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OMRON

Open Network for High-Speed Control

# CompoNet

- **CompoNet Master Unit**
  **CS1W-CRM21/CJ1W-CRM21**
- **CompoNet Slave Unit**
  **CRT1 Series**
- **CompoNet Repeater Unit**
  **CRS1 Series**

**Fast and Intelligent**


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# 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 Mbits/s (See note.), 3 Mbits/s, 1.5 Mbits/s, 93.75 kbits/s<br>**Note:** Drop-line connections are not supported with a baud rate of 4 Mbits/s, so Slaves with prewired cables (Bit Slaves) cannot be used. |
| Modulation | Base-band |
| Coding | Manchester code |
| Error control | Manchester code rules, CRC |
| Communications media | The following media can be used.<br>• Round cable I (JIS C 3306, VCTF 2-conductor)<br>• Flat Cable I (DCA4-4F10 Standard Flat Cable)<br>• Flat Cable II (DCA5-4F10 Sheathed Flat Cable)<br>**Note:** Round cable I, 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. |
| Communications distance and wiring | Refer to *Cable Types, Baud Rates, and Maximum Distances* on page 12 of *CompoNet Catalog* (Cat. No. R140). |
| 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)<br>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<br>Bit Slave Units: 128 input nodes and 128 output nodes<br>Repeater Units: 64 nodes |
| Bits allocated per node address | Word Slave Units: 16 bits<br>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<br>Bit Slave Units: IN0 to IN127 and OUT0 to OUT127<br>Repeater Units: 0 to 63 |
| Repeater Unit application conditions | Up to 64 Repeater Units can be connected per network. When Repeater Units are connected in series from the Master Unit, up to 2 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)<br>• Power is supplied from the Master Unit or Repeater Units. |
| Communications power supply | 24 VDC ±10% |
| Connection forms | Flat Cable at baud rate of 93.75 kbits/s: No restrictions<br>Other cables or baud rates: Trunk line and branch lines |
| | Connections for Slave Units and Repeater Units: T-branch or multidrop connections |
| Remote I/O communications | Automatic startup when power is turned ON (See note.) or manual startup using the Remote I/O Communications Start Switch in I/O Communications Manual Start Mode.<br>**Note:** When power is turned ON to the PLC and the Slave Unit communications power is turned ON. Communications are not started in the following cases:<br>• In Registered Slave Unit Participation Standby Mode, communications is not started until all registered Slave Units are participating in the network.<br>• In Communications Error Communications Stop Mode, communications stop when a communications error occurs. |
| I/O communications manual startup mode | I/O Communications Manual Startup Mode can be set from the CompoNet Support Software so that remote I/O communications are not started when the power is turned ON. Remote I/O communications will not start until the Remote I/O Communications Start Switch is turned ON in memory. |
| Communications error communications stop mode | All remote I/O communications are stopped if a communications error occurs in any Slave Unit.<br>**Note:** Communications will not stop for verification errors for registration tables or duplicated address settings. |
| Communications error input data zero clear mode | All input data will be cleared to zeros in any Slave Unit in which a communications error occurs. |

| Item | | Specification |
|---|---|---|
| Duplicated Slave address check | | If the same address is set for two different Slave Units or the same memory is allocated to two different nodes, the Slave Unit that joins communications last will cause a duplicated address error and will leave the network. The Duplicated Address Error Flag will turn ON.<br>**Note:** This error will also occur if a Slave Unit leaves the network and then a different type of Slave Unit joins the network. |
| Registration table | | The Slave Units that can participate for each node address are registered in a table so that only the registered Slave Units can participate. If a different Slave Unit attempts to join the network, the Registration Table Verification Error Flag will turn ON. The Registration Table is generated automatically or manually edited from the CompoNet Support Software. |
| Slave Unit status | Without registration table | Participation Flag and Communications Error Flag for each Slave Unit<br>• Participation Flag: Turns ON and remains ON if the Slave Unit joins the network even one time after system power is turned ON.<br>• Communications Error Flag: Turns ON if the Slave Unit cannot communicate with the Master Unit for any reason after the Slave Unit has joined the network (i.e., if the Participation Flag is ON). (Turns OFF when the error is removed.)<br>Duplicated Address Error Flags and Alarm Flags |
| | With registration table | • Participation Flags and Communications Error Flags for each node address for all Slave Units registered in the Registration Table<br>• Registration Table Verification Error Flags<br>• All Registered Slave Units Participating Flag<br>**Note:** The Registered Slave Unit Participation Monitoring Time can be set (verification error check timing).<br>Registered Slave Unit Participation Standby Mode can be set. (Remote I/O communications will not start until all registered Slave Units are participating.) |

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 | • Remote I/O communications<br>• Message communications | Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total)<br>Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total) | 1, 2, 4, or 8 | 0.4 | | --- | CS1W-CRM21 | CE, U1, UC1 (pending) |
| CJ1 Special I/O Unit | • Remote I/O communications<br>• Message communications | Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total)<br>Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total) | 1, 2, 4, or 8 | 0.4 | --- | | CJ1W-CRM21 | CE, U1, UC1 (pending) |

**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.

## 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 communications power supply connector for Slave Units and Repeater Units on the trunk line when using Flat Cable<br>**Note:** The Master Unit does not required communications power. | |
| **Communications power supply connector allowable current capacity** | 5 A max. | |
| **Maximum number of mountable Master Units** | One word number assigned: 80 Units<br>Two word numbers assigned: 48 Units<br>Four word numbers assigned: 24 Units<br>Eight word numbers assigned: 12 Units | One word number assigned: 40 Units<br>Two word numbers assigned: 40 Units<br>Four word numbers assigned: 24 Units<br>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:<br>• Registration Table<br>• Registration Table Check Type<br>• Registered Slave Unit Participation Monitoring Time, Registered Slave Unit Participation Standby Mode, and Event Disable Setting<br>• Software Settings Table<br>• Communications Error Communications Stop Mode<br>• Communications Error Input Data Zero Clear Mode<br>• Network settings<br>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) |

## Smart Functions

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

### ■ CompoNet Slave Unit Functions

Yes: Supported, ---: Not supported

| Unit | Digital I/O Slave Units | | | | | |
|---|---|---|---|---|---|---|
| | 2-tier Terminal Block | | | 3-tier Terminal Block | | |
| | CRT1-□D16(-1) | | CRT1-ROS16<br>CRT1-ROF16 | CRT1-□D16TA(-1) | | |
| **Function** | **Input Units** | **Output Units** | **Output Units** | **Input Units** | **Output Units** | **Input/Output Units** |
| Operation Time Monitor | Yes | | | | | |
| Contact Operation Monitor | Yes | | | | | |
| Total ON Time Monitor | Yes | | | | | |
| Automatic Baud Rate Detection | Yes | | | | | |
| Unit Conduction Time Monitor | Yes | | | | | |
| Naming Units | Yes | | | | | |
| Naming Connected Devices | Yes | | | | | |
| Network Power Voltage Monitor | Yes | | | | | |
| I/O Power Status Monitor | Yes | | --- | Yes | | |
| Communications Error History Monitor | Yes | | | | | |
| Input Filter | Yes | --- | --- | Yes | --- | Yes |
| Communications Error Output | --- | Yes | Yes | --- | Yes | Yes |
| Preventing Malfunctions Caused by Inrush Current at I/O Startup | Yes | --- | --- | Yes | --- | Yes |
| Sensor Power Short-circuit Detection | --- | | | | | |
| External Load Short-circuit Detection | --- | | | | | |
| Removable Terminal Block Structure | Yes | | | | | |
| Expansion Using Expansion Units | Yes | | 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 | --- | | | | | |
| Disconnected Line Detection | --- | | | | | |
| User Adjustment | --- | | | | | |

