



Open Network for High-Speed Control



High Speed Sensor & Actuator Network

- » Extremely Fast Communications
- » Powerful Diagnostic Information
- » Simple Installation & Low Cost Solutions

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 PLCs)
Baud rate	4 Mbps, 3 Mbps, 1.5 Mbps, 93.75 kbps
Modulation	Base-band
Coding	Manchester code
Error control	Manchester code rules, CRC
Communications media	<p>The following media can be used.</p> <ul style="list-style-type: none"> • Round cable I • Round cable II • Flat Cable I • Flat Cable II <p>Note: Round cable I, round cable II, Flat Cable I, and Flat Cable II 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.</p>
Communications distance and wiring	Refer to <i>Cable Types, Baud Rates, and Maximum Distances</i> in the <i>Master Unit Operation Manual</i> .
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 be 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 Slave 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) <ul style="list-style-type: none"> • Power is supplied from the Master Unit or Repeater Units.
Connection forms	Standard or Sheathed Flat Cable 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

CompoNet Master Units

CS/CJ-series CompoNet Master Units4
 ■CS1W/CJ1W-CRM21

■ **Standards** Certification is given as of March 2009. Enquire for application conditions.

	North America: UL				North America: CSA	Nippon Kaiji Kyokai (Japan's classification society)	Lloyd's Register of Shipping (Britain's classification society)
	For the USA	For the USA, hazardous locations	For the USA and Canada	For the USA and Canada, hazardous locations			
Name of standard	UL	UL (Class I Div2)	cULus	cULus (Class I Dis2)	CSA	NK	LR
CompoNet-compliant standard	UL508	UL1604	cULus508	cULus1604			
	↓	↓	↓	↓	↓	↓	↓
Abbreviation in this catalog	U	U1	UC	UC1	C	N	L

CS/CJ-series CompoNet Master Units

CS1W/CJ1W-CRM21

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

The CS/CJ-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 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

Name	Specifications		Number of unit numbers allocated	Power consumption (A)			Model	Standards
	Types of communications	Maximum number of I/O points per Master Unit		5-V system	24-V system	26-V system		
CS1 Special I/O Unit (See note.)	<ul style="list-style-type: none"> • 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
CJ1 Special I/O Unit (See note.)	<ul style="list-style-type: none"> • 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

Note: 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.

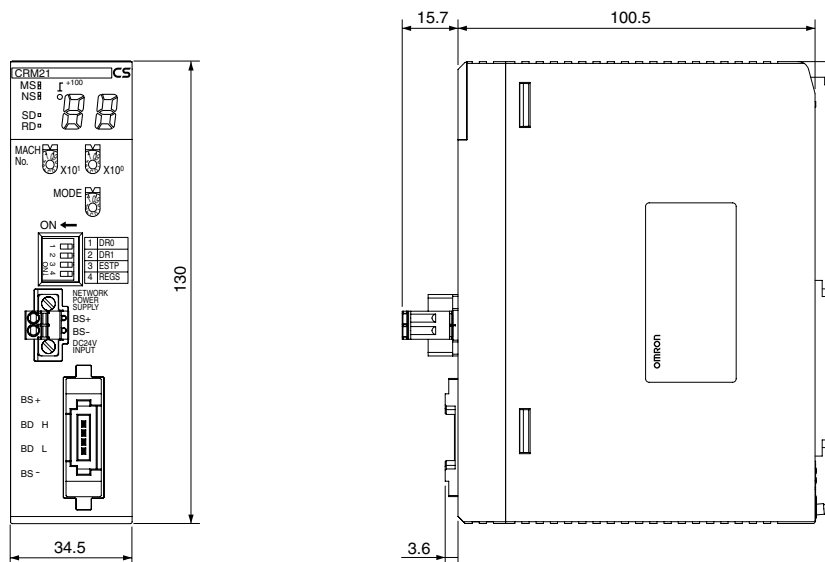
Master Unit Specifications

Item	Model	CS1W-CRM21	CJ1W-CRM21
Applicable PLC		All CS-series PLCs	All CJ-series PLCs
Unit classification		CS-series Special I/O Unit	CJ-series Special I/O Unit
Current consumption (Power supplied from PLC's Power Supply Unit)		400 mA max. at 5 VDC	
Communications power supply connector		One connector for the communications power supply is required for a Slave or Repeater Unit on the trunk line when using Round Cable II, Flat Cable I, or Flat Cable II. (See note.)	
Communications power supply connector 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: 80 Units Two word numbers assigned: 48 Units Four word numbers assigned: 24 Units Eight word numbers assigned: 12 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
Mounting location		According to CS/CJ-series Special I/O Unit specifications.	
Communications power ON/OFF monitoring		The ON/OFF status of the communications power supply can be detected at the communications power supply connector.	
Data stored in Master Unit (built-in EEPROM)		1) The following device parameters: <ul style="list-style-type: none"> • 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 PLC 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/s ² in X, Y, and Z directions for 80 min each (sweep time of 8 min × 10 sweeps = 80 min)	
Shock resistance		196 m/s ² (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		190 g max. (Master Unit only)	130 g max. (Master Unit only)

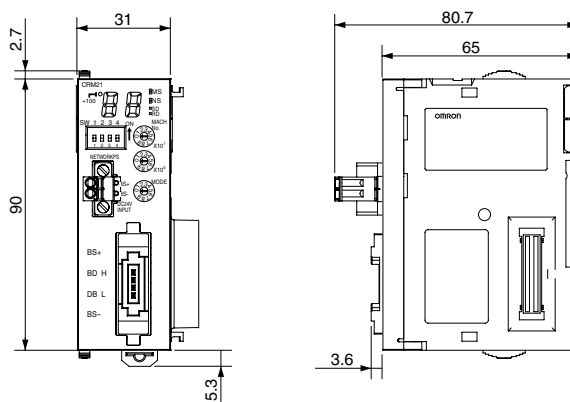
Note: Communications power does not need to be supplied to the Master Unit.

Dimensions

CJ1W-CRM21



CS1W-CRM21



CompoNet Slave Unit CRT1 Series/ CompoNet Repeater Unit CRS1 Series

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Digital I/O Slave Units with Screw Terminal Blocks (2-tier Terminal Block/Relay Output/SSR Output)	23
■CRT1-□D08(-1)/□D16(-1)/ROS□/ROF□	
Digital I/O Slave Units with Screw Terminal Blocks (3-tier Terminal Block)	30
■CRT1-□D08TA(-1)/□D16TA(-1)/□D08TAH(-1)/□D16TAH(-1)	
Digital I/O Slave Units with e-CON Connectors	35
■CRT1-□D16S(-1)/□D32S(-1)/□D16SH(-1)/□D32SH(-1)	
Digital I/O Slave Units with e-CON Connector (Vertical type)	42
■CRT1-VID08S(-1)/VOD08S(-1)	
Digital I/O Slave Units with MIL Connector (Vertical type)	44
■CRT1-VID16ML(-1)/VOD16ML(-1)	
Digital I/O Slave Units with MIL Connector (Vertical type)	46
■CRT1-VID32ML(-1)/VOD32ML(-1)/VMD32ML(-1)	
Digital I/O Slaves Units with Clamp Terminals	49
■CRT1-□D08SL(-1)/□D16SL(-1)	
Analog I/O Slave Units	53
■CRT1-AD04/DA02	
Analog I/O Slave Units with MIL Connectors/e-CON Connectors	55
■CRT1-VAD04□□/-VDA02□□	
Temperature Input Units	59
■CRT1-TS04T/-TS04P	
Expansion Units	62
■XWT-ID08(-1)/OD08(-1)/ID16(-1)/OD16(-1)	
SmartSlice CompoNet Communications Unit	65
■GRT1-CRT	
Bit Slave Units with e-CON Connectors	68
■CRT1B-□D02S(-1)/□D02SP(-1)/ID04SP(-1)	
Bit Slave Units with Clamp Terminal Blocks	72
■CRT1B-MD04SLP(-1)	
Repeater Unit	74
■CRS1-RPT01	
Sensor Communications Unit	77
■ZS-CRT	

■ **Standards** Certification is given as of February 2009. Enquire for application conditions.

	North America: UL				North America: CSA	Nippon Kaiji Kyokai (Japan's classification society)	Lloyd's Register of Shipping (Britain's classification society)
	For the USA	For the USA, hazardous locations	For the USA and Canada	For the USA and Canada, hazardous locations			
Name of standard	UL	UL (Class I Div2)	cULus	cULus (Class I Dis2)	CSA	NK	LR
CompoNet-compliant standard	UL508	UL1604	cULus508	cULus1604			
Abbreviation in this catalog	U	U1	UC	UC1	C	N	L

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 powerful 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

Function	Unit				
	Digital I/O Slave Units				
	2-tier Terminal block				
	CRT1-□D08(-1)		CRT1-□D16(-1)		
	Input Units	Output Units	Input Units	Output Units	I/O Units
Operation Time Monitor	Yes				
Contact Operation Monitor (See note.)	Yes				
Total ON Time Monitor (See note.)	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	---				
Unconnected Line Detection	---				
Load Short-circuit Detection	---				
Disconnected Line Detection	---				
Removable Terminal Block Structure	Yes				
Expansion Using Expansion Units	---		Yes		
Scaling	---				
Last Maintenance Date	Yes				
Cumulative Counter	---				
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

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Unit	Digital I/O Slave Units			
		2-tier Terminal block			
		CRT1-ROS08	CRT1-ROS16	CRT1-ROF08	CRT1-ROF16
		Output Units		Output Units	
Operation Time Monitor		Yes		Yes	
Contact Operation Monitor (See note.)		Yes		Yes	
Total ON Time Monitor (See note.)		Yes		Yes	
Automatic Baud Rate Detection		Yes		Yes	
Unit Conduction Time Monitor		Yes		Yes	
Naming Units		Yes		Yes	
Naming Connected Devices		Yes		Yes	
Network Power Voltage Monitor		Yes		Yes	
I/O Power Status Monitor		---		---	
Communications Error History Monitor		Yes		Yes	
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		Yes	
Expansion Using Expansion Units		---	Yes	---	Yes
Scaling		---		---	
Last Maintenance Date		Yes		Yes	
Cumulative Counter		---		---	
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			---		

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Digital I/O Slave Units			
	3-tier Terminal block			
	CRT1-□D08TA(-1) (without Short-circuit and Disconnected Line Detection)		CRT1-□D08TAH(-1) (with Short-circuit and Disconnected Line Detection)	
	Input Units	Output Units	Input Units	Output Units
Operation Time Monitor	Yes			
Contact Operation Monitor (See note.)	Yes			
Total ON Time Monitor (See note.)	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	---
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	Yes			
Expansion Using Expansion Units	---			
Scaling	---			
Last Maintenance Date	Yes			
Cumulative Counter	---			
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	---			

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Unit					
	Digital I/O Slave Units					
	3-tier Terminal block					
	CRT1-□D16TA(-1) (without Short-circuit and Disconnected Line Detection)			CRT1-□D16TAH(-1) (with Short-circuit and Disconnected Line Detection)		
	Input Units	Output Units	I/O Units	Input Units	Output Units	I/O units
Operation Time Monitor	Yes					
Contact Operation Monitor (See note.)	Yes					
Total ON Time Monitor (See note.)	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	---	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	Yes					
Expansion Using Expansion Units	---					
Scaling	---					
Last Maintenance Date	Yes					
Cumulative Counter	---					
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	---					

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Digital I/O Slave Units					
	Units with e-CON Connectors					
	CRT1-□D16S(-1) (without Short-circuit and Disconnected Line Detection)			CRT1-□D16SH(-1) (with Short-circuit and Disconnected Line Detection)		
	Input Units	Output Units	I/O Units	Input Units	Output Units	I/O units
Operation Time Monitor	Yes					
Contact Operation Monitor (See note.)	Yes					
Total ON Time Monitor (See note.)	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	Yes	---	Yes	Yes
Communications Error History Monitor	Yes					
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	---					
Expansion Using Expansion Units	---					
Scaling	---					
Last Maintenance Date	Yes					
Cumulative Counter	---					
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	---					

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Unit					
	Digital I/O Slave Units					
	Units with e-CON Connectors					
	CRT1-□D32S(-1) (without Short-circuit and Disconnected Line Detection)			CRT1-□D32SH(-1) (with Short-circuit and Disconnected Line Detection)		
	Input Units	Output Units	I/O Units	Input Units	Output Units	I/O units
Operation Time Monitor	Yes					
Contact Operation Monitor (See note.)	Yes					
Total ON Time Monitor (See note.)	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	Yes	---	Yes	Yes
Communications Error History Monitor	Yes					
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	---					
Expansion Using Expansion Units	---					
Scaling	---					
Last Maintenance Date	Yes					
Cumulative Counter	---					
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	---					

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Unit	
	Digital I/O Slave Units	
	Units with e-CON Connectors	
	CRT1-V□D08S(-1)	
	Input Units	Output Units
Operation Time Monitor	Yes	
Contact Operation Monitor (See note.)	Yes	
Total ON Time Monitor (See note.)	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	---
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	---	
Disconnected Line Detection	---	
Removable Terminal Block Structure	---	
Expansion Using Expansion Units	---	
Scaling	---	
Last Maintenance Date	Yes	
Cumulative Counter	---	
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	---	

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Unit	Digital I/O Slave Units				
		Units with MIL Connectors				
		CRT1-V□D16ML(-1)		CRT1-V□D32ML(-1)		
		Input Units	Output Units	Input Units	Output Units	I/O Units
Operation Time Monitor				Yes		
Contact Operation Monitor (See note.)				Yes		
Total ON Time Monitor (See note.)				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				---		
Unconnected Line Detection				---		
Load Short-circuit Detection				---		
Disconnected Line Detection				---		
Removable Terminal Block Structure				---		
Expansion Using Expansion Units				---		
Scaling				---		
Last Maintenance Date				Yes		
Cumulative Counter				---		
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				---		

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Unit				
	Digital I/O Slave Units				
	Units with Screw-less Clamp Terminals				
	CRT1-□D08SL(-1)		CRT1-□D16SL(-1)		
	Input Units	Output Units	Input Units	Output Units	I/O Units
Operation Time Monitor			Yes		
Contact Operation Monitor (See note.)			Yes		
Total ON Time Monitor (See note.)			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			---		
Unconnected Line Detection			---		
Load Short-circuit Detection			---		
Disconnected Line Detection			---		
Removable Terminal Block Structure			Yes		
Expansion Using Expansion Units			---		
Scaling			---		
Last Maintenance Date			Yes		
Cumulative Counter			---		
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			---		

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Unit		Analog I/O Slave Units			
	2-tier Terminal block		Units with e-CON Connectors		Units with MIL Connectors	
	CRT1-AD04 CRT1-DA02		CRT1-VAD04S CRT1-VDA02S		CRT1-VAD04ML CRT1-VDA02ML	
	Input Units	Output Units	Input Units	Output Units	Input Units	Output Units
Operation Time Monitor	---					
Contact Operation Monitor (See note.)	---					
Total ON Time Monitor (See note.)	---					
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	---					
Communications Error History Monitor	Yes					
Input Filter	---					
Communications Error Output	---	Yes	---	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	Yes	---	Yes	---	Yes	---
Removable Terminal Block Structure	Yes					
Expansion Using Expansion Units	---					
Scaling	Yes					
Last Maintenance Date	Yes					
Cumulative Counter	Yes					
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	Yes					
Top/Valley Count	---					
Temperature Range Total Time Count	---					
Input Temperature Variation Detection	---					
Input Error Detection Disable Function	---					

Note: The Contact Operation Monitor and the Total ON Time Monitor cannot be used at the same time for the same contact.

Yes: Supported, ---: Not supported

Function	Unit	Bit Slave Units					Repeater Unit
	Temperature Input Units	CRT1B-□D02S(-1)		CRT1B-□D0□SP(-1) CRT1B-MD04SLP(-1)			CRS1-RPT01
	CRT1-TS04T CRT1-TS04P	Input Units	Output Units	Input Units	Output Units	I/O units	
Operation Time Monitor	---	Yes					---
Contact Operation Monitor (See note.)	---	Yes					---
Total ON Time Monitor (See note.)	---	Yes					---
Automatic Baud Rate Detection	Yes	Yes					Yes
Unit Conduction Time Monitor	Yes	Yes					Yes
Naming Units	Yes	Yes					Yes
Naming Connected Devices	Yes	Yes					---
Network Power Voltage Monitor	Yes	Yes					Yes
I/O Power Status Monitor	---	---					---
Communications Error History Monitor	Yes	Yes					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	---	Yes	---	Yes	---	Yes	---
Unconnected Line Detection	---	---					---
Load Short-circuit Detection	---	---	Yes	---	Yes	Yes	---
Disconnected Line Detection	Yes	---					---
Removable Terminal Block Structure	Yes	---					---
Expansion Using Expansion Units	---	---					---
Scaling	Yes	---					---
Last Maintenance Date	Yes	Yes					Yes
Cumulative Counter	Yes	---					---
Moving Average	Yes	---					---
Setting the Number of AD Conversion Points	---	---					---
Rate of Change	Yes	---					---
Comparator	Yes	---					---
Peak/Bottom Hold	Yes	---					---
Top/Valley Hold	Yes	---					---
User Adjustment	Yes	---					---
Top/Valley Count	Yes	---					---
Temperature Range Total Time Count	Yes	---					---
Input Temperature Variation Detection	Yes	---					---
Input Error Detection Disable Function	Yes	---					---

Note: 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?

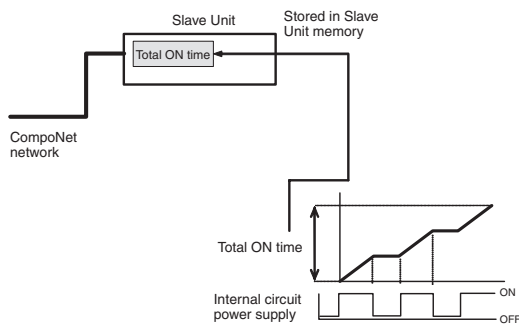
Smart Functions

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.

