
Leakage voltage	0.1 mA max	0.1 mA max
ON delay time	0.5 ms max	
OFF delay time	1.5 ms max	
Number of circuits per common	16 points	
Insulation method	Photocoupler insulation	on
Output indication	Indicator (yellow)	
Power supply type	Multi-power supply typ	oe .
Communications power consumption	10 mA max. for 24-VD 20 mA max. for 14-VD	
Weight	64 g	

# **Input and Output Section Specifications**

#### ● e-CON connector type 4-input and 4-output Expansion Unit

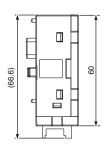
Item		Specification and Performance	
	Model	XWT-VMD08S	XWT-VMD08S-1
	Internal I/O common	NPN	PNP
	Number of I/O points	4 inputs, 4 outputs	
	ON delay time	1.5 ms max for inputs, 0.5 ms max for outputs	
	OFF delay time	1.5 ms max	
	Number of circuits per common	4 points	
Common	Insulation method	Inputs: Non-insulated Outputs: Photocouple	r insulation
	Input and output indication	Indicator (yellow)	
	Power supply type	Inputs: Network power outputs: Multi-power s	
	Communications power consumption	10 mA max. for 24-VE 15 mA max. for 14-VE	
	Weight	64 g	
	ON voltage	10.5 VDC min (between each terminal and V terminal)	10.5 VDC min (between each terminal and G terminal)
Input	OFF voltage	5 VDC max (between each terminal and V terminal)	5 VDC max (between each terminal and G terminal)
part	OFF current	1.0 mA max	
	Input current	6.0 mA max per point for 24-VDC power supply 3.0 mA min per point for 10.5-VDC power supply	
	Current supply for connected input devices	50 mA per point	
	I/O power supply voltage	20.4 to 26.4 VDC (24	VDC -15% to +10%)
	I/O consumption current	10 mA max for 24-VD	C power supply
	Rated output current	0.3 A per point, 1.0 A	per common
Output part	Residual voltage	1.2 VDC max (DC at 0.3 A, between each output terminal and G terminal)  1.2 VDC max (DC 0.3 A, between each output terminal ard V terminal)	
	Leakage voltage	0.1 mA max	
	Current supply for connected output devices	100 mA per point	

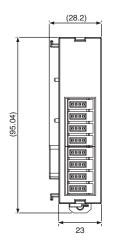
#### ● MIL connector type 8-input and 8-output Expansion Unit

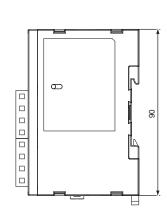
Item		Specif	fication
	Model	XWT-VMD16ML	XWT-VMD16ML-1
	Internal I/O common	NPN	PNP
	Number of I/O points	8 inputs, 8 outputs	1
	ON delay time	1.5 ms max for inputs outputs	, 0.5 ms max for
	OFF delay time	1.5 ms max	
Common	Number of circuits per common	8 points	
	Insulation method	Photocoupler insulation	on
	Input and output indication	Indicator (yellow)	
	Power supply type	Multi-power supply	
	Communications power consumption	10 mA max. for 24-VE 20 mA max. for 14-VE	
	Weight	64 g	
	I/O power supply voltage	20.4 to 26.4 VDC (24	VDC -15% to +10%)
	I/O consumption current	2 mA max for 24-VDC power supply	
	ON voltage	17 VDC min (between each terminal and V terminal)	17 VDC min (between each terminal and G terminal)
Input part	OFF voltage	5 VDC max (between each terminal and V terminal)	5 VDC max (between each terminal and G terminal)
	OFF current	1.0 mA max	
	Input current	6.0 mA max per point supply 3.0 mA min per point supply	·
	I/O power supply voltage	20.4 to 26.4 VDC (24	VDC -15% to +10%)
	I/O consumption current	10 mA max for 24-VD	C power supply
Output	Rated output current	0.3 A per point, 1.0 A	per common
part	Residual voltage	1.2 VDC max (DC at 0.3 A, between each output terminal and G terminal)	1.2 VDC max (DC at 0.3 A, between each output terminal and V terminal)
	Leakage voltage	0.1 mA max	



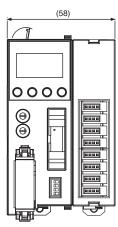
●e-CON Connector type XWT-VMD08S (NPN) XWT-VMD08S-1 (PNP) XWT-VOD08S (NPN) XWT-VOD08S-1 (PNP)



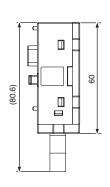


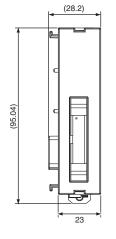


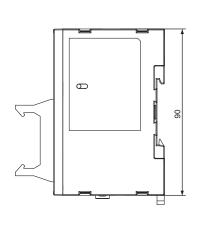
Dimension when it is mounted to a Slave Unit:



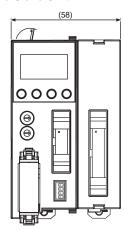
● MIL Connector type XWT-VMD16ML (NPN) XWT-VMD16ML-1 (PNP) XWT-VOD16ML (NPN) XWT-VOD16ML-1 (PNP)







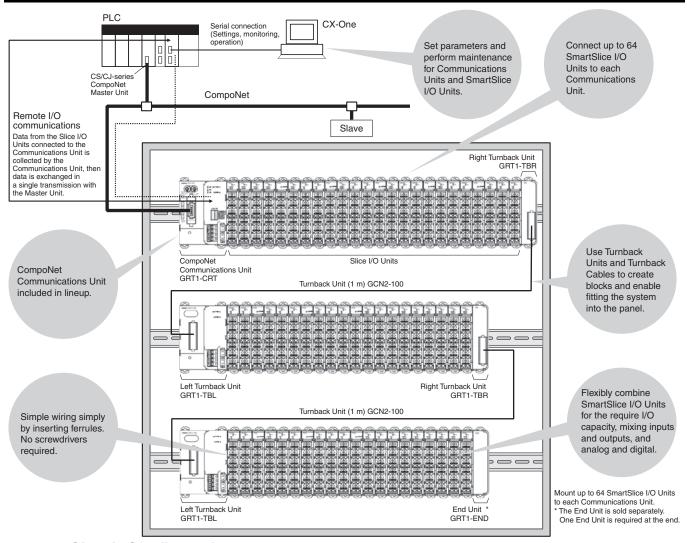
Dimension when it is mounted to a Slave Unit:



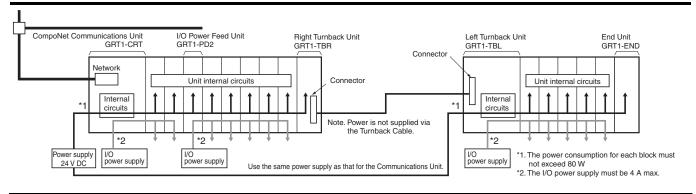
# **SmartSlice GRT1-series**

Flexible I/O Configuration Matched to the Application to Downsize Panels, Lower Costs, and Reduce Wiring Work.

#### **System Configuration**



#### **Internal Circuit Configuration**



# **SmartSlice CompoNet Communications Unit**

# **GRT1-CRT**

# The CompoNet-compliant unit can interface up to 256 inputs and 256 outputs at one node.

- Connects to up to 64 SmartSlice I/O Units.
- Concentrate I/O at one Slave: Up to 256 inputs and 256 outputs.
- Mix different I/O types at one Slave to help save space.
- Just set the node address for easy startup.
- Replace SmartSlice I/O Units online while continuing communications, minimizing system downtime.
- Smart function provided to monitor operating status, facilitating preventive maintenance and increasing operating rates.
- Register dummy SmartSlice I/O to reduce design work for future expansions.



#### **Ordering Information**

Name	Specifications	Model
CompoNet Communications Unit	Connects to up 64 SmartSlice I/O Units (Inputs: 32 bytes maximum, Outputs: 32 bytes maximum)	GRT1-CRT

#### **Specifications**

Item Model	GRT1-DRT	
Network power supply voltage	14 to 26.4 V DC	
Unit power supply voltage	20.4 to 26.4 V DC (24 V +10%/–15%)	
I/O power supply voltage	20.4 to 26.4 V DC * (24 V +10%/-15%)	
Noise immunity	Conforms to IEC 61000-4-4, 2 kV (power line)	
Vibration resistance+	0 to 60 Hz, 0.7-mm double amplitude 0 to 150 Hz: 50 m/s <sup>2</sup>	
Shock resistance	150 m/s <sup>2</sup>	
Dielectric strength	500 V AC between isolated circuits	
Insulation resistance	$20~\mathrm{M}\Omega$ min. between isolated circuits	
Ambient operating temperature	-10 to 55°C (with no icing or condensation)	
Ambient operating humidity	25% to 85%	
Ambient operating environment	No corrosive gases	
Ambient storage temperature	−25 to 65°C (with no icing or condensation)	
Mounting method	35-mm DIN track mounting	

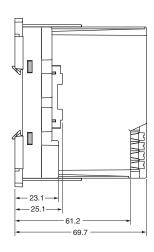
 $<sup>^{\</sup>star}\,$  For power supply input to the Slice I/O Units.

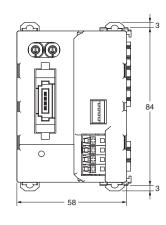
# **Specifications of the CompoNet Communications Unit**

Item	Specification
I/O points	Inputs: 32 bytes maximum (including status and areas which the Unit does not use) Output: 32 bytes maximum (including areas which the Unit does not use)
Maximum number of SmartSlice I/O Units	64 (Do not count the End Unit.)
Status area	1 word (This word shows the status of the CompoNet Communications Unit.)
Parameter backup and restore	You can back up or restore a maximum of 2 KB of data for one CompoNet Communications Unit.
Baud rate	The CompoNet Communications Unit uses the baud rate of the CompoNet Master Unit (93. 75 kbps, 1.5 Mbps, 3 Mbps, or 4 Mbps).
Communications media	You can use these cables: Round Cable I (JIS C 3306, VCTF 2-core 0.75-mm² twisted-pair cable) Round Cable II (JIS C 3306, VCTF 4-core 0.75-mm² twisted-pair cable) Flat Cable I (without sheath, DCA4-4F10)  Note: The Round Cable I, Round Cable II and Flat Cable I are different types of cable. You must use a Repeater to divide a branch line from the main line to use more than one type of cable.
Indicators	MS (green/red): This indicator shows the status of the CompoNet Communications Unit. NS (green/red): This indicator shows the communications status of the CompoNet network. TS (green/red): This indicator shows the status of the SmartSlice I/O Terminal. UNIT PWR (green): This indicator shows the status of the Unit power supply. I/O PWR (green): This indicator shows the status of the I/O power supply.
Switches	Rotary switches: There are two rotary switches. You use them to set the node address.  DIP switch: There is one DIP switch with four pins. You use them to set the operating mode.
Connectors	There is one CompoNet communications connector.
Terminals	Clamp terminals for Unit power supply (24 VDC) Clamp terminals for I/O power supply (24 VDC)
Power consumption	2.5 W
Power consumption for each SmartSlice I/O Terminal block	80 W max. (You must divide the I/O Terminal into blocks to use more than 80 W.)
SmartSlice I/O Terminal blocks	Main block and a maximum of two expansion blocks
Current consumption for I/ O power supply	4 A max.
Weight	137 g
Accessories	None

Dimensions (Unit: mm)

#### **GRT1-CRT**





# **SmartSlice Ordering Information**

Name		Appearance	Specifications	Model
CompoNet Communication Unit			Up to 64 Slice I/O Units can be connected (Inputs: 32 bytes maximum, Output: 32 bytes maximum)	GRT1-CRT
			4 inputs NPN	GRT1-ID4
			4 inputs PNP	GRT1-ID4-1
			4 outputs NPN	GRT1-OD4
			4 outputs PNP	GRT1-OD4-1
			8 inputs NPN	GRT1-ID8
	Digital I/O Units		8 inputs PNP	GRT1-ID8-1
			8 outputs NPN	GRT1-OD8
			8 outputs PNP	GRT1-OD8-1
			Relay Outputs 2 points	GRT1-ROS2
			101	GRT1-IA4-1
Slice I/O Units			AC Input 4 points	GRT1-IA4-2
Slice I/O Offics		•	Analog inputs (current/voltage)	GRT1-AD2
	Analog I/O Units		Analog outputs (current)	GRT1-DA2C
			Analog output (voltage)	GRT1-DA2V
			Temperature input (Resistance thermometer:Pt100) 2 points	GRT1-TS2P
	Temperature Input (Resistance Thermometers)		Temperature input (Resistance thermometer:Pt1000) 2 points	GRT1-TS2PK
			Thermocouple Input 2 points	GRT1-TS2T
			Counter inputs: 1, External outputs: 1 NPN	GRT1-CT1
	Counter Units		Counter inputs: 1, External outputs: 1 PNP	GRT1-CT1-1
	Turnbook Unite		Right Turnback Unit (Mounts to the right side of Slice I/O Terminal.)	GRT1-TBR
	Turnback Units		Left Turnback Unit (Mounts to the left side of Slice I/O Terminal. Can supply power to I/O Units.)	GRT1-TBL
	Turnback Cable *1		1 m	GCN2-100
System Units				GRT1-PD2
•			Use when the total current consumption of the I/O Power Supply	GRT1-PD2G
	I/O Power Feed Unit	=	exceeds 4 A, or to make the I/O Power Supply a separate system.	GRT1-PD8
	I/O Power Feed Unit			GRT1-PD8-1
			Use to add V/G terminals for I/O power supply.	GRT1-PC8
			222 17 22 23 17 24 25 11 11 25 25 25 25 25 25 25 25 25 25 25 25 25	GRT1-PC8-1
	End Unit *2		Necessary for terminating the Slice I/O Terminal.	GRT1-END
Option	Terminal Block		Package of 5 Terminal Blocks	GRT1-BT1-5
				1

<sup>\*1</sup> Use the Turnback Cable together with the Turnback Units.
\*2 The End Unit is sold separately. It is not provided with the Communications Unit.