Yes: Supported, ---: Not supported

| Unit / Function | Digital I/O Slave Units | | | | | Analog I/O Slave Units | | Bit Slave Units | | | | | Repeater Units |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Connector | | | Clamp Terminals | | | | | | | | | |
| | CRT1-□D16S(-1) | | | CRT1-□D16SL(-1) | | CRT1-AD04 CRT1-DA02 | | CRT1B-□D02S(-1) | | CRT1B-□D0□SP(-1) CRT1B-MD04SLP(-1) | | | CRS1-RPT01 |
| | Input Units | Output Units | Input/ Output Units | Input Units | Output Units | Input Units | Output Units | Input Units | Output Units | Input Units | Output Units | Input/ Output Units | |
| Operation Time Monitor | Yes | | | | | --- | | Yes | | | | | --- |
| Contact Operation Monitor | Yes | | | | | --- | | Yes | | | | | --- |
| Total ON Time Monitor | Yes | | | | | --- | | Yes | | | | | --- |
| Automatic Baud Rate Detection | Yes | | | | | Yes | | Yes | | | | | Yes |
| Unit Conduction Time Monitor | Yes | | | | | Yes | | Yes | | | | | Yes |
| Naming Units | Yes | | | | | Yes | | Yes | | | | | Yes |
| Naming Connected Devices | Yes | | | | | Yes | | Yes | | | | | --- |
| Network Power Voltage Monitor | Yes | | | | | Yes | | Yes | | | | | Yes |
| I/O Power Status Monitor | --- | Yes | | Yes | | --- | | --- | | | | | --- |
| Communications Error History Monitor | Yes | | | | | Yes | | Yes | | | | | Yes |
| Input Filter | Yes | --- | Yes | Yes | --- | --- | | Yes | --- | Yes | --- | Yes | --- |
| Communications Error Output | --- | Yes | Yes | --- | Yes | --- | Yes | --- | Yes | --- | Yes | Yes | --- |
| Preventing Malfunctions Caused by Inrush Current at I/O Startup | Yes | --- | Yes | Yes | --- | --- | | Yes | --- | Yes | --- | Yes | --- |
| Sensor Power Short-circuit Detection | --- | | | | | --- | | Yes | --- | Yes | --- | Yes | --- |
| External Load Short-circuit Detection | --- | | | | | --- | | --- | Yes | --- | Yes | Yes | --- |
| Removable Terminal Block Structure | --- | | | Yes | | Yes | | --- | | | | | --- |
| Expansion Using Expansion Units | --- | | | | | --- | | --- | | | | | --- |
| Scaling | --- | | | | | Yes | | --- | | | | | --- |
| Last Maintenance Date | Yes | | | | | Yes | | Yes | | | | | Yes |
| Cumulative Counter | --- | | | | | Yes | | --- | | | | | --- |
| Moving Average | --- | | | | | Yes | --- | --- | | | | | --- |
| Setting the Number of AD Conversion Points | --- | | | | | Yes | --- | --- | | | | | --- |
| Rate of Change | --- | | | | | Yes | --- | --- | | | | | --- |
| Comparator | --- | | | | | Yes | --- | --- | | | | | --- |
| Peak/Bottom Hold | --- | | | | | Yes | --- | --- | | | | | --- |
| Top/Valley Hold | --- | | | | | Yes | --- | --- | | | | | --- |
| Disconnected Line Detection | --- | | | | | Yes | --- | --- | | | | | --- |
| User Adjustment | --- | | | | | 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?

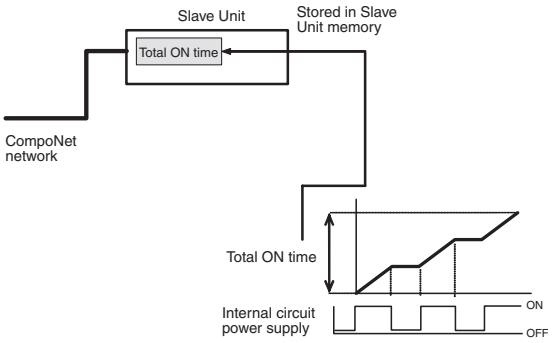
## ■ Smart Functions

### ● 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 CompoNet Support Software, 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.

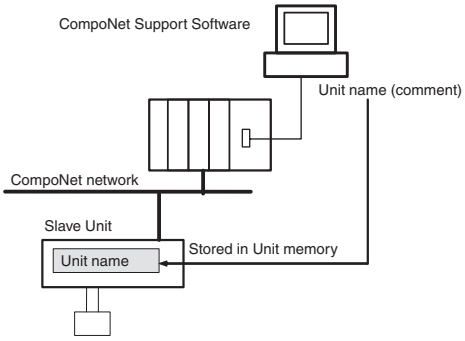
### ● Unit Conduction Time Monitor

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 CompoNet Support Software 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.



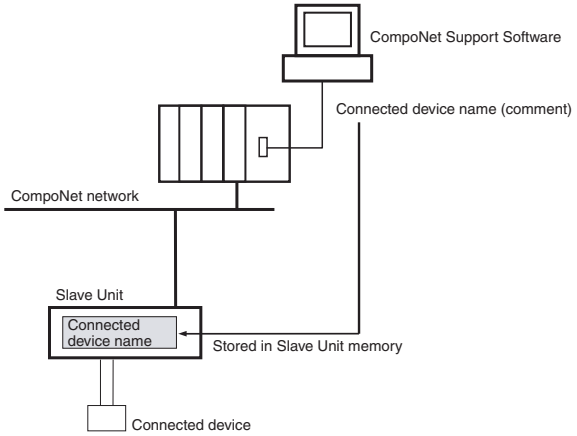

### ● Naming Units

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.



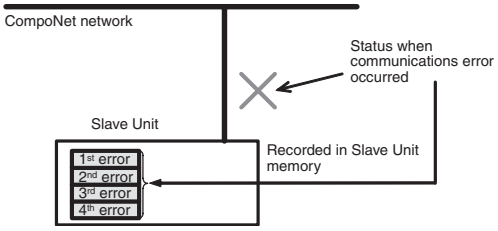

### ● Naming Connected Devices

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.