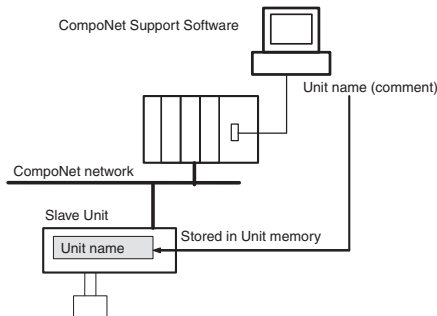
Unit Conduction Time Monitor

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

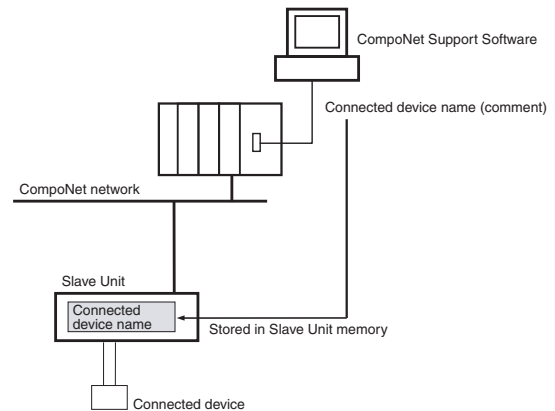
The user can set any name for each Unit (up to 32 characters) as a comment. The name is stored in the Slave Unit memory. The CX-Integrator or explicit messages can be used to read/write the name (i.e., the comment).



Naming Connected Devices

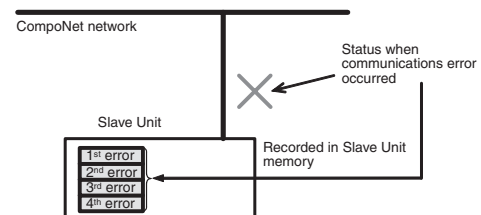
The user can set any name for each I/O contact in the Unit (up to 32 characters).

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.



Communications Error History Monitor

The previous four error history records (communications error codes and the power voltage when the error occurred) can be stored in the Slave Unit memory.



Last Maintenance Date

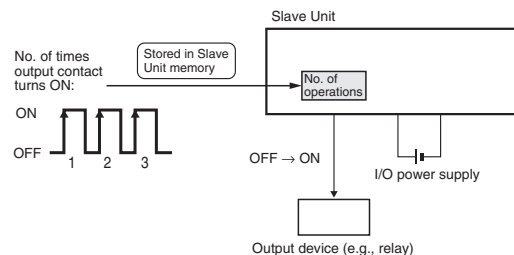
This function can be used to write the date maintenance was last performed in the Slave Unit memory. This makes it easier to decide when the next maintenance should be performed next.

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



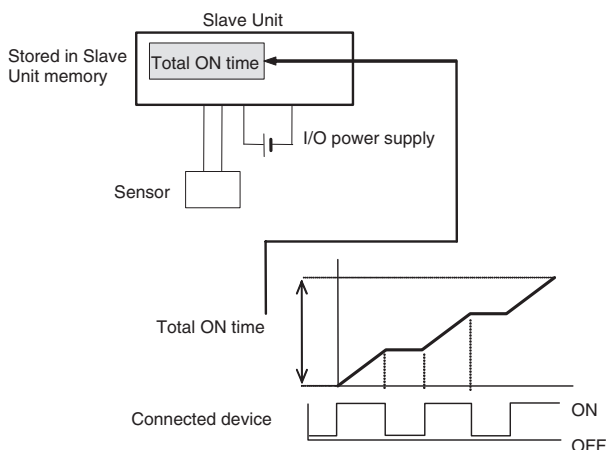
- Note 1.** The contact operation monitor and the total ON time monitor cannot both be used for the same contact at the same time. Select only one of these functions under the *Detection Mode*.
- 2.** This function does not operate if the I/O power is not turned ON.

● 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.

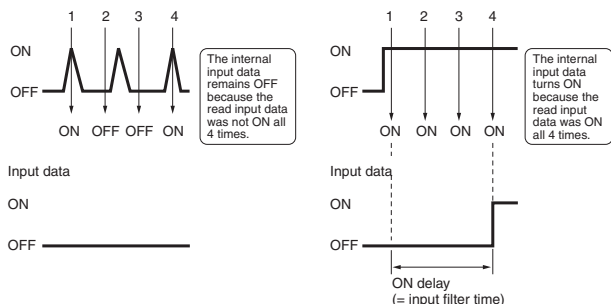
- Measurement time: 0 to 4,294,967,295 s (Stored data: 0000 0000 to FFFF FFFF Hex)
- Measurement unit: s



- 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.
- 3.** The Total ON Time Monitor Function checks at 1 second intervals whether or not the connected device is turned ON. Keep this in mind when measuring total ON times for inputs of less than 1 s.

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

Input values can be read more than once during the set time interval to eliminate data emissions due to noise and switch chattering. An ON delay or OFF delay can also be implemented using this function.



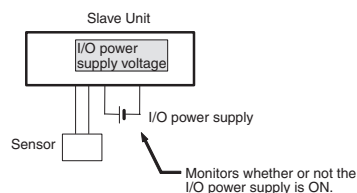
● Error Prevention for Surge Current at Startup (Digital I/O Slave Units and Bit Slave Input Units Only)

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)

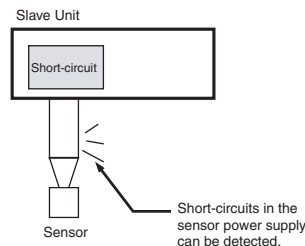
This function monitors the sensor power supply current. If the current is 100 mA or higher per input contact, a power short-circuit is detected.

The I/O power for the Slave Unit turns OFF if a short-circuit is detected for even just one of the contacts being used.

The Slave Unit SHT0 indicator can be used to check whether a power short-circuit has been detected. When a sensor power short-circuit is detected, 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. When the cause of the short-circuit is removed, the Slave Unit is automatically reset, and the power output to the connector that had the short-circuit is turned ON again.

Note: Use a power supply rated 100 W or higher as the communications power supply. A short-circuit is detected if a current of 80 mA or more flows for two inputs in the Unit's sensor power output. The communications power supply may be temporarily cut if a short-circuit occurs. The Slave Unit is automatically restored after the cause of the short-circuit has been removed but external circuits must also be created to ensure safe system operation while the power is disconnected. Use the following formulas as a guide for calculating the sensor current consumption.

- Total network current = Total Unit current consumption + total sensor current consumption
- Communications power capacity used \geq {total network current + (short-circuit detection current = 80 mA)} \times (CompoNet network voltage)



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

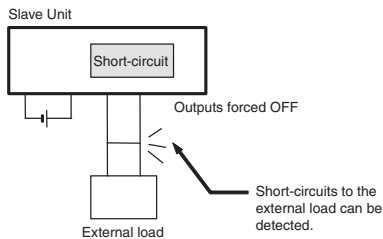
This function monitors the load current for the output section and detects a load short-circuit if the current per contact (or common) exceeds a specific value. When an external load short-circuit is detected, all Unit outputs are turned OFF to prevent damage to the Unit's output circuits.

The I/O power for the Unit turns OFF if a short-circuit is detected for even just one of the contacts being used.

The Slave Unit's SHT0 or SHT1 indicators can be used to check whether an external load short-circuit has been detected. When a load short-circuit is detected, 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.

When the cause of the short-circuit is removed, the Slave Unit is automatically reset, and the power output to the connector for which the short-circuit was detected is turned ON again.

Note: The OMRON S82J-series Power Supply Unit is recommended as the I/O power supply. Load short-circuits may not be detected for power supplies with an inverted L overcurrent protection characteristic. If using a power supply with an inverted L overcurrent protection characteristic, use one rated 100 W or higher.



Performance Specifications

Item	Specification
Communications power supply voltage	14 to 26.4 VDC
I/O power supply voltage	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 ² in X, Y, and Z directions for 80 min each
Shock resistance	150 m/s ² (3 times each in 6 directions on 3 axes)
Dielectric strength	500 VAC (between isolated circuits)
Insulation resistance	20 M Ω 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 (See note.)	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)

Note: Applicable only to Slaves to which screw terminal blocks are mounted.

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.

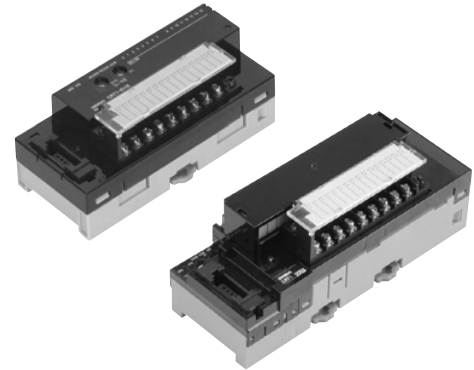
Digital I/O Slave Units with Screw Terminal Blocks (2-tier Terminal Block/Relay Output/SSR Output)

CRT1-□D08(-1)/□D16(-1)/ROS□/ROF□

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			Model	Standards
Two-tier Screw Terminal Block	Inputs	8 inputs	NPN	CRT1-ID08	CE, U, U1
			PNP	CRT1-ID08-1	
	Outputs	8 outputs	NPN	CRT1-OD08	
			PNP	CRT1-OD08-1	
	Inputs	16 inputs	NPN	CRT1-ID16 (See note.)	
			PNP	CRT1-ID16-1 (See note.)	
	Outputs	16 outputs	NPN	CRT1-OD16 (See note.)	
			PNP	CRT1-OD16-1 (See note.)	
Inputs/Outputs	8 inputs/ 8 outputs	NPN	CRT1-MD16		
		PNP	CRT1-MD16-1		
Screw Terminal Block with Relay Outputs	Outputs	8 outputs	Contacts	CRT1-ROS08	CE
		16 outputs		CRT1-ROS16	
Screw Terminal Block with SSR Outputs	Outputs	8 outputs	SSR	CRT1-ROF08	---
		16 outputs		CRT1-ROF16	

Note: 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

● 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/s ² (3 times 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 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/s ² in X, Y, and Z directions for 80 min each
Shock resistance	150 m/s ² (3 times 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 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	Specification	
Model	CRT1-ID08	CRT1-ID08-1
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 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	
Weight	160 g max.	

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

Item	Specification	
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	
Weight	141 g max.	

Output Section Specifications

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

Item	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/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)
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-VDC power supply voltage 55 mA max. for 14-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	Specification	
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/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)
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	
Output handling for communications errors	Hold or clear can be selected. (CX-Integrator)	
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.

● 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 (See note.)
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.

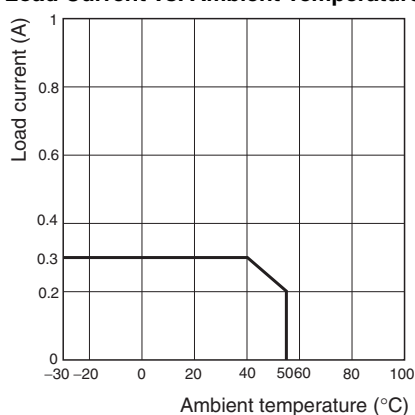
Note: The SSRs cannot be replaced.

● 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-VDC power supply voltage 60 mA max. for 14-VDC power supply voltage	
Weight	170 g max.	

Input Section Specifications

Item	Specification	
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 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)	
Power supply type	Multi-power supply	

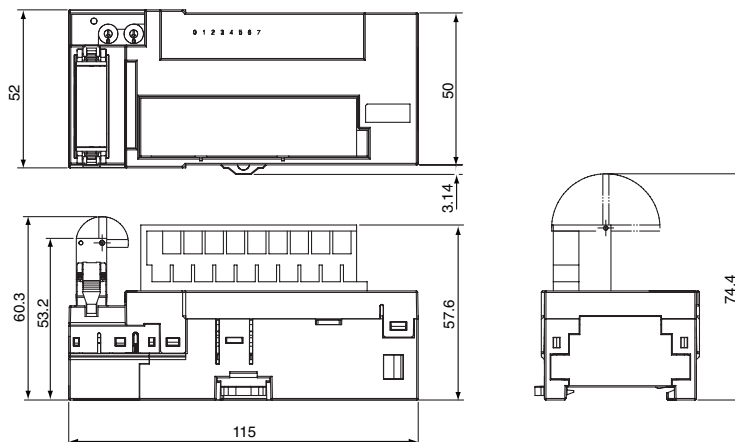
Output Section Specifications

Item	Specification	
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/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)
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)	
Output handling for communications errors	Select either hold or clear from CX-Integrator.	

Dimensions

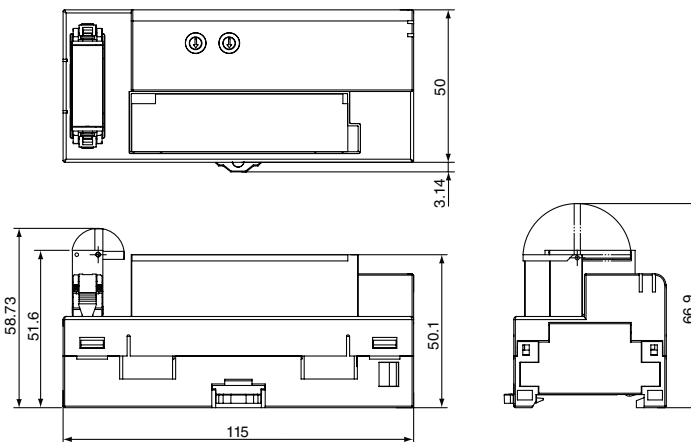
CRT1-ID08 (-1)
 CRT1-OD08 (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



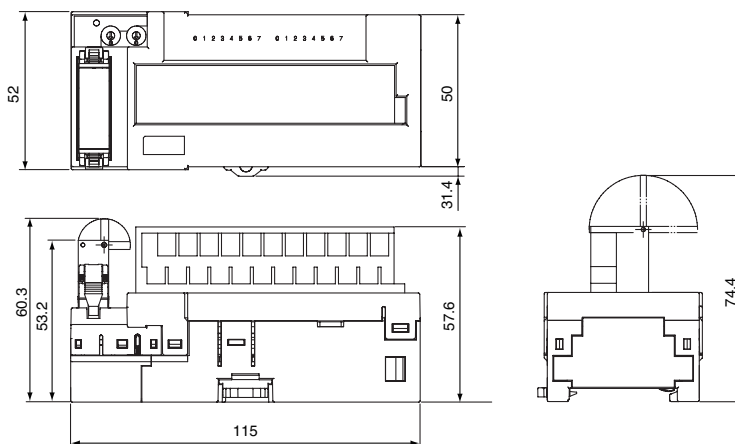
CRT1-ID16 (-1)
 CRT1-OD16 (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



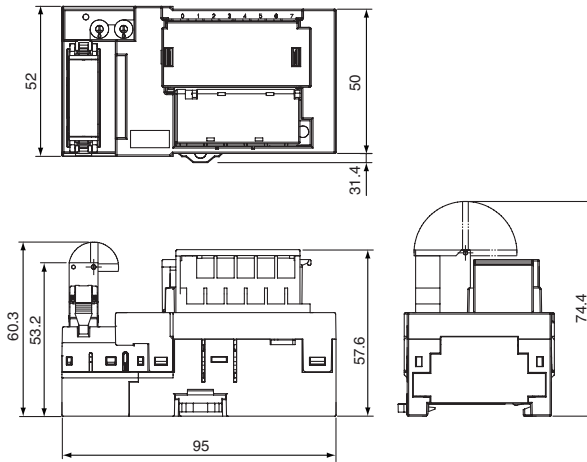
CRT1-MD16 (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



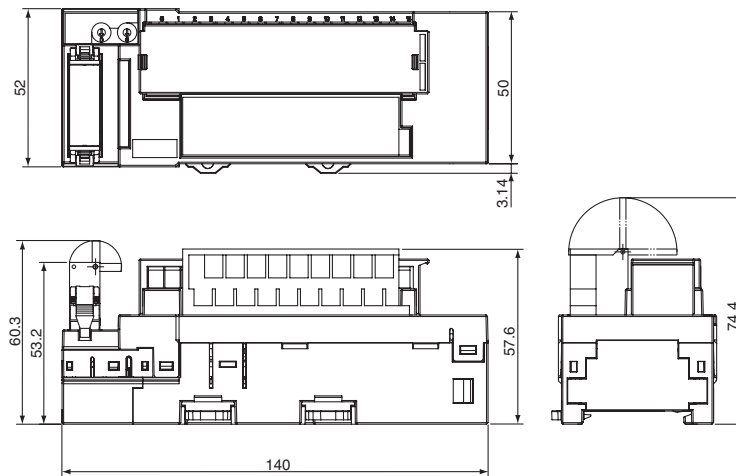
CRT1-ROS08
 CRT1-ROF08

When a DCN4-TB4 Open Type Connectors Is Mounted



CRT1-ROS16
 CRT1-ROF16

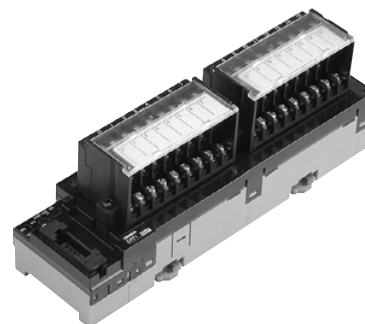
When a DCN4-TB4 Open Type Connectors Is Mounted



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

CRT1-□D08TA(-1)/□D16TA(-1)/□D08TAH(-1)/□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	Specifications			Model	Standards	
Three-tier Screw Terminal Block	Inputs	8 inputs	NPN	CRT1-ID08TA	CE, U, U1	
			PNP			CRT1-ID08TA-1
	Outputs	8 outputs	NPN	CRT1-OD08TA		
			PNP	CRT1-OD08TA-1		
	Inputs	16 inputs	NPN	CRT1-ID16TA		
			PNP	CRT1-ID16TA-1		
	Outputs	16 outputs	NPN	CRT1-OD16TA		
			PNP	CRT1-OD16TA-1		
	Inputs/ Outputs	8 inputs/ 8 outputs	NPN	CRT1-MD16TA		
			PNP	CRT1-MD16TA-1		
	Inputs	8 inputs	NPN	CRT1-ID08TAH		CE
			PNP	CRT1-ID08TAH-1		
	Outputs	8 outputs	NPN	CRT1-OD08TAH		CE, U, U1
			PNP	CRT1-OD08TAH-1		
	Inputs	16 inputs	NPN	CRT1-ID16TAH		CE
			PNP	CRT1-ID16TAH-1		
Outputs	16 outputs	NPN	CRT1-OD16TAH	CE, U, U1		
		PNP	CRT1-OD16TAH-1			
Inputs/ Outputs	8 inputs/ 8 outputs	NPN	CRT1-MD16TAH	CE		
		PNP	CRT1-MD16TAH-1			

Input Section 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.			
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			
Isolation method	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 supply 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.			
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)			
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		40 mA max. for 24-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	
Weight	330 g max.		340 g max.	