**Bit Slave Units with Compact Connectors** 

# CRT1B- $\square$ D02JS(-1)/ $\square$ D04JS(-1)

# Bit slave of smallest class in industry Innovation in wiring for any type of machinery

- Available in 2 types: 2-point Bit Slave Unit and 4-point Bit Slave Unit.
- Compact size for installation in limited space. Save space and wiring since bit slave can be installed near I/O devices.
- Industry first bit slave connectable with round cables which can be easily purchased at a lower price. Connectable with flat cables, too for easy wiring. Cables are selectable depending on applications.



#### **Ordering Information**

Name	Specifications		Model	
	Inputs	2 inputs	NPN	CRT1B-ID02JS
	inputs	2 outputs	PNP	CRT1B-ID02JS-1
	Outputs	2 inputs	NPN	CRT1B-OD02JS
	Outputs	2 outputs	PNP	CRT1B-OD02JS-1
	Inputs/Outputs	1 input/1 output	NPN	CRT1B-MD02JS
Compact Connectors	inputs/Outputs	1 input/1 output	PNP	CRT1B-MD02J-1
Compact Connectors	Inputs	4 inputs	NPN	CRT1B-ID04JS
	inputs	4 outputs	PNP	CRT1B-ID04JS-1
	Outputs	4 inputs	NPN	CRT1B-OD04JS
	Outputs	4 outputs	PNP	CRT1B-OD04JS-1
	Inputs/Outputs	2 inputs/2 outputs	NPN	CRT1B-MD04JS
	inputs/Outputs	2 inputs/2 outputs	PNP	CRT1B-MD04JS-1
Mounting Bracket				CRT1-ATT03

#### Peripheral Devices

#### For Round Cable I

Name	Model
Open Type Connector (for Unit connection) (Honda Tsushin Kogyo Co.,Ltd.)	HCN-TB4LMZG+ *1
Terminating Resistor	DRS1-T

#### For Round Cable II

Name	Model
Open Type Connector (for Unit connection) (Honda Tsushin Kogyo Co.,Ltd.)	HCN-TB4LMZG+ *1
Terminating Resistor	DCN4-TM4 *2
Flat Connector Socket	DCN4-TR4 *2

Note: The DCN4-MD4 Multidrop Connector cannot be used with Bit Slaves with Compact Connectors. Use Open Type Connector from Honda Tsushin Kogyo Co., Ltd.

#### For Flat Cable I

Name	Model
Flat Connector Socket	DCN4-TR4 *2
Flat Connector Plug	DCN4-BR4 *2
Flat Multidrop Connector Plug	DCN4-MR4 *2
Terminating Resistor	DCN4-TM4 *2
Special Tools	DWT-A01

Note: The DCN4-MD4 Multidrop Connector cannot be used with Bit Slaves with Compact Connectors.

<sup>\*1</sup> For information of HCN-TB4LMZG+, contact to Honda Tsushin Kogyo Co.,Ltd. Tel:+81-52-242-2111

<sup>\*2</sup> The minimum quantity packaged is 10 Connectors.Oder the Connectors in multiples of 10.

#### Compact Connectors

The compact connectors use XA-series Connectors from JST Mfg. Co., Ltd. Special cable connectors must be attached for cables connecting to external devices if a Slave Unit with Compact Connectors is used.

Name		Applicable cable range				
		mm²	AWG#	Wire sheath external diameter	Model	Crimping Tool
	Loose terminal	0.08 to 0.33	28 to 22	1.2 to 1.9	BXA-001T-P0.6	YC-692R
Contacts	Chain terminal				SXA-001T-P0.6	YRS-692
Comacis	Loose terminal	0.22 to 0.5	24 to 20	1.5 to 1.9	BXA-01T-P0.6	YC-701R
	Chain terminal	0.22 10 0.5			SXA-01T-P0.6	YRS-701
Housing				XAP-03V-1		

Note 1. Automated Crimp Tools are also available. For details, contact the manufacturer.

#### **Performance Specifications**

For Basic Performance Specifications of Slave Units, refer to page 32.

#### **Input Section Specifications**

Item	Specification				
Model	CRT1B-ID02JS	CRT1B-ID02JS-1	CRT1B-ID04JS	CRT1B-ID04JS-1	
I/O capacity	2 inputs		4 inputs		
Internal I/O common	NPN	PNP	NPN	PNP	
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	
OFF voltage					
OFF current	1.0 mA max.		1.0 mA max.		
Input current	3.0 mA min./input (at 10.5 VDC	<b>(</b> )	3.0 mA min./input (at 10.5 VDC	<b>(</b> )	
Sensor power supply voltage	Communications power supply voltage 0 V (max.) Communications power supply voltage –1 V (min.)		Communications power supply voltage 0 V (max.) Communications power supply voltage –1 V (min.)		
ON delay	1.5 ms max.		1.5 ms max.		
OFF delay	1.5 ms max.		1.5 ms max.		
Number of circuits per common	2 inputs/common		4 inputs/common		
Power short-circuit detection	Not supported.		Not supported.		
Isolation method	No isolation		No isolation		
Input indicators	LEDs (yellow)		LEDs (yellow)		
Degree of protection	IEC standard IP20		IEC standard IP20		
Installation	M4 screw mounting using CRT	1B-ATT03 Mounting Bracket	M4 screw mounting using CRT1B-ATT03 Mounting Bracket		
Power supply type	Network power supply		Network power supply		
Communications power supply current consumption *	25 mA max. for 24-VDC power supply voltage 30 mA max. for 14-VDC power supply voltage		35 mA max. for 24-VDC power supply voltage 40 mA max. for 14-VDC power supply voltage		
Input device supply current	50 mA/point (G terminal) 50 mA/point (V terminal)		50 mA/point (G terminal) 50 mA/point (V terminal)		
Weight	16 g max.		21 g max.		

<sup>\*</sup> The current consumption is for Bit Slave Unit communications current when all inputs are OFF, i.e., it does not include input device current consumption. The communications power supply is also used for the I/O power supply for sensors. Be sure to consider the sensor current consumption and the number of sensors connected in addition to the communications power.

<sup>2.</sup> For information on the processing procedure, refer to the instruction manual included with the tool or contact the manufacturer (JST Mfg. Co., Ltd.).

The power supply current consumption is expressed by the following formula.

Communications power supply current consumption = Bit Slave Unit communications current consumption + (Bit Slave Unit input current × number of inputs used) + (sensor current consumption × number of sensors used)

### **Output Section Specifications**

Item	Specification			
Model	CRT1B-OD02JS	CRT1B-OD02JS-1	CRT1B-OD04JS	CRT1B-OD04JS-1
I/O capacity	2 outputs		4 outputs	
Internal I/O common	NPN	PNP	NPN	PNP
Rated output current	0.1 A/output		0.1 A/output	ı
Load power supply voltage	Communications power supply Communications power supply		Communications power supply voltage 0 V (max.) Communications power supply voltage -1.2 V (min.)	
Residual voltage	1.2 V max. (0.1 A DC, between each output terminal and G terminal)	1.2 V max. (0.1 A DC, between each output terminal and V terminal)	1.2 V max. (0.1 A DC, between each output terminal and G terminal)	1.2 V max. (0.1 A DC, between each output terminal and V terminal)
Leakage current	0.1 mA max.		0.1 mA max.	
ON delay	0.5 ms max.		0.5 ms max.	
OFF delay	1.5 ms max.		1.5 ms max.	
Number of circuits per common	2 outputs/common		4 outputs/common	
Load short-circuit detection	Not supported.		Not supported.	
Isolation method	No isolation		No isolation	
Output indicators	LEDs (yellow)		LEDs (yellow)	
Degree of protection	IEC standard IP20		IEC standard IP20	
Installation	M4 screw mounting using CRT	1B-ATT03 Mounting Bracket	M4 screw mounting using CRT1B-ATT03 Mounting Bracke	
Power supply type	Network power supply		Network power supply	
Communications power supply current consumption (See note.)	25 mA max. for 24-VDC power supply voltage 30 mA max. for 14-VDC power supply voltage		30 mA max. for 24-VDC power supply voltage 35 mA max. for 14-VDC power supply voltage	
Output device supply current	30 mA/point (G terminal)	30 mA/point (V terminal)	30 mA/point (G terminal) 30 mA/point (V terminal)	
Weight	16 g max.		21 g max.	

<sup>\*</sup> The current consumption is for Bit Slave Unit communications current when all outputs are OFF, i.e., it does not include the output device load current consumption. The communications power supply is also used for the I/O power supply for actuators. Be sure to consider the actuator load current consumption and the number of sensors connected in addition to the communications power. The power supply current consumption is expressed by the following formula.

#### **Input and Output Section Specifications**

#### ●1-point Input and 1-point Output units **Input Section Specification**

Item Specification			
Item	·		
Model	CRT1B-MD02JS CRT1B-MD02JS-		
I/O capacity	1 input		
Internal I/O common	NPN	PNP	
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)  10.5 VDC min. (between each i terminal and the terminal)		
OFF voltage			
OFF current	1.0 mA max.		
Input current	3.0 mA min./input (at	10.5 VDC)	
Sensor power supply voltage	Communications power supply voltage 0 V (max.) Communications power supply voltage -1 V (min.)		
ON delay	1.5 ms max.		
OFF delay	1.5 ms max.		
Number of circuits per common	1 input/common		
Power short-circuit detection	Not supported.		
Isolation method	No isolation		
Input indicators	LEDs (yellow)		
Degree of protection	IEC standard IP20		
Installation	M4 screw mounting us Mounting Bracket	sing CRT1B-ATT03	
Power supply type	Network power supply	/	
Communications power supply current consumption *	25 mA max. for 24-VDC power supply voltage 30 mA max. for 14-VDC power supply voltage		
Input device supply current	50 mA/point 50 mA/point (G terminal) (V terminal)		
Weight	16 g max.		

#### **Output Section Specification**

Item	Specification	
Model	CRT1B-MD02JS	CRT1B-MD02JS-1
I/O capacity	1 output	
Internal I/O common	NPN	PNP
Rated output current	0.1 A/output	
Load power supply voltage	Communications power supply voltage 0 V (max.) Communications power supply voltage –1.2 V (min.)	
Residual voltage	1.2 V max. (DC, 0.1 A, between each output terminal and G terminal)	1.2 V max. (DC, 0.1 A, between each output terminal and V terminal)
Leakage current	0.1 mA max.	
ON delay	0.5 ms max.	
OFF delay	1.5 ms max.	
Number of circuits per common	1 output/common	
Load short-circuit detection	Not supported.	
Isolation method	No isolation	
Output indicators	LEDs (yellow)	
Degree of protection	IEC standard IP20	
Installation	M4 screw mounting using CRT1B-ATT03 Mounting Bracket	
Power supply type	Network power supply	
Output device supply current	30 mA/point (G terminal) 30 mA/point (V terminal)	

<sup>\*</sup> The current consumption is for Bit Slave Unit communications current when all inputs are OFF, i.e., it does not include input device current consumption. The communications power supply is also used for the I/O power supply for sensors. Be sure to consider the sensor current consumption and the number of sensors connected in addition to the communications power. The power supply current consumption is expressed by the following formula.