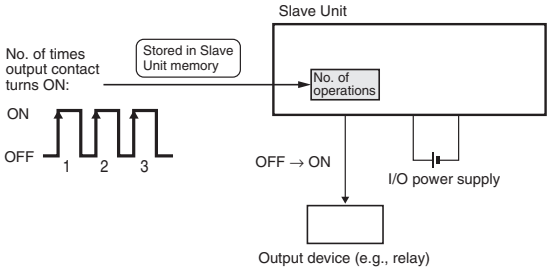

### ● Last Maintenance Date

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 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 CompoNet Support Software 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 CompoNet Support Software 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

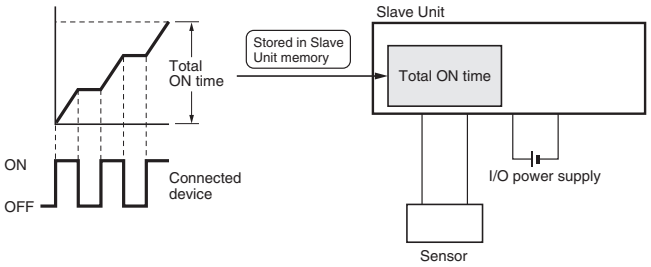



**Note 1.** The contact operation monitor and the total ON time monitor cannot both be used for the same contact at the same time. Select only one of these functions under the *Operation Monitor Mode*.
**2.** This function does not operate if the I/O power is not turned ON.

### ● 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 CompoNet Support Software 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 CompoNet Support Software or using explicit messages.

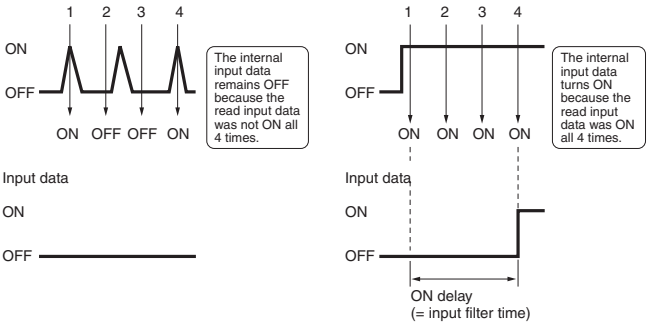
- Measurement time: 0 to 4,294,967,295 s (Stored data: 0000 0000 to FFFF FFFF Hex)
- Measurement unit: s




**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 *Operation Monitor 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.

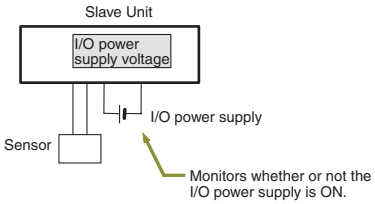



### ● Preventing Malfunctions Caused by Inrush Current at Startup (Input Units Only) (Digital I/O Slave Units and Bit Slave Input Units Only)

This function does not accept inputs from when the power is turned ON until the Unit stabilizes, i.e., inputs are not received while the I/O power is OFF and for 100 ms after the I/O power is turned ON.
This means input errors caused by inrush current when the I/O power is turned ON can be eliminated.

### ● 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 CompoNet Support Software or using explicit messages.



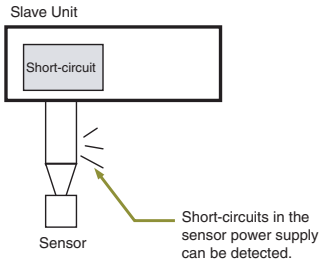

**Note:** A detection voltage cannot be set for the I/O power supply.

### ● 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 sensor 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 sensor 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 CompoNet Support Software 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 100 mA or more flows 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 Sensor Unit current consumption + total sensor current consumption
- Communications power capacity used ≥ {total network current + (short-circuit detection current = 100 mA)} × (CompoNet network voltage)



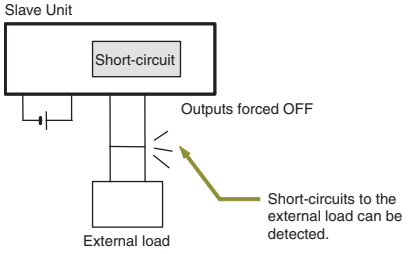

### ● External Load Short-circuit Detection (Output Only) (Bit Slave Units Only)

This function monitors the load current for the output section and detects an external 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 an external load short-circuit is detected, a flag in a status area in the Slave Unit turns ON to notify the Master Unit. The notifica-

tion details can be read using the CompoNet Support Software 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.



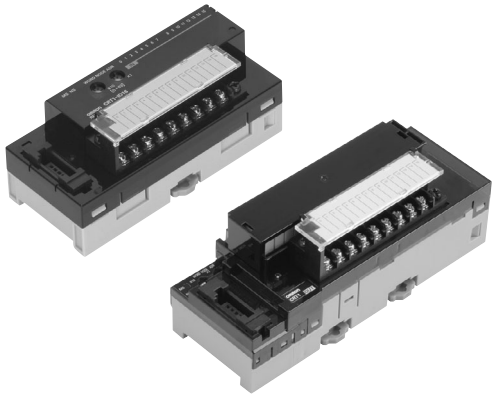
CompoNet Digital I/O Slave Units with Screw Terminal Blocks (2-tier Terminal Block/Relay Output/SSR Output)

# CRT1-ID16(-1)/OD16(-1)/ROS16/ROF16

## 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.



NEW

## Ordering Information

| Name | Specifications | | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|
| | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| Two-tier Screw Terminal Block | Inputs | 16 inputs | NPN | Yes | Yes | Yes | CRT1-ID16 | CE (certified), UC1 (pending) |
| | | | PNP | | | | CRT1-ID16-1 | |
| | Outputs | 16 outputs | NPN | | | | CRT1-OD16 | |
| | | | PNP | | | | CRT1-OD16-1 | |
| Screw Terminal Block with Relay Outputs | Outputs | 16 outputs | Contacts | Yes | Yes | Yes | CRT1-ROS16 *NEW* | CE (certified), UC1 (pending) |
| Screw Terminal Block with SSR Outputs | Outputs | 16 outputs | SSR | Yes | Yes | Yes | CRT1-ROF16 *NEW* | --- |

**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.

### ● 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

### ● 2-tier Terminal Block

| 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/s² in X, Y, and Z directions for 80 min each |
| Shock resistance | 150 m/s² (3 times each in 6 directions on 3 axes) |
| Dielectric strength | 500 VAC (between isolated circuits) |
| Insulation resistance | 20 MΩ min. (between isolated circuits) |
| Ambient operating temperature | −10 to 55°C |
| Ambient operating humidity | 25% to 85% (with no condensation) |
| Ambient operating atmosphere | No corrosive gases |
| Storage temperature | −25 to 65°C |
| Storage humidity | 25% to 85% (with no condensation) |
| Tightening torque for the terminal block screws | M3 terminal screws: 0.5 N·m<br>M3 mounting screws: 0.5 N·m |
| Installation | Mounted on 35-mm DIN Track |

### ● Relay Output/SSR Output

| 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/s² in X, Y, and Z directions for 80 min each |
| Shock resistance | 150 m/s² (3 times in 6 directions on 3 axes) |
| Dielectric strength | 500 VAC (between isolated circuits) |
| Insulation resistance | 20 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) |
| Tightening torque for the terminal block screws | M3 terminal screws: 0.5 N·m<br>M3 mounting screws: 0.5 N·m |
| Installation | Mounted on 35-mm DIN Track |

# Input Section Specifications

### ● 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<br>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 and I/O power must be supplied separately.) | |
| Communications power supply current consumption | 55 mA max. for 24-VDC power supply voltage<br>85 mA max. for 14-VDC power supply voltage | |
| Weight | 141 g max. | |