Output Section Specifications

● 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			
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			
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
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		40 mA max. for 24-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 power supply voltage 70 mA max. for 14-VDC power supply voltage	
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			
Isolation method	Photocoupler			
Input indicator	LED (yellow)			
Power supply type	Multi-power supply			
I/O power supply current consumption	5 mA max. for 24-VDC power supply voltage		25 mA max. for 24-VDC power supply voltage	

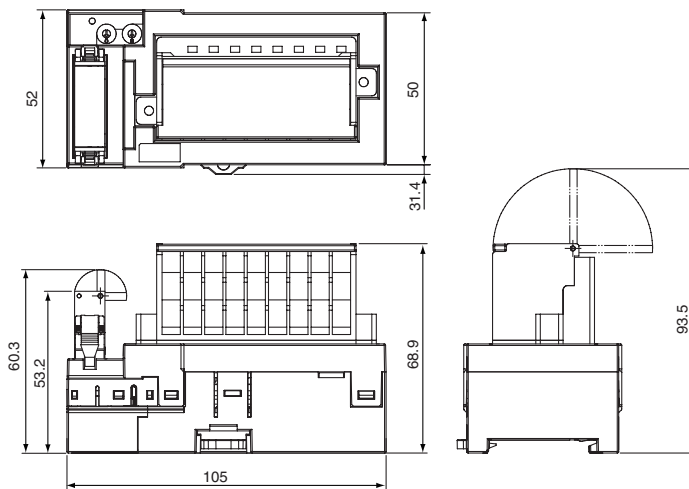
Output Section Specifications

Item	Specification			
Model	CRT1-MD16TA	CRT1-MD16TA-1	CRT1-MD16TAH	CRT1-MD16TAH-1
I/O capacity	8 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.			
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)			
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.			

Dimensions

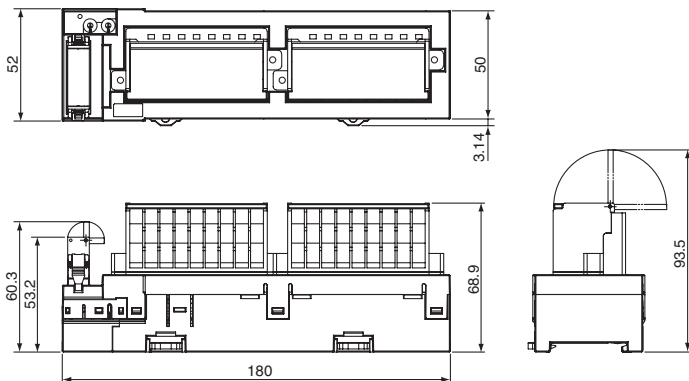
CRT1-ID08TA (-1)
 CRT1-OD08TA(-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



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

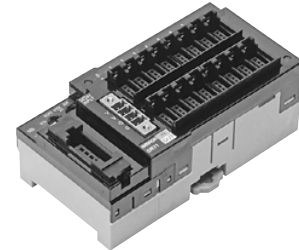
When a DCN4-TB4 Open Type Connectors Is Mounted



Digital I/O Slave Units with e-CON Connectors

CRT1-□D16S(-1)/□D32S(-1)/□D16SH(-1)/□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	Standards
e-CON Connectors	Inputs	16 inputs	NPN	CRT1-ID16S	CE
			PNP		
	Outputs	16 outputs	NPN	CRT1-OD16S	CE, U, U1
			PNP		
	Inputs/ Outputs	8 inputs / 8 outputs	NPN	CRT1-MD16S	CE
			PNP		
	Inputs	32 inputs	NPN	CRT1-ID32S	CE
			PNP		
	Outputs	32 outputs	NPN	CRT1-OD32S	CE, U, U1
			PNP		
	Inputs/ Outputs	16 inputs / 16 outputs	NPN	CRT1-MD32S	CE
			PNP		
	Inputs	16 inputs	NPN	CRT1-ID16SH	CE
			PNP		
	Outputs	16 outputs	NPN	CRT1-OD16SH	CE, U, U1
			PNP		
	Inputs/ Outputs	8 inputs / 8 outputs	NPN	CRT1-MD16SH	CE
			PNP		
	Inputs	32 inputs	NPN	CRT1-ID32SH	CE
			PNP		
	Outputs	32 outputs	NPN	CRT1-OD32SH	CE
			PNP		
	Inputs/ Outputs	16 inputs / 16 outputs	NPN	CRT1-MD32SH	CE
			PNP		

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

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

Input Section 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.			
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)			
Installation	DIN Track			
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	110 mA max. for 24-VDC power supply voltage 125 mA max. for 14-VDC power supply voltage		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	Specification			
Model	CRT1-ID32S	CRT1-ID32S-1	CRT1-ID32SH	CRT1-ID32SH-1
I/O capacity	32 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	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 supply voltage 200 mA max. for 14-VDC power supply voltage		210 mA max. for 24-VDC power supply voltage 235 mA max. for 14-VDC power supply voltage	
Weight	180 g max.			

Output Section Specifications

● Sixteen-point Output Unit

Item	Specification			
Model	CRT1-OD16S	CRT1-OD16S-1	CRT1-OD16SH	CRT1-OD16SH-1
I/O capacity	16 outputs			
Internal I/O common	NPN	PNP	NPN	PNP
Rated output current	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.			
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			
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 power supply voltage 60 mA max. for 14-VDC power supply voltage		40 mA max. for 24-VDC power supply voltage 65 mA max. for 14-VDC power supply voltage	
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	Specification			
Model	CRT1-OD32S	CRT1-OD32S-1	CRT1-OD32SH	CRT1-OD32SH-1
I/O capacity	32 outputs			
Internal I/O common	NPN	PNP	NPN	PNP
Rated output current	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.			
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			
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 supply voltage 80 mA max. for 14-VDC power supply voltage		50 mA max. for 24-VDC power supply voltage 90 mA max. for 14-VDC power supply voltage	
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		60 mA max. for 24-VDC power supply voltage 90 mA max. for 14-VDC power supply voltage	
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			
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	Specification			
Model	CRT1-MD16S	CRT1-MD16S-1	CRT1-MD16SH	CRT1-MD16SH-1
I/O capacity	8 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.			
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			
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.			

● 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	45 mA max. for 24-VDC power supply voltage 70 mA max. for 14-VDC power supply voltage		60 mA max. for 24-VDC power supply voltage 100 mA max. for 14-VDC power supply voltage	
Weight	180 g max.			

Input Section Specifications

Item	Specification			
Model	CRT1-MD32S	CRT1-MD32S-1	CRT1-MD32SH	CRT1-MD32SH-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	1.0 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			

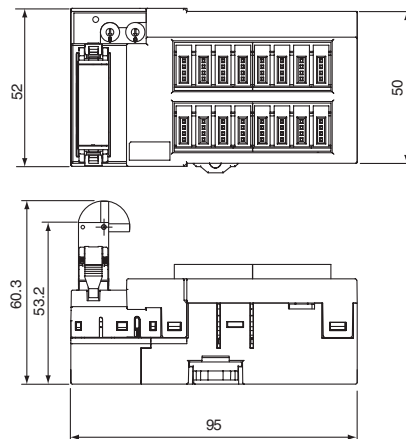
Output Section Specifications

Item	Specification			
Model	CRT1-MD32S	CRT1-MD32S-1	CRT1-MD32SH	CRT1-MD32SH-1
I/O capacity	16 outputs			
Internal I/O common	NPN	PNP	NPN	PNP
Rated output current	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.			
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			
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-VDC power supply voltage
Output handling for communications errors	Select either hold or clear from CX-Integrator.			

Dimensions

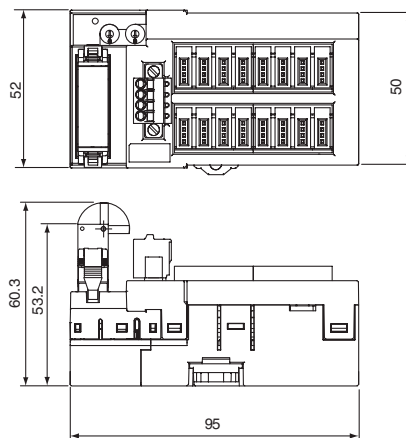
CRT1-ID16S (-1)
 CRT1-ID16SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



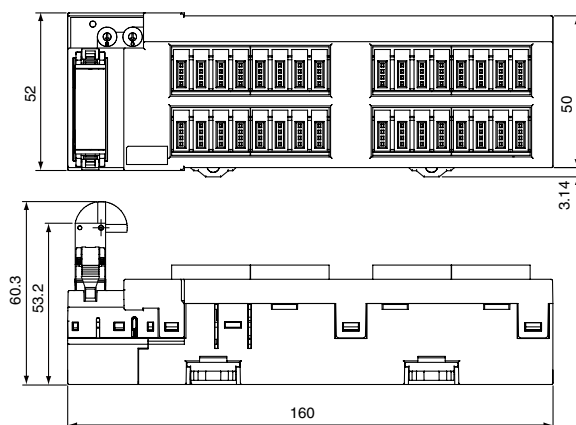
CRT1-MD16S (-1)
 CRT1-MD16SH (-1)
 CRT1-OD16S (-1)
 CRT1-OD16SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



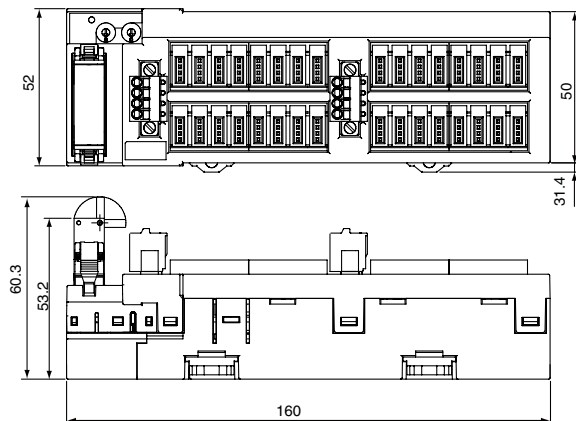
CRT1-ID32S (-1)
 CRT1-ID32SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



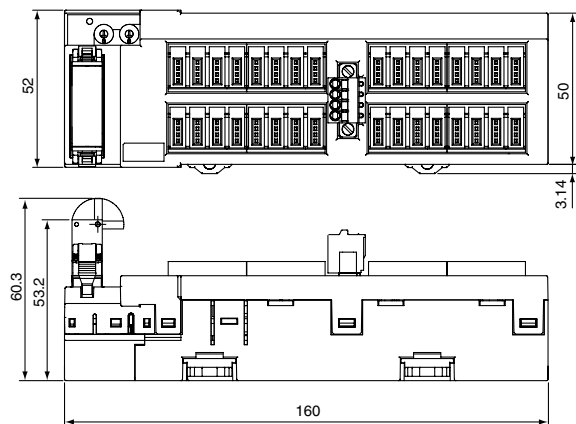
CRT1-OD32S (-1)
 CRT1-OD32SH (-1)

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	Standards	
e-CON Connectors (See note.)	Inputs	8 inputs	NPN	Without Short-circuit and Disconnected Line Detection	CRT1-VID08S	CE
			PNP		CRT1-VID08S-1	
	Outputs	8 outputs	NPN		CRT1-VOD08S	
			PNP		CRT1-VOD08S-1	
Mounting Bracket	Unit with e-CON Connectors CRT1-V□D08S(-1)			CRT1-ATT02	---	

Note: 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.

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-VDC power supply voltage 50 mA max. for 14-VDC power supply voltage	
Weight	80 g max.	

Output Section Specifications

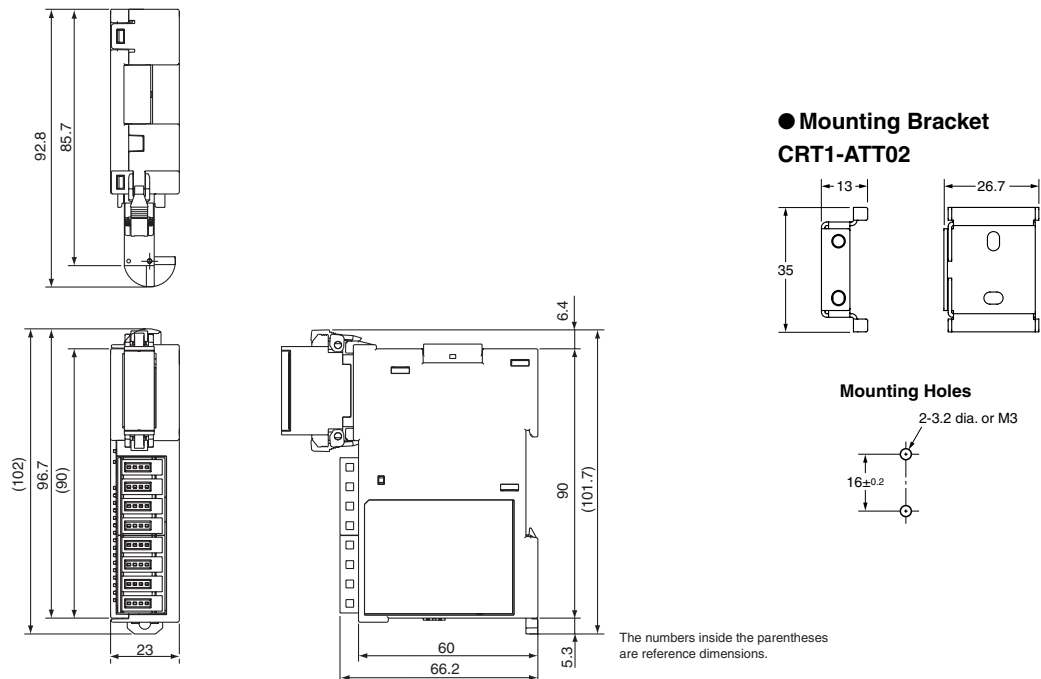
Item	Specification	
Model	CRT1-VOD08S	CRT1-VOD08S-1
I/O capacity	8 outputs	
Internal I/O common	NPN	PNP
Rated output current	0.3 A/output, 2 A/common	
Residual voltage	1.2 V max. (0.3 A DC, between each output terminal and the G terminal)	1.2 V max. (0.3 A DC, between each output terminal and the V terminal)
Leakage current	0.1 mA max.	
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 Mounting 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 start-up 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	Standards	
MIL Connector (See note.)	Inputs	16 inputs	NPN	CRT1-VID16ML	CE
			PNP	CRT1-VID16ML-1	
	Outputs	16 outputs	NPN	CRT1-VOD16ML	
			PNP	CRT1-VOD16ML-1	
Mounting Bracket	Unit with MIL Connectors		CRT1-ATT01	---	

Note: 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.

Input Section Specifications

Item	Specification	
Model	CRT1-VID16ML	CRT1-VID16ML-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 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-1
I/O capacity	16 outputs	
Internal I/O common	NPN	PNP
Rated output current	0.3 A/output, 2 A/common (See note.)	
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.	
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 or Mounting Bracket	
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	
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	70 g max.	

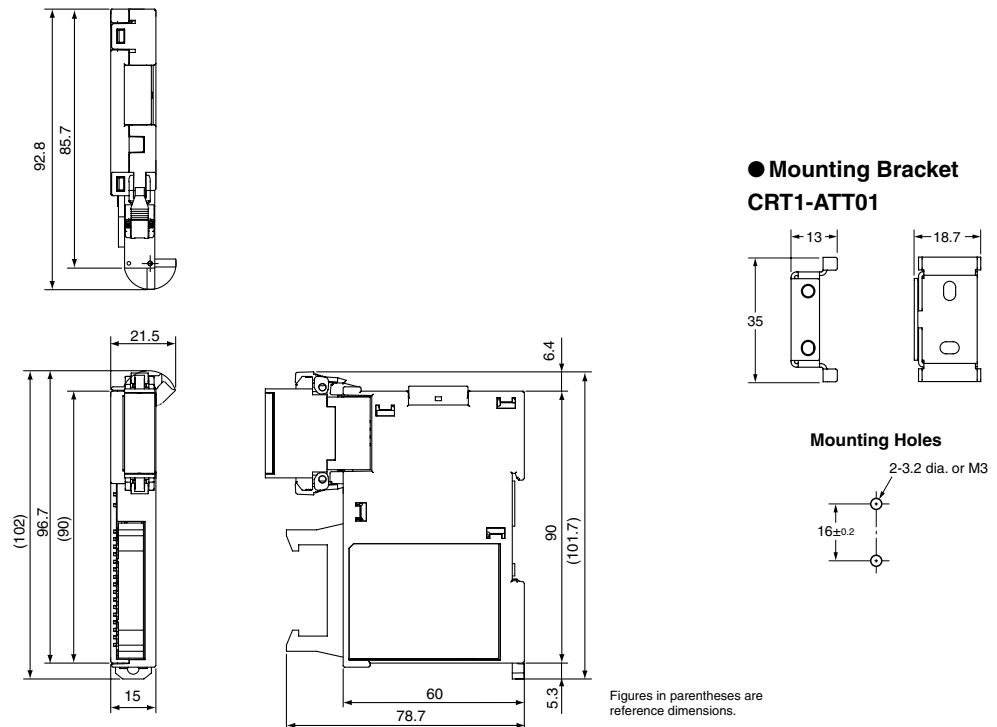
Note: Do not use a total external load current of more than 2 A, and do not use more than 1 A per V terminal or G terminal.

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	Standards
MIL Connector (See note.)	Inputs	32 inputs	NPN	CRT1-VID32ML	CE
			PNP	CRT1-VID32ML-1	
	Outputs	32 outputs	NPN	CRT1-VOD32ML	
			PNP	CRT1-VOD32ML-1	
	Inputs/ Outputs	16 inputs/ 16 outputs	NPN	CRT1-VMD32ML	
			PNP	CRT1-VMD32ML-1	
Mounting Bracket	Unit with MIL Connectors CRT1-V□D32ML(-1)			SRT1-ATT02	---

Note: 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.

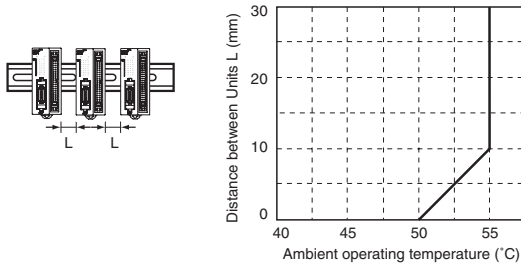
Slave *External I/O Connections* in the appendix for applicable connectors.