Communications power supply current consumption = Bit Slave Unit communications current consumption + (Bit Slave Unit input current × number of inputs used) + (sensor current consumption × number of sensors used)

# ● 2-points Inputs and 2-points Outputs units Input Section Specification

input Section Specifica	input Section Specification				
Item	Specification				
Model	CRT1B-MD04JS CRT1B-MD04JS-				
I/O capacity	2 inputs				
Internal I/O common	NPN	PNP			
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)  10.5 VDC min. (between each i terminal and the terminal)				
OFF voltage					
OFF current	1.0 mA max.				
Input current	3.0 mA min./input (at	10.5 VDC)			
Sensor power supply voltage	Communications power supply voltage 0 V (max.) Communications power supply voltage –1 V (min.)				
ON delay	1.5 ms max.				
OFF delay	1.5 ms max.				
Number of circuits per common	2 inputs/common				
Power short-circuit detection	Not supported.				
Isolation method	No isolation				
Input indicators	LEDs (yellow)				
Degree of protection	IEC standard IP20				
Installation	M4 screw mounting using CRT1B-ATT03 Mounting Bracket				
Power supply type	Network power supply	1			
Communications power supply current consumption *	35 mA max. for 24-VDC power supply voltage 40 mA max. for 14-VDC power supply voltage				
Input device supply current	50 mA/point (O terminal) 50 mA/point (V terminal)				
Weight	21 g max.				

#### **Output Section Specification**

- Catput Coolion Opcomodion				
Item	Specif	fication		
Model	CRT1B-MD04JS	CRT1B-MD04JS-1		
I/O capacity	2 outputs			
Internal I/O common	NPN	PNP		
Rated output current	0.1 A/output			
Load power supply voltage	Communications power 0 V (max.) Communications power -1.2 V (min.)	117 0		
Residual voltage	1.2 V max. (DC, 0.1 A, between each output terminal and G terminal)	1.2 V max. (DC, 0.1 A, between each output terminal and V terminal)		
Leakage current	0.1 mA max.			
ON delay	0.5 ms max.			
OFF delay	1.5 ms max.			
Number of circuits per common	2 outputs/common			
Load short-circuit detection	Not supported.			
Isolation method	No isolation			
Output indicators	LEDs (yellow)			
Degree of protection	IEC standard IP20			
Installation	M4 screw mounting using CRT1B-ATT03 Mounting Bracket			
Power supply type	Network power supply			
Output device supply current	30 mA/point (G terminal) 30 mA/point (V terminal)			

<sup>\*</sup> The current consumption is for Bit Slave Unit communications current when all inputs are OFF, i.e., it does not include input device current consumption. The communications power supply is also used for the I/O power supply for sensors. Be sure to consider the sensor current consumption and the number of sensors connected in addition to the communications power. The power supply current consumption is expressed by the following formula.

in addition to the communications power. The power supply current consumption is expressed by the following formula.

Communications power supply current consumption = Bit Slave Unit communications current consumption + (Bit Slave Unit input current × number of inputs used) + (sensor current consumption × number of sensors used)

### Wiring

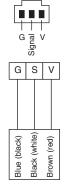
Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

The I/O connector section uses compact connectors. Pin arrangements and signals are shown below.

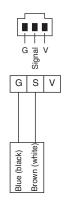
The figure of connector shows the side to insert cables.

#### ● 2-points Inputs/4-points Inputs type

#### CRT1B-ID02JS (NPN) CRT1B-ID04JS (NPN)

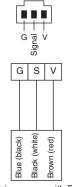


3-wire sensor with NPN output (photoelectric sensor or proximity sensor)

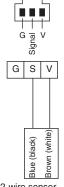


2-wire sensor (e.g., limit switch)

#### CRT1B-ID02JS-1 (PNP) CRT1B-ID04JS-1 (PNP)



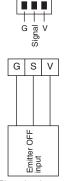
3-wire sensor with PNP output (photoelectric sensor or proximity sensor)



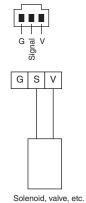
2-wire sensor (e.g., limit switch)

#### ●2-points Outputs/4-points Outputs type

#### CRT1B-OD02JS (NPN) CRT1B-OD04JS (NPN)

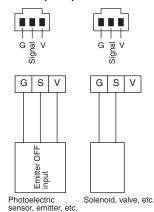


Photoelectric sensor, emitter, etc.



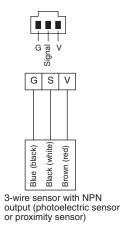
Soleriola, valve, etc

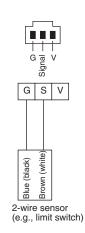
#### CRT1B-OD02JS-1 (PNP) CRT1B-OD04JS-1 (PNP)



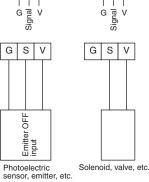
#### ● 1-point Input/1-point Output type, 2-points Inputs/2-points Outputs type CRT1B-MD02JS (NPN) CRT1B-MD04JS (NPN)

Input Connectors



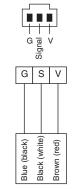


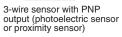
# **Output Connectors** G S V



#### CRT1B-MD02JS-1 (PNP) CRT1B-MD04JS-1 (PNP)

Input Connectors

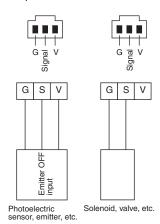




G S V (white) Blue (black)

2-wire sensor (e.g., limit switch)

**Output Connectors** 





#### ●2-points Inputs, 2-points Outputs, 1-point Input/1-point Output type

CRT1B-ID02JS

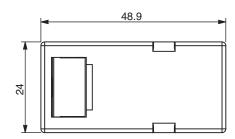
CRT1B-ID02JS-1

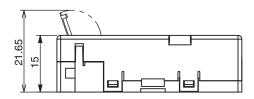
CRT1B-OD02JS

CRT1B-OD02JS-1

CRT1B-MD02JS

CRT1B-MD02JS-1





#### ● 4-points Inputs, 4-points Outputs, 2-points Inputs/2-points Outputs type

CRT1B-ID04JS

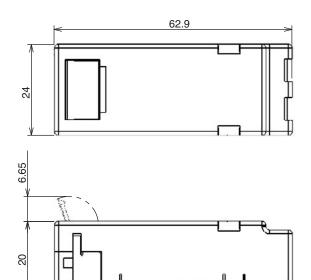
CRT1B-ID04JS-1

CRT1B-OD04JS

CRT1B-OD04JS-1

CRT1B-MD04JS

CRT1B-MD04JS-1



**Bit Slave Units with e-CON Connectors** 

# **CRT1B-**□**D02S(-1)**

# Simple and Intelligent Bit Slaves with Industry-standard e-CON connectors.

Slave Units capable of 2-point bit-level distribution. The I/O power supply is supplied from the communications power in the previously connected flat cable, and has a short-circuit detection function for protection.

- Industry-standard e-CON connectors
- Short-circuit protection safeguards the network from I/O short circuits.
- Simple communications connections with flat cable and connectors.
- Bit-level distribution to support essentially any application.



#### **Ordering Information**

Name	Specifications			Model
	Inputs	2 inputs	NPN	CRT1B-ID02S
Bit Slave Units with e-CON Connectors			PNP	CRT1B-ID02S-1
	Outrotto	2 outputs	NPN	CRT1B-OD02S
	Outputs 2 outputs		PNP	CRT1B-OD02S-1

#### **Performance Specifications**

For Basic Performance Specifications of Slave Units, refer to page 32.

### **Input Section Specifications**

Item	Specification				
Model	CRT1B-ID02S CRT1B-ID02S-1				
I/O capacity	2 inputs				
Internal I/O common	NPN PNP				
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)			
OFF voltage	5 VDC max. (between each input terminal and the V terminal)	5 VDC max. (between each input terminal and the G terminal)			
OFF current	1.0 mA max.				
Input current	3.0 mA max./input (at 10.5 VDC)				
Sensor power supply voltage	Communications power supply voltage + 0 V (max.) Communications power supply voltage – 1 V (min.)				
ON delay	1.5 ms max.				
OFF delay	1.5 ms max.				
Number of circuits per common	2 inputs/common				
Power short-circuit detection	Supported				
Isolation method	No isolation				
Input indicators	LEDs (yellow)				
Degree of protection	IEC standard IP20				
Installation	Screw installation (M4)				
Power supply type	Network power supply				
Communications power supply current consumption *	65 mA max. for 24-VDC power supply voltage 80 mA max. for 14-VDC power supply voltage 45 mA max. for 24-VDC power supply voltage 65 mA max. for 14-VDC power supply voltage				
Weight	70 g max.				

<sup>\*</sup> The current consumption is for Bit Slave Unit communications current when all inputs are OFF, i.e., it does not include input device current consumption. The communications power supply is also used for the I/O power supply for sensors. Be sure to consider the sensor current consumption and the number of sensors connected in addition to the communications power.

The power supply current consumption is expressed by the following formula.

Communications power supply current consumption = Bit Slave Unit communications current consumption + (Bit Slave Unit input current x number of inputs used) + (sensor current consumption x number of sensors used)

### **Output Section Specifications**

Item	Specification			
Model	CRT1B-OD02S CRT1B-OD02S-1			
I/O capacity	2 outputs			
Internal I/O common	NPN PNP			
Rated output current	0.2 A/output			
Load power supply voltage	Communications power supply voltage + 0 V (max.) Communications power supply voltage - 1.2 V (min.)			
Residual voltage	1.2 V max. (0.2 A DC, between each output terminal and the BS-	1.2 V max. (0.2 A DC, between each output terminal and the BS+		
Leakage current	0.1 mA max.			
ON delay	0.5 ms max.			
OFF delay	1.5 ms max.			
Number of circuits per common	2 outputs/common			
Load power short-circuit detection	Supported			
Isolation method	No isolation			
Output indicators	LEDs (yellow)			
Degree of protection	IEC standard IP20			
Installation	Screw installation (M4)			
Power supply type	Network power supply			
Communications power supply current consumption *	t 55 mA max. for 24-VDC power supply voltage 55 mA max. for 24-VDC power supply voltage 75 mA max. for 14-VDC power supply voltage 70 mA max. for 14-VDC power supply voltage			
Weight	59 g max.			

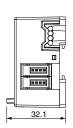
<sup>\*</sup> The current consumption is for Bit Slave Unit communications current when all outputs are OFF, i.e., it does not include output device load current consumption. The communications power supply is also used for the I/O power supply for actuators. Be sure to consider the actuator load current consumption and the number of actuators connected in addition to the communications power.

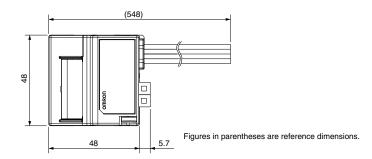
The power supply current consumption is expressed by the following formula.

Communications power supply current consumption = Bit Slave Unit communications current consumption + (Bit Slave Unit input current x number of inputs used) + (actuator load current x number of actuators used)



CRT1B-ID02S(-1) CRT1B-OD02S(-1)





### **Repeater Unit**

# CRS1-RPT01

# Simple and Intelligent Repeater Units Extend the Network

Repeater Units can make CompoNet Networks easier to wire, and extend cable length.

When Repeater Units are connected in series from the Master Unit, up to two extra segment layers can be created (i.e., up to 2 Repeater Units are allowed between a Slave Unit and the Master Unit).

- Expand the network to up to 1,500 m using two segment layers of Repeater Units (baud rate: 93.75 kbps).
- Avoid total system breakdown caused by errors in lower-level Units.
- Repeater Units allow a different cable types to be used in the same network.
- Implement various network layouts by branching lines or extending the trunk line.
- Display a network configuration list or identify error locations by using the setting and monitoring software for CompoNet.
- Monitor the power supply for the entire network with communications power supply monitoring function.