# Output Section Specifications

## ● 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 and I/O power must be supplied separately.) | |
| Communications power supply current consumption | 55 mA max. for 24-VDC power supply voltage<br>85 mA max. for 14-VDC power supply voltage | |
| Output handling for communications errors | Hold or clear can be selected. (CompoNet Support Software) | |
| Weight | 141 g max. | |

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

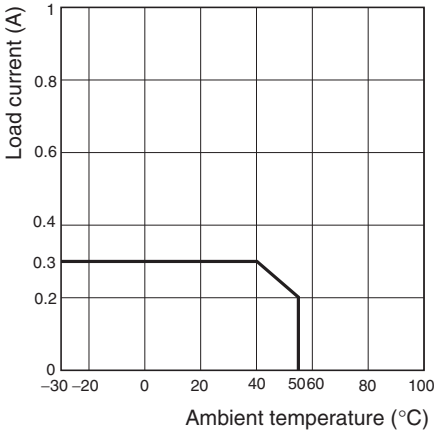
| Item | Specification |
|---|---|
| Model | CRT1-ROS16 |
| I/O capacity | 16 outputs |
| Mounted Relays | DRTA-NY5W-K (5 VDC) |
| Rated load | Resistive load<br>250 VAC, 2 A, common: 8 A<br>30 VDC, 2 A, common: 8 A |
| Rated ON current | 3 A |
| Maximum contact voltage | 250 VAC, 125 VDC |
| Maximum 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<br>255 mA max. for 14-VDC power supply voltage |
| Output hold for communications errors | Hold or clear can be selected. (CompoNet Support Software) |
| Weight | 260 g max. |

## ● 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<br>130 mA max. for 14-VDC power supply voltage |
| Output hold for communications errors | Hold or clear can be selected. (CompoNet Support Software) |
| Weight | 250 g max. |

Note: The SSRs cannot be replaced.

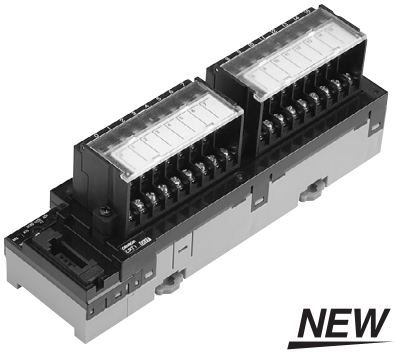
### Load Current vs. Ambient Temperature



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

# CRT1-ID16TA(-1)/OD16TA(-1)/MD16TA(-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.



NEW

**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 | | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|
| | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| Three-tier Screw Terminal Block | Inputs | 16 inputs | NPN | Yes | Yes | Yes | CRT1-ID16TA NEW | CE (certified), UC1 (pending) |
| | | | PNP | | | | CRT1-ID16TA-1 NEW | |
| | Outputs | 16 outputs | NPN | | | | CRT1-OD16TA NEW | |
| | | | PNP | | | | CRT1-OD16TA-1 NEW | |
| | Inputs/ outputs | 8 inputs and 8 outputs | NPN | | | | CRT1-MD16TA NEW | |
| | | | PNP | | | | CRT1-MD16TA-1 NEW | |

**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 |
| 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 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) |
| Tightening torque for the terminal block screws | M3 terminal screws: 0.5 N·m<br>M3 mounting screws: 0.5 N·m |
| Installation | Mounted on 35-mm DIN Track |

## Input Section Specifications

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

| Item | Specification | |
|---|---|---|
| Model | CRT1-ID16TA | CRT1-ID16TA-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<br>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 | |
| Isolation method | Photocoupler | |
| Input indicator | LED (yellow) | |
| Installation | DIN Track mounting | |
| Power supply type | Multi-power supply | |
| Communications power supply current consumption | 40 mA max. for 24-VDC power supply voltage<br>55 mA max. for 14-VDC power supply voltage | 37 mA max. for 24-VDC power supply voltage<br>55 mA max. for 14-VDC power supply voltage |
| I/O power supply current consumption | 3.6 mA max. for 24-VDC power supply voltage | 3.5 mA max. for 24-VDC power supply voltage |
| Weight | 330 g max. | |

## Output Section Specifications

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

| Item | Specification | |
|---|---|---|
| Model | CRT1-OD16TA | CRT1-OD16TA-1 |
| I/O capacity | 16 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 mounting | |
| Power supply type | Multi-power supply | |
| Communications power supply current consumption | 45 mA max. for 24-VDC power supply voltage<br>65 mA max. for 14-VDC power supply voltage | |
| I/O power supply current consumption | 12 mA max. for 24-VDC power supply voltage | |
| Output handling for communications errors | Hold or clear can be selected. (CompoNet Support Software) | |
| Weight | 330 g max. | |

# Input and Output Section Specifications

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

### Basic Specifications

| Item | Specification |
|---|---|
| Installation | DIN Track mounting |
| Communications power supply current consumption | 40 mA max. for 24-VDC power supply voltage<br>60 mA max. for 14-VDC power supply voltage |
| Weight | 330 g max. |

### Input Section Specifications

| Item | Specification | |
|---|---|---|
| Model | CRT1-MD16TA | CRT1-MD16TA-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<br>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 | |
| Isolation method | Photocoupler | |
| Input indicator | LED (yellow) | |
| Power supply type | Multi-power supply | |
| I/O power supply current consumption | 3.5 mA max. for 24-VDC power supply voltage | |

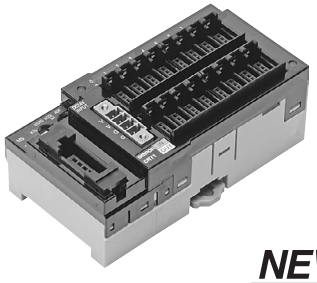
### Output Section Specifications

| Item | Specification | |
|---|---|---|
| Model | CRT1-MD16TA | CRT1-MD16TA-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) | |
| I/O power supply current consumption | 12 mA max. for 24-VDC power supply voltage | |
| Output handling for communications errors | Hold or clear can be selected. (CompoNet Support Software) | |

CompoNet Digital I/O Slave Units with Connectors

# CRT1-ID16S(-1)/OD16S(-1)/MD16S(-1)

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



NEW

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

## Ordering Information

| Name | Specifications | | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|
| | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| Digital I/O Slave Units with Connectors | Inputs | 16 inputs | NPN | Yes | Yes | Yes | CRT1-ID16S NEW | CE (certified), UC1 (pending) |
| | | | PNP | | | | CRT1-ID16S-1 NEW | |
| | Outputs | 16 outputs | NPN | | | | CRT1-OD16S NEW | |
| | | | PNP | | | | CRT1-OD16S-1 NEW | |
| | Inputs/ outputs | 8 inputs and 8 outputs | NPN | | | | CRT1-MD16S NEW | |
| | | | PNP | | | | CRT1-MD16S-1 NEW | |

**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 |
| 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 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 | Mounted on 35-mm DIN Track |

# Input Section Specifications

### ● Sixteen-point Input Units

| Item | Specification | |
|---|---|---|
| Model | CRT1-ID16S | CRT1-ID16S-1 |
| I/O capacity | 16 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 current | 1.0 mA max. | |
| Input current | At 24 VDC: 6.0 mA max./input<br>At 11 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 | Network power supply | |
| Communications power supply current consumption | 110 mA max. for 24-VDC power supply voltage<br>125 mA max. for 14-VDC power supply voltage | 110 mA max. for 24-VDC power supply voltage<br>120 mA max. for 14-VDC power supply voltage |
| Weight | 110 g max. | |