Input Section Specifications

Item	Specification	
Model	CRT1-VID32ML	CRT1-VID32ML-1
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. (See note.)	
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.	

Note: 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.



Input and Output Section Specifications

● Sixteen-point Input and Sixteen-point Output Units

Common Specifications

Item	Specification	
Model	CRT1-VMD32ML	CRT1-VMD32ML-1
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.	

Output Section Specifications

Item	Specification	
Model	CRT1-VOD32ML	CRT1-VOD32ML-1
I/O capacity	32 outputs	
Internal I/O common	NPN	PNP
Rated output current	0.3 A/output, 4 A/common (See note.)	
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.	
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 voltage 80 mA max. for 14-VDC power supply voltage	
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.	

Note: 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 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.	

Note: 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	
Internal I/O common	NPN	PNP
Rated output current	0.3 A/output, 2 A/common (See note.)	
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.	
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 supply voltage	
Output handling for communications errors	Select either hold or clear from CX-Integrator.	

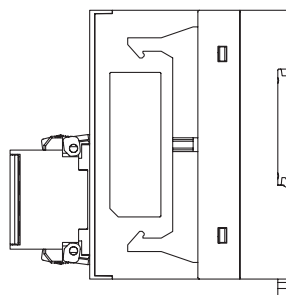
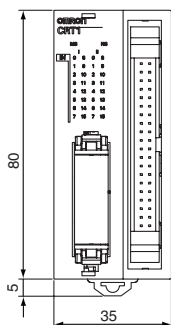
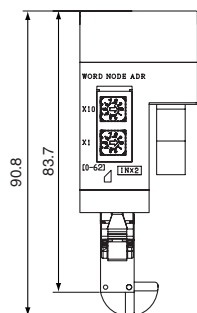
Note: Do not use a total external load current of more than 2 A, and do not use more than 1 A per V terminal or G terminal.

Dimensions

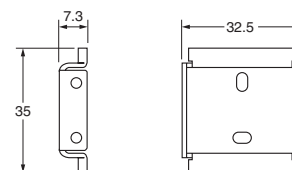
(Unit: mm)

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

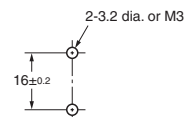
When a DCN4-TB4 Open Type Connectors Is Mounted



● Mounting Bracket
 SRT2-ATT02



Mounting Holes

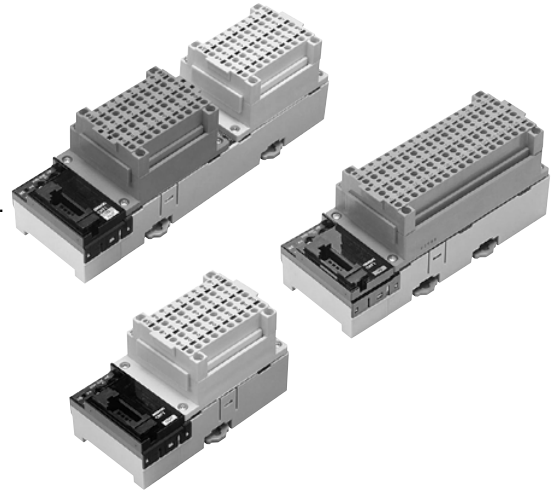


Digital I/O Slaves Units with Clamp Terminals

CRT1-□D08SL(-1)/□D16SL(-1)

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

- Screw-less (M3) design eliminates 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	Specifications		Model	Standards	
Clamp Terminals	Inputs	8 inputs	NPN	CRT1-ID08SL	CE
			PNP	CRT1-ID08SL-1	
	Outputs	8 outputs	NPN	CRT1-OD08SL	
			PNP	CRT1-OD08SL-1	
	Inputs	16 inputs	NPN	CRT1-ID16SL	CE
			PNP	CRT1-ID16SL-1	
	Outputs	16 outputs	NPN	CRT1-OD16SL	
			PNP	CRT1-OD16SL-1	
	Inputs/ Outputs	8 inputs/ 8 outputs	NPN	CRT1-MD16SL	
			PNP	CRT1-MD16SL-1	

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

Input Section Specifications

● Eight-point Input Units

Item	Specification	
Model	CRT1-ID08SL	CRT1-ID08SL-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 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-1
I/O capacity	8 outputs	
Internal I/O common	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)
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-1
I/O capacity	16 outputs	
Internal I/O common	NPN	PNP
Rated output current	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)
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-1
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	

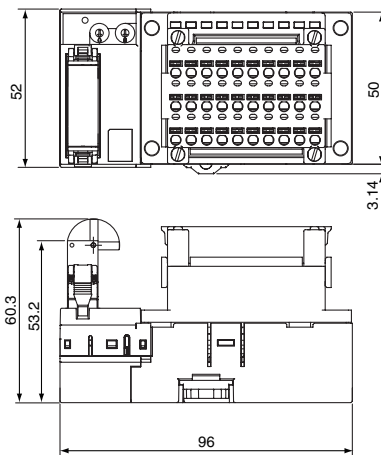
Output Specifications

Item	Specification	
Model	CRT1-MD16SL	CRT1-MD16SL-1
I/O capacity	8 outputs	
Internal I/O common	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)
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

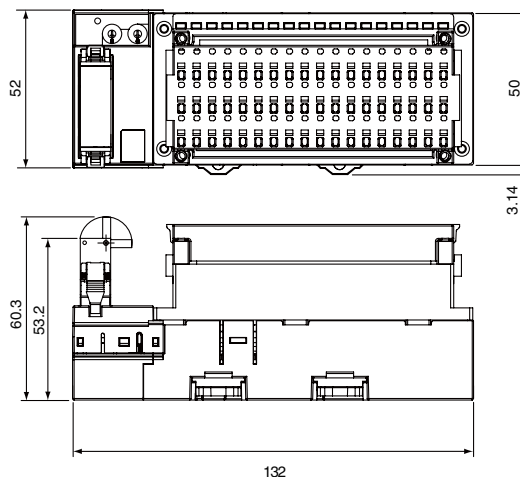
CRT1-ID08SL (-1)
 CRT1-OD08SL (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



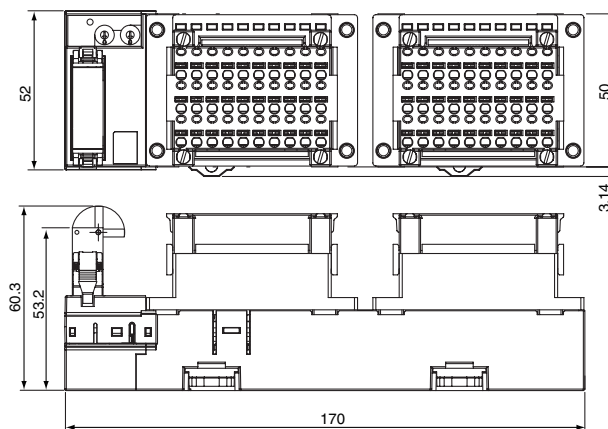
CRT1-ID16SL (-1)
 CRT1-OD16SL (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



CRT1-MD16SL (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



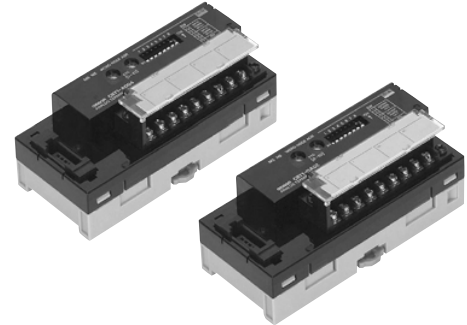
Analog I/O Slave Units

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	Standards
Analog I/O Slave Units (See note.)	Analog inputs	4 inputs	CRT1-AD04	CE, U, U1
	Analog outputs	2 outputs	CRT1-DA02	

Note: 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.

Input Section 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 signal input	±15 V	±30 mA	
Input impedance	1 M Ω min.	Approx. 250 Ω	
Resolution	1/6,000 (full scale)		
Overall accuracy	25°C	±0.3% FS	±0.4% FS
	-10 to 55°C	±0.6% FS	±0.8% FS
Conversion cycle	1 ms/1 points		
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 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

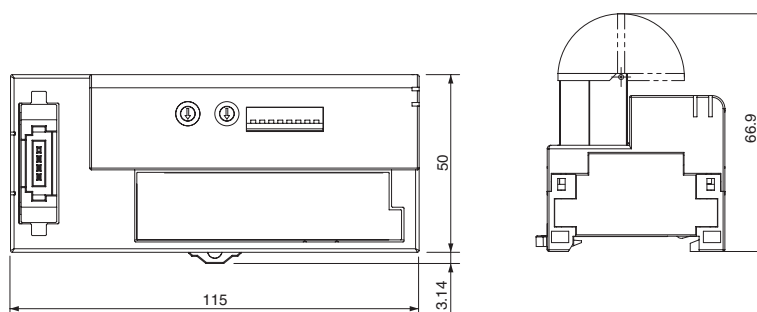
Item	Specification		
		Voltage output	Current output
Model	CRT1-DA02		
Output signal ranges	0 to 5 V 1 to 5 V 0 to 10 V -10 to 10 V		0 to 20 mA 4 to 20 mA
External output allowable load resistance	1 kΩ min.		600 Ω max.
Resolution	1/6,000 (full scale)		
Overall accuracy	25°C	±0.4% FS	±0.4% FS (See note.)
	-10 to 55°C	±0.8% FS	±0.8% FS (See note.)
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) 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		

Note: 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

CRT1-VAD04□□/-VDA02□□

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.



NEW

Ordering Information

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

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

Input Section 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 signal input	±15 V	±30 mA
Input impedance	1 MΩ min.	Approx. 250 Ω
Resolution	1/6,000 (full scale)	
Overall accuracy	25°C	±0.3% FS
	-10 to 55°C	±0.6% 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 signal input	±15 V	±30 mA
Input impedance	1 MΩ min.	Approx. 250 Ω
Resolution	1/6,000 (full scale)	
Overall accuracy	25°C	±0.3% FS
	-10 to 55°C	±0.6% 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 (See note.)	Less than 200 mA (for each CH)	
Weight	85 g max.	

Note: 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 output allowable load resistance	1 kΩ min.	600 Ω max.
Resolution	1/6,000 (full scale)	
Overall accuracy	25°C	±0.4% FS
	-10 to 55°C	±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.	

Note: 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 output allowable load resistance	1 kΩ min.	600 Ω max.
Resolution	1/6,000 (full scale)	
Overall accuracy	25°C	±0.4% FS
	-10 to 55°C	±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.	

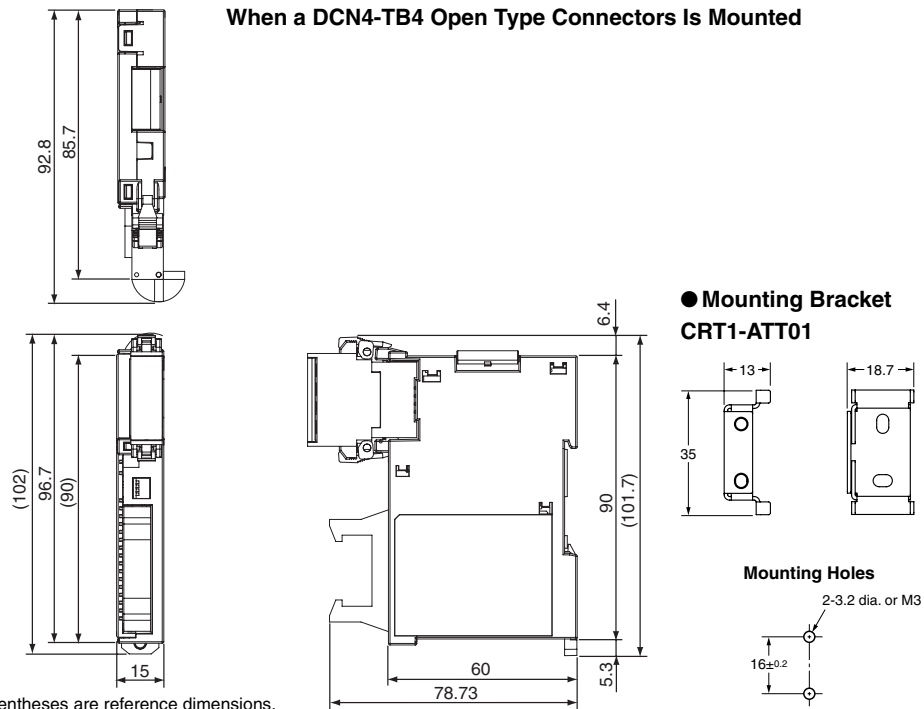
Note: The specified accuracy does not apply below 0.2 mA when using the 0 to 20 mA range.

Dimensions

(Unit: mm)

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

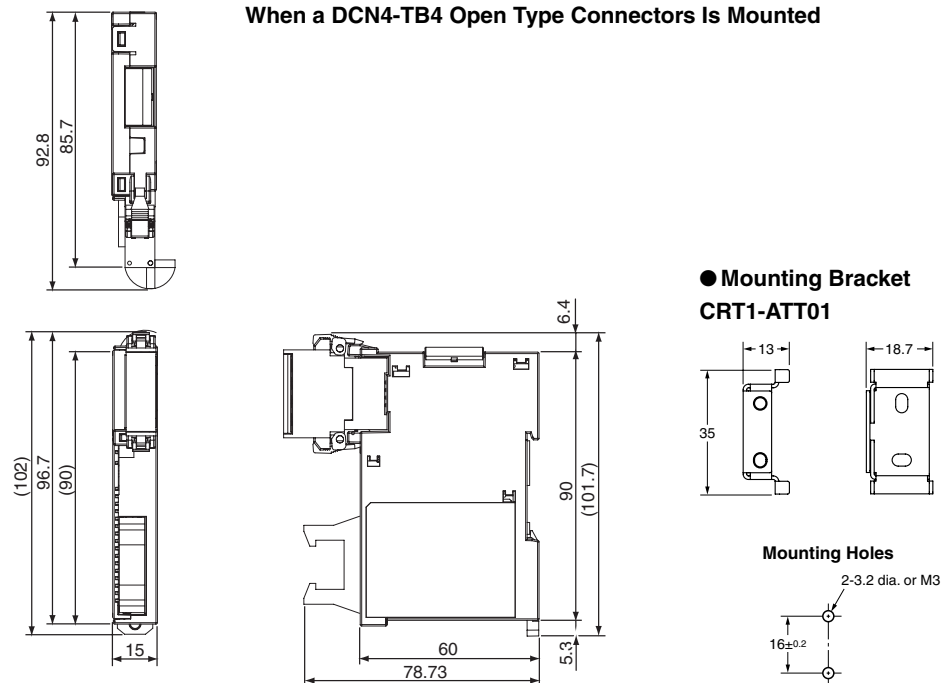
When a DCN4-TB4 Open Type Connectors Is Mounted



Note: The numbers inside the parentheses are reference dimensions.

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

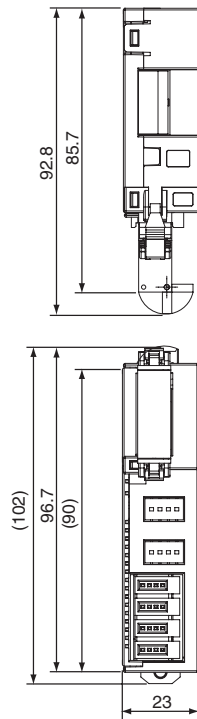
When a DCN4-TB4 Open Type Connectors Is Mounted



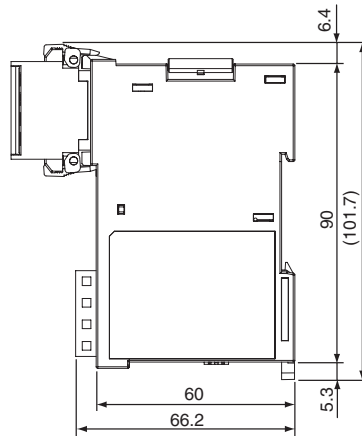
Note: The numbers inside the parentheses are reference dimensions.

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

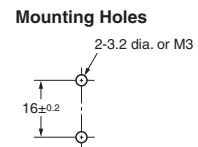
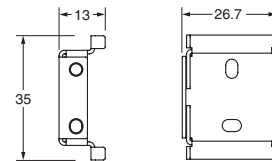
CRT1-VAD04S



When a DCN4-TB4 Open Type Connectors Is Mounted



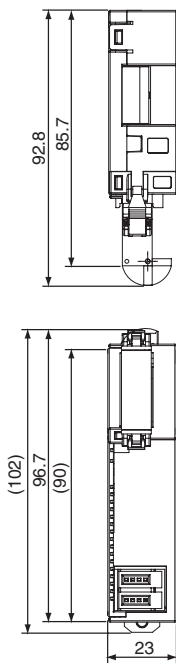
● Mounting Bracket
CRT1-ATT02



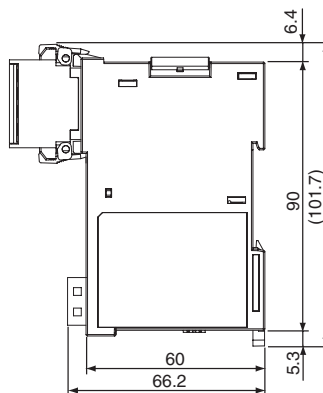
Note: The numbers inside the parentheses are reference dimensions.

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

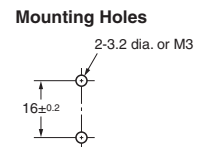
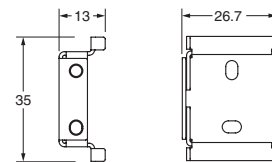
CRT1-VDA02S



When a DCN4-TB4 Open Type Connectors Is Mounted



● Mounting Bracket
CRT1-ATT02



Note: The numbers inside the parentheses are reference dimensions.

Temperature Input Units

CRT1-TS04T/-TS04P

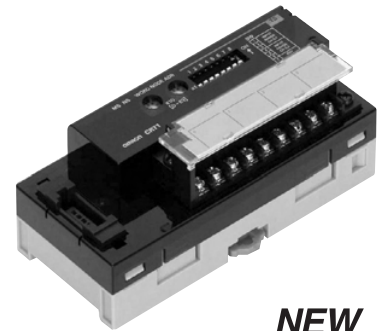
High-speed Transfer of Temperature Data with CompoNet.

