# CJ1W-SCU

CSM CJ1W-SCU DS E 4 1

# The Serial Communications Units That Enable High-speed Connections with External Devices

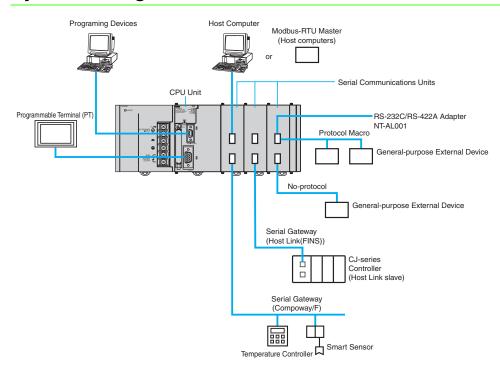
 Each Serial Communications Unit provides two serial communications ports: RS-232C and RS-422A/485, and the serial communications mode can be set separately for each port from Protocol Macro, Host Link, NT Link, Serial Gateway, and No-protocol.



# **Features**

- Mount a total of up to 16 CPU Bus Units, including these Serial Communications Units, to the CPU Rack or Expansion Racks to create systems
  with up to 32 serial communications ports.
- Connect an NT-AL001 RS-232C/RS-442A Link Adapter to the RS-232C port to enable 1:N communications.
- With the CJ1W-SCU□2, you can use a faster baud rate (up to 230.4 kbps) and faster data transfer to the CPU Unit to enable connecting to high-speed external devices.

# **System Configuration**



# **Ordering Infomation**

### 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.

Unit type	Product name		Specifications	No. of unit	Cur		Model	Standards
Onit type	Product name	Communications Interface	Communications functions	allocated	5V	24V	Wodei	Standards
CJ1 CPU Bus Units	Serial Communications Units High-speed type	2 RS-232C ports	The following functions can be selected for each port with an CJ-system: Protocol macro Host Link NT Links (1:N mode) Serial Gateway No-protocol Modbus-RTU Slave	1	0.28 *1	_	CJ1W-SCU22 *2	UC1, N,
		2 RS-422A/485 ports	The following functions can be selected for each port with an NJ-system:  • Protocol macro	·	0.40	_	CJ1W-SCU32 *2	L, CE
		1 RS-232C port and 1 RS-422A/485 port	Serial Gateway     No-protocol     Modbus-RTU Slave		0.36 *1	_	CJ1W-SCU42 *2	
CJ1 CPU Bus Units	Serial Communications Units	2 RS-232C ports	The following functions can be selected for each port: • Protocol macro *3 • Host Link		0.28 *1	_	CJ1W-SCU21-V1 *7	
		2 RS-422A/485 ports	NT Links (1:N mode) Serial Gateway *4 No-protocol *5 Modbus-RTU Slave *6	1	0.38	_	CJ1W-SCU31-V1 *7	UC1, N, L, CE
		1 RS-232C port and 1 RS-422A/485 port			0.38 *1	_	CJ1W-SCU41-V1 *7	

- \*1. When an NT-AL001 RS-232C/RS-422A Conversion Unit is used, this value increases by 0.15 A/Unit.
- \*2. Sinple Backup Function and Interrupt notification function cannot be used with an NJ-system.
  \*3. You can activate Protocol macro trace function when the CPU Unit is set to the RUN mode. (MONITOR mode is not available with the NJ-series CPU Units.)
- \*4. The Serial Gateway function is enabled only for Serial Communications Units of unit version 1.2 and later.
- \*5. The no-protocol function is enabled only for Serial Communications Units of unit version 1.2 and later (and a CPU Unit of unit version 3.0 or later is also required).
- \*6. The Modbus-RTU Slave function is enabled only for Serial Communications Units of unit version 1.3 and later.
- \*7. This unit cannot be used, with the Machine Automation Controller NJ-series.

### **Accessories**

Model	Accessories	Specifications		
CJ1W-SCU22	2 Serial Port (RS-232C) Connector	Connector set for serial port connection (D-SUB 9-pin male connector)		
CJ1W-SCU32	2 Serial Port (RS-422A/485) Connector	Terminal Block Connector (FMC1.5/5-STF-3.5AU by Phoenix Contact)		
CJ1W-SCU42	1 Serial Port (RS-232C) Connector	Connector set for serial port connection (D-SUB 9-pin male connector)		
	1 Serial Port (RS-422A/485) Connector	Terminal Block Connector (FMC1.5/5-STF-3.5AU by Phoenix Contact)		
CJ1W-SCU21-V1 CJ1W-SCU31-V1 CJ1W-SCU41-V1	2 Serial Port (RS-232C) Connector	Connector set for serial port connection (D-SUB 9-pin male connector)		

### **Mountable Racks**

Model		NJ system		CJ system (CJ1, CJ2)		CP1H system	NSJ system	
		CPU Rack *4	Expansion Rack *4	CPU Rack	Expansion Backplane	CP1H PLC	NSJ Controller	Expansion Backplane
CJ1W-SCU22	Unit version 2.0		10 Units	- 10 Units *1 (	10 Units *2 (per Expansion Backplane)	2 Units *3	Not supported	10 Units *2 (per Expansion Backplane)
CJ1W-SCU32	Unit version 2.0	10 Units	(per Expansion Backplane)					
CJ1W-SCU42	Unit version 2.0							
CJ1W-SCU21-V1	Unit version 1.3							
CJ1W-SCU31-V1	Unit version 1.3	Not su	Not supported					
CJ1W-SCU41-V1	Unit version 1.3							

Note: It may not be possible to mount this many Units to a Rack depending on the current consumption of the other Units.