# Output Section Specifications

### ● Sixteen-point Output Unit

| Item | Specification | |
|---|---|---|
| Model | CRT1-OD16S | CRT1-OD16S-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 | 38 mA max. for 24-VDC power supply voltage<br>60 mA max. for 14-VDC power supply voltage | 39 mA max. for 24-VDC power supply voltage<br>60 mA max. for 14-VDC power supply voltage |
| I/O power supply current consumption | 20 mA max. for 24-VDC power supply voltage | |
| Output handling for communications errors | Hold or clear can be selected. (CompoNet Support Software) | |
| Weight | 110 g max. | |

# Input and Output Section Specifications

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

### Basic Specifications

| Item | Specification |
|---|---|
| Installation | DIN Track mounting |
| Communications power supply current consumption | 75 mA max. for 24-VDC power supply voltage<br>95 mA max. for 14-VDC power supply voltage |
| Weight | 120 g max. |

### Input Section Specifications

| Item | Specification | |
|---|---|---|
| Model | CRT1-MD16S | CRT1-MD16S-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 current | 1.0 mA max. | |
| Input current | At 24 VDC: 6.0 mA max./input<br>At 11 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 | |
| Isolation method | Photocoupler | |
| Input indicator | LED (yellow) | |
| Power supply type | Network power supply | |

### Output Section Specifications

| Item | Specification | |
|---|---|---|
| Model | CRT1-MD16S | CRT1-MD16S-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 | |
| I/O power supply current consumption | 12 mA max. for 24-VDC power supply voltage | |
| Output handling for communications errors | Hold or clear can be selected. (CompoNet Support Software) | |

CompoNet Digital I/O Slaves with Clamp Terminals

# CRT1-ID16SL(-1)/OD16SL(-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 mm$^2$)


## Ordering Information

| Name | Specifications | | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|
| | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| Digital I/O Slaves with Clamp Terminals | Inputs | 16 inputs | NPN | Yes | Yes | Yes | CRT1-ID16SL NEW | CE (certified), UC1 (pending) |
| | | | PNP | | | | CRT1-ID16SL-1 NEW | |
| | Outputs | 16 outputs | NPN | | | | CRT1-OD16SL NEW | |
| | | | PNP | | | | CRT1-OD16SL-1 NEW | |

**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 |
| 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 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 | Mounted on 35-mm DIN Track |

## Input Section Specifications

### ● 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<br>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 | 34 mA max. for 24-VDC power supply voltage<br>55 mA max. for 14-VDC power supply voltage | |
| I/O power supply current consumption | 13 mA max. for 24-VDC power supply voltage | |
| Weight | 250 g max. | |

## Output Section Specifications

### ● 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 | 37 mA max. for 24-VDC power supply voltage<br>60 mA max. for 14-VDC power supply voltage | |
| I/O power supply current consumption | 29 mA max. for 24-VDC power supply voltage | 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. | |

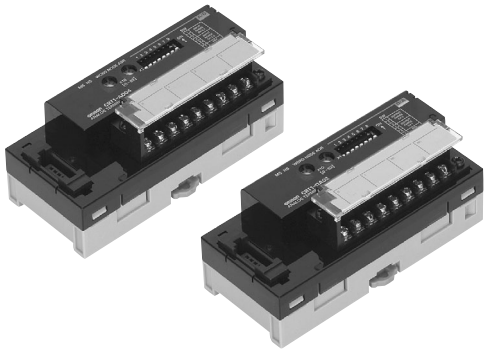
CompoNet Analog I/O Slave Units

# 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 flowrate 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 | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|
| | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| Analog I/O Slave Units | Analog inputs | 4 inputs | Yes | Yes | Yes | CRT1-AD04 | CE, UC1 (pending) |
| | Analog outputs | 2 outputs | | | | CRT1-DA02 | |

**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 |
| 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 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) |
| Tightening torque for the terminal block screws | M3 terminal screws: 0.5 N·m<br>M3 mounting screws: 0.5 N·m |
| Installation | Mounted on 35-mm DIN Track |

## Input Section Specifications

| Item | | Specification | |
|---|---|---|---|
| | | Voltage input | Current input |
| Model | | CRT1-AD04 | |
| Input signal ranges | | 0 to 5 V<br>1 to 5 V<br>0 to 10 V<br>–10 to 10 V | 0 to 20 mA<br>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 | ±0.4% FS (See note.) |
| | –10 to 55°C | ±0.6% FS | ±0.8% FS (See note.) |
| Analog conversion cycle | | 4 ms max./4 points | |
| AD conversion data | | –10 to 10 V range: F448 to 0BB8 hex full scale (–3,000 to 3,000)<br>Other ranges: 0000 to 1770 hex full scale (0 to 6,000)<br>AD conversion range: ±5% FS of the above data ranges. | |
| Isolation method | | Photocoupler isolation (between input and communications lines)<br>No isolation between input signal wires | |
| Installation | | DIN Track mounting | |
| Power supply type | | Multi-power supply | |
| Communications power current consumption | | 110 mA max. for 24-VDC power supply<br>175 mA max. for 14-VDC power supply | |
| Weight | | 153 g | |

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

## Output Section Specifications

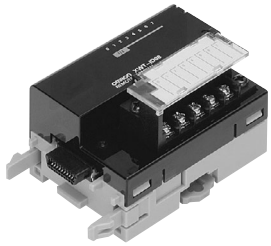
| Item | | Specification | |
|---|---|---|---|
| | | Voltage output | Current output |
| Model | | CRT1-DA02 | |
| Output signal ranges | | 0 to 5 V<br>1 to 5 V<br>0 to 10 V<br>–10 to 10 V | 0 to 20 mA<br>4 to 20 mA |
| External output allowable load resistance | | 1 kΩ min. | 600 Ω max. |
| Resolution | | 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 time | | 2 ms max./2 points | |
| DA conversion data | | –10 to 10 V range: F448 to 0BB8 hex full scale (–3,000 to 3,000)<br>Other ranges: 0000 to 1770 hex full scale (0 to 6,000)<br>AD conversion range: ±5% FS of the above data ranges. | |
| Isolation method | | Photocoupler isolation (between output and communications lines)<br>No isolation between output signal wires. | |
| Installation | | DIN Track mounting | |
| Power supply type | | Multi-power supply | |
| Communications power current consumption | | 125 mA max. for 24-VDC power supply<br>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.