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.



NEW

Ordering Information

Name	Specifications			Model	Standards
	Input/Output	Points	Specifications		
Temperature Input Unit	Thermocouple Input	4 inputs	Switchable between R, S, K, J, T, E, B, N, L, U, W, and PL2	CRT1-TS04T NEW	CE
	Platinum-resistance thermometer input		PT100 (-200 to 850°C) PT100 (-200 to 2000°C)	CRT1-TS04P NEW	

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. When 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.														
Indicator accuracy		(±0.3% of indication value or ±1°C, whichever is larger) ±1 digit max. (See note.) Indicator Accuracy in Exceptional Cases <table border="1"> <thead> <tr> <th>Input type and temperature range</th> <th>Input accuracy</th> </tr> </thead> <tbody> <tr> <td>K, T, and N below -100°C</td> <td>±2°C ±1 digit max.</td> </tr> <tr> <td>U and L</td> <td>±2°C ±1 digit max.</td> </tr> <tr> <td>R and S below 200°C</td> <td>±3°C ±1 digit max.</td> </tr> <tr> <td>B below 400°C</td> <td>Not specified.</td> </tr> <tr> <td>W</td> <td>±0.3% of indication value or ±3°C (whichever is larger) ±1 digit max.</td> </tr> <tr> <td>PL2</td> <td>±0.3% of indication value or ±2°C (whichever is larger) ±1 digit max.</td> </tr> </tbody> </table>	Input type and temperature range	Input accuracy	K, T, and N below -100°C	±2°C ±1 digit max.	U and L	±2°C ±1 digit max.	R and S below 200°C	±3°C ±1 digit max.	B below 400°C	Not specified.	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.	-200 to 850°C input range: (±0.3% of indication value or ±0.8°C, whichever is larger) ±1 digit max. -200 to 200°C input range: (±0.3% of indication value or ±0.5°C, whichever is larger) ±1 digit max.
Input type and temperature range	Input accuracy																
K, T, and N below -100°C	±2°C ±1 digit max.																
U and L	±2°C ±1 digit max.																
R and S below 200°C	±3°C ±1 digit max.																
B below 400°C	Not specified.																
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 (See note.)															
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.														

Note. There are specifications that apply to the mounting direction and input accuracy. Refer to the next page for details.

Effects of Mounting Direction on Accuracy

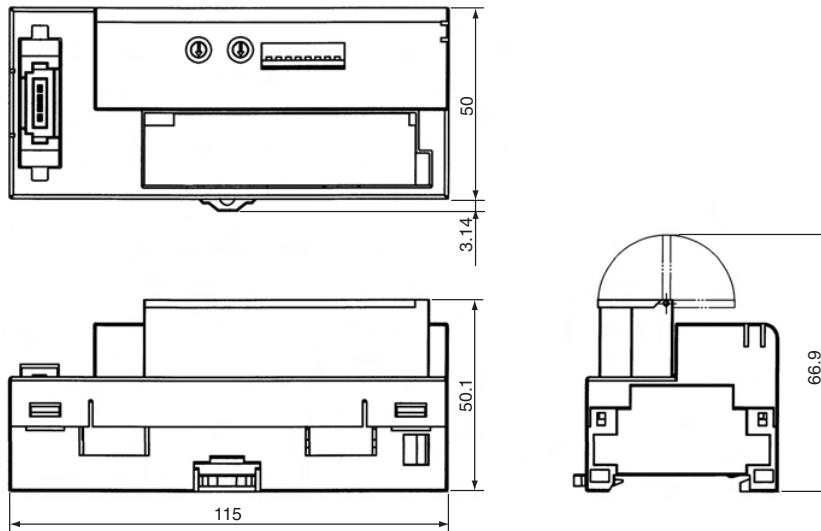
A cold junction compensator is included in the Terminal Block of the CRT1-TS04T. The input accuracy depends on the mounting direction if only the Unit is replaced.

Mounting direction	Input accuracy														
Mounted normally	As specified in the Performance Specifications.														
Mounted in any direction other than the above	±0.3% of indication value or ±2°C (whichever is larger) ±1 digit max. Indicator Accuracy in Exceptional Cases <table border="1"> <thead> <tr> <th>Input type and temperature range</th> <th>Input accuracy</th> </tr> </thead> <tbody> <tr> <td>K, T, and N below -100°C</td> <td>±3°C ±1 digit max.</td> </tr> <tr> <td>U and L</td> <td>±3°C ±1 digit max.</td> </tr> <tr> <td>R and S below 200°C</td> <td>±4°C ±1 digit max.</td> </tr> <tr> <td>B below 400°C</td> <td>Not specified.</td> </tr> <tr> <td>W</td> <td>±0.3% of indication value or ±4°C (whichever is larger) ±1 digit max.</td> </tr> <tr> <td>PL2</td> <td>±0.3% of indication value or ±3°C (whichever is larger)</td> </tr> </tbody> </table>	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)
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)														

Dimensions

(Unit: mm)

CRT1-TS04T
 CRT1-TS04P



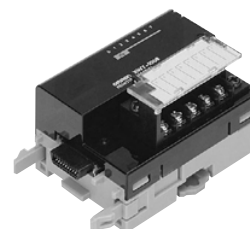
Expansion Units

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	Standards
Expansion Units	Inputs	8 inputs	NPN	XWT-ID08	CE, UC, UC1, N
			PNP	XWT-ID08-1	
	Outputs	8 outputs	NPN	XWT-OD08	
			PNP	XWT-OD08-1	
	Inputs	16 inputs	NPN	XWT-ID16	
			PNP	XWT-ID16-1	
	Outputs	16 outputs	NPN	XWT-OD16	
			PNP	XWT-OD16-1	
One Expansion Unit can be mounted to one CRT1-ID16(-1), CRT1-OD16(-1), CRT1-ROS16, or CRT1-ROF16 Digital I/O Slave.					

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		16 inputs	
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

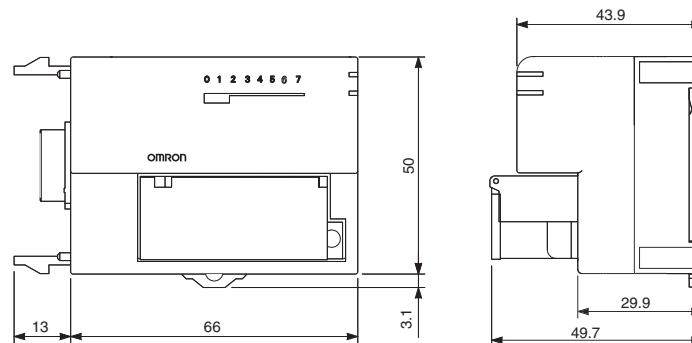
Item	Specification			
	XWT-OD08	XWT-OD08-1	XWT-OD16	XWT-OD16-1
Model	XWT-OD08	XWT-OD08-1	XWT-OD16	XWT-OD16-1
Internal I/O common	NPN	PNP	NPN	PNP
I/O capacity	8 outputs		16 outputs	
Rated output current	0.5 A/output, 2.0 A/common		0.5 A/output, 4.0 A/common	
Residual voltage	1.2 V max. (0.5 A DC, between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

Dimensions

(Unit: mm)

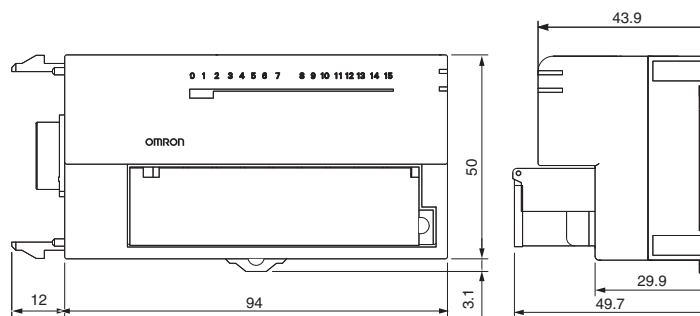
XWT-ID08 (-1)

XWT-OD08 (-1)



XWT-ID16 (-1)

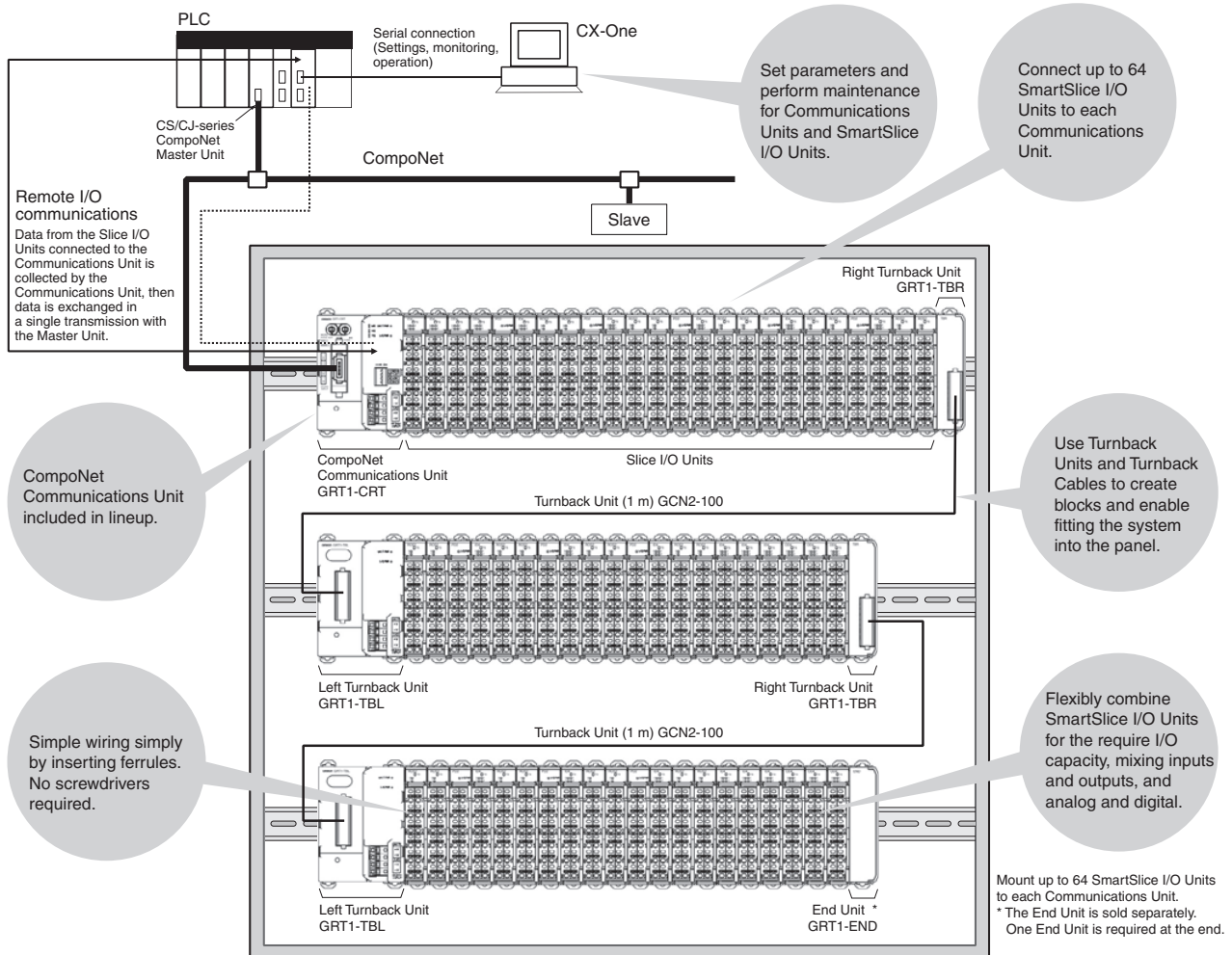
XWT-OD16 (-1)



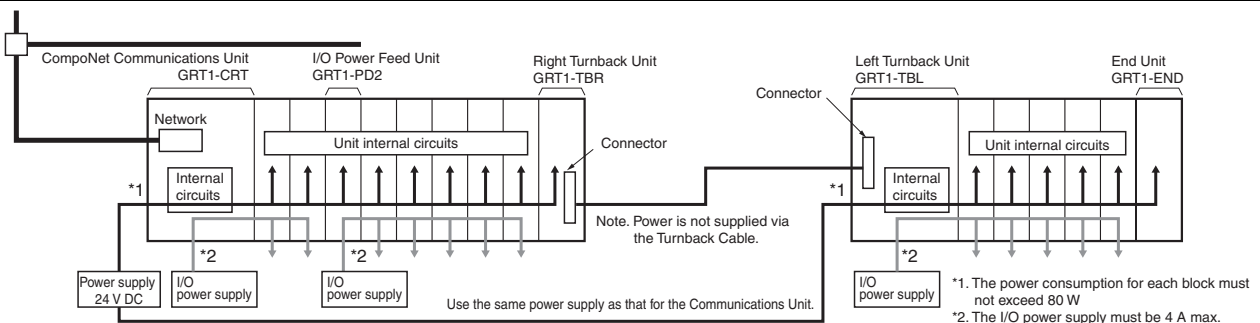
SmartSlice GRT1-series

Flexible I/O Configuration Matched to the Application to Down-size 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	Standards
CompoNet Communications Unit	Connects to up to 64 SmartSlice I/O Units (Inputs: 32 bytes maximum, Outputs: 32 bytes maximum)	GRT1-CRT	CE

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 (See note 1.) (24 V +10%/–15%)
Noise immunity		Conforms to IEC 61000-4-4, 2 kV (power line)
Vibration resistance+		10 to 60 Hz, 0.7-mm double amplitude 60 to 150 Hz: 50 m/s ²
Shock resistance		150 m/s ²
Dielectric strength		500 V AC between isolated circuits
Insulation resistance		20 MΩ 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

Note: For power supply input to the Slice I/O Units.

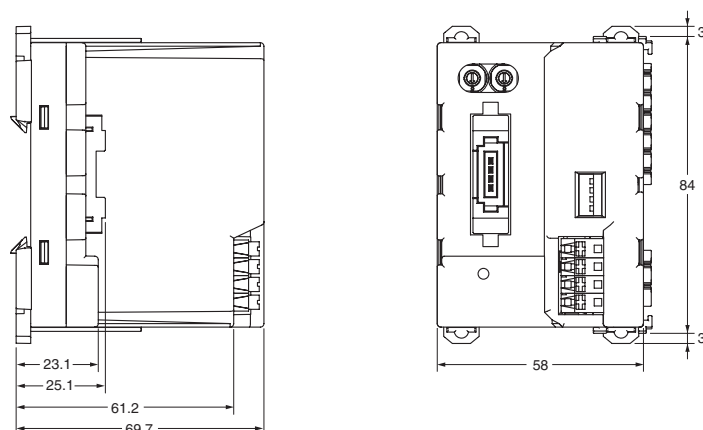
Specifications of the CompoNet Communications Unit

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-mm ² twisted-pair cable) Round Cable II (JIS C 3306, VCTF 4-core 0.75-mm ² twisted-pair cable) Flat Cable I (without sheath, DCA4-4F10) Flat Cable II (with sheath, DCA5-4F10) Note: The Round Cable I, Round Cable II, Flat Cable I, and Flat Cable II 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	125 g
Accessories	None










Dimensions

(Unit: mm)

GRT1-CRT



SmartSlice Ordering Information

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
Slice I/O Units	Digital I/O Units		4 inputs NPN	GRT1-ID4	CE, UC1, L
			4 inputs PNP	GRT1-ID4-1	
			4 outputs NPN	GRT1-OD4	
			4 outputs PNP	GRT1-OD4-1	
			8 inputs NPN	GRT1-ID8 NEW	CE, UC, L
			8 inputs PNP	GRT1-ID8-1 NEW	
			8 outputs NPN	GRT1-OD8 NEW	
			8 outputs PNP	GRT1-OD8-1 NEW	
			Relay Outputs 2 points	GRT1-ROS2	CE, UC1, L
	Analog I/O Units		Analog inputs (current/voltage)	GRT1-AD2	CE, UC1, L
			Analog outputs (current)	GRT1-DA2C	
			Analog output (voltage)	GRT1-DA2V	
	Temperature Input (Resistance Thermometers)		Temperature input (Resistance thermometer:Pt100) 2 points	GRT1-TS2P	CE, UC1, L
			Temperature input (Resistance thermometer:Pt1000) 2 points	GRT1-TS2PK NEW	
			Thermocouple Input 2 points	GRT1-TS2T	CE, UC, L
Counter Units		Counter inputs: 1, External outputs: 1 NPN	GRT1-CT1	CE, UC, L	
		Counter inputs: 1, External outputs: 1 PNP	GRT1-CT1-1		
System Units	Turnback Units		Right Turnback Unit (Mounts to the right side of Slice I/O Terminal.)	GRT1-TBR	CE, UC1, L
			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 m	GCN2-100	CE, UC1 * 2, L
	I/O Power Feed Unit		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
				GRT1-PD2G NEW	
				GRT1-PD8 NEW	
				GRT1-PD8-1 NEW	
GRT1-PC8 NEW					
Use to add V/G terminals for I/O power supply.	GRT1-PC8-1 NEW				
End Unit *1		Necessary for terminating the Slice I/O Terminal.	GRT1-END	CE, UC1, L	
Option	Terminal Block	---	Package of 5 Terminal Blocks	GRT1-BT1-5	---

*1 The End Unit is sold separately. It is not provided with the Communications Unit.

*2 Use the GCN2-100 together with the GCN1-TBR or GCN1-TBL.

Bit Slave Units with e-CON Connectors

CRT1B-□D02S(-1)/□D02SP(-1)/ID04SP(-1)

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

Slave Units capable of 2- and 4-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. IP54 dust- and splash-proof models also available.



- Industry-standard e-CON connectors
- Short-circuit protection safeguards the network from I/O short circuits.
- Simple communications connections with flat cable and connectors.
- Models with 2 or 4 points eliminate the need for unnecessary I/O points.
- IEC 60529 protection enables bit-level distributed installation without control boxes (IP54 Units).
- Dust- and splash-proof models can be used in environments where protection is necessary (IP54 Units).
- Bit-level distribution to support essentially any application.