- \*1. This is the number of Units for a CJ2H-CPÚ6⊟ CJ2H CPU Unit (without EtherNet/IP) and a CJ1W-PA205⊟ or CJ1W-PD025 Power Supply Unit. (When not using NT-AL001)
- \*2. This is the number of Units for a CJ1W-PA205□ or CJ1W-PD025 Power Supply Unit. \*3. A CP1W-EXT01 CJ Unit Adaptor is required
- \*4. A total of up to 16 Units, including all other CPU Bus Units.

# **Specifications**

Item		Description							
Device name		Serial Communications Unit							
Classification		CPU Bus Unit							
Model number		CJ1W-SCU22	CJ1W-SCU32	CJ1W-SCU42	CJ1W-SCU21-V1	CJ1W-SCU31-V1	CJ1W-SCU41-V1		
Serial ports	Port 1	RS-232C	RS-422A/485	RS-422A/485	RS-232C	RS-422A/485	RS-422A/485		
	Port 2	RS-232C	RS-422A/485	RS-232C	RS-232C	RS-422A/485	RS-232C		
	Port 1		acro, Serial Gateway,			nacro, NT Link, or loop	pback test can be		
Protocol	Port 2	Modbus-RTU Slave, loopback test , or 1:1 Host Link can be selected for each port. *1 *2			selected for each port.  • Unit Ver. 1.2 or later also supports Serial Gateway, no-protocol, and 1:1 Host Link modes. (Note: The Serial Gateway car also be executed in protocol macro mode.) *1  • Unit Ver. 1.3 or later also supports Modbus-RTU slave mode				
	CPU Unit	None					_		
	CPU Rack		nits, including all other	CPU Bus Units. No					
Number of mountable Units	Expansion Rack	mounted in one of the CJ2H-CPU6 - EIP CJ2H-CPU6 - CJ2H Slots 0 to 4 CJ1M-CPU - CP	nal interrupt task is use e following slots on the CPU Unit: Slots 0 to 3 M-CPU□□ or CJ1G/H-	e ĆPU Rack. } CPU□□H CPU Unit:	A total of up to 16 Units, including all other CPU Bus Units. No restrictions on the mounting location.				
Data exchange	Ordinary refreshing of software switches and status	Allocated 25 words o	f the 25 words in the 0	CPU Bus Unit CIO Are	a (constant data excha	ange with the CPU Ui	nit)		
with the CPU Unit	Transfer from the CPU Unit set by the system	Of the CPU Bus Unit DM Area, each serial port is allocated 10 words (total 20 words).  Data is transferred from the CPU Unit at the following times:  • Startup or restart  • Ladder instruction: STUP(237)  • Port Settings Changing Flag turns ON (Auxiliary Area)							
Simple Backup Function		CPU Unit's Memory	Card. The backed-up	an be used to backup t data can be restored o with the CJ1-H and C	r compared.	ta in the Serial Comm	unications Unit to the		
Current consumpt	tion *3	280mA+x	400mA	360mA+x	280mA+x	380mA	380mA+x		
Weight		160g Max.	120g Max.	140g Max.	110g Max.	110g Max.	110g Max.		
General specificat	tions	Conforms to general	specifications for CJ S	Serise.					

<sup>\*1.</sup> Serial Gateway: The Serial Gateway can also be executed in protocol macro mode.

\*2. No-protocol: An external interrupt task can be executed when data is received in No-protocol Mode. If the CJ2H CPU Units with unit version 1.1 or later and CJ2M CPU Units is used, the high-speed communications instructions (DRXDU(261) and DTXDU(262)) can also be used.

\*3. The current consumption is for one Serial Communications Unit. When an NT-AL001 Link Adapter is connected to the Serial Communications Unit, power is supplied to the Link Adapter from the Unit. A current consumption of 150 mA must be added for each Link Adapter that is connected. In the above specifications, "x" indicates that 150 mA must be added for each port to which an NT-AL001 Link Adapter is connected to provide the required 5-V power supply.