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 | One Expansion Unit can be mounted to each Digital I/O Slave with a 2-tier Screw Terminal Block. | XWT-ID08 | CE, 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 | |

**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 |
| 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 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) |
| Tightening torque for the terminal block screws | M3 terminal screws: 0.5 N·m<br>M3 mounting screws: 0.5 N·m |
| Installation | Mounted on 35-mm DIN Track |

## 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<br>At 17 VDC: 3.0 mA max./input | | | |
| ON delay | 1.5 ms max. | | | |
| OFF delay | 1.5 ms max. | | | |
| Number of circuits per common | 8 inputs/common | | 16 inputs/common | |
| Communications power supply current consumption | 5 mA | | 10 mA | |
| Weight | 80 g max. | | 120 g max. | |

## Output Section Specifications

| Item | Specification | | | |
|---|---|---|---|---|
| Model | XWT-OD08 | XWT-OD08-1 | XWT-OD16 | XWT-OD16-1 |
| Internal I/O common | NPN | PNP | NPN | PNP |
| I/O capacity | 8 outputs | | 16 outputs | |
| Rated output current | 0.5 A/output, 2.0 A/common | | 0.5 A/output, 4.0 A/common | |
| Residual voltage | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) |
| Leakage current | 0.1 mA max. | | | |
| ON delay | 0.5 ms max. | | | |
| 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. | |

## CompoNet Bit Slave Units with 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 | | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|
| | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| IP20 | Inputs | 2 inputs | NPN | No | Yes | No | CRT1B-ID02S | CE, UC1 (pending) |
| | | | PNP | | | | CRT1B-ID02S-1 | |
| | Outputs | 2 outputs | NPN | | | | CRT1B-OD02S | |
| | | | PNP | | | | CRT1B-OD02S-1 | |
| IP54 | Inputs | 2 inputs | NPN | | No | Yes | 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 | |

**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 |
| 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 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 | Secured with M4 screws |

## Input Section Specifications

| Item | Specification | | | | | |
|---|---|---|---|---|---|---|
| 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.)<br>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 | |
| Sensor power short-circuit detection | Detected. | | | | | |
| 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<br>80 mA max. for 14-VDC power supply voltage | 45 mA max. for 24-VDC power supply voltage<br>65 mA max. for 14-VDC power supply voltage | 65 mA max. for 24-VDC power supply voltage<br>80 mA max. for 14-VDC power supply voltage | | 85 mA max. for 24-VDC power supply voltage<br>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.)<br>Communications power supply voltage − 1.2 V (min.) | | | |
| Residual voltage | 1.2 V max. (0.2 A DC, between each output terminal and the V terminal) | 1.2 V max. (0.2 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.2 A DC, between each output terminal and the V terminal) | 1.2 V max. (0.2 A DC, between each output terminal and the G terminal) |
| Leakage current | 0.1 mA max. | | | |
| ON delay | 0.5 ms max.<br>1.5 ms max. | | | |
| OFF delay | | | | |
| Number of circuits per common | 2 outputs/common | | | |
| External load power short-circuit detection | Detected. | | | |
| 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<br>75 mA max. for 14-VDC power supply voltage | 55 mA max. for 24-VDC power supply voltage<br>70 mA max. for 14-VDC power supply voltage | 50 mA max. for 24-VDC power supply voltage<br>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)

CompoNet 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 | | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|
| | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| IP54 | Inputs/ outputs | 2 inputs and 2 outputs | NPN | No | No | Yes | CRT1B-MD04SLP | CE, UC1 (pending) |
| | | | PNP | | | | CRT1B-MD04SLP-1 | |

**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 |
| 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 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 | Secured with M4 screws |

## 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.)<br>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 | |
| Sensor power short-circuit detection | Detected. | |
| 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<br>90 mA max. for 14-VDC power supply voltage | 75 mA max. for 24-VDC power supply voltage<br>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.)<br>Communications power supply voltage − 1.2 V (min.) | |
| Residual voltage | 1.2 V max. (0.2 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.2 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 | 2 outputs/common | |
| External load power short-circuit detection | Detected. | |
| Isolation method | No isolation | |
| Input indicators | LEDs (yellow) | |

CompoNet 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 kbits/s).
- 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 | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|
| | | VCTF 2-conductor cable | 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.<br>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 | CRS1-RPT01 | CE, UC1 (pending) |

**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.

## Specifications

| Item | Specification |
|---|---|
| Model | CRS1-RPT01 |
| Communications ports | Upstream port (port 1): Ttrunk line or sub-trunk line<br>Downstream port (port 2): Sub-trunk line (Can be wired with the same communications specifications as the Master Unit.)<br>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<br>**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. |

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□□<br>ZS-MDC□□<br>ZS-HLDC□□<br>ZFV-CA□□<br>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.

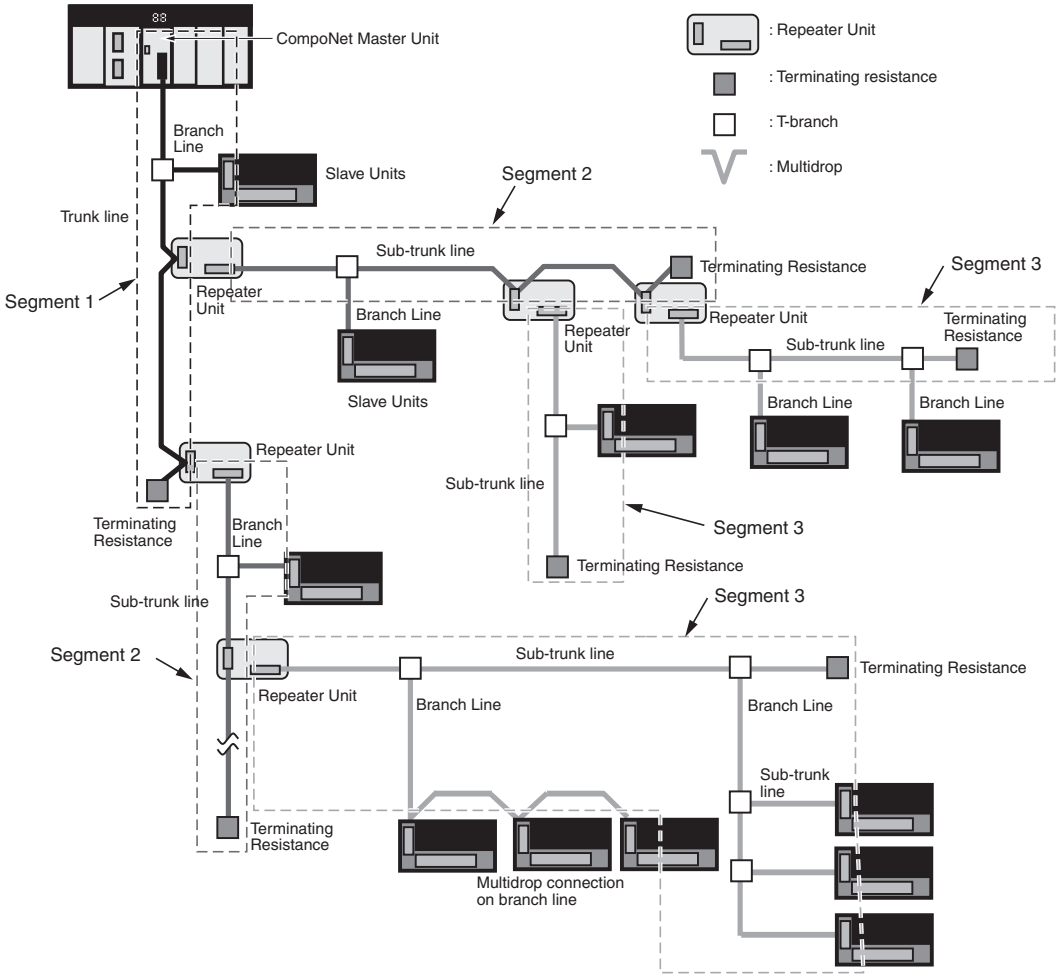
## Performance Specifications

| 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 |

# Appendix

# 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.

# 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.

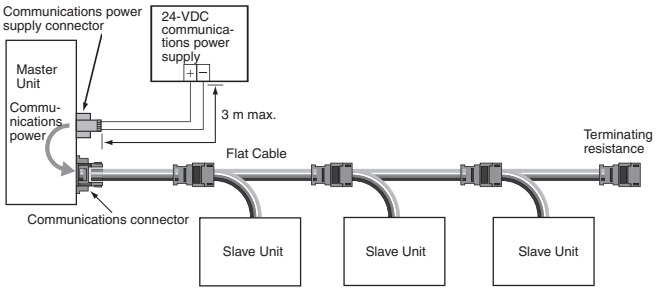
The method for supplying communications power and I/O power depends on the types of cable and Slave Unit that are used. The differences are shown in the following table.