Ordering Information

Name	Specifications		Model	Standards
IP20	Inputs	2 inputs	NPN	CRT1B-ID02S
			PNP	CRT1B-ID02S-1
	Outputs	2 outputs	NPN	CRT1B-OD02S
			PNP	CRT1B-OD02S-1
IP54	Inputs	2 inputs	NPN	CRT1B-ID02SP
			PNP	CRT1B-ID02SP-1
	Outputs	2 outputs	NPN	CRT1B-OD02SP
			PNP	CRT1B-OD02SP-1
	Inputs	4 DC inputs	NPN	CRT1B-ID04SP
			PNP	CRT1B-ID04SP-1
				CE, U

Input Section Specifications

Item	Specification					
	CRT1B-ID02S	CRT1B-ID02S-1	CRT1B-ID02SP	CRT1B-ID02SP-1	CRT1B-ID04SP	CRT1B-ID04SP-1
Model	CRT1B-ID02S	CRT1B-ID02S-1	CRT1B-ID02SP	CRT1B-ID02SP-1	CRT1B-ID04SP	CRT1B-ID04SP-1
I/O capacity	2 inputs				4 inputs	
Internal I/O common	NPN	PNP	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)	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)	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	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				4 inputs/common	
Power short-circuit detection	Supported					
Isolation method	No isolation					
Input indicators	LEDs (yellow)					
Degree of protection	IEC standard IP20			IEC standard IP54		
Installation	Screw installation (M4)					
Power supply type	Network power supply					
Communications power supply current consumption (See note.)	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	65 mA max. for 24-VDC power supply voltage 80 mA max. for 14-VDC power supply voltage		85 mA max. for 24-VDC power supply voltage 90 mA max. for 14-VDC power supply voltage	
Weight	70 g max.			184 g max.		188 g

Note: 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

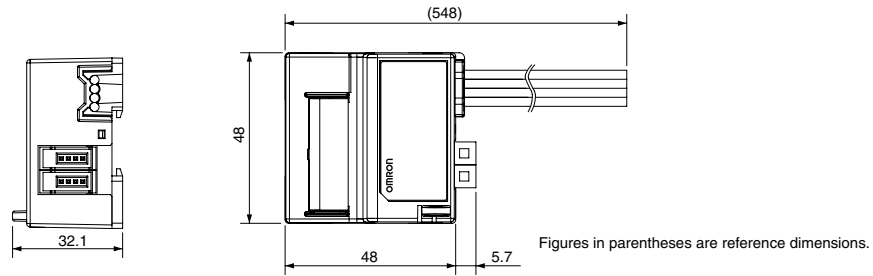
Item	Specification			
Model	CRT1B-OD02S	CRT1B-OD02S-1	CRT1B-OD02SP	CRT1B-OD02SP-1
I/O capacity	2 outputs			
Internal I/O common	NPN	PNP	NPN	PNP
Rated output current	0.2 A/output			
Load power supply voltage	Communications power supply voltage + 0 V (max.) Communications power supply voltage - 1.2 V (min.)			
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+	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		IEC standard IP54	
Installation	Screw installation (M4)			
Power supply type	Network power supply			
Communications power supply current consumption (See note.)	55 mA max. for 24-VDC power supply voltage 75 mA max. for 14-VDC power supply voltage	55 mA max. for 24-VDC power supply voltage 70 mA max. for 14-VDC power supply voltage	50 mA max. for 24-VDC power supply voltage 75 mA max. for 14-VDC power supply voltage	
Weight	59 g max.		169 g max.	

Note: 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)

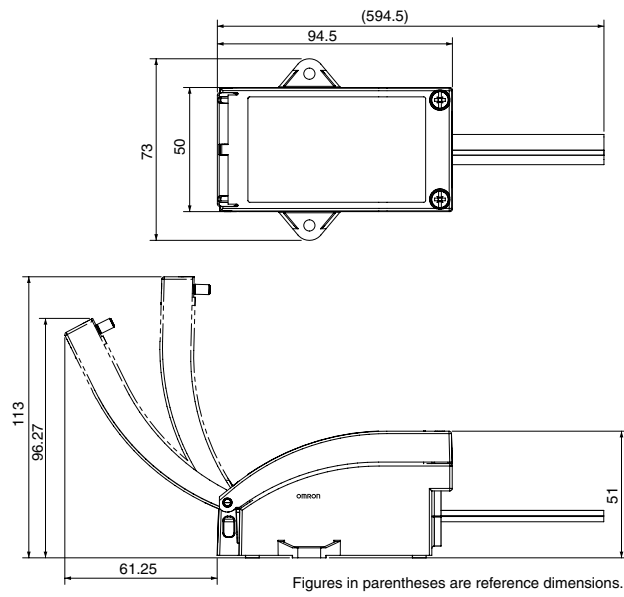
Dimensions

(Unit: mm)

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



CRT1B-ID02SP(-1)
 CRT1B-OD02SP(-1)
 CRT1B-ID04SP(-1)



Bit Slave Units with Clamp Terminal Blocks

CRT1B-MD04SLP(-1)

Simple and Intelligent IP54 Bit Slave Units That Resist Dust and Splashing

Screw-less dust- and splash-proof IP54 Bit Slaves for 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.

- IEC 60529 protection enables bit-level distributed installation without control boxes.
- Screw-less models makes wiring as easy as a single push.
- Short-circuit protection safeguards the network from I/O short circuits.
- Simple communications connections with flat cable and connectors.
- Models with 2 or 4 points eliminate the need for unnecessary I/O points.
- Dust- and splash-proof models can be used in environments where protection is necessary.
- Bit-level distribution to support essentially any application.



Ordering Information

Name	Specifications		Model	Standards
IP54	Inputs/outputs	2 inputs and 2 outputs	NPN	CE, U
			PNP	
			CRT1B-MD04SLP	
			CRT1B-MD04SLP-1	

Input Section Specifications

Item	Specification	
Model	CRT1B-MD04SLP	CRT1B-MD04SLP-1
I/O capacity	2 inputs	
Internal I/O common line	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 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 IP54	
Installation	Screw installation (M4)	
Power supply type	Network power supply	
Communications power supply current consumption (See note.)	80 mA max. for 24-VDC power supply voltage 90 mA max. for 14-VDC power supply voltage	75 mA max. for 24-VDC power supply voltage 85 mA max. for 14-VDC power supply voltage
Weight	191 g max.	

Note: The current consumption is for Bit Slave Unit communications current when all inputs and outputs are OFF, i.e., it does not include input device current consumption or output load current consumption. The communications power supply is also used for the I/O power supply for sensors and actuators. Be sure to consider the sensor and actuator current consumption and the number of sensors and actuators connected.

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) + (actual load current x number of actuators used)

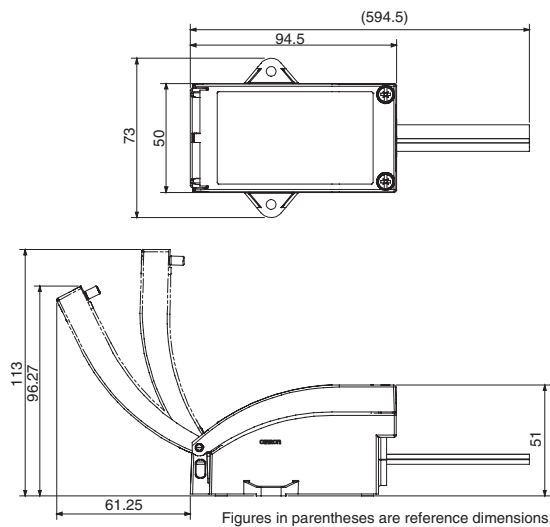
Output Section Specifications

Item	Specification	
Model	CRT1B-MD04SLP	CRT1B-MD04SLP-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-terminal)	1.2 V max. (0.2 A DC, between each output terminal and the BS+ 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 power short-circuit detection	Supported	
Isolation method	No isolation	
Input indicators	LEDs (yellow)	

Dimensions

(Unit: mm)

CRT1B-MD04SLP (-1)

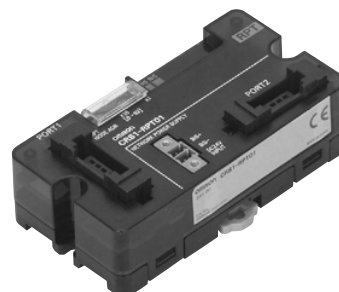


Repeater Unit CRS1-RPT01

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	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 (See note.)	CE, U, U1, L

Note: 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): Trunk 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 ²
Shock resistance	150 m/s ²
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).

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.

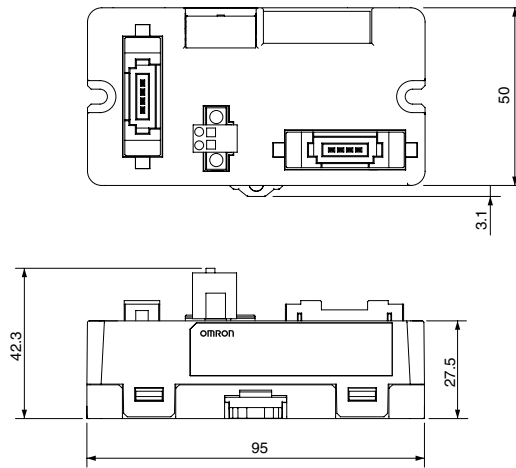
Product number	Applicable power cable size	Crimping tool	Manufacturer
AI0,5-10 WH	0.5 mm (AWG20)	CRIMPFOX UD6 (Product No. 1204436) or CRIMPTFOX ZA3 series	Phoenix Contact
H0.5/16 orange	0.5 mm (AWG20)	Crimper PZ1.5 (Product No. 900599)	Weidmuller

The following screwdriver is recommended for use when removing ferrules.

Product number	Manufacturer
XW4Z-00C	OMRON

Dimensions

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

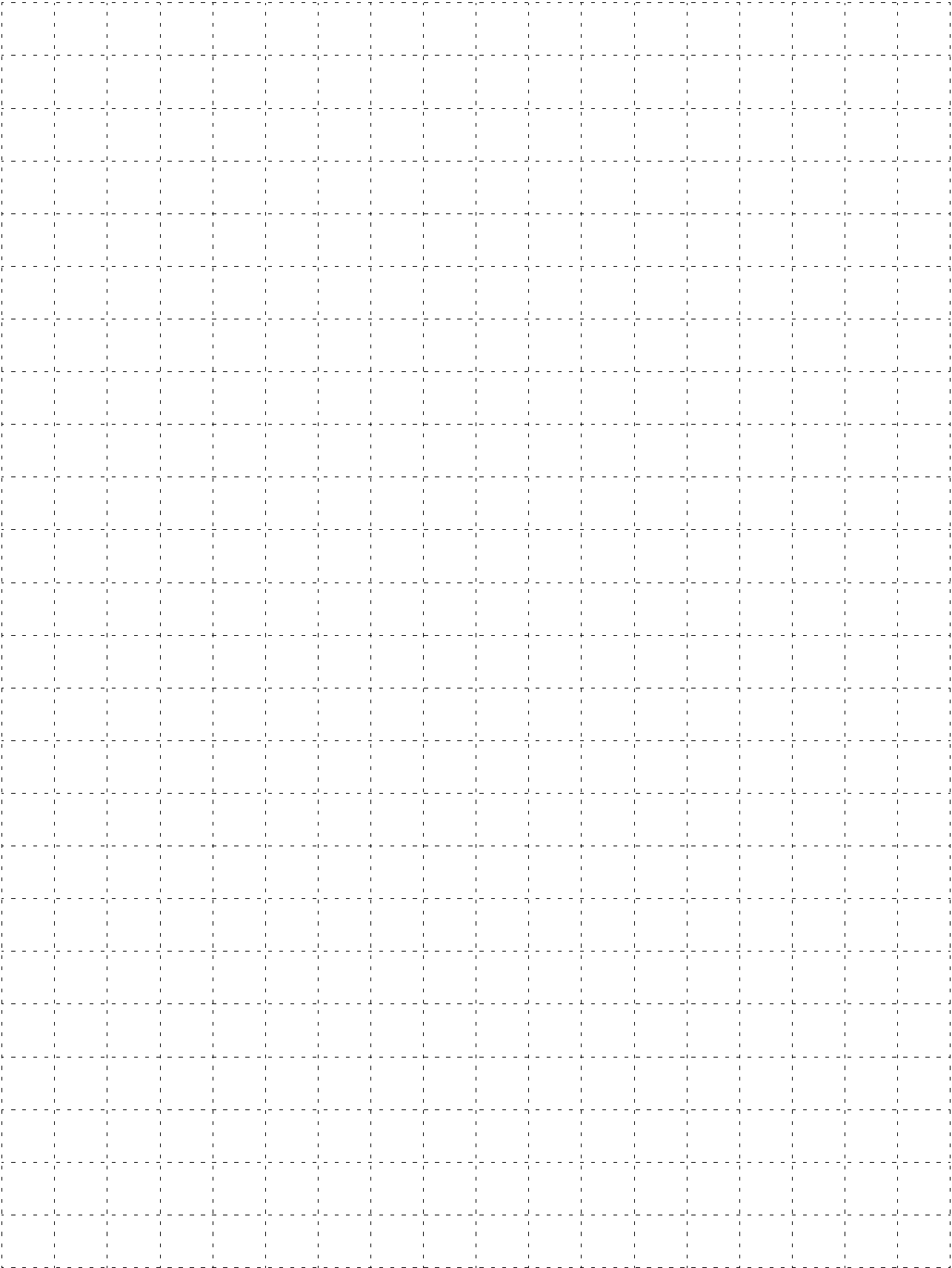
Name	I/O classification	Allocated bits	Internal circuit power supply	I/O power supply voltage	Connected Controller model	Model	Standards
Sensor Communications Unit	Input and output	160 bits max.	Supplied along with communications power	24 VDC	ZS-LDC□□ ZS-MDC□□ ZS-HLDC□□ ZFV-CA□□ ZG-WDC□□	ZS-CRT	CE

International Standards

- The standards indicated in the “Standards” column are those current for UL, CSA, cULus, NK, and Lloyd standards and EC Directives as of the end of October 2007. 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 Directive.
- Ask your OMRON representative for the conditions under which the standards were met.

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), ZG-WDC□□ (Ver. 1.100 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 ²
Shock resistance	150 m/s ²
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

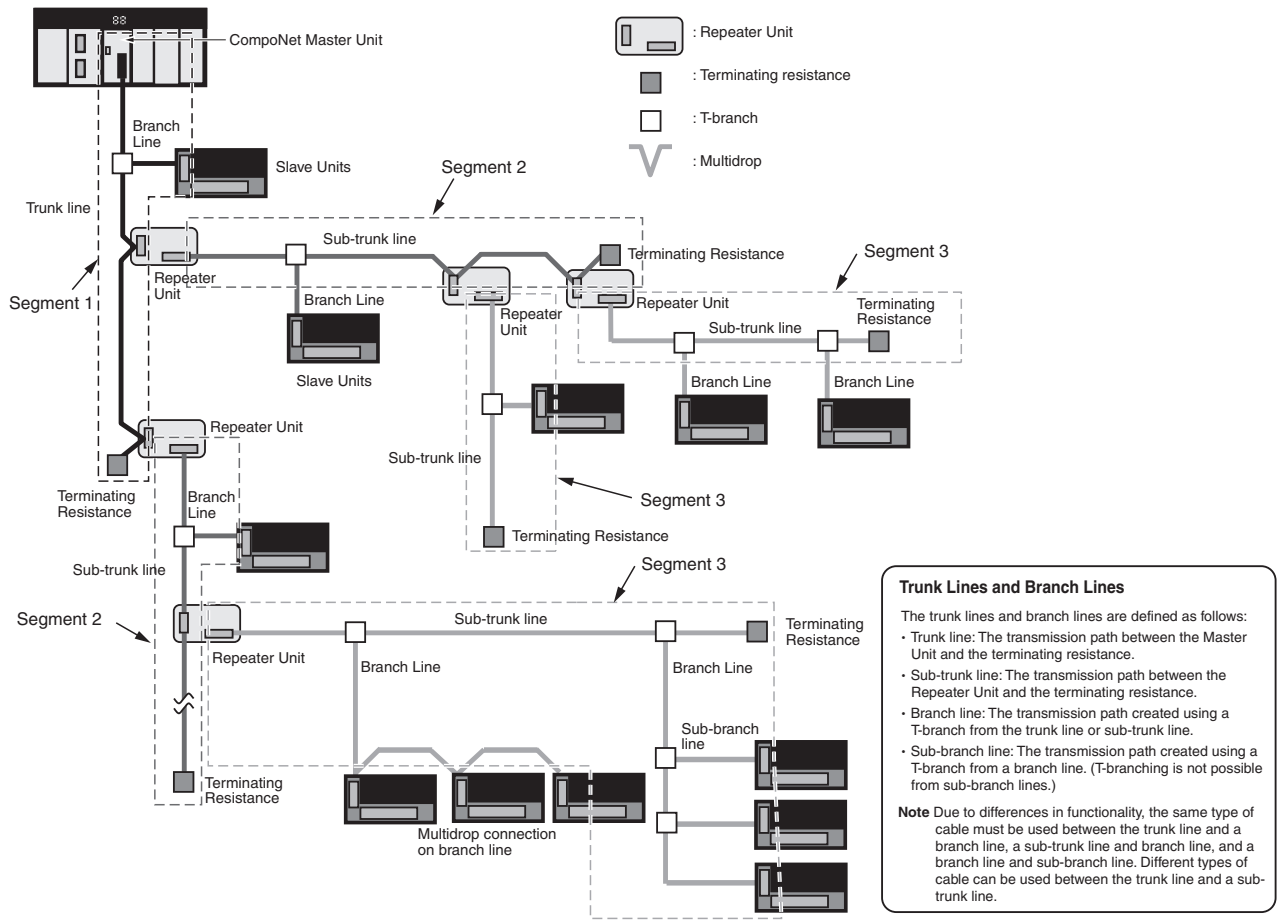


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CompoNet Network Configuration Elements

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.

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)	Special I/O Unit Area (First word depends on unit number of Master Unit.)	2
1	Mode 1	Word Slave Units: IN0 to IN15 and OUT0 to OUT15	256 inputs and 256 outputs (Word Slave Units)		4
2	Mode 2	Word Slave Units: IN0 to IN31 and OUT0 to OUT31	512 inputs and 512 outputs (Word Slave Units)		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.
- 2.** 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.

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.