# **Protocol Specifications**

### **Host Link Specifications**

Item			Description				
Communications mode	Half-duplex (Full-duplex for sla	ve-initiated communica	tions)				
Synchronous mode	Start-stop synchronization (asy	tart-stop synchronization (asynchronous mode)					
Baud rate *1		RS-232C port and RS-422A/485 ports: ,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200/230,400 bps *2 Default setting: 9,600 bps					
Communications distance *1	RS-232C port : 15 m max. *3  RS-422A/485 Port : • CJ1W-SCU□1-V1  500 m max. (total cable length: 500 m max., T-branch branch lines: 10 m max.) • CJ1W-SCU□2  1,200 m max. (total cable length: 1,200 m max., Multidrop connections are possible. However, maximum cable length is 500 m if the NT-AL001 is used for RS-422A-485 connections.)						
Connection configuration	RS-232C port : 1:1 (1:N (N RS-422A/485 port : 1:N (N = 3		ossible using an Converting Link Adapters.)				
Number of connected Units	32 Units max. (unit numbers 0	to 31; unit number 0 is	set for 1:1 connection)				
Frame structure	C-mode commands	Header: @, address: (host link unit number) 0 to 31 (BCD), data: header code + text, error ch code: FCS, terminator: * +CR					
Frame structure	FINS commands	Header: @, address: (host link unit number) 0 to 31 (BCD), data: header code (always "FA") + FINS header + FINS command + text, error check code: FCS, terminator: * +CR					
Error check codes	Vertical parity: Even, odd. or no FCS (horizontal parity converte						
	Command flow	Commands	Contents				
		C-mode commands	1:1 or 1:N communications with directly connected Controller *4				
Command flow and support	Host computer to Controller	FINS commands (in Host Link protocol)	1:1 or 1:N communications with directly connected Controller.				
	Controller to host computer	FINS commands (in Host Link protocol)	Communications using SEND(090), RECV(098), and CMND(490) from CPU Unit. *5				

### **Protocol Macro Function Specifications**

lte	em	Description			
Number of protocols	20 max.	Can be created and registered with the Protocol Support Tool (CX-Protocol).			
Number of sequences	1,000 max.				
Number of sequences		60 max.			
Per protocol	Number of messages	300 max.			
	Number of reception matrixes	100 max.			
Sequence execution condition	on	Using the CPU Unit's PMCR (260) instruction (spec	cifying the sequence number)		
Communications mode		Half-duplex or full-duplex			
Synchronous mode		Start-stop synchronization (asynchronous mode)			
Baud rate *1		RS-232C port and RS-422A/485 ports: 1,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200/230,400 bps Default setting: 9,600 bps *2			
Communications distance *1	ı	RS-232C port : 15 m max. RS-422A/485 port :  • CJ1W-SCU□1-V1  500 m max. (total cable length: 500 m max., T-branch branch lines: 10 m max.)  • CJ1W-SCU□2  1,200 m max. (total cable length: 1,200 m max., Multidrop connections are possible. However, maximum cable length is 500 m if the NT-AL001 is used for RS-422A-485 connections.)			
Connection configuration		RS-232C port : 1:1 (1:N (N = 32 Units max.) is possible using a Converting Link Adapter.) RS-422A/485 port : 1:N (N = 32 Units max.)			
Number of connected Units		32 Units max. (unit numbers 0 to 31; unit number 0 is set for 1:1 connection)			
Maximum number of data exchange words between	Operand setting	250 words	Including the word that specifies the number of words (1 word)		
Controller and protocol	Link word setting	500 words	O1, O2, I1, and I2: 500 words total		
macro function	Direct setting	500 words	Maximum number of words per data attribute		

<sup>\*1.</sup> Confirm the baud rates and communications distance supported by connected devices.
\*2. The CJ1W-SCU□2 is required for communications at 230,400 bps.
\*3. The maximum cable length for RS-232C is 15 m. The RS-232C standard, however, does not cover baud rates above 19.2 Kbps. Refer to the manual for the device being connected to confirm support.
\*4. The specified frame format must be prepared on the host computer and then sent.
\*5. The host computer must interpret the commands and return a response in the correct format.
Connection between the host computer and Controller must be 1:1.

lte		Description								
100	Number of steps pe	r	'							
	sequence		16 max.							
	Transmission contro parameters	ol	X-on/X-off flow, RS/CS flow, delimiter control, or contention control, and modem control can be selected.							
			Scan notif	Scan notification: Writes the receive data to I/O memory during CPU Unit scanning.						
	Response notification	Response notification		Scan method (fixed) Support						
Sequence contents (step common parameters)	method (operand)		Interrupt r	notification		Not support				
, , ,			Interrupt r	notification for red	ception case number	Not suppprt				
	Monitoring time duri send/receive proces	_			pletion, or send complet 0 s, 0.1 to 9.9 s, 1 to 99 s					
	Link word setting		Communi	cations Unit refre	eshing.	Unit and the Serial Comstoring receive data and	· ·			
	Commands				e only (RECV), send and ON (OPEN), or ER-OFF	receive (SEND&RECV), (CLOSE)	, wait (WAIT), reception			
	Repeat counter		1 to 255 ti	imes						
	Retry count		0 to 9 (On	ly when the com	mand is SEND&RECV)					
	Send wait time				, 1 to 99 s, or 1 to 99 mir is SEND or SEND&REC					
	With or without resp write (operand)				receive data is stored in the receive data is stored in the receive or not to store the receive or not to store the receive data.					
Step contents	Next processing	When a step has ended normally, End (sequence completed), Next (proceed to the next step No.), Goto (go to the specified step No.), or Abort (interrupt the step and terminate that sequence) can be selected.								
	Error processing		When a step has ended abnormally, End, Next, Goto, or Abort can be selected.							
	Send message		Data sent to the specified address when the command is SEND or SEND&RECV.			Consists of a header, address, length, data,				
	Receive message		Data sent from the specified address when the command is RECV or SEND&RECV.			error check code, and terminator.				
	Reception matrix		When the command is RECV or SEND&RECV, sets the expected receive messages (15 max.), and switches to the next processing according to the message received.			Specifies the receive messages and the next processing for each of cases No. 00 to No. 15. Of the maximum 16 cases, one case must be set as "Other" in the receive messages (in addition to the set receive messages).				
	Header and terminator data attributes	Con- stant	ASCII data, hexadecimal data, or control code							
		Con- stant	ASCII data, hexadecimal data, or control code (with an address, no control code is possible)							
			No conversion, conversion to ASCII data, or conversion to hexadecimal data (the read/write direction can be specified)							
			Designa- tion method	(X, Y) X: Effective add Y: Data size (1	dress (where read from, to 1.000) *4	or where written to)				
				,	Word read	Specify using the 3rd operand of the PMCR(260) instruction.				
Message unit contents	Data attributes of				(I/O memory to send data)	Specify using a link word.				
	addresses and data in send/receive	Vari-		Word		I/O memory direct designation	Set leading address + n (The linear expression			
	messages	able	x	designation	Word write	Specify using the 4th operand of the PMCR(260) instruction.	aN + b, including repeat counter N, is also possible for n.)			
					(receive data to I/O memory)	Specify using a link word.				
						I/O memory direct designation				
				Wild card	*	Any data or address ca (only in receive message				
				Repeat counter	N					