| Power supply method | Cable types | Communications power supply | I/O power supply |
|---|---|---|---|
| Multi-power supply | Flat Cable | 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 | The communications power supply and the I/O power supply are provided together through Communications Cable. | |
| | Round Cable I | Cannot be used. | |

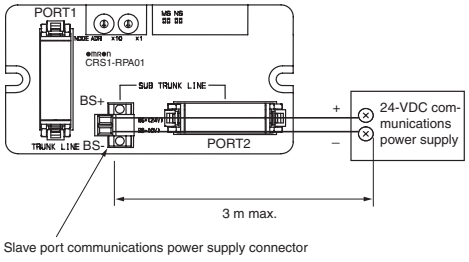
## Connection Locations for Communications Power Supply

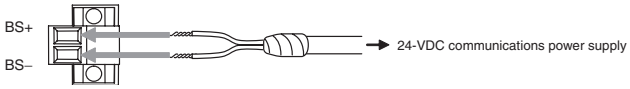
### ■ Flat Cable

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 Flat Cable. Connect only one communications power supply for the trunk line. The cable between the communications power supply and the communications power supply connector must be no longer than 3 m.



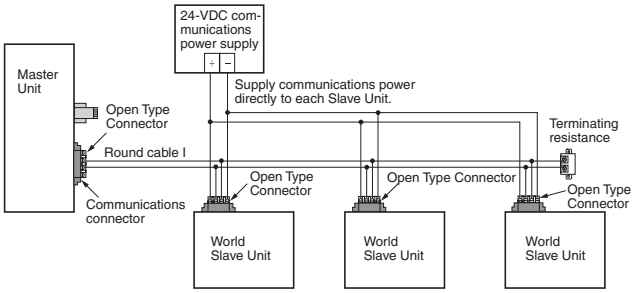

When Repeater Units are used, communications power to sub-trunk lines is supplied by the downstream port communications power supply connectors (BS+ and BS–) of the Repeater Units. The cable between the communications power supply and the communications power supply connector must be no longer than 3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



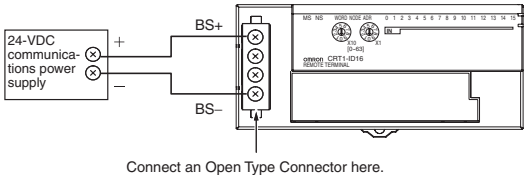




### ■ Round Cable

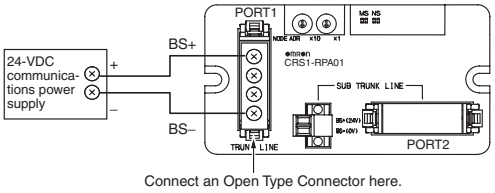
A 24-VDC power supply is connected individually to each Slave Unit. Power does not need to be supplied to the Master Unit.




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.




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




### ● Ferrules

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

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

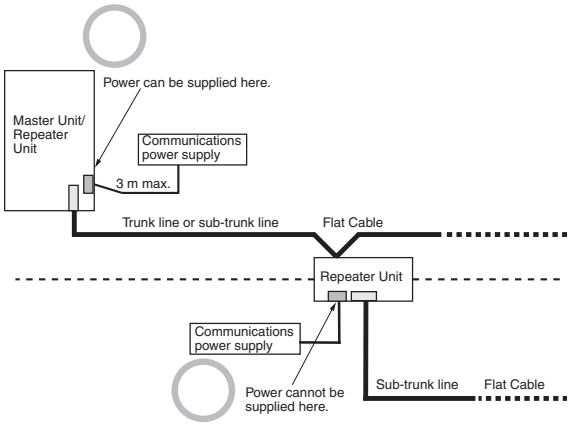
The following screwdriver is recommended for removing ferrules.

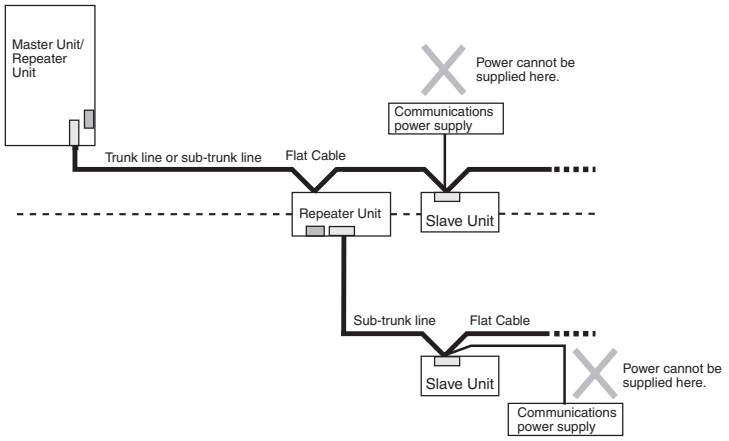
| Model | Manufacturer |
|---|---|
| XW4Z-00C | OMRON Corporation |

## Restrictions

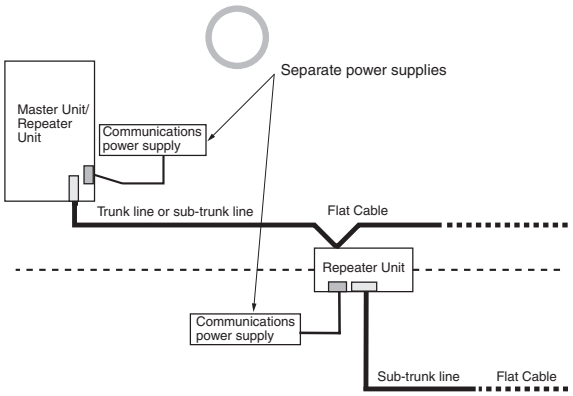
The following restrictions apply when supplying communications power through Flat Cable.

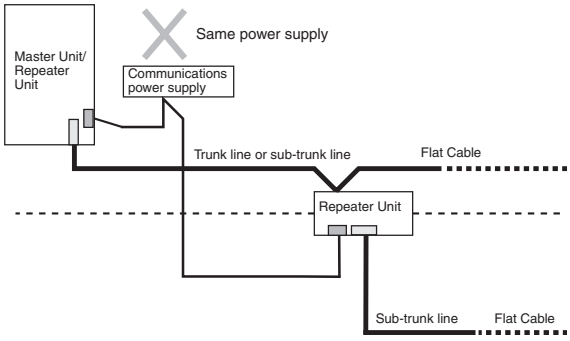
- The communications power supply can be connected at only one location for the trunk line and one location each for the sub-trunk lines.
- Communications power to the trunk line can be supplied only through the communications power supply connector on the Master Unit. Communications power to a sub-trunk 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.