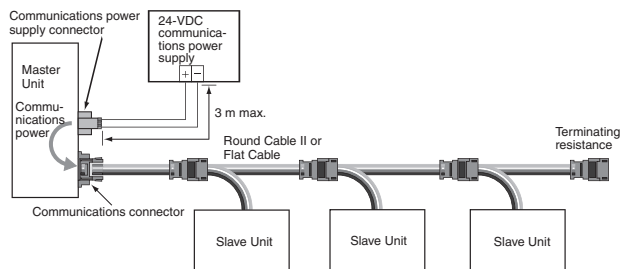
The method for supplying communications power and I/O power depends on the types of cable and Slave Unit that are used. The differences are shown in the following table.

Power supply method	Cable types	Communications power supply	I/O power supply
Multi-power supply	Flat Cable I, II	Supplied through the Communications Cable by supplying power to the Master Unit.	Supplied to individual Units separately from the communications power supply.
	Round Cable I	Supplied to Units individually	
Network power supply	Flat Cable I, II	The communications power supply and the I/O power supply are provided together through Communications Cable.	
	Round Cable I		

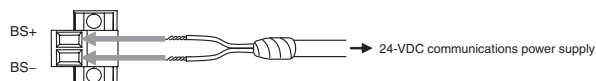
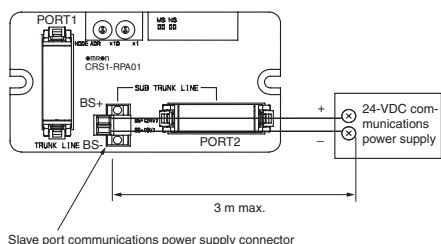
Connection Locations for Communications Power Supply

■ 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.



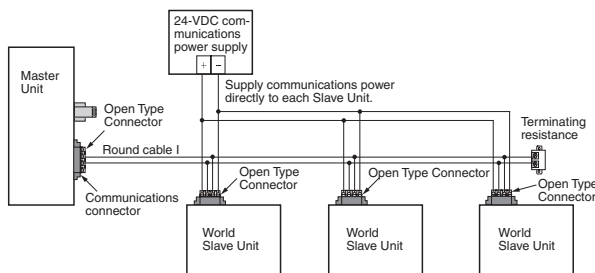
● Ferrules

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

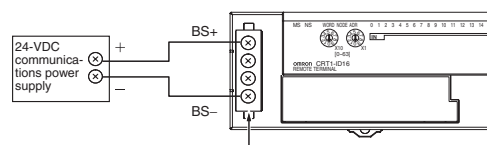
Model	Applicable wire size	Crimping tool	Manufacturer
A10, 5-10 WH	0.5 mm/AWG20	CRIMPFOX UD6 (product number 1204436) or the CRIMPFOX ZA3 Series	Phoenix Contact K.K.
H 0.5/16 orange	0.5 mm/AWG20	Crimper PZ 1.5 (Product number 900599)	Weidmuller Co. Ltd.

■ 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.

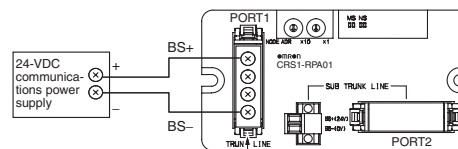


Before connecting the power supply, first connect a DCN4-TB4 Open Type Connector to the communications connector to convert it to a screw terminal block.



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.



Connect an Open Type Connector here.

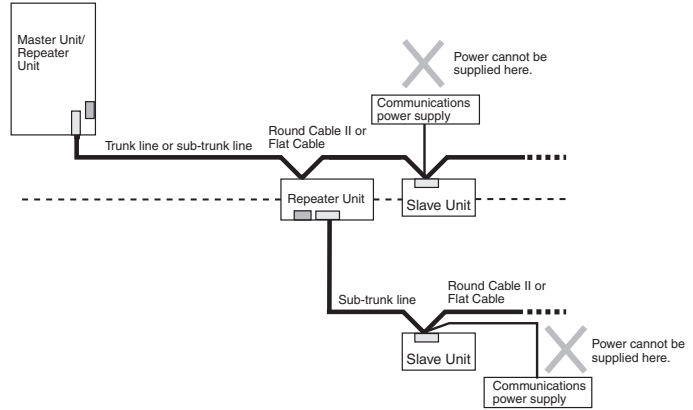
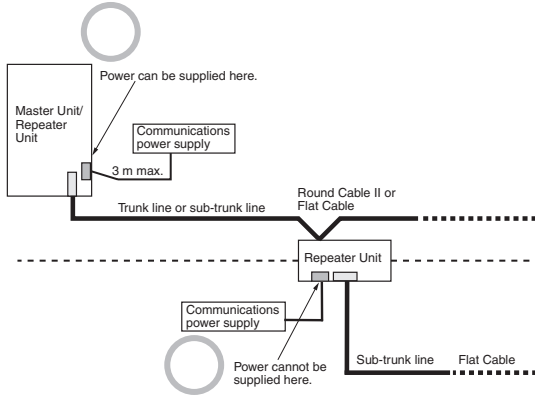
The following screwdriver is recommended for removing ferrules.

Model	Manufacturer
XW4Z-00C	OMRON Corporation

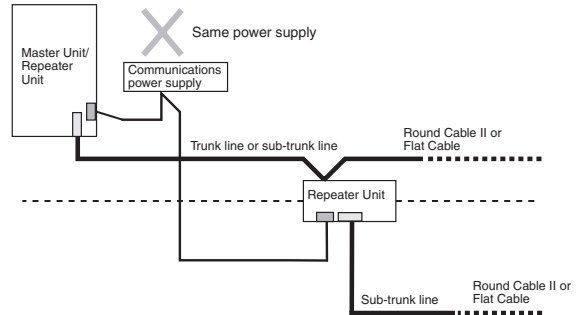
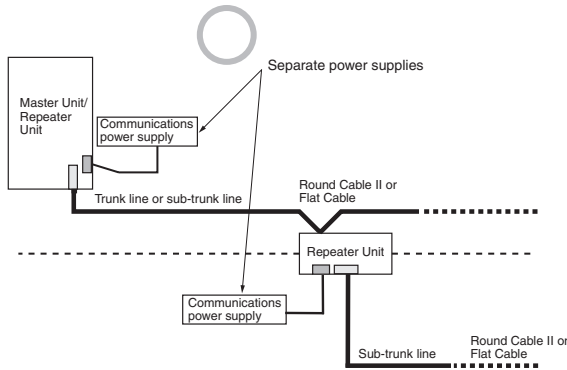
Restrictions

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	Applicable wire range	
3-1473562-4	Orange	sheath outer diameter: 0.9 to 1.0 mm	Cross-sectional area: 0.08 to 0.5 mm ²
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	
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 mm ²) to AWG24 (0.2 mm ²), sheath outer diameter: 0.8 to 1.0 mm
37104-3122-000FL	Yellow	AWG26 (0.14 mm ²) to AWG24 (0.2 mm ²), sheath outer diameter: 1.0 to 1.2 mm
37104-3163-000FL	Orange	AWG26 (0.14 mm ²) to AWG24 (0.2 mm ²), sheath outer diameter: 1.2 to 1.6 mm
37104-2124-000FL	Green	AWG22 (0.3 mm ²) to AWG20 (0.5 mm ²), sheath outer diameter: 1.0 to 1.2 mm
37104-2165-000FL	Blue	AWG22 (0.3 mm ²) to AWG20 (0.5 mm ²), sheath outer diameter: 1.2 to 1.6 mm
37104-2206-000FL	Gray	AWG22 (0.3 mm ²) to AWG20 (0.5 mm ²), sheath outer diameter: 1.6 to 2.0 mm

● OMRON Connectors

Model	Specification	Applicable wire range
XN2A-1430	Spring clamp type	AWG28 (0.08 mm ²) to AWG20 (0.5 mm ²), sheath outer diameter: 1.5 mm max.

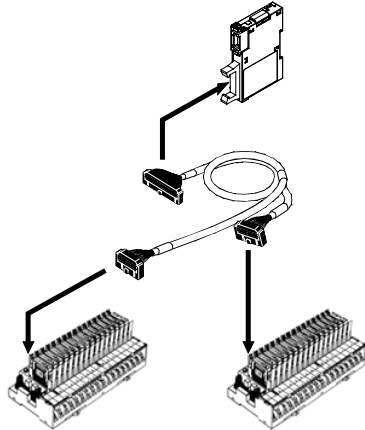
Connecting to MIL Connector Terminals

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	---
CRT1-VOD16ML-1/ XWT-VOD16ML-1	G79-I□C	G7TC-OC16-1	---
	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	G79-M50-25-D1 (50 cm) G79-M75-50-D1 (75 cm)	Inputs: G7TC-ID16 G7TC-IA16 Outputs: G7TC-OC16/OC08 G7OD-SOC16/VSOC16 G7OD-FOM16/VFOM16 G7OA-ZOC16-3 G7OD-SOC08 G7OR-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).

Type	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

- 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
CRT1-V□D16ML/ XWT-V□D16ML	G79-A200C (2 m) G79-A500C (5 m)	Loose wire size: AWG24 Loose wires are cut.
	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 (Nippon Terminal)
CRT1-V□D32ML	G79-A200C-D1 (2 m) G79-A500C-D1 (5 m)	Loose wire size: AWG28 Loose wires are cut.
	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 (Nippon Terminal)
CRT1-VDA02ML/ CRT1-VAD02MLD/ CRT1-VDA02MLD		Indicated cable is not available
CRT1-VAD04ML		

■ 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
	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
Socket	No polarity guide	XG5M-1031-N	XG5M-1034-N
	Uses polarity guide	XG5M-1032-N	XG5M-1035-N
Semi-cover (See note.)		XG5S-0501	

• 16-pin Cable

Component		Wire size: AWG24	Wire size: AWG28 to AWG26
Socket		XG5M-1632-N	XG5M-1635-N
Semi-cover (See note.)		XG5S-0801	

• 20-pin Cable

Component		Wire size: AWG24	Wire size: AWG28 to AWG26
Socket		XG5M-2032-N	XG5M-2035-N
Semi-cover (See note.)		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 (See note.)		XG5S-2001	
Hood Cover		XG5S-4022	

Note: 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

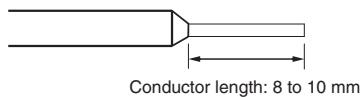
For Slave Units with screw-less clamp terminal blocks, the terminal blocks can be easily wired by inserting pin terminals. Follow the procedure below to connect the external device cable to a screw-less clamp terminal block.

■ **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 ² /AWG20	PZ6 roto	Weidmuller Co. Ltd.
H0.75/14 white	0.75 mm ² /AWG18		
H1.5/14 red	1.5 mm ² /AWG16		

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



Power Supplies

S8VS Switch Mode Power Supply (15/30/60/90/120/180/240/480-W Models)

15/30-W Models

Compact, Thin Power Supplies That Mount Just About Anywhere to Contribute to Control Panel Downsizing

- Compact, thin size: 22.5 × 85 × 96.5 mm (W × H × D).
- Three mounting directions (standard, horizontal, facing horizontal).
- Mounting directly to the panel is possible.
- Safety standards:
UL 508/60950-1/1604, cUL: CSA C22.2 No. 14/60950-1/213,
EN 50178 (= VDE0160), EN 60950-1 (= VDE 0805 Teil 1).
- Mount to DIN Rail.
- Complies with SEMI F47-0200 (200-VAC input).
- RoHS-compliant.



60/90/120/180/240/480-W Models

Improved Versions of Standard-type Power Supplies without Indication Monitor (60 to 240 W). EMI Class B Compliant.

- New 90-W models that conform to UL Class 2 standards.
- New models with screwless terminal blocks and without indication monitor (except that 480-W models have an indication monitor).
- Status displayed on 3-digit, 7-segment display.
- Safety standards:
UL508/60950-1, CSA C22.2 No. 14/60950-1 (15-W, 30-W, 60-W to 240-W models with Indication monitor),
CSA C22.2 No. 107.1/60950-1 (60-W to 240-W standard, 480-W models),
EN 50178 (= VDE0160), EN 60950-1 (= VDE0805 Teil 1)
- Compact: 150 × 115 × 127.2 mm (W × H × D) (480-W models).



S8VM Switch Mode Power Supply (15/30/50/100/150/300/600/1,500-W Models)

Power Supply Featuring OMRON's Unique, New Undervoltage Compact Body Contributing to Machine Downsizing

- New undervoltage alarm function assists in determining causes of errors (S8VM-□□□24A□/P□ only).
- Power failure alarm function provides notification of output voltage errors (300-, 600-, and 1,500-W models only).
- Broad range of possibilities with 8 capacities and 29 models to choose from.
- RoHS-compliant including lead-free construction.
- Safety standards: UL508/60950-1/1604, CSA C22.2 No. 14/No. 60950-1/No. 213, EN50178, EN60950-1 (The 300-, 600-, and 1,500-W models will not conform to safety standards if the customer replaces the fan.)
- Harmonic current emissions: Conforms to EN61000-3-2 (except for 15- and 30-W models).
- New, attentive design prevents screws from falling out of terminal block (except for output terminals of 300-, 600-, and 1,500-W models).
- Finger protection prevents electric shock.
- Mount to DIN Rail.
- Warranty Period: 5 years. (The fan is not covered.)



Ordering Information

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■ Standards Certification is given as of March 2009. Enquire for application conditions.

	North America: UL				North America: CSA	Nippon Kaiji Kyokai (Japan's classification society)	Lloyd's Register of Shipping (Britain's classification society)
	For the USA	For the USA, hazardous locations	For the USA and Canada	For the USA and Canada, hazardous locations			
Name of standard	UL	UL (Class I Div2)	cULus	cULus (Class I Dis2)	CSA	NK	LR
CompoNet-compliant standard	UL508	UL1604	cULus508	cULus1604			
	↓	↓	↓	↓	↓	↓	↓
Abbreviation in this catalog	U	U1	UC	UC1	C	N	L

● 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.

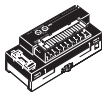
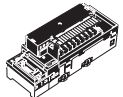
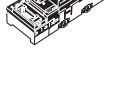
CompoNet Master Units

Name	Appearance	Specifications		Number of unit numbers allocated	Power consumption (A)			Model	Standards
		Type of communications	Maximum number of I/O points per Master Unit		5-V system	24-V system	26-V system		
CS1 Special I/O Unit (See note.)		<ul style="list-style-type: none"> 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
CJ1 Special I/O Unit (See note.)		<ul style="list-style-type: none"> 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

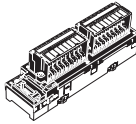


Note. These Units are also available with a DCN-TB4 Terminal Conversion Adapter included in the package. Add "(-B)" to the end of the model number to receive the Adapter as well.

CompoNet Slave Units



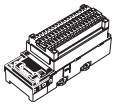
- Word Slave Units
- Digital I/O Slave Units

Name	Appearance	Specifications				Communications Cables				Model	Standards
						Round cable I	Round cable II	Sheathed Flat Cable I	Sheathed Flat Cable II		
Two-tier Screw Terminal Block		Inputs	8 inputs	NPN	---	Yes	Yes	Yes	Yes	CRT1-ID08	CE, U, U1
				PNP						CRT1-ID08-1	
		Outputs	8 outputs	NPN						CRT1-OD08	
				PNP						CRT1-OD08	
		Inputs	16 inputs	NPN						CRT1-ID16 (See note.)	
				PNP						CRT1-ID16-1 (See note.)	
		Outputs	16 outputs	NPN						CRT1-OD16 (See note.)	
				PNP						CRT1-OD16-1 (See note.)	
Inputs/Outputs	8 inputs/8 outputs	NPN	CRT1-MD16								
		PNP	CRT1-MD16-1								
Screw Terminal Block with Relay Outputs		Outputs	8 outputs	Cont acts	---	Yes	Yes	Yes	Yes	CRT1-ROS08	CE
			16 outputs							CRT1-ROS16	
Screw Terminal Block with SSR Outputs		Outputs	8 outputs	SSR	---	Yes	Yes	Yes	Yes	CRT1-ROF08	---
			16 outputs							CRT1-ROF16	

Note. 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				Communications Cables				Model	Standards						
						Round cable I	Round cable II	Sheathed Flat Cable I	Sheathed Flat Cable II								
Three-tier Screw Terminal Block		Inputs	8 inputs	NPN	Without Short-circuit and Disconnected Line Detection	Yes	Yes	Yes	Yes	CRT1-ID08TA	CE, U, U1						
				PNP						CRT1-ID08TA-1							
		Outputs	8 outputs	NPN						CRT1-OD08TA							
				PNP						CRT1-OD08TA-1							
		Inputs	16 inputs	NPN						CRT1-ID16TA							
				PNP						CRT1-ID16TA-1							
		Outputs	16 outputs	NPN						CRT1-OD16TA							
				PNP						CRT1-OD16TA-1							
		Inputs/Outputs	8 inputs/8 outputs	NPN						CRT1-MD16TA							
				PNP						CRT1-MD16TA-1							
		Inputs	8 inputs	NPN						With Short-circuit and Disconnected Line Detection		Yes	Yes	Yes	Yes	CRT1-ID08TAH	CE
				PNP												CRT1-ID08TAH-1	CE, U, U1
		Outputs	8 outputs	NPN												CRT1-OD08TAH	CE
				PNP												CRT1-OD08TAH-1	CE, U, U1
		Inputs	16 inputs	NPN												CRT1-ID16TAH	CE
				PNP												CRT1-ID16TAH-1	CE, U, U1
		Outputs	16 outputs	NPN												CRT1-OD16TAH	CE
				PNP												CRT1-OD16TAH-1	CE, U, U1
Inputs/Outputs	8 inputs/8 outputs	NPN	CRT1-MD16TAH	CE													
		PNP	CRT1-MD16TAH-1	CE													
e-CON Connectors		Inputs	16 inputs	NPN	Without Short-circuit and Disconnected Line Detection	Yes	Yes	Yes	Yes		CRT1-ID16S					CE	
				PNP							CRT1-ID16S-1					CE, U, U1	
		Outputs	16 outputs	NPN							CRT1-OD16S					CE	
				PNP							CRT1-OD16S-1					CE, U, U1	
		Inputs/outputs	8 inputs / 8 outputs	NPN							CRT1-MD16S					CE	
				PNP							CRT1-MD16S-1					CE, U, U1	
		Inputs	32 inputs	NPN							CRT1-ID32S					CE	
				PNP							CRT1-ID32S-1					CE, U, U1	
		Outputs	32 outputs	NPN						CRT1-OD32S	CE						
				PNP						CRT1-OD32S-1	CE, U, U1						
		Inputs/outputs	16 inputs / 16 outputs	NPN						CRT1-MD32S	CE						
				PNP						CRT1-MD32S-1	CE, U, U1						
		Inputs	16 inputs	NPN						With Short-circuit and Disconnected Line Detection	Yes	Yes	Yes	Yes	CRT1-ID16SH	CE	
				PNP											CRT1-ID16SH-1	CE, U, U1	
		Outputs	16 outputs	NPN											CRT1-OD16SH	CE	
				PNP											CRT1-OD16SH-1	CE, U, U1	
		Inputs/outputs	8 inputs / 8 outputs	NPN											CRT1-MD16SH	CE	
				PNP											CRT1-MD16SH-1	CE, U, U1	
Inputs	32 inputs	NPN	CRT1-ID32SH	CE													
		PNP	CRT1-ID32SH-1														
Outputs	32 outputs	NPN	CRT1-OD32SH														
		PNP	CRT1-OD32SH-1														
Inputs/outputs	16 inputs / 16 outputs	NPN	CRT1-MD32SH														
		PNP	CRT1-MD32SH-1														
e-CON Connectors		Inputs	8 inputs	NPN	Without Short-circuit and Disconnected Line Detection	Yes	Yes	Yes	Yes						CRT1-VID08S (See note.)	CE	
				PNP											CRT1-VID08S-1 (See note.)		
		Outputs	8 outputs	NPN											CRT1-VOD08S (See note.)		
				PNP											CRT1-VOD08S-1 (See note.)		