5

	tem			Description					
				Linear expression including repeat counter	aN+b	a: 0 to 1000; b: 1 to 100 N: Repeat counter valu			
	Data attributes of			Wild card	*	Can be received regardless of the length (only in receive messages)			
	addresses and data in send/receive messages	Vari- able	Υ		Word read (I/O memory to send data)	Specify using the 3rd operand of the PMCR(260) instruction.	Set leading address + n (The linear expression		
				Word designa- tion		Specify using a link word.	aN + b, including repeat counter N, is		
Message unit contents						I/O memory direct designation	also possible for n.)		
	Error check codes	LRC, LRC2, CRC-CCITT, CRC-16, SUM, SUM1, and SUM2 can be calculated.							
	Maximum length of send/receive message	1,000 bytes. (A maximum length between 200 and 1,000 bytes can be set in the Setup Area.)							
	Maximum number of attributes registered message	96 attributes *5							
	Maximum number of data attributes regist one message	30 attributes *6							
Trace function			A total of up to 1,700 bytes (characters) of time-series data can be traced in send and receive messages.     Changes to the step No. and control signals such as RS and CS can also be traced.						

- \*1. The baud rate and the communications distance sometimes depend on the remote device.
- \*2. A baud rate of 57,600 bps can be selected when using Unit Ver. 1.2 or later (115,200 bps is not possible). The CJ1W-SCU□2 is required for communications at 115,200 or 230,400 bps.
  \*3. Unit Ver. 1.2 or later supports continuous I/O refreshing in addition to the previous on-request I/O refreshing.
- \*4. The data size is the number of bytes on the transmission path.
- \*5. The CX-Protocol can be used to register up to 96 attributes per message.
  \*6. A macro syntax error will occur when the protocol macro is executed if more than 31 write attributes are registered in one message.

Note: When using 2-wire RS-422A/485 communications in Protocol Macro Mode, set only modem controls for the send control parameters, and do not use RS/CS flow controls.

### **Serial Gateway Specifications**

Item	Description
Conversion source	FINS commands (received through network (including Host Link FINS) or CPU bus)
Conversion functions	The received FINS command sent to the Unit's serial port is converted according to the FINS command code as follows:  2803 hex: FIN header removed and converted to Compo-Way/F command.  2804 hex: FIN header removed and converted to Modbus-RTU command.  2805 hex: FIN header removed and converted to Modbus-ASCII command.  The converted command is sent to the serial port.  When the received FINS command is sent to the Unit (user-specified FINS command code), the FINS command is enclosed in a Host Link header and terminator.
Converted format	CompoWay/F commands     Modbus-RTU commands     Modbus-ASCII commands     Host Link FINS commands
Enabled serial communications mode	Serial Gateway mode or protocol macro mode
Queuing functions	Up to five FINS commands can be converted and then queued for processing.
Protocol macro execution processing	When a FINS command is received during protocol macro execution, the Serial Gateway is executed using an interrupt between steps in the communications sequence. If the next step is a RECEIVE command, the Serial Gateway will not be executed until the next step. For other conditions, the interrupt is executed immediately. *1
Response timeout monitoring	The time is monitored from when the message is converted into the specified protocol using the Serial Gateway until the response is received (in Serial Gateway mode or protocol macro mode).  Default: 5 s (setting range: 0.1 to 25.5 s) *2
Send start timeout monitoring	The time is monitored from when the FINS command is received until it is converted into the specified protocol and starts to be sent (in protocol macro mode only).  Default: 5 s (setting range: 0.1 to 25.5 s) *3
Send delay	The time can be set from when the message is converted into another protocol using Serial Gateway conversion until the data is actually sent. (Serial Gateway or protocol macro mode)  Default: 0 s (setting range: 0.01 to 300.00 s)

- \*1. The reception buffer is cleared during Serial Gateway execution.
  - The Serial Gateway can be prohibited in protocol macro mode by turning ON the Serial Gateway Prohibit Switch in the CIO Area.
- When a timeout occurs, the FINS end code (0205 hex: Response timeout) is returned to the source of the FINS command and a response is received after a timeout occurs.
- \*3. When a timeout occurs, the FINS end code (0204 hex: Remote node busy) is returned to the source of the FINS command. The send processing will not be executed and the received FINS command will be discarded.