#### **Ordering Information**

Name	Specifications	Model
Repeater Unit	A sub-trunk line can be connected downstream (for trunk-branch line configuration) or further branching is enabled downstream (for configurations with no wiring restrictions) in the same way as for a Master Unit.  A Repeater Unit can be used to branch the trunk line and increase the number of connected Units, as well as to extend the length of the communications line.	CRS1-RPT01 *

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

### **Specifications**

Item	Specification
Model	CRS1-RPT01
Communications ports	Upstream port (port 1): Ttrunk line or sub-trunk line  Downstream port (port 2): Sub-trunk line (Can be wired with the same communications specifications as the Master Unit.)  Different types of communications cable can be connected to the upstream and downstream ports.
Maximum number of layers	Up to two extra segment layers can be created from the Master Unit.
Number of nodes per network (per Master Unit)	64 nodes
Number of nodes per trunk line or sub-trunk line	32 nodes (Including Slave Units)
Communications power supply connector	One downstream communications port power supply connector  Note: Communications power for the Repeater Unit is supplied from the BS+ and BS- terminals on the upstream port communications connector (PORT1).
Communications power supply connector allowable current capacity	5 A max.
Noise immunity	Conforms to IEC 61000-4-4 2 kV (power line).
Vibration resistance	10 to 150 Hz with double-amplitude of 0.7 mm or 50 m/s <sup>2</sup>
Shock resistance	150 m/s <sup>2</sup>
Dielectric strength	500 VAC (between isolated circuits)
Insulation resistance	20 MΩ min. (between isolated circuits)
Ambient operating temperature	-10 to 55°C
Ambient operating humidity	25% to 85% (with no condensation)
Ambient operating atmosphere	No corrosive gases
Storage temperature	-25 to 65°C
Storage humidity	25% to 85% (with no condensation)
Installation	DIN Track or M4 screws
Weight	73 g
Communications power supply voltage	14 to 26.4 VDC
Communications power supply current consumption	95 mA max.

#### ● Slave Port Communications Power Supply Connector

This connector supplies communications power to Slave Units and Repeater Units connected to the Slave port communications connector (port 2).

	\(\frac{1}{2}\)
BS+	Communications power supply +
BS-	Communications power supply –

Note: Communications power for the Repeater Unit is supplied from the BS+ and BS- terminals on the upstream port communications connector (port 1).

#### **Recommended Ferrules**

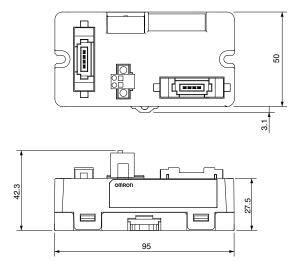
The following ferrules are recommended for the communications power supply cable.

Product number	Applicable power cable size	Crimping tool	Manufacturer
AI0,5-10 WH	0.5 mm (AWG20)	CRIMPFOX UD6 (Product No. 1204436) or CRIMPTFOX ZA3 series	Phoenix Contact K.K.
H0.5/16 orange	0.5 mm (AWG20)	Crimper PZ1.5 (Product No. 900599)	Weidmuellr Japan Co.,Ltd.

The following screwdriver is recommended for use when removing ferrules.

Product number	Manufacturer
XW4Z-00C	OMRON Corporation

#### CRS1-RPT01



### **Sensor Communications Unit**

# **ZS-CRT**

# A Communications Gateway that Connects Smart Sensors to CompoNet

High-Speed Smart Sensor measurement data collection at the PLC or PT.

- Start up simply by connecting the communications cable.
- Supports triggered measurements and acquisition of judgment results, and features control signal lines that do not require wiring.



### **Ordering Information**

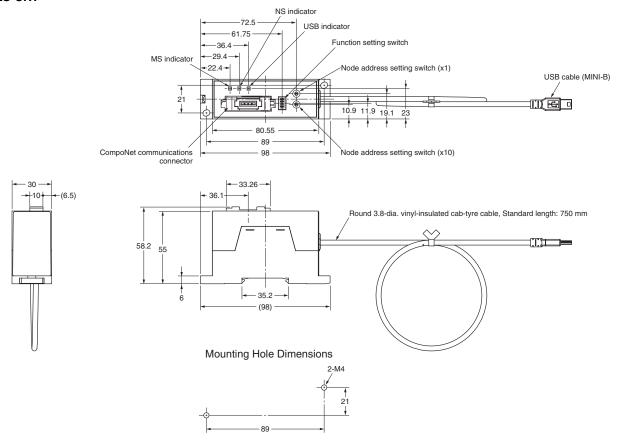
Name	I/O classification	Allocated bits	Internal circuit power supply	I/O power supply voltage	Connected Controller model	Model
Sensor Communications Unit	Input and output	160 bits max.	Supplied along with communications power	24 VDC	ZS-LDC \\ ZS-MDC \\ ZS-HLDC \\ ZFV-CA \\ \\	ZS-CRT

### **Performance Specifications**

Item	Specification
Communications power supply voltage	14 to 26.4 VDC
Communications power supply current consumption	200 mA max.
Connected Controller models	ZS-LDC (Ver. 2.300 or later), ZS-MDC (Ver. 2.200 or later), ZS-HLDC (Ver. 1.030 or later), ZFV-CA (Ver. 1.300 or later)
Functions	Constant monitoring function for measurement results, trigger measurement monitoring function, message communications function
Indicators	MS (green/red), NS (green/red), and USB (green/red)
Vibration resistance	10 to 150 Hz with double-amplitude of 0.7 mm or 50 m/s <sup>2</sup>
Shock resistance	150 m/s <sup>2</sup>
Dielectric strength	1,000 VAC 50/60 Hz for 1 min
Insulation resistance	30 MΩ min.
Ambient operating temperature	00 to 50°C
Ambient operating humidity	25% to 85% (with no condensation)
Storage temperature	−15 to 65°C (No icing or condensation)
Storage humidity	25% to 85% (with no condensation)
Installation	Mounted on 35-mm DIN Track
Degree of protection	IP20
Material	Case: ABS
Accessories	Instruction Manual, ferrite core
Weight	Approx. 130 g



#### **ZS-CRT**



### **Sensor Communication Unit**

# E3X-CRT

# A Communication Gateway that Connects Fiber, Laser and Proximity Sensor Amplifier to CompoNet

- Easy connect to all amplifiers by only connector.
- Supports reading ON/OFF data.
- Supports setting data and executing tuning by explicit massage.
- Supports connection 16pcs amplifier (max).
- Easy, waste-free I/O configuration when making system changes or additions.



#### **Ordering Information**

#### ■ CompoNet Slave Sensor Communication Unit

I/O Classification	Allocated bits	Internal circuit power supply	Power Supply Voltage	Model
Change by operation mode	el *	Supplied along with communications power	DC24V	E3X-CRT

<sup>\*</sup> E3X-CRT has two operations

Mode	I/O Classification	Allocated bits	Connection amplifier number (max)				
I/O mode1	Input Unit	Input: 32bit	15				
I/O mode2	Input and Output Unit	Input: 64bit Output: 64bit	16				

#### Supports Sensor Amplifier

Unit	Characteristic	Connection Method	Power Supply	Model	
Standard fiber amplifier	Simple setting and operation Fiber Amplifier			E3X-HD0	
2CH Fiber amplifier	Supports connection 2CH fiber Amplifier	Connect to a	0 1: 1 1 :::	E3X-MDA0	
High-function fiber amplifier	Supports setting 2 thresholds fiber Amplifier	communication unit Only	Supplied along with a power supply connector.	E3X-DA0-S	
Laser sensor amplifier	Laser type digital Sensor Amplifier	by connector	power supply connector.	E3C-LDA0	
Proximity sensor amplifier	High Precision Proximity Sensor Amplifier			E2C-EDA0	

Note. Limitation about amplifier setting: See the E3X-ECT User's manual (Man No.E413).

### **Ratings and Specifications**

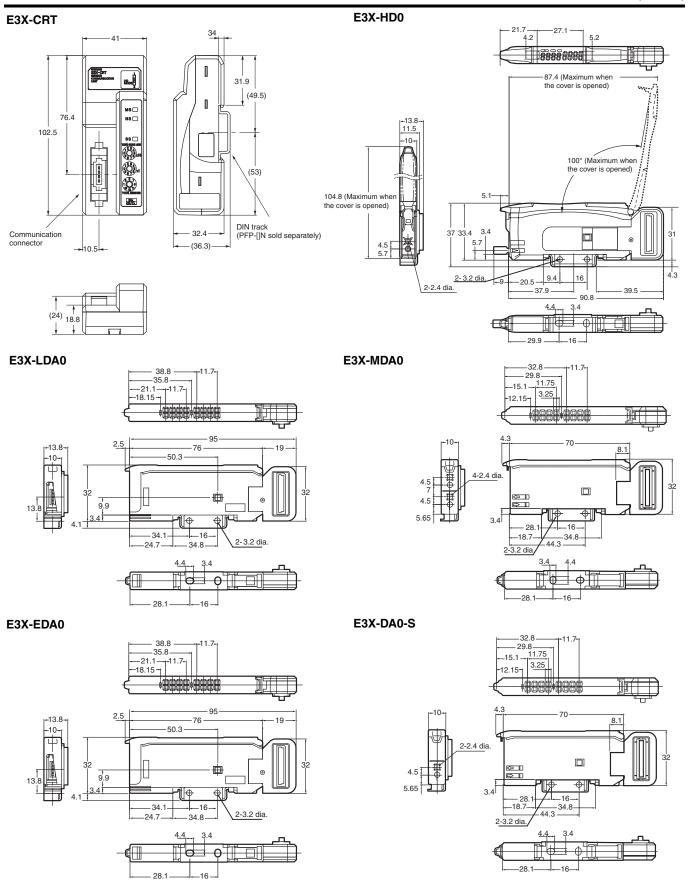
Communications power	DC14-26.4V(supply from communication connector)
Power supply wattage and current	2.4 W (max) (Not include sensors current) 100 mA (max) DC24V (Not include sensors current)
Communication method	CompoNet
Function	I/O communication, explicit message, Sensor Error Output
Indicators	MS (green/red), NS (green/red), SS (Sensor Status) (green/red)
Vibration resistance	10 to 150 Hz with double-amplitude of 0.7 mm or 50 m/s² 80 minutes
Shock resistance	150 m/s <sup>2</sup> 3 directions each 3 times
Dielectric strength	AC 500V 50/60Hz 1min
Insulation resistance	20 MΩ min.

Ambient operating temperature	0 to 55°C *
Ambient operating humidity	25-85% (with no condensation)
Storage temperature	-30 to +70°C (No icing or condensation)
Storage humidity	25 to 85% (No icing or condensation)
Installation	Mounted on 35-mm DIN Track
Accessories	Connector Cover, Brackets for DIN
Weight	95 g (max)

\* Limitation of the temperature by connection amplifiers number below.

1 to 2 : 0 to 55 °C, 3 to 10: 0 to 50 °C, 10 to 16: 0 to 45 °C





### **Multi-function Compact Inverter MX2-Series CompoNet Communication Unit**

# X-MX2-CR

# Support for open network with **CompoNet Communications Unit**

- Reduced wiring of Multi-function compact inverter MX2 series \*1
- 8 types of remote I/O functions The unique remote I/O functions in addition to remote I/O functions of CompoNet communications standard
- Parameter edit via CompoNet by using support tool CX-Drive \*2



<sup>\*2</sup> CX-Drive can be used with version 2.6 or higher.



#### **Ordering Information**

Name	Mountable Inverter	Model		
CompoNet communication unit	MX2-series	3G3AX-MX2-CRT-E		

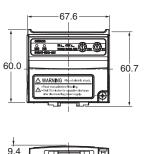
#### **Performance Specifications**

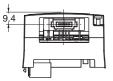
Power supply Supplied from the inverter		
Protective structure	IP20	
Ambient Operating Temperature	-10 to 55°C (with no condensation)	
Ambient Storage Temperature -20 to 65°C (with no condensation)		
Ambient Operating Humidity 20 to 90%RH		
Vibration Resistance	5.9m/s <sup>2</sup> (0.6G) , 10 to 55Hz	
Application Environment         At a maximum altitude of 1,000 m; indoors (without corrosive gases or		
Insulation Resistance 500VAC (between isolated circuits)		
Weight	Approx.170g	
Number of Words allocated	Initial setting IN:2CH/OUT:2CH (At maximum setting IN:8CH/OUT:8CH)	

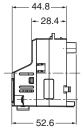
Note. For detail, refer to the MX2-series Catalog (Cat. No.1916).