Note. 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				Communications Cables				Model	Standards
						Round cable I	Round cable II	Sheathed Flat Cable I	Sheathed Flat Cable II		
MIL Connector		Inputs	16 inputs	NPN	---	Yes	Yes	Yes	Yes	CRT1-VID16ML (See note.)	CE
				PNP						CRT1-VID16ML-1 (See note.)	
		Outputs	16 outputs	NPN						CRT1-VOD16ML (See note.)	
				PNP						CRT1-VOD16ML-1 (See note.)	
MIL Connector		Inputs	32 inputs	NPN	---	Yes	Yes	Yes	Yes	CRT1-VID32ML (See note.)	CE
				PNP						CRT1-VID32ML-1 (See note.)	
		Outputs	32 outputs	NPN						CRT1-VOD32ML (See note.)	
				PNP						CRT1-VOD32ML-1 (See note.)	
		Inputs/ Outputs	16 inputs/ 16 outputs	NPN						CRT1-VMD32ML (See note.)	
				PNP						CRT1-VMD32ML-1 (See note.)	
Clamp Terminal Blocks		Inputs	16 inputs	NPN	---	Yes	Yes	Yes	Yes	CRT1-ID08SL	CE
				PNP						CRT1-ID08SL-1	
		Outputs	16 outputs	NPN						CRT1-OD08SL	
				PNP						CRT1-OD08SL-1	
		Inputs	8 inputs	NPN						CRT1-ID16SL	CE
				PNP						CRT1-ID16SL-1	
		Outputs	8 outputs	NPN						CRT1-OD16SL	
				PNP						CRT1-OD16SL-1	
		Inputs/ Outputs	8 inputs/ 8 outputs	NPN						CRT1-MD16SL	
				PNP						CRT1-MD16SL-1	


Note. 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	Specifications		Communications Cables				Model	Standards
				Round cable I	Round cable II	Standard Flat Cable I	Sheathed Flat Cable II		
Analog I/O Slave Units (See note.)		Analog inputs	4 inputs	Yes	Yes	Yes	Yes	CRT1-AD04	CE, U, U1
		Analog outputs	2 outputs					CRT1-DA02	
MIL Connector Type		Analog inputs	4 inputs					CRT1-VAD04ML NEW	CE
		Analog outputs	2 outputs					CRT1-VDA02ML NEW	
e-CON Connector Type		Analog inputs	4 inputs					CRT1-VAD04S NEW	
		Analog outputs	2 outputs					CRT1-VDA02S NEW	

Note. 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

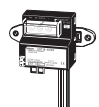
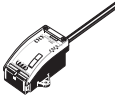
Name	Appearance	Specifications			Communications Cables				Model	Standards
					Round cable I	Round cable II	Standard Flat Cable I	Sheathed Flat Cable II		
Temperature Input Units		Thermocouple Input	4 inputs	Switchable between (R, S, K, J, T, E, B, N, L, U, W, PL2)	Yes	Yes	Yes	Yes	CRT1-TS04T NEW	CE
		Platinum-resistance thermometer input							PT100 (-200 to 850°C) PT100 (-200 to 2000°C)	

● Expansion Units

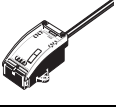
Name	Appearance	Specifications				Model	Standards
		Inputs	Outputs	NPN	PNP		
Expansion Units		Inputs	8 inputs	NPN	One Expansion Unit can be mounted to one CRT1-ID16(-1), CRT1-OD16(-1), CRT1-ROS16, or CRT1-ROF16 Digital I/O Slave.	XWT-ID08	CE, UC, UC1, N
				PNP		XWT-ID08-1	
		Outputs	8 outputs	NPN		XWT-OD08	
				PNP		XWT-OD08-1	
		Inputs	16 inputs	NPN		XWT-ID16	
				PNP		XWT-ID16-1	
		Outputs	16 outputs	NPN		XWT-OD16	
				PNP		XWT-OD16-1	

■ Bit Slave Units

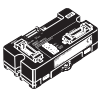
● Units with Connectors

Name	Appearance	Specifications		Communications Cables				Model	Standards	
				Round cable I	Round cable II	Standard Flat Cable I	Sheathed Flat Cable II			
IP20		Inputs	2 inputs	No	No	Yes	No	CRT1B-ID02S	CE, U	
								PNP		CRT1B-ID02S-1
		Outputs	2 outputs					NPN		CRT1B-OD02S
								PNP		CRT1B-OD02S-1
IP54		Inputs	2 inputs	---	---	No	Yes	CRT1B-ID02SP	CE, U	
								PNP		CRT1B-ID02SP-1
		Outputs	2 outputs					NPN		CRT1B-OD02SP
								PNP		CRT1B-OD02SP-1
		Inputs	4 DC inputs					NPN		CRT1B-ID04SP
								PNP		CRT1B-ID04SP-1

● Units with Clamp Terminals

Name	Appearance	Specifications		Communications Cables				Model	Standards
				Round cable I	Round cable II	Standard Flat Cable I	Sheathed Flat Cable II		
IP54		Inputs/outputs	2 inputs and 2 outputs	No	No	No	Yes	CRT1B-MD04SLP	CE, U
								PNP	


■ Repeater Unit

Name	Appearance	Specifications	Communications Cables				Model	Standards
			Round cable I	Round cable II	Standard Flat Cable I	Sheathed Flat Cable II		
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.	Yes	Yes	Yes	Yes	CRS1-RPT01 (See note.)	CE, U, U1, L





Note. 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

● Slice I/O Units

Name	Appearance	Specifications	Model	Standards
Slice I/O Units		4 inputs NPN	GRT1-ID4	CE, UC1, L
		4 inputs PNP	GRT1-ID4-1	
		4 outputs NPN	GRT1-OD4	
		4 outputs PNP	GRT1-OD4-1	
		8 inputs NPN	GRT1-ID8 NEW	CE, UC, L
		8 inputs PNP	GRT1-ID8-1 NEW	
		8 outputs NPN	GRT1-OD8 NEW	
		8 outputs PNP	GRT1-OD8-1 NEW	
		Relay Outputs 2 points	GRT1-ROS2	CE, UC1, L
		Analog inputs (current/voltage)	GRT1-AD2	CE, UC1, L
		Analog outputs (current)	GRT1-DA2C	
		Analog output (voltage)	GRT1-DA2V	
		Temperature input (Resistance thermometer:Pt100) 2 points	GRT1-TS2P	CE, UC1, L
		Temperature input (Resistance thermometer:Pt1000) 2 points	GRT1-TS2PK	
		Thermocouple Input 2 points	GRT1-TS2T NEW	CE, UC, L
		Counter inputs: 1, External outputs: 1 NPN	GRT1-CT1	CE, UC, L
Counter inputs: 1, External outputs: 1 PNP		GRT1-CT1-1		

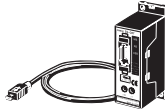
● System Units

Name	Appearance	Specifications	Model	Standards	
System Units		Right Turnback Unit (Mounts to the right side of Slice I/O Terminal.)	GRT1-TBR	CE, UC1, L	
		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 m	GCN2-100	UC * 2, CE, L
		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
				GRT1-PD2G NEW	
				GRT1-PD8 NEW	
			GRT1-PD8-1 NEW		
Use to add V/G terminals for I/O power supply.		GRT1-PC8 NEW			
		GRT1-PC8-1 NEW			
End Unit *1		Necessary for terminating the Slice I/O Terminal.	GRT1-END	CE, UC1, L	
Option	Terminal Block	---	Package of 5 Terminal Blocks	GRT1-BT1-5	---

*1 The End Unit is sold separately. It is not provided with the Communications Unit.

*2 Use the GCN2-100 together with the GCN1-TBR or GCN1-TBL.

■ Sensor Communications Unit

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

■ Support Software



Product name	Specifications			Model	Standards
		Number of licenses	Media		
CX-One FA Integrated Tool Package Ver. 3.□	The CX-One is a package that integrates the Support Software for OMRON PLCs and components. CX-One runs on the following OS. Windows 2000 (Service Pack 3 or higher), XP, or Vista. CX-One Ver.3.□ includes CX-Integrator. For details, refer to the CX-One catalog (Cat. No. R134).	1 license (See note 1.)	CD	CXONE-AL01C-V3	---
			DVD (See note 2.)	CXONE-AL01D-V3	

Note 1. Multi licenses are available for the CX-One (3, 10, 30, or 50 licenses).

2. When purchasing the DVD format, verify the computer model and DVD drive specifications before purchasing.

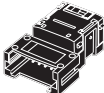




Peripheral Devices

■ 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
Flat Cable II		Sheathed 4-conductor flat cable (UL compliant) Length: 100 m Conductor diameters: 0.75 mm ² × 2, 0.5 mm ² × 2	DCA5-4F10	


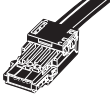


Note. Also can be used with general-purpose round cable I (VCTF 2-conductor cable).

● 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. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Used when connecting a DCN4-TM4 Terminating Resistor to the end of the trunk line or a sub-trunk line. 	DCN4-TR4 (See note.)	UC
Flat Connector Plug		Use this Connector in a set with a DCN4-TR4 Flat Connector Socket for the following applications. <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Connecting Communications Cable to a Unit • Connecting Communications Cable to a DCN4-MD4 Multidrop Connector (when a multidrop connection is used) 	DCN4-BR4 (See note.)	
Multidrop Connector		Use Multidrop Connectors for multi-drop wiring of Slave Units or Repeater Units to trunk lines, sub-trunk lines, or branch lines.	DCN4-MD4 (See note.)	
Terminating Resistance		This is a Connector-type Terminating Resistor for Flat Cable I. It is connected to a DCN4-TR4 Flat Connector Socket at the end of a trunk line or sub-trunk line.	DCN4-TM4 (See note.)	UC
Special Tools		Crimping Tool for DCN4-TR4 Flat Connector Socket or DCN4-BR4 Flat Connector Plug	DWT-A01 (See note.)	---



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

● For Flat Cable II

Name	Appearance	Application	Model	Standards
Flat Connector Socket		Use this Connector in a set with a DCN5-BR4 Flat Connector Plug for the following applications. <ul style="list-style-type: none"> • 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 	DCN5-TR4 (See note.)	UC
		Use this Connector independently for the following applications. <ul style="list-style-type: none"> • Used when connecting a DCN5-TM4 Terminating Resistor to the end of the trunk line or a sub-trunk line. 		
Flat Connector Plug		Use this Connector in a set with a DCN5-TR4 Flat Connector Socket for the following applications. <ul style="list-style-type: none"> • 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 	DCN5-BR4 (See note.)	
		Use this Connector independently for the following applications. <ul style="list-style-type: none"> • Connecting Communications Cable to a Unit 		
Terminating Resistance		This is a Connector-type Terminating Resistor for Flat Cable II. It is connected to a DCN5-TR4 Flat Connector Socket at the end of a trunk line or sub-trunk line.	DCN5-TM4 (See note.)	UC
Special Tools		Crimping Tool for DCN5-TR4 Flat Connector Socket or DCN5-BR4 Flat Connector Plug	DWT-A02	---


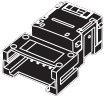


Note: The minimum quantity packaged is 10 Connectors. Order the Connectors in multiples of 10.

● For Round Cable I

Name	Appearance	Application	Model	Standards
Open Type Connector (for connecting Units)		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 (See note.)	UC
Terminating Resistor		This is a Terminal Block-type Terminating Resistor for round cable. It is connected to the end of a trunk line or sub-trunk line round cable.	DRS1-T	UC

Note: The minimum quantity packaged is 10 Connectors. Order the Connectors in multiples of 10.

● 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 (See note.)	UC
Flat Connector Socket		Use this Connector in a set with a DCN4-BR4 Flat Connector Plug for the following applications. <ul style="list-style-type: none"> • 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 	DCN4-TR4 (See note.)	UC
		Use this Connector independently for the following applications. <ul style="list-style-type: none"> • Used when connecting a DCN4-TM4 Terminating Resistor to the end of the trunk line or a sub-trunk line. 		
Terminating Resistance		This is a Connector-type Terminating Resistor for Flat Cable I. It is connected to a DCN4-TR4 Flat Connector Socket at the end of a trunk line or sub-trunk line.	DCN4-TM4 (See note.)	UC
Special Tools		Crimping Tool for DCN5-TR4 Flat Connector Socket or DCN5-BR4 Flat Connector Plug	DWT-A02	---

Note: The minimum quantity packaged is 10 Connectors. Order the Connectors in multiples of 10.

■ Mounting Bracket

Name	Appearance	Application	Model	Standards
Mounting Bracket	---	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	
		Unit with MIL Connectors For CRT1-V□D32ML(-1)	SRT2-ATT02	

Related Manuals

Manuals

Cat. No.	Name	Contents
W457	CompoNet Slave Units and Repeater Unit Operation Manual	This manual tells Contains information on the specifications of CompoNet Slave Units and Repeater Units.
W456	CJ1W-CRM21/CJ1W-CRM21 CompoNet Master Units Operation Manual	This manual tells Contains general information on CompoNet networks, information on communications specifications and wiring methods common to communications networks, and information on CS/CJ-series Master Units.
W342	SYSMAC CS/CJ/CP Series SYSMAC One NSJ Series Communications Commands Reference Manual	This manual tells Contains information on communications commands for CS/CJ-series Master Units.
W464	CX-Integrator Ver.□.□ Operation Manual	This manual contains information on the CX-Integrator
W455	GRT1 Series SmartSlice I/O Units Operation Manual	This manual tells you about the models, functions, specifications, and operating procedures of the SmartSlice I/O Units.
W476	SmartSlice CompoNet Communications Unit Operation Manual	This manual tells you about the functions, specifications, and operating procedures of the CompoNet Communications Unit.

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6. **Governmental Approvals.** Buyer shall be responsible for, and shall bear all costs involved in, obtaining any government approvals required for the importation or sale of the Products.
7. **Taxes.** All taxes, duties and other governmental charges (other than general real property and income taxes), including any interest or penalties thereon, imposed directly or indirectly on Omron or required to be collected directly or indirectly by Omron for the manufacture, production, sale, delivery, importation, consumption or use of the Products sold hereunder (including customs duties and sales, excise, use, turnover and license taxes) shall be charged to and remitted by Buyer to Omron.
8. **Financial.** If the financial position of Buyer at any time becomes unsatisfactory to Omron, Omron reserves the right to stop shipments or require satisfactory security or payment in advance. If Buyer fails to make payment or otherwise comply with these Terms or any related agreement, Omron may (without liability and in addition to other remedies) cancel any unshipped portion of Products sold hereunder and stop any Products in transit until Buyer pays all amounts, including amounts payable hereunder, whether or not then due, which are owing to it by Buyer. Buyer shall in any event remain liable for all unpaid accounts.
9. **Cancellation; Etc.** Orders are not subject to rescheduling or cancellation unless Buyer indemnifies Omron against all related costs or expenses.
10. **Force Majeure.** Omron shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
11. **Shipping; Delivery.** Unless otherwise expressly agreed in writing by Omron:
 - a. Shipments shall be by a carrier selected by Omron; Omron will not drop ship except in "break down" situations.
 - b. Such carrier shall act as the agent of Buyer and delivery to such carrier shall constitute delivery to Buyer;
 - c. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid;
 - d. Delivery and shipping dates are estimates only; and
 - e. Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
12. **Claims.** Any claim by Buyer against Omron for shortage or damage to the Products occurring before delivery to the carrier must be presented in writing to Omron within 30 days of receipt of shipment and include the original transportation bill signed by the carrier noting that the carrier received the Products from Omron in the condition claimed.
13. **Warranties.** (a) **Exclusive Warranty.** Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied. (b) **Limitations.** OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) **Buyer Remedy.** Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty. See <http://www.omron247.com> or contact your Omron representative for published information.
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15. **Indemnities.** Buyer shall indemnify and hold harmless Omron Companies and their employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Omron is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless Omron and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
16. **Property; Confidentiality.** Any intellectual property in the Products is the exclusive property of Omron Companies and Buyer shall not attempt to duplicate it in any way without the written permission of Omron. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Omron. All information and materials supplied by Omron to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
17. **Export Controls.** Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (ii) sale of products to "forbidden" or other proscribed persons; and (iii) disclosure to non-citizens of regulated technology or information.
18. **Miscellaneous.** (a) **Waiver.** No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) **Assignment.** Buyer may not assign its rights hereunder without Omron's written consent. (c) **Law.** These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) **Amendment.** These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) **Severability.** If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) **Setoff.** Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) **Definitions.** As used herein, "including" means "including without limitation"; and "Omron Companies" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

Certain Precautions on Specifications and Use

1. **Suitability of Use.** Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
 - (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
 - (ii) Use in consumer products or any use in significant quantities.
 - (iii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
 - (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this Product.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON'S PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
2. **Programmable Products.** Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
3. **Performance Data.** Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.
4. **Change in Specifications.** Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.
5. **Errors and Omissions.** Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

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