### **No-protocol Specifications**

Item		Description					
Communications mode	Full-duplex						
Baud rate *1	RS-232C port and RS-422A/48 Default setting: 9,600 bps	5 ports: 1,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200/230,400 bps *2					
Communications distance *1	CJ1W-SCU  1,200 m max. (total cable length)	RS-422A/485 port :  • CJ1W-SCU□1-V1  500 m max. (total cable length: 500 m max., T-branch branch lines: 10 m max.)					
Messages (communications frame structure)	Data only (without start code     Start code + data     Data + end code     Start code + data + end code     Data + CR + LF     Start code + data + CR + LF     Start code + data + CR + LF  Set in allocated DM Area (The start code can be included)	*					
	Start code	None or 00 to FF hex					
	End code	None, 00 to FF hex, or CR + LF					
	Number of receive data bytes during reception	Set the number of receive data bytes between 1 and 256 bytes (according to the DM Area settings) when frame structure 1 or 2 above is used.					
Sending messages	TXDU(256) instruction *3						
Receiving messages	RXDU(255) instructions *3						
Maximum message length	Sending and receiving: Up to 2	59 bytes including the start code and end code (up to 256 bytes excluding start/end codes)					
Data conversion	No conversion						
Communications protocol	None						
Message delay time	When the TXD (236), TXDU (256) instruction is executed, after the send delay time, the data is sent from the port. *3 0 to 300 s (0 to 300,000 ms) (Can be set in 10-ms units depending on the DM Area settings)						
Receive counter	The number of data bytes (0 to	256) received at the port can be counted.					
Reception buffer clear timing	CJ1W-SCU□1-V1     The reception buffer is cleared immediately after executing the RXD(235)/RXDU(255) instruction     CJ1W-SCU□2     With the DRXDU(261) instruction, you can specify whether the reception buffers will be cleared or not in a setting in the DM Area words allocated to the Unit. *3						

\*1. The baud rate and the communications distance sometimes depend on the remote device.
\*2. The CJ1W-SCU□2 is required for communications at 115,200 or 230,400 bps.
\*3. The DTXDU (262) and DRXDU (261) instructions can be used only when a CJ1W-SCU□2 Serial Communications Unit is connected to the CJ2H CPU Units with unit version 1.1 or later and CJ2M CPU Units.

### **Modbus-RTU Specifications**

Item	Description					
Mode	Modbus-RTU slave mode *1					
Baud rate	1,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200/230,400 bps *2 Default: 19,200 bps					
Data length	8 bits					
Parity	Odd, even, or none Default: Even					
Stop bits	Odd or even parity :1 bit No parity :2 bits					
Address setting range	1 to 247 (broadcasting: 0)					
Frame format	Slave address: 1 byte Function code: 1 byte Data : 0 to 252 bytes CRC code : 2 bytes					

\*1. Modbus-ASCII mode is not supported.

\*2. The CJ1W-SCU□2 is required for communications at 230,400 bps.

# **Supported Commands**

Function code (hexadecimal)	Function	Modbus name
01	Reads multiple bits from the CIO, Work, Holding, or Auxiliary Area of I/O memory.	Read Coils
02	Reads multiple bits from the CIO Area of I/O memory.	Read Discrete Inputs
03	Reads multiple words from the DM or EM Area of I/O memory.	Read Holding Registers
04	Reads multiple words from the CIO, Work, Holding, or Auxiliary Area of I/O memory.	Read Input Registers
05	Writes a bit in I/O memory.	Write Single Coil
06	Writes a word in the DM or EM Area of I/O memory.	Write Single Register
08	Executes an echoback test.	Diagnostic
0F	Writes multiple bits in I/O memory.	Write Multiple Coils
10	Writes multiple words in the DM or EM Area of I/O memory.	Write Multiple Registers

# **Unit Version and Manufacturing Dates/Lot Numbers**

### CJ1W-SCU□1-V1

Classification	Туре	Model	May 2004	June 2004	November 2005
		CJ1W-SCU21-V1	Per-Ver 1.2	Unit version 1.2	Unit version 1.3
<b>CPU Bus Units</b>		(Lot No:040617 and later)	) Onit version 1.3		
		CJ1W-SCU31-V1	_	_	Unit version 1.3 *
Support	CX-Programmer	WS02-CXPC1-EV□	Ver.4.0 or earlier	Ver.5.0	Ver.6.1
Software	CX-Protocol	WS02-PSTC1-E	Ver.1.4 or earlier	Ver.1.5	Ver.1.7