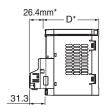
**Dimensions** (Unit: mm)

#### 3G3AX-MX2-CRT-E









Note. After the CompoNet Communication Unit is installed, dimension D of the inverter increases by 26.4 mm. (Dimension D of the inverter varies depending on the capacity. Refer to the MX2-series USER'S MANUAL(Cat.No.1570))

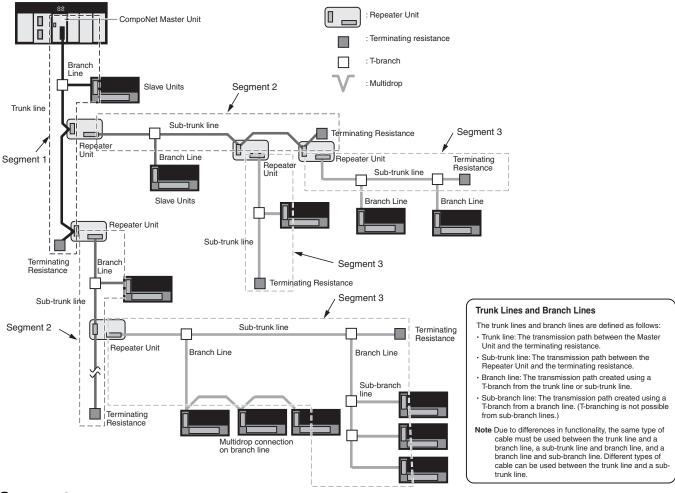
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# **Appendix**

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■ Connecting to Screw-less Clamp Terminal Blocks	

# **CompoNet Network Configuration Elements**

A CompoNet Network is a remote I/O system that consists of the following elements.



#### Segment

#### ■ Segment layers

When Repeater Units are used, the CompoNet Network is divided into segments by the Repeater Units.

Each segment is connected to the network, but is isolated electrically.

Three layers of these isolated segments can be configured, called segments 1, 2, and 3, counted in order from the Master Unit.

Repeater Units can be used to add a maximum of two extra segment layers.

Including Repeater Units connected using multidrop connections, a maximum of 64 Repeater Units can be connected in a single network (i.e., to a single Master Unit).

#### ■ Number of Units Per Segment

A maximum of 32 Slave Units and Repeater Units can be connected in the same segment.

#### **Types of Node Addresses for CompoNet Networks**

The following types of node addresses are used when setting node addresses for CompoNet networks.

Node address type	Address range	Applicable slaves
Word input slave Word mixed slave	0 to 63	Input slaves or I/O slaves that are allocated inputs or outputs in 16-point units
Word output slave	0 to 63	Output slaves that are allocated outputs in 16-point units
Bit input slave Bit mixed slave	0 to 127	Input slaves or I/O slaves that are allocated inputs or outputs in 2-point units
Bit output slave	0 to 127	Output slaves that are allocated outputs in 2-point units
Repeater Unit	0 to 63	Repeater Units

#### ■ Node address types for mixed slaves are the same as those for input slaves.

- Word input slaves and word mixed slaves have the same node address type.
- Bit input slaves and bit mixed slaves have the same node address type.
- If a Word Input Expansion Unit (XWT-ID16 or XWT-ID08) is connected to a word output slave, it is treated as a mixed slave. The node address type will be a word mixed slave instead of a word output slave.

#### ■ The same node addresses can sometimes be used as long as the node address types are different.

The same node address can be used for different node address types as long as the allocated words or bits do not overlap.

The same node address cannot be used for word mixed slaves and word output slaves because the allocated words overlap. The same thing applies to bit mixed slaves and bit output slaves.

- Example 1: You can use a word input slave with a node address of 0 and a word output slave with a node address of 0 at the same time.
- Example 2: You can use a word mixed slave with a node address of 1 and a bit mixed slave with a node address of 1 at the same time.
- Example 3: You can use a word input slave with a node address of 2 and a Repeater with a node address of 2 at the same time.

#### ■ The same node address cannot be used for slaves with the same node address type.

- Example 1: You cannot use two word input slaves with a node address of 1.
- Example 2: You cannot use a bit input slave with a node address of 2 and a bit mixed slave with a node address of 2 at the same time.

#### ■ Nodes for which the bit or word allocations overlap cannot be used at the same time.

- Example 1: A 64-point word output slave with a node address of 2 is allocated the words for node addresses 2, 3, 4, and 5 for word output slaves. Therefore, word output slaves with node addresses of 3, 4, and 5 cannot be used at the same time.
- Example 2: Example 2: A word mixed slave with 32 inputs, 32 outputs, and a node address of 0 uses node addresses 0 and 1 for both word mixed slaves and word output slaves. Therefore, word input slaves, word mixed slaves, and word output slaves with a node address of 1 cannot be used at the same time.

# **CompoNet Network Specification**

Slave Unit I/O information and status information is allocated in the Special I/O Unit memory area or a user-specified area of the CPU Unit to which the Master Unit is mounted.

The area is determined by the unit number of the Master Unit as a Special I/O Unit and by the communications mode number. The user specifies the communications mode number using the CompoNet Support Software. The bits used by Slave Units are determined by the node address for each Slave Unit.

The relationship between communications mode numbers, the number of connected nodes, and the number of points that can be controlled is described next.

Communications mode number	Mode name	Connectable node addresses	Control points	Memory area	Number of unit numbers used by each Master Unit
0	Mode 0	Word Slave Units: IN0 to IN7 and OUT0 to OUT7	128 inputs and 128 outputs (Word Slave Units)		2
1	Mode 1	Word Slave Units: IN0 to IN15 and OUT0 to OUT15	256 inputs and 256 outputs (Word Slave Units)	Special I/O Unit Area (First	4
2	Mode 2	Word Slave Units: IN0 to IN31 and OUT0 to OUT31	512 inputs and 512 outputs (Word Slave Units)	word depends on unit number of Master Unit.)	8
3	Mode 3	Word Slave Units: IN0 to IN15 and OUT0 to OUT15 Bit Slave Units: IN0 to IN63 and OUT0 to OUT63	256 inputs and 256 outputs (Word Slave Units) 128 inputs and 128 outputs (Word Slave Units)		8
4	Reserved				
5	Reserved				
6	Reserved				
7	Reserved				
8	Software Setting Mode	Can be set within the following ranges: Word Slave Units: IN0 to IN63 and OUT0 to OUT63 Bit Slave Units: IN0 to IN127 and OUT0 to OUT127	Can be set within the following ranges: Word Slave Units: 1,024 inputs and 1,024 outputs Bit Slave Units: 256 inputs and 256 outputs	Can be allocated anywhere in the CIO, DM, WR, or HR Area. Status and parameters are allocated in the Special I/O Unit Area. Note: Status and parameters are allocated in the Special I/O Unit Area.	1
9	Reserved				

Note 1. In a CompoNet Network, Word Slave Units have 16 bits per node address. Bit Slave Units have two bits allocated per node address.

<sup>2.</sup> Do not use the reserved communications mode numbers (4 to 7 and 9). A communications mode setting error (H4 at the 7-segment LED indicator) will occur if any of these mode numbers is set.

<sup>3.</sup> CompoNet Network for CompoNet Gateway Unit, refer to the CompoNet Gateway Unit page.

# **Communications and I/O Power Supply Wiring**

The following power supplies are required to operate the CompoNet Network.

- Communications power supply: Used for communications with individual Units and for internal circuit operations of Units.
- I/O power supply: Used for I/O operations for Units with external I/O.

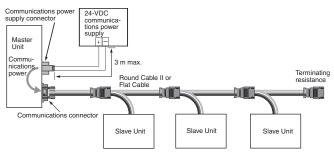
The method for supplying communications power and I/O power depends on the types of cable and Slave Unit that are used. The differences are shown in the following table.

Power supply method	Cable types	Communications power supply	I/O power supply
	Flat Cable I, II	Supplied through the Communications Cable by	Cumplied to individual Unite consectable from the
Multi-power supply	Round Cable II	supplying power to the Master Unit.	Supplied to individual Units separately from the
	Round Cable I	Supplied to Units individually	communications power supply.
	Flat Cable I, II	The communications power supply and the I/O power su	pply are provided together through Communications
Network power supply	Round Cable II	Cable.	
	Round Cable I	Cannot be used.	

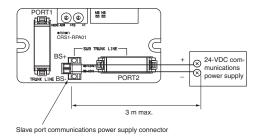
### **Connection Locations for Communications Power Supply**

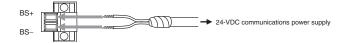
#### ■ Round Cable II Flat Cable

Connect a 24-VDC power supply to the Master Unit's communications power supply connector (BS+ and BS-). This provides communications power to each Slave Unit and Repeater Unit connected by Round Cable II or Flat Cable. Connect only one communications power supply for the trunk line. The cable between the communications power supply and the communications power supply connector must be no longer than 3 m.



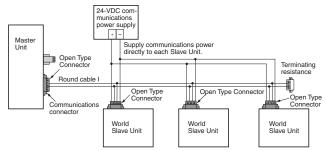
When Repeater Units are used, communications power to sub-trunk lines is supplied by the downstream port communications power supply connectors (BS+ and BS-) of the Repeater Units. The cable between the communications power supply and the communications power supply connector must be no longer than 3 m.



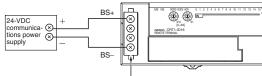


#### ■ Round Cable I

A 24-VDC power supply is connected individually to each Slave Unit. Power does not need to be supplied to the Master Unit.

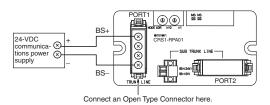


Before connecting the power supply, first connect a DCN4-TB4 Open Type Connector to the communications connector to convert it to a screw terminal block



Connect an Open Type Connector here.

When using a Repeater Unit, supply power through the BS+ and BS- terminals of the Repeater Unit's PORT1 connector.



#### Ferrules

The following ferrules are recommended for the communications power supply cable.

Model	Applicable wire size	Crimping tool	Manufacturer
AI0, 5-10 WH	0.5 mm/AWG20	CRIMPFOX UD6 (product number 1204436) or the CRIMPFOX ZA3 Series	Phoenix Contact K.K.
H 0.5/16 orange	0.5 mm/AWG20	Crimper PZ 1.5 (Product number 900599)	Weidmuellr Japan Co.,Ltd.

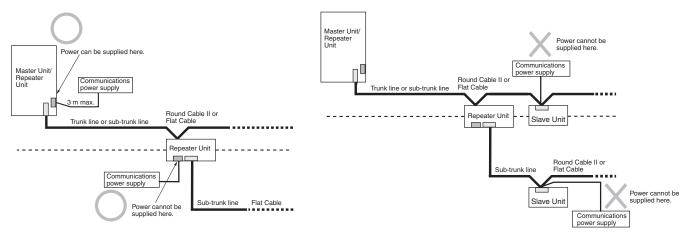
The following screwdriver is recommended for removing ferrules.

Model	Manufacturer
XW4Z-00C	OMRON Corporation

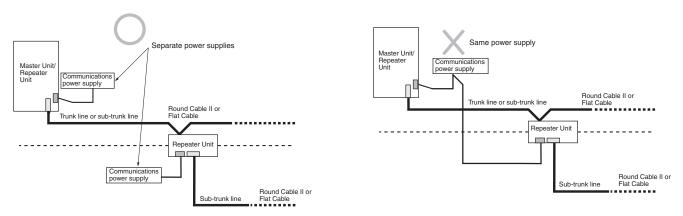
#### Restrictions

The following restrictions apply when supplying communications power through Round Cable II or Flat Cable.

- The communications power supply can be connected at only one location for the trunk line and one location each for the sub-trunk lines.
- Communications power to the trunk line can be supplied only through the communications power supply connector on the Master Unit. Communications power to a sub-trunk line can be supplied only through the slave port communications power supply connector on the Repeater Unit. Communications power cannot be supplied at any other location.



• Use separate power supplies for the Master Unit trunk line and for each sub-trunk line (i.e., for the trunk line on the Master side of the Repeater Unit and the sub-trunk line on the Slave side).



Transmission quality will not be maintained and communications errors may occur if this restriction is not observed.

# **Connecting External I/O for Slave Units**

# **Connecting to e-CON Connector Terminals**

For Slave Units with e-CON connector terminals, a special cable connector must be attached to an external device cable. Follow the procedure below to attach the connector to the cable.

#### **■** Checking the Cable Connector and Cable Wire Size

The wire size and sheath diameter of applicable cables depend on the type of cable connector. Use the following table to check that the cable connector and external device cable wire size and sheath diameter are compatible.

#### • Tyco Electronics Connectors

Model Housing color Ap		Applicable	wire range
3-1473562-4	Orange	sheath outer diameter: 0.9 to 1.0 mm	
1-1473562-4	Red	sheath outer diameter: 0.9 to 1.0 mm	
1473562-4	Yellow	sheath outer diameter: 1.0 to 1.15 mm	Cross-sectional area: 0.08 to 0.5 mm <sup>2</sup>
2-1473562-4	Blue	sheath outer diameter: 1.15 to 1.35 mm	
4-1473562-4	Green	sheath outer diameter: 1.35 to 1.60 mm	

#### Sumitomo 3M Connectors

Model	Housing color	Applicable wire range
37104-3101-000FL	Red	AWG26 (0.14 mm²) to AWG24 (0.2 mm²), sheath outer diameter: 0.8 to 1.0 mm
37104-3122-000FL	Yellow	AWG26 (0.14 mm²) to AWG24 (0.2 mm²), sheath outer diameter: 1.0 to 1.2 mm
37104-3163-000FL	Orange	AWG26 (0.14 mm²) to AWG24 (0.2 mm²), sheath outer diameter: 1.2 to 1.6 mm
37104-2124-000FL	Green	AWG22 (0.3 mm²) to AWG20 (0.5 mm²), sheath outer diameter: 1.0 to 1.2 mm
37104-2165-000FL	Blue	AWG22 (0.3 mm²) to AWG20 (0.5 mm²), sheath outer diameter: 1.2 to 1.6 mm
37104-2206-000FL	Gray	AWG22 (0.3 mm²) to AWG20 (0.5 mm²), sheath outer diameter: 1.6 to 2.0 mm

#### OMRON Connectors

Model	Specification	Applicable wire range	
XN2A-1430	Spring clamp type	AWG28 (0.08 mm²) to AWG20 (0.5 mm²), sheath outer diameter: 1.5 mm max.	

# **Connecting to MIL Connector Terminals**

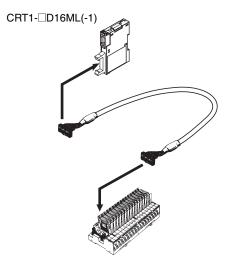
Use any of the following methods to connect to a MIL connector.

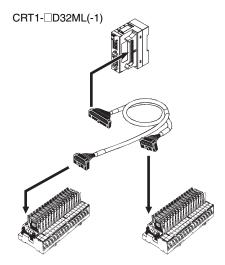
- Use an OMRON MIL Cable.
- Pressure-weld a Flat Cable to a MIL Socket.
- Pressure-weld a loose-wire cable to a MIL connector.

#### ■ Using OMRON MIL Cable

• Connecting Relay Terminals

The MIL Cables for connecting OMRON Relay Terminals are shown in the following table. Select the appropriate Cable depending on the combination of Remote I/O Terminals and Relay Terminals that are used.





Slave model	MIL Cable model	Connected Relay Terminal	Remarks
CRT1-VID16ML	G79-I□C	G7TC-ID16 G7TC-IA16	
CRT1-VOD16ML/ XWT-VOD16ML	G79-O□C	G7TC-OC16/OC08 G7OD-SOC16/VSOC16 G7OD-FOM16/VFOM16 G7OA-ZOC16-3 G7OD-SOC08 G7OR-SOC08	
	G79-I□C	G7TC-OC16-1	
CRT1-VOD16ML-1/ XWT-VOD16ML-1	G79-O□C	G7OD-SOC16-1 G7OD-FOM16-1 G7OA-ZOC16-4	
CRT1-VID32ML	G79-I50-25-D1 (50 cm) G79-I75-50-D1 (75 cm)	G7TC-ID16 G7TC-IA16	
CRT1-VOD32ML	G79-O50-25-D1 (50 cm) G79-O75-50-D1 (75 cm)	G7TC-OC16/OC08 G7OD-SOC16/VSOC16 G7OD-FOM16/VFOM16 G7OA-ZOC16-3 G7OD-SOC08 G7OR-SOC08	
CRT1-VOD32ML-1	G79-O50-25-D1 (50 cm) G79-O75-50-D1 (75 cm)	G7OD-SOC16-1 G7OD-FOM16-1 G7OA-ZOC16-4	
	G79-I50-25-D1 (50 cm) G79-I75-50-D1 (75 cm)	G7TC-OC16-1	
CRT1-VMD32ML	Inputs: G7TC-ID16 G7TC-IA16 Outputs: G7TC-OC16/OC08 G79-M50-25-D1 (50 cm) G79-M75-50-D1 (75 cm) G70-FOM16/VFOM16 G70A-ZOC16-3 G70D-SOC08 G70R-SOC08		Inputs and outputs are distinguished by color. Input tube color: Red Output tube color: Yellow
CRT1-VMD32ML-1	G79-M50-25-D2 (50 cm) G79-M75-50-D2 (75 cm)	Inputs: G7OA-ZIM16-5 G7OD-SOC16-1 G7OD-FOM16-1 G7OA-ZOC16-4	Inputs and outputs are distinguished by color. Input tube color: Red Output tube color: Yellow

• Connecting to a Connector-Terminal Block Conversion Unit The following Connector-Terminal Block Conversion Units are available. For details, refer to the *SYSMAC Selection Guide* (Cat. No. X066).

Туре	Series
Slim	XW2D
Through-type	XW2B
With common terminal	XW2C
Three-tier with common terminal	XW2E
Screw-less clamp terminals	XW2F
e-CON connector	XW2N

<sup>•</sup> Connecting Loose Wires to Devices

The following table shows the Cables available when the Slave Unit has a MIL connector and the other device has loose wires. Use these Cables as needed.

Slave model		MIL Cable model	Remarks	
		G79-A200C (2 m) G79-A500C (5 m)	Loose wire size: AWG24 Loose wires are cut.	
CRT1-V□D16ML/ XWT-V□D16ML	20 pins	G79-Y100C (1 m) G79-Y150C (1.5 m) G79-Y200C (2 m) G79-Y300C (3 m) G79-Y500C (5 m)	Forked terminals are attached to the loose wires. Forked terminal: 161071-M2 (JST Mfg. Co., Ltd.)	
		G79-A200C-D1 (2 m) G79-A500C-D1 (5 m)	Loose wire size: AWG28 Loose wires are cut.	
CRT1-V□D32ML	40 pins	G79-Y100C-D1 (1 m) G79-Y200C-D1 (2 m) G79-Y500C-D1 (5 m)	Forked terminals are attached to the loose wires. Forked terminal: 161071-M2 (JST Mfg. Co., Ltd.)	
CRT1-VDA02ML/ CRT1-VAD02MLD/ CRT1-VDA02MLD	10 pins		Indicated cable is not available	
CRT1-VAD04ML 16 pins			7	

#### ■ Pressure-welding a Flat Cable to a MIL Socket

To make your own connecting cable by pressure-welding the flat cable to the MIL socket, use the components shown in the table below and follow the directions.

• Required Components

Number of connector pins	Model	
10 pins	No polarity guide	XG4M-1031-T
το μπο	Uses polarity guide	XG4M-1030-T
16 pins	XG4M-1630-T	
20 pins	XG4M-2030-T	
40 pins	XG4M-4030-T	

#### ■ Pressure-welding a Loose-wire Cable to a MIL Connector

To prepare a connecting cable by pressure-welding a loose-wire cable to a MIL connector, assemble the connector from the components shown in the following table.

#### • 10-pin Cable

Component		Wire size: AWG24	Wire size: AWG28 to AWG26
Cooket	No polarity guide	XG5M-1031-N	XG5M-1034-N
Socket Uses polarity guide		XG5M-1032-N	XG5M-1035-N
Semi-cover *		XG5S-0501	

#### • 16-pin Cable

Component	Wire size: AWG24	Wire size: AWG28 to AWG26
Socket	XG5M-1632-N	XG5M-1635-N
Semi-cover *	XG5S-0801	

#### • 20-pin Cable

Component	Wire size: AWG24	Wire size: AWG28 to AWG26
Socket	XG5M-2032-N	XG5M-2035-N
Semi-cover *	XG5S-1001	
Hood Cover	XG5S-2012	

#### • 40-pin Cable

Component	Wire size: AWG24	Wire size: AWG28 to AWG26
Socket	XG5M-4032-N	XG5M-4035-N
Semi-cover *	XG5S-2001	
Hood Cover	XG5S-4022	

<sup>\*</sup> Two Semi-covers are required per connector.

For details on individual components, refer to the Connectors Group Catalog (Cat. No. G015).

### **Connecting to Screw-less Clamp Terminal Blocks**

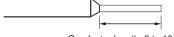
For Slave Units with screw-less clamp terminal blocks, the terminal blocks can be easily wired by inserting pin terminals. Follow the procedure below to connect the external device cable to a screw-less clamp terminal block.

#### **■** Applicable Pin Terminals

When wiring an external device cable to a screw-less clamp terminal block, special pin terminals must be placed on the cable wires. The applicable pin terminals are listed in the following table.

Name	Applicable wire size	Crimp tool	Manufacturer
H0.5/14 orange	0.5 mm <sup>2</sup> /AWG20		
H0.75/14 white	0.75 mm <sup>2</sup> /AWG18	PZ6 roto	Weidmuellr Japan Co.,Ltd.
H1.5/14 red	1.5 mm <sup>2</sup> /AWG16		

The pin terminal conductor should be about 8 to 10 mm in length.



Conductor length: 8 to 10 mm

# **Ordering Information**

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#### International Standards

- The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations),
   C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations),
   CU: cUL, N: NK, L: Lloyd, and CE: EC Directives.
- · Contact your OMRON representative for further details and applicable conditions for these standards.

#### EC Directives

The EC Directives applicable to PLCs include the EMC Directives and the Low Voltage Directive. OMRON complies with these directives described below.

#### ● EMC Directives

Applicable Standards
EMI : EN61131-2
EN61000-6-4
EMS: EN61131-2
EN61000-6-2

PLCs are electrical devices that are incorporated in machines and manufacturing installations. OMRON PLCs conform to the related EMC standards so that the devices and machines into which they are built can more easily conform to EMC standards. The actual PLCs have been checked for conformity to EMC standards. Whether these standards are satisfied for the actual system, however, must be checked by the customer.

EMC-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PLC is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.

Note: The applicable EMS standards depend on the product.

#### ● Low Voltage Directive Applicable Standard:EN61131-2

Devices that operate at voltages from 50 to 1,000 VAC or 75 to 150 VDC must satisfy the appropriate safety requirements. With PLCs, this applies to Power Supply Units and I/O Units that operate in these voltage ranges.

These Units have been designed to conform to EN61131-2, which is the applicable standard for PLCs.

# **CompoNet Master Units**

		Specifications		Number of	Power consumption (A)				
Name	Appearance	Type of communications	Maximum number of I/O points per Master Unit	unit numbers allocated	5-V system	24-V system	26-V system	Model	Standards
CJ1 Special I/O Unit *		Remote I/O communications     Message communications	Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total) Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total)	1, 2, 4, or 8	0.4			CJ1W- CRM21	CE, U, U1, L, N
CS1 Special I/O Unit *	7	Remote I/O communications     Message communications	Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total) Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total)	1, 2, 4, or 8	0.4			CS1W- CRM21	CE, U, U1, L, N

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

# **CompoNet Master Board**

Name	Appearance	Specification	Model	Standards
PCI Bus type		PCI bus Rev2.2 5V	3G8F7-CRM21	05
CompactPCI Bus type		PICMG 2.0 R3.0 5V 32-Bit 3U	3G8F8-CRM21	- CE

# **CompoNet Gateway Units**

### ■ CompoNet Gateway Unit for CC-Link

Name	Appearance	Model	Standards
CompoNet Gateway Unit for CC-Link	To the second	GQ-CRM21	CE, UI, C

# **CompoNet Slave Units**

#### ■ Word Slave Units

#### Digital I/O Slave Units

Name	Appearance	Specifications			Model	Standards	
		In a sta	0 :	NPN		CRT1-ID08	
		Inputs	8 inputs	PNP		CRT1-ID08-1	CE, U,
		Outouto	O outputo	NPN		CRT1-OD08	U1, N
Two-tier Screw		Outputs	8 outputs	PNP	- - -	CRT1-OD08	
		lanuta	16 inputs	NPN		CRT1-ID16 *	
Terminal		Inputs		PNP		CRT1-ID16-1 *	CE, U,
Block		Outputs	16 outputs	NPN		CRT1-OD16 *	U1, C, N
				PNP		CRT1-OD16-1 *	
			9 inputa/9 outputa	NPN	1	CRT1-MD16	CE, U,
		Inputs/Outputs	8 inputs/8 outputs	PNP	1	CRT1-MD16-1	U1, N