<sup>\*</sup> Available April, 2006

### CJ1W-SCU□2

Classification	on Type Model		September 2009	
	0 1 1 0 1 11	CJ1W-SCU22		
<b>CPU Bus Units</b>	Serial Communications Units	CJ1W-SCU32	Unit version 2.0	
		CJ1W-SCU42		
Support	CX-Programmer	WS02-CXPC□-V□	Ver.8.3	
Software	CX-Protocol	WS02-PSTC1-E	Ver.1.9	

# **Function Support by Unit Version**

### **Function Support by Unit Version 2.0**

		Product	Unit version 2.0
			CJ1W-SCU22
CJ Ser	ies	Serial Communications Units	CJ1W-SCU32
			CJ1W-SCU42
	Serial gates	way	Supported
		1:1 links	Supported
	Host Link	Host Link compatible device selection	Supported
S	No-protoco	i	Supported
Functions		Link word specification data exchange timing	On-request I/O refreshing Continuous I/O refreshing
J.	Protocol macro	Reception buffer processing for PMCR(260) instruction execution	Select to clear or hold contents.
		Baud rate (bps)	230,400 supported.
	Standard s	ystem protocol additions	Supported
	MODBUS s	lave protocol added	Supported

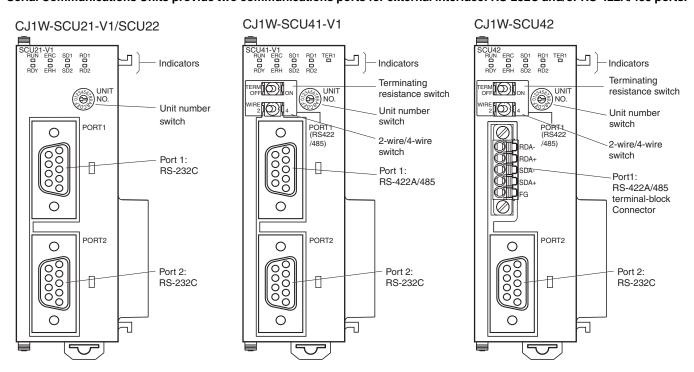
# Function Support by Unit Version 1.2 and Unit Version 1.3

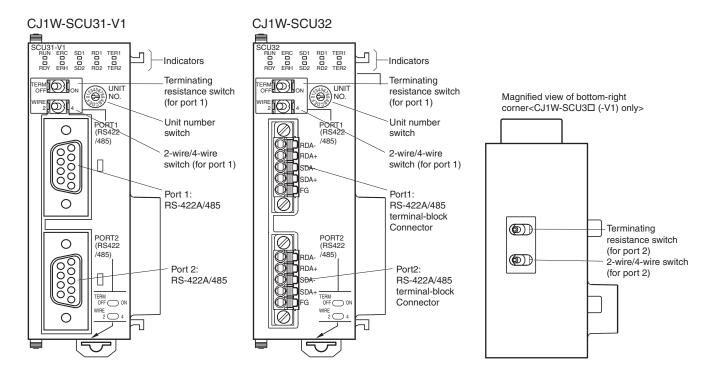
		Product	Earlier version (pre-ver. 1.2)	Unit version 1.2	Unit version 1.3
			CJ1W-SCU21	CJ1W-SCU21-V1	CJ1W-SCU21-V1 (Same as pre-ver. 1.2)
CJ Ser	ies	Serial Communications Units	_	_	CJ1W-SCU31-V1
			CJ1W-SCU41	CJ1W-SCU41-V1	CJ1W-SCU41-V1 (Same as pre-ver. 1.2)
	Serial gates	way	Not supported	Supported	Supported (Same as pre-ver. 1.2)
		1:1 links	Not supported	Supported	Supported (Same as pre-ver. 1.2)
	Host Link	Host Link compatible device selection	Not supported	Supported	Supported (Same as pre-ver. 1.2)
	No-protoco	I	Not supported	Supported	Supported (Same as pre-ver. 1.2)
Functions		Link word specification data exchange timing	On-request I/O refreshing only	On-request I/O refreshing Continuous I/O refreshing	On-request I/O refreshing Continuous I/O refreshing (Same as pre-ver. 1.2)
π	Protocol macro	Reception buffer processing for PMCR(260) instruction execution	Clearing only	Select to clear or hold contents.	Select to clear or hold contents. (Same as pre-ver. 1.2)
		Baud rate (bps)	38,400 max. (57,600 and 115,200 not supported)	57,600 supported.	57,600 supported. (Same as pre-ver. 1.2)
	Standard s	ystem protocol additions	Not supported	Supported	Supported (Same as pre-ver. 1.2)
	MODBUS s	lave protocol added	_	_	Supported

Note: Make sure that a CJ-series CPU Unit with unit version 3.0 or later is used when using no-protocol mode.

### **External Interface**

### Serial Communications Units provide two communications ports for external interface: RS-232C and/or RS-422A/485 ports.