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

Name	Appearance		Spec	ifications		Model	Standards
Screw Terminal Block		Outouto	8 outputs			CRT1-ROS08	CE, UC,
with Relay Outputs		Outputs	16 outputs	Contacts		CRT1-ROS16	UC1, N
Screw Terminal Block	ALC: NO SECOND S	Outputs	8 outputs	SSR	-	CRT1-ROF08	
with SSR Outputs	Ť	Culputo	16 outputs	0011		CRT1-ROF16	
ı		Inputs	8 inputs	NPN		CRT1-ID08TA	
ı			p	PNP		CRT1-ID08TA-1	
ı		Outputs	8 outputs	NPN		CRT1-OD08TA	
ı				PNP		CRT1-OD08TA-1	
ı		Inputs	16 inputs	NPN	Without Short-circuit and	CRT1-ID16TA	
ı		mpato	To inputo	PNP	Disconnected Line Detection	CRT1-ID16TA-1	
ı		Outputs	16 outputs	NPN		CRT1-OD16TA	
ı		Outputs	10 outputs	PNP		CRT1-OD16TA-1	
Three-tier		Inputs/Outputs	8 inputs/8 outputs	NPN		CRT1-MD16TA	
Screw		inputs/Outputs	o iriputs/o outputs	PNP		CRT1-MD16TA-1	CE, UC,
Terminal	8 0	lanuta	O innuto	NPN		CRT1-ID08TAH	UC1
Block	T P	Inputs	8 inputs	PNP		CRT1-ID08TAH-1	
ı	The state of the s			NPN		CRT1-OD08TAH	
ı		Outputs	8 outputs	PNP		CRT1-OD08TAH-1	
ı				NPN	With	CRT1-ID16TAH	
ı		Inputs	16 inputs	PNP	Short-circuit and Disconnected	CRT1-ID16TAH-1	
ı				NPN	Line Detection	CRT1-OD16TAH	
ı		Outputs	16 outputs	PNP		CRT1-OD16TAH-1	
ı		Inputs/Outputs 8 inp		NPN	-	CRT1-MD16TAH	
ı			8 inputs/8 outputs	PNP		CRT1-MD16TAH-1	
<del>                                     </del>							+
ı		Inputs	16 inputs	NPN		CRT1-ID16S	
ı				PNP		CRT1-ID16S-1	
ı		Outputs	16 outputs	NPN		CRT1-OD16S	
ı				PNP		CRT1-OD16S-1	
ı		Inputs/outputs	8 inputs /8 outputs	NPN	Without Short-circuit and Disconnected Line Detection	CRT1-MD16S	
ı		, , , , , , , , , , , , , , , , , , , ,		PNP		CRT1-MD16S-1	
ı		Inputs	32 inputs	NPN		CRT1-ID32S	
ı		inputs	OZ IIIpato	PNP		CRT1-ID32S-1	
ı		Outputs	32 outputs	NPN		CRT1-OD32S	
ı		Outputs	oz outputo	PNP		CRT1-OD32S-1	
ı	^	Inputs/outputs	16 inpute /16 outpute	NPN		CRT1-MD32S	
e-CON		inputs/outputs	16 inputs /16 outputs	PNP	<del> </del>	CRT1-MD32S-1	CE, UC,
Connectors		Innuto	16 inputs	NPN		CRT1-ID16SH	UC1
ı		Inputs	16 iriputs	PNP		CRT1-ID16SH-1	
ı		Outouto	1C autouta	NPN		CRT1-OD16SH	
ı		Outputs	16 outputs	PNP		CRT1-OD16SH-1	
ı		I	0 :	NPN	1	CRT1-MD16SH	
ı		Inputs/outputs	8 inputs /8 outputs	PNP	With	CRT1-MD16SH-1	
ı			00: 1	NPN	Short-circuit and Disconnected Line Detection	CRT1-ID32SH	
ı		Inputs	32 inputs	PNP		CRT1-ID32SH-1	
		Outputo	22 outputs	NPN		CRT1-OD32SH	7
		Outputs	32 outputs	PNP		CRT1-OD32SH-1	7
		Inputo/outroute	16 inputo /16 autout-	NPN		CRT1-MD32SH	7
		Inputs/outputs 16 i	16 inputs /16 outputs	PNP		CRT1-MD32SH-1	1
	_			NPN		CRT1-VID08S *	
i	1	Inputs	8 inputs		+		CE, UC,
e-CON	2			PNP	Without Short-circuit and Disconnected Line Detection	CRT1-VID08S-1 *	CE, UC, UC1
Connectors		Outpute 9 outpute	8 outputs	NPN		CRT1-VOD08S *	
		Outputs 8	8 outputs PNI	DND		CRT1-VOD08S-1 *	

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

Name	Appearance		Specifications			Model	Standards
		Innute	16 innute	NPN		CRT1-VID16ML *	
MIL	i)	Inputs	16 inputs	PNP		CRT1-VID16ML-1 *	CE, UC,
Connector	7	0.44-	10	NPN	] <del></del>	CRT1-VOD16ML *	UC1, N
	A	Outputs	16 outputs	PNP		CRT1-VID16ML *  CRT1-VID16ML-1 *  CRT1-VOD16ML-1 *  CRT1-VOD16ML-1 *  CRT1-VID32ML *  CRT1-VID32ML-1 *  CRT1-VOD32ML-1 *  CRT1-VOD32ML-1 *  CRT1-VMD32ML-1 *  CRT1-VMD32ML-1 *  CRT1-UMD32ML-1 *  CRT1-UMD32ML-1 *  CRT1-ID08SL  CRT1-ID08SL  CRT1-ID08SL  CRT1-ID08SL-1  CRT1-OD16SL  CRT1-ID16SL  CRT1-OD16SL  CRT1-OD16SL  CRT1-OD16SL  CRT1-MD16SL	
		Innute	20 innuts	NPN		CRT1-VID32ML *	
		Inputs	32 inputs	PNP		CRT1-VID32ML-1 *	
MIL		Outoute	20 autauta	NPN		CRT1-VOD32ML *	CE, UC, UC1, N
Connector		Outputs	32 outputs	PNP		CRT1-VOD32ML-1 *	
	1	Inputs/Outputs	16 inputs/16 outputs	NPN		CRT1-VMD32ML *	
				PNP		CRT1-VMD32ML-1 *	
		Inputs	8 inputs	NPN		CRT1-ID08SL	U, CE, N
		Inputs		PNP		CRT1-ID08SL-1	
		Outputs	8 outputs	NPN		CRT1-OD08SL	
		Outputs	o outputs	PNP		CRT1-OD08SL-1	
Clamp Terminal		Inputs	16 inputs	NPN		CRT1-ID16SL	
Blocks	E su	inputs	16 inputs	PNP	<b>1</b>	CRT1-ID16SL-1	
	and all	Outpute	1C autouta	NPN		CRT1-OD16SL	
		Outputs	16 outputs	PNP		CRT1-OD16SL-1	
		Inputs/Outputs 8 inputs/8 outputs	9 inputo/9 outputo	NPN		CRT1-MD16SL	
			o iripuis/o outputs	PNP		CRT1-MD16SL-1	

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

#### Analog I/O Slave Units

Name	Appearance	Specification	ns	Model	Standards
Analog I/O		Analog inputs	4 inputs	CRT1-AD04 *	CE, U,
Slave Units		Analog outputs	2 outputs	CRT1-DA02 *	U1, C, N
MIL Connector	0	Analog inputs	4 inputs	CRT1-VAD04ML	
Type		Analog outputs	2 outputs	CRT1-VDA02ML	CE, UC,
e-CON Connector	5	Analog inputs	4 inputs	CRT1-VAD04S	UC1
Type	15.5	Analog outputs	2 outputs	CRT1-VDA02S	
Analog I/O Slave Units (Numerical		Analog inputs (Channel Insulation)	2 inputs	CRT1-VAD02MLD	
indicator type) MIL Connector Type		Analog outputs	2 outputs	CRT1-VDA02MLD	CE
Analog I/O Slave Units (Numerical	Slave Units Numerical ndicator ype) e-CON Connector	Analog inputs (Channel Insulation)	2 inputs	CRT1-VAD02SD	OE
indicator type) e-CON Connector Type		Analog outputs	2 outputs	CRT1-VDA02SD	

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

### • Temperature Input Units

Name	Appearance	Specifications			Model	Standards
Tomporatura	Thermocouple Input		Switchable between (R, S, K, J, T, E, B, N, L, U, W, PL2)	CRT1-TS04T	CE, UC,	
Temperature Input Units	Trans.	Platinum-resistance thermometer input	4 inputs	PT100 (-200 to 850°C) PT100 (-200 to 2000°C)	CRT1-TS04P	UC1, N

#### Expansion Units

Name	Appearance			Specific	ations	Model	Standards
		Inputs	Q innute	NPN		XWT-ID08	
		inputs	8 inputs	PNP		XWT-ID08-1	
		Outouto	8 outputs	NPN	One Expansion Unit can be	XWT-OD08	
Expansion	- 5000000	Outputs	8 outputs	PNP	mounted to one CRT1-ID16(-1),	XWT-OD08-1	CE, UC,
Units		Inputs	16 inputs	NPN	CRT1-OD16(-1), CRT1-ROS16, or CRT1-ROF16 Digital I/O Slave.	XWT-ID16	UC1, N
		inputs	10 inputs	PNP	- Chi i-nor io Digital I/O Slave.	XWT-ID16-1	
		Outputs	16 outputs	NPN		XWT-OD16	
		Outputs	10 outputs	PNP		XWT-OD16-1	
		Digital outputs	8 outputs	NPN		XWT-VOD08S	
Expansion Units e-CON		Digital outputs	8 outputs	PNP	XWT-VOD08S-1  XWT-VMD08S  One Expansion Unit can be mounted to one CRT1-VAD02□□D or CRT1-VDA02□□D Analog I/O Slave Unit.  XWT-VMD08S-1  XWT-VMD08S-1  XWT-VMD08S-1	XWT-VOD08S-1	-
Connector type		Digital inputs and outputs	4 inputs/ 4 outputs	NPN		XWT-VMD08S	
		Digital inputs and outputs	4 inputs/ 4 outputs	PNP		XWT-VMD08S-1	
		Digital outputs	16 outputs	NPN		XWT-VOD16ML	
Expansion Units		Digital outputs	16 outputs	PNP		XWT-VOD16ML-1	
MIL Connector type		Digital inputs and outputs	8 inputs/ 8 outputs	NPN		XWT-VMD16ML	
		Digital inputs and outputs	8 inputs/ 8 outputs	PNP		XWT-VMD16ML-1	

#### **■** Bit Slave Units

#### Compact Connectors

Name	Appearance		Specifications			Standards
		Inputs	2 inputs	NPN	CRT1B-ID02JS	
		inputs	2 outputs	PNP	CRT1B-ID02JS-1	
		Outputo	2 inputs	NPN	CRT1B-OD02JS	
		Outputs	2 outputs	PNP	CRT1B-OD02JS-1	
		Innuta/Outnuta	1 input/1 output	NPN	CRT1B-MD02JS	
Compact		Inputs/Outputs	1 input/1 output	PNP	CRT1B-MD02J-1	CE
Connectors		Inputs	4 inputs	NPN	CRT1B-ID04JS	- CE
			4 outputs	PNP	CRT1B-ID04JS-1	
			Outpute	4 inputs	NPN	CRT1B-OD04JS
		Outputs	4 outputs	PNP	CRT1B-OD04JS-1	
		Innuta/Outnuta	2 inputs/2 outputs	NPN	CRT1B-MD04JS	
		Inputs/Outputs	2 inputs/2 outputs	PNP	CRT1B-MD04JS-1	
		lanuta	O innuto	NPN	CRT1B-ID02S	
e-CON			2 inputs	PNP	CRT1B-ID02S-1	CF II
connectors	3 10 10 10 10 10 10 10 10 10 10 10 10 10		2 outpute	NPN	CRT1B-OD02S	CE, U
		Outputs	2 outputs	PNP	CRT1B-OD02S-1	

#### **■** Repeater Unit

Name	Appearance	Specifications	Model	Standards
Repeater Unit		A sub-trunk line can be connected downstream (for trunk-branch line configuration) or further branching is enabled downstream (for configurations with no wiring restrictions) in the same way as for a Master Unit. A Repeater Unit can be used to branch the trunk line and increase the number of connected Units, as well as to extend the length of the communications line.	CRS1-RPT01 *	CE, U, U1, L, N

<sup>\*</sup> These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

#### ■ SmartSlice GRT1 Series

#### **●** CompoNet Communications Unit

Name	Appearance	Specifications	Model	Standards
CompoNet Communication Unit		Up to 64 Slice I/O Units can be connected (Inputs: 32 bytes maximum, Output: 32 bytes maximum)	GRT1-CRT	CE, UC1, L

#### ● Slice I/O Units

	Name	Appearance	Specifications	Model	Standards
			4 inputs NPN	GRT1-ID4	
			4 inputs PNP	GRT1-ID4-1	CE, UC1, L, N
			4 outputs NPN	GRT1-OD4	CE, UCI, L, N
		_	4 outputs PNP	GRT1-OD4-1	
			8 inputs NPN	GRT1-ID8	
	Digital I/O Units		8 inputs PNP	GRT1-ID8-1	CE, UC, L
			8 outputs NPN	GRT1-OD8	OL, 00, L
			8 outputs PNP	GRT1-OD8-1	
			Relay Outputs 2 points	GRT1-ROS2	CE, UC1, L, N
			AC Input 4 points	GRT1-IA4-1	CE, UC1, L
			Ac input 4 points	GRT1-IA4-2	OL, 001, L
Slice	Analog I/O Units		Analog inputs (current/voltage)	GRT1-AD2	
I/O Units			Analog outputs (current)	GRT1-DA2C	CE, UC1, L
			Analog output (voltage)	GRT1-DA2V	
	Temperature Input		Temperature input (Resistance thermometer:Pt100) 2 points	GRT1-TS2P	05 1104 1
	(Resistance Thermometers)		Temperature input (Resistance thermometer:Pt1000) 2 points	GRT1-TS2PK	CE, UC1, L
	memometers)		Thermocouple Input 2 points	GRT1-TS2T	CE, UC, L
•	Counter Units		Counter inputs: 1, External outputs: 1 NPN	GRT1-CT1	OF HO I
	Counter Units		Counter inputs: 1, External outputs: 1 PNP	GRT1-CT1-1	— CE, UC, L

### System Units

	Name	Appearance	Specifications	Model	Standards
	Turnback Units		Right Turnback Unit (Mounts to the right side of Slice I/O Terminal.)	GRT1-TBR	CE, UC1, L, N
	Turnback Offics		Left Turnback Unit (Mounts to the left side of Slice I/O Terminal. Can supply power to I/O Units.)	GRT1-TBL	CL, 001, L, N
System	Turnback Cable *1		1 m	GCN2-100	UC, CE, L, N
Units			Use when the total current consumption of the I/O Power Supply exceeds 4 A, or to make the I/O Power Supply a separate system.	GRT1-PD2	CE, UC1, L, N
				GRT1-PD2G	
	I/O Power Feed Unit			GRT1-PD8	
	I/O Fower reed Offic			GRT1-PD8-1	CE, UC, L
			Use to add V/G terminals for I/O power supply.	GRT1-PC8	
			ose to add v/G terminals for i/O power supply.	GRT1-PC8-1	
	End Unit *2		Necessary for terminating the Slice I/O Terminal.	GRT1-END	CE, UC1, L, N
Option	Terminal Block		Package of 5 Terminal Blocks	GRT1-BT1-5	

<sup>\*1</sup> Use the Turnback Cable together with the Turnback Units.
\*2 The End Unit is sold separately. It is not provided with the Communications Unit.

#### **■** Sensor Communications Unit

Name	Appearance	I/O classification	Allocated bits	Internal circuit power supply	I/O Power sup- ply voltage	Connected Controller model	Model	Standards
Sensor Communications		Input and output	160 bits max.	Supplied along with	DC24V	ZS-LDC ZS-MDC ZS-HLDC ZS-HLDC ZFV-CA	ZS-CRT	CE
Unit	o o o	Change by opera	ation mode	communications power	DG24V	E3X-HD0 E3X-MDA0 E3X-DA0-S E3C-LDA0 E2C-EDA0	E3X-CRT	OL.

# ■ Multi-function Compact Inverter

Name	Appearance	Mountable Inverter	Model	Standards
CompoNet Communication Unit		MX2-Series	3G3AX-MX2-CRT-E	U, CE

#### **■** Support Software

Name	Specifications	Number of licenses	Media	Model	Standards
FA Integrated Tool Package CX-One Ver. 4.□	The CX-One is a package that integrates the Support Software for OMRON PLCs and components. CX-One runs on the following OS. Windows XP (Service Pack 3 or higher), Vista or 7 Note. Except for Windoes XP 64-bit version.  CX-One Ver.4. includes CX-Integrator For details, refer to the CX-One catalog (Cat. No. R134).	1 license *1	DVD *2	CXONE-AL01D-V4	

<sup>\*1</sup> Multi licenses are available for the CX-One (3, 10, 30, or 50 licenses).
\*2 The CX-One is also available on CD (CXONE-AL□□C-V4).

# **Peripheral Devices**

#### **■** Communications Cables

Name	Appearance	Specification	Model	Standards
Flat Cable I		4-conductor flat cable (UL2555) Length: 100 m Conductor diameters: 0.75 mm $^2$ × 2, 0.5 mm $^2$ × 2	DCA4-4F10	UC

Note. Also can be used with general-purpose round cable I (VCTF 2-conductor cable).

#### For Flat Cable I

Name	Appearance	Specification	Model	Standards
Flat Connector Socket		Use this Connector in a set with a DCN4-BR4 Flat Connector Plug for the following applications.  • Extending the trunk line or a sub-trunk line  • T-branching from the trunk line or a sub-trunk line  • T-branching a sub-branch line from a branch line  Use this Connector independently for the following applications.  • Used when connecting a DCN4-TM4 Terminating Resistor to the end of the trunk line or a sub-trunk line.	DCN4-TR4 *	
Flat Connector Plug		Use this Connector in a set with a DCN4-TR4 Flat Connector Socket for the following applications.  • Extending the trunk line or a sub-trunk line  • T-branching from the trunk line or a sub-trunk line  • T-branching a sub-branch line from a branch line  Use this Connector independently for the following applications.  • Connecting Communications Cable to a Unit	DCN4-BR4 *	C, UC
Multidrop Connector		Connecting Communications Cable to a DCN4-MD4 Multidrop Connector (when a multidrop connection is used)  Use Multidrop Connectors for multi-drop wiring of Slave Units or Repeater Units to trunk lines, sub-trunk lines, or branch lines.	DCN4-MD4 *	
Multidrop Connector Plug	<b>\$</b>	Connecting Communications Cable to a Unit in a multidrop connection This connector can be used with the following Units:Bit Slave Units with Compact Connectors (CRT1B-□D0□JS(-1))	DCN4-MR4	
Terminating Resistance		This is a Connector-type Terminating Resistor for Flat Cable I or Round Cable II. It is connected to a DCN4-TR4 Flat Connector Socket at the end of a trunk line or sub-trunk line.	DCN4-TM4 *	C, UC
Special Tools		Crimping Tool for DCN4-TR4 Flat Connector Socket or DCN4-BR4 Flat Connector Plug	DWT-A01	

Note. Multidrop Connectors (DCN4-MD4) are not connectable with Bit Slave Units with Compact Connectors, Use Multidrop Connector Plugs (DCN4-MR4) instead.

\* The minimum quantity packaged is 10 Connectors. Order the Connectors in multiples of 10.

#### • For Round Cable I

Name	Appearance	Application	Model	Standards
Open Type Connector (for connecting Units)	<b>E</b>	Converts the Unit's communications connector into a screw terminal block to enable connecting round cable to a Slave Unit or Repeater Unit.	DCN4-TB4 *	UC
Terminating Resistor		This is a Terminal Block-type Terminating Resistor for Round cable I or Round cable II. It is connected to the end of a trunk line or sub-trunk line round cable.	DRS1-T	UC

Note: The DCN4-TB4 Multidrop Connector cannot be used with Bit Slaves with Compact Connectors. Use Open Type Connector (for Unit connection) HCN-TB4LMZG+ from Honda Tsushin Kogyo Co., Ltd. Tel:+81-52-242-2111

#### • For Round Cable II

Name	Appearance	Application	Model	Standards
Open Type Connector (for connecting Units)		Converts the Unit's communications connector into a screw terminal block to enable connecting round cable to a Slave Unit or Repeater Unit.	DCN4-TB4 *	OC
Flat Connector Socket		Use this Connector in a set with a DCN4-BR4 Flat Connector Plug for the following applications.  • Extending the trunk line or a sub-trunk line  • T-branching from the trunk line or a sub-trunk line  • T-branching a sub-branch line from a branch line  Use this Connector independently for the following applications.  • Used when connecting a DCN4-TM4 Terminating Resistor to the end of the trunk line or a sub-trunk line.	DCN4-TR4 *	UC
Terminating		This is a Connector-type Terminating Resistor for Flat Cable I or Round cable II. It is connected to a DCN4-TR4 Flat Connector Socket at the end of a trunk line or sub-trunk line.	DCN4-TM4 *	OC
Resistance		This is a Terminal Block-type Terminating Resistor for Round cable I or Round cable II. It is connected to the end of a trunk line or sub-trunk line round cable.	DRS1-T	UC
Special Tools		Crimping Tool for DCN4-TR4 Flat Connector Socket or DCN4-BR4 Flat Connector Plug	DWT-A01	

Note. The DCN4-TB4 Multidrop Connector cannot be used with Bit Slaves with Compact Connectors. Use Open Type Connector (for Unit connection) HCN-TB4LMZG+ from Honda Tsushin Kogyo Co., Ltd. Tel:+81-52-242-2111

#### **■** Mounting Bracket

Name	Appearance		Model	Standards	
		Unit with e-CON Connectors:	For CRT1-V D08S(-1)/VAD04S/VDA02S	CRT1-ATT02	
		Unit with MIL Connectors:	For CRT1-V D016ML(-1)/VAD04ML/VDA02ML	CRT1-ATT01	
Mounting Bracket		Unit with MIL Connectors:	For CRT1-V□D32ML(-1)	SRT2-ATT02	
		Bit Slaves with Compact Conn	CRT1-ATT03		

<sup>\*</sup> The minimum quantity packaged is 10 Connectors. Order the Connectors in multiples of 10.

<sup>\*</sup> The minimum quantity packaged is 10 Connectors. Order the Connectors in multiples of 10.

# **Related Manuals**

# Manuals

Cat. No.	Model	Name
W457	CRT1 Series	CRT2 Series CompoNet Slave Units and Repeater Unit Operation Manual
W493	CJ1W-CRM21	CJ1W-CRM22 CJ-series CompoNet Master Units Operation Manual for NJ-series CPU Unit
W456	CS1W-CRM21/CJ1W-CRM21	CompoNet Master Units OPERATION MANUAL
W485	3G8F7-CRM21(for PCI Bus)/3G8F8-CRM21(for CompactPCI Bus)	CompoNet Master Board USER'S MANUAL
W484	CRT1-VAD02SD/MLD CRT1-VDA02SD/MLD	CompoNet Analog I/O Slave(Numerical indicator type) USER'S MANUAL
W489	GQ-CRM21	CC-Link-CompoNet GateWay Unit USER'S MANUAL
W342	SYSMAC CS/CJ/CP Series, SYSMAC One NSJ Series	SYSMAC CS/CJ/CP/NSJ Series Communications Commands REFERENCE MANUAL
W504	SYSMAC-SE2	SYSMAC-SE2□□□ Sysmac Studio Version 1 OPERATION MANUAL
W464	CXONE-AL CV4/CXONE-AL CD-V4	CS/CJ/CP/NSJ Series CX-Integrator Ver.2. ☐ OPERATION MANUAL
W455	SmartSlice GRT1 Series	Slice I/O Units OPERATION MANUAL
W476	GRT1-CRT	SmartSlice CompoNet Communications Units OPERATION MANUAL
1582	3G3AX-MX2-CRT-E	MX2-Series CompoNet Communication Unit User's Manual

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#### Read and Understand this Catalog

Please read and understand this catalog before purchasing the product. Please consult your OMRON representative if you have any questions or comments.

#### Warranty and Limitations of Liability

#### WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

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#### **DIMENSIONS AND WEIGHTS**

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

#### PERFORMANCE DATA

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- $\bullet$  The application examples provided in this catalog are for reference only. Check functions and Agriculture of the equipment before use.
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Note: Do not use this document to operate the Unit.

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# **ПОСТАВКА** ЭЛЕКТРОННЫХ КОМПОНЕНТОВ

многоканальный

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001 Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

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