# Specifications of the RS-232C port and RS-422A/485 port

### RS-232C Port

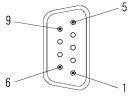
Protocol	Host Link	Protocol macro	1:N NT Links		
Communications method	Full-duplex	Full-duplex or half-duplex	Half-duplex		
Synchronization	Start-stop synchronization (asynchronous)				
Baud rate	1,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200/230,400 bps *1 Standard NT link or high-speed NT link *2				
Connections	1:1 (1:N is possible using Link Adapters)				
Transmission distance	15 m max. *3				
Interface	Complies with EIA RS-232C				

Protocol	No-protocol	Serial Gateway	Modbus-RTU		
Communications method	Full-duplex	_	_		
Synchronization	_	_	_		
Baud rate	1,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200/ 230,400 bps *1				
Connections	1:1 (1:N is possible using Link Adapters)				
Transmission distance	15 m max. *3				
Interface	Complies with EIA RS-232C				

<sup>\*1.</sup> The CJ1W-SCU□2 is required for communications at 230,400 bps.

### **Connector Pin Layout**

Pin No.	Abbreviation	Signal name	I/O
1 *1	FG	Shield	_
2	SD	Send data	Output
3	RD	Receive data	Input
4 *2	RTS (RS)	Request to send	Output
5 *2	CTS (CS)	Clear to send	Input
6 *3	5V	Power supply	_
7 *2	DSR (DR)	Data set ready *4	Input
8 *2	DTR (ER)	Data terminal ready	Output
9	SG	Signal ground	_
Shell *1	FG	Shield	_



- \*1. Pin No. 1 and the shell are connected to the ground terminal (GR) of the Power Supply Unit inside of the Serial Communications Unit. Therefore, the cable shield can be grounded by grounding the GR of the Power Supply Unit.

  The status of the RTS (RS), CTS (CS), DSR (DR), and DTR (ER) signals can be monitored in the words allocated in the CIO Area. For details,
- refer to 2-3 I/O Memory Allocations.

\*3. Pin 6 (5 V) is required when the NT-AL001 Link Adapter is connected.

\*4. The DSR signal is used to monitor the signal cable. It can also be used as a CD (carrier detect) signal. (The DSR signal does not affect system operation, and is available for use by the user.)

Note: Do not connect the 5-V power supply of Pin 6 to any external device other than an NT-AL001 Link Adapter. Otherwise, the external device and the Serial Communications Unit may be damaged.

The following cables are provided for connection to NT-AL001 Link Adapters. We recommend that these cables be used.

NT-AL001 connecting cables: XW2Z-070T-1 (0.7 m)

XW2Z-200T-1 (2 m)

### **Applicable Connectors**

Plug: XM2A-0901 (manufactured by OMRON) or equivalent Hood: XM2S-0911-E (manufactured by OMRON) or equivalent One plug and one hood are provided for each port.

### **Recommended Cables**

UL2426 AWG28 × 5P IFS-RVV-SB (UL-approved, Fujikura Ltd.) AWG28 × 5P IFVV-SB (not UL-approved, Fujikura Ltd.)

UL2426-SB (MA) 5P × 28AWG (7/0.127) (UL-approved, Hitachi Cable, Ltd.) CO-MA-VV-SB 5P × 28AWG (7/0.127) (not UL-approved, Hitachi Cable, Ltd.) Cable length: 15 m max.

<sup>\*2.</sup> High-speed NT link is only available with Serial Communications Units manufactured on or after December 20th, 1999. With earlier models, only standard NT link is available.

The maximum cable length for RS-232C is 15 m. The RS-232C standard, however, does not cover baud rates above 19.2 Kbps. Refer to the manual for the device being connected to confirm support.

### RS-422A/485 Port

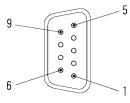
Protocol	Host Link	Protocol macro	1:N NT Links		
Communications method	Full-duplex	Full-duplex or half-duplex	Half-duplex		
Synchronization	Start-stop synchronous (asynchronous)				
Baud rate	1,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200/230,400 bps *1 Standard NT link or high-speed NT link				
Connections	1:N (N: 32 Units max.) 1:N (N: 8 Units max.)				
Transmission distance	500 m max. (The total combined cable length is 500 m max. Tbranch lines must be a maximum of 10 m long.)				
Interface	Complies with EIA RS-485				

Protocol	No-protocol	Serial Gateway	Modbus-RTU		
Communications method	Full-duplex	_	_		
Synchronization	_	_	_		
Baud rate	1,200/2,400/4,800/9,600/19,200/38,400/57,600/115,200/ 230,400 bps *1				
Connections	1:N (N: 32 Units max.)				
Transmission distance	500 m max. (The total combined cable length is 500 m max. Tbranch lines must be a maximum of 10 m long.)				
Interface	Complies with EIA RS-485				

<sup>\*1.</sup> The CJ1W-SCU□2 is required for communications at 230,400 bps.

# Connector Pin Layout (CJ1W-SCU31-V1/SCU41-V1)

Pin No.	Abbreviation	Signal name	I/O
1 *1	SDA	Send data -	Output
2 *1	SDB	Send data +	Output
3	NC	Not used	_
4	NC	Not used	_
5	NC	Not used	_
6 *1	RDA	Receive data -	Input
7	NC	Not used	_
8 *1	RDB	Receive data +	Input
9	NC	Not used	_
Shell *2	FG	Shield	_



Note: With SDA/B or RDA/B, the signal polarity may be reversed by the remote device. Be sure to check the polarity before wiring.

### **Applicable Connectors**

Plug: XM2A-0901 (OMRON) or equivalent Hood: XM2S-0911-E (OMRON) or equivalent One plug and one hood are provided for each port.

### **Recommended Cables**

CO-HC-ESV-3P × 7/0.2 (manufactured by Hirakawa Hewtech Corp.)

Cable length: 500 m max. (The total combined cable length is 500 m max. Tbranch lines must be a maximum of 10 m long.)

<sup>\*2.</sup> High-speed NT link is only available with Serial Communications Units manufactured on or after December 20th, 1999. With earlier models, only standard NT link is available.

<sup>\*1.</sup> When 2-wire connections are used, use Pins 1 and 2, or Pins 6 and 8.

<sup>\*2.</sup> The shell is connected to the ground terminal (GR) of the Power Supply Unit inside of the Serial Communications Unit. Therefore, the cable shield can be grounded by grounding the GR of the Power Supply Unit.

### Connector Pin Layout (CJ1W-SCU32/SCU42)

Pin No.	Abbreviation	Signal name	I/O
1 *1	RDA	Receive data-	Input
2 *1	RDB	Receive data+	Input
3 *1	SDA	Send data-	Output
4 *1	SDB	Send data+	Output
5 *2	FG	Shield	_



Note: The signal names SDA/B and RDA/B do not always have the same polarity as that shown above. Check the polarity of the external device before making connections.

### **Applicable Connectors**

Plug: FMC 1.5/5-STF-3.5AU (by Phoenix Contact)

### **Recommended Cable**

CO-HC-ESV-3P×7/0.2 (by Hirakawa Hewtech) Cable length: 1,200 m max. (multidrop connections)

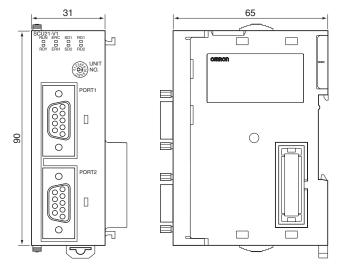
<sup>\*1.</sup> For 2-wire connections, use either pins 1 and 2 or pins 3 and 4.

\*2. Pin 5 (the shield) is connected to the GR terminal on the Power Supply Unit though the Serial Communications Unit. The cable shield can thus be grounded by grounding the GR terminal of the Power Supply Unit.

Dimensions (Unit: mm)

### CJ1W-SCU22 CJ1W-SCU21-V1/SCU31-V1/SCU41-V1

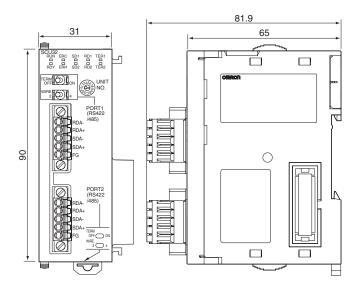




Note: The appearance varies with the model.

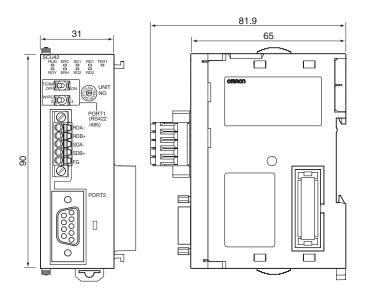
### CJ1W-SCU32





### CJ1W-SCU42





# **Related Manuals**

Manual name	Cat. No.	Model numbers	Application	Description
CJ-series Serial Communications Units Operation Manual for NJ-series CPU Unit	W494	CJ1W-SCU□2	Learning about the functions to use Serial Communications Unit and Boards with NJ series configuration (hardware and serial communications mode).  Learning about the standard system protocol with OMRON components	Describes the use of Serial Communications Unit and Boards with NJ-series configuration (hardware and serial communications mode), including the usage of standard system protocols. Refer to the CX-Protocol Operation Manual (Cat. No. W344) for the details of functions of protocol macros made by users.
Serial Communications Boards and Serial Communications Units Operation Manual	W336	CS1W-SCB□1-V1 CS1W-SCU□1-V1 CJ1W-SCU□1-V1 CJ1W-SCU□2	Learning about the functions to use Serial Communications Unit and Boards (hardware and serial communications mode) .  Learning about the standard system protocol with OMRON components	Describes the use of Serial Communications Unit and Boards with CJ-series configuration (hardware and serial communications mode), including the usage of standard system protocols. Refer to the CX-Protocol Operation Manual (Cat. No. W344) for the details of functions of protocol macros made by users.
CX-Protocol Operation Manual	W344		Learning about the use of CX-Protocol, which enables protocol macro creation.  Learning about the details of functions of protocol macros made by users.	Describes 1) the use of the CX-Protocol, and 2) details on protocol macros. Use this manual to create protocol macros for serial communications, or to customize the standard system protocol.
CX-Integrator CS/CJ/CP/NSJ- series Network Configuration Tool Operation Manual	W464		Learning how to configure networks (data links, routing tables, Communications Unit settings, etc.).	Describes operating procedures for the CX-Integrator.

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