# Power Supplies

## S8VS Switch Mode Power Supply (15/30/60/90/120/180/240-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.
- Warranty Period: 3 years.
- Lead-free solder. (Eco-label-certified Product)

**(60-W, 90-W, 120-W, 180-W, and 240-W Models)**

### Models with Accumulated Operating Time Function and Maintenance Forecast Monitor Function Added to the Series

- Compact size: 40 × 95 × 108.3 mm (W × H × D) (60-W Models).
- Display shows status with 3-digit, 7-segment LED display.
- Safety standards:
  UL 508/60950, CSA C22.2 No. 14/60950-1/213, EN 50178 (= VDE 0160), EN 60950-1 (= VDE 0805 Teil 1).
- Mount to DIN Rail.
- Warranty Period: 3 years.
- Lead-free soldering. (Eco-label-certified Product)

## 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.)

MEMO

# Ordering Information



### ● 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.

### ● 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.

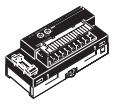
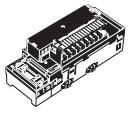
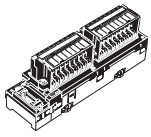
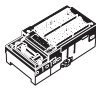
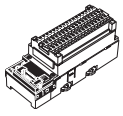
## CompoNet Master Units

| 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 |  | • Remote I/O communications<br>• Message communications | Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total)<br>Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total) | 1, 2, 4, or 8 | 0.4 | | --- | CS1W-CRM21 | CE, U1, UC1 (pending) |
| CJ1 Special I/O Unit |  | • Remote I/O communications<br>• Message communications | Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total)<br>Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total) | 1, 2, 4, or 8 | 0.4 | --- | | CJ1W-CRM21 | CE, U1, UC1 (pending) |

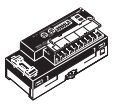
## CompoNet Slave Units

### ■ Word Slave Units

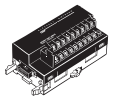
#### ● Digital I/O Slave Units

| Name | Appearance | Specifications | | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| Two-tier Screw Terminal Block |  | Inputs | 16 inputs | NPN | Yes | Yes | Yes | CRT1-ID16 | CE, UC1 (pending) |
| | | | | PNP | | | | CRT1-ID16-1 | |
| | | Outputs | 16 outputs | NPN | | | | CRT1-OD16 | |
| | | | | PNP | | | | CRT1-OD16-1 | |
| Screw Terminal Block with Relay Outputs |  | Outputs | 16 outputs | Contacts | Yes | Yes | Yes | CRT1-ROS16 *NEW* | CE, UC1 (pending) |
| Three-tier Screw Terminal Block |  | Inputs | 16 inputs | NPN | Yes | Yes | Yes | CRT1-ID16TA *NEW* | CE, UC1 (pending) |
| | | | | PNP | | | | CRT1-ID16TA-1 *NEW* | |
| | | Outputs | 16 outputs | NPN | | | | CRT1-OD16TA *NEW* | |
| | | | | PNP | | | | CRT1-OD16TA-1 *NEW* | |
| | | Inputs/ outputs | 8 inputs and 8 outputs | NPN | | | | CRT1-MD16TA *NEW* | |
| | | | | PNP | | | | CRT1-MD16TA-1 *NEW* | |
| Digital I/O Slave Units with Connectors |  | Inputs | 16 inputs | NPN | Yes | Yes | Yes | CRT1-ID16S *NEW* | CE, UC1 (pending) |
| | | | | PNP | | | | CRT1-ID16S-1 *NEW* | |
| | | Outputs | 16 outputs | NPN | | | | CRT1-OD16S *NEW* | |
| | | | | PNP | | | | CRT1-OD16S-1 *NEW* | |
| | | Inputs/ outputs | 8 inputs and 8 outputs | NPN | | | | CRT1-MD16S *NEW* | |
| | | | | PNP | | | | CRT1-MD16S-1 *NEW* | |
| CompoNet Digital I/O Slaves with Clamp Terminals |  | Inputs | 16 inputs | NPN | Yes | Yes | Yes | CRT1-ID16SL *NEW* | CE, UC1 (pending) |
| | | | | PNP | | | | CRT1-ID16SL-1 *NEW* | |
| | | Outputs | 16 outputs | NPN | | | | CRT1-OD16SL *NEW* | |
| | | | | PNP | | | | CRT1-OD16SL-1 *NEW* | |

#### ● Analog I/O Slave Units

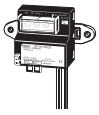
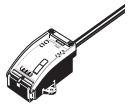
| Name | Appearance | Specifications | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|
| | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| Analog I/O Slave Units |  | Analog inputs | 4 inputs | Yes | Yes | Yes | CRT1-AD04 | CE, UC1 (pending) |
| | | Analog outputs | 2 outputs | | | | CRT1-DA02 | |

### ● Expansion Units

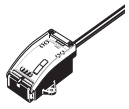
| Name | Appearance | Specifications | | | | Model | Standards |
|---|---|---|---|---|---|---|---|
| Expansion Units |  | Inputs | 8 inputs | NPN | One Expansion Unit can be mounted to each Digital I/O Slave with a 2-tier Screw Terminal Block. | XWT-ID08 | CE, UC1, N |
| | | | | PNP | | XWT-ID08-1 | |
| | | 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

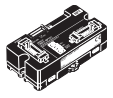
### ● Units with Connectors

| Name | Appearance | Specifications | | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| IP20 |  | Inputs | 2 inputs | NPN | No | Yes | No | CRT1B-ID02S | CE, UC1 (pending) |
| | | | | PNP | | | | CRT1B-ID02S-1 | |
| | | Outputs | 2 outputs | NPN | | | | CRT1B-OD02S | |
| | | | | PNP | | | | CRT1B-OD02S-1 | |
| IP54 |  | Inputs | 2 inputs | NPN | | No | Yes | 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 | |

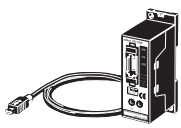
### ● Units with Clamp Terminals

| Name | Appearance | Specifications | | | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | VCTF 2-conductor cable | Standard Flat Cable I | Sheathed Flat Cable II | | |
| IP54 |  | Inputs/ outputs | 2 inputs and 2 outputs | NPN | No | No | Yes | CRT1B-MD04SLP | CE, UC1 (pending) |
| | | | | PNP | | | | CRT1B-MD04SLP-1 | |

## ■ Repeater Unit

| Name | Appearance | Specifications | Communications Cables | | | Model | Standards |
|---|---|---|---|---|---|---|---|
| | | | VCTF 2-conductor cable | 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.<br>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 | CRS1-RPT01 | CE, UC1 (pending) |

## ■ 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□□<br>ZS-MDC□□<br>ZS-HLDC□□<br>ZFV-CA□□<br>ZG-WDC□□ | ZS-CRT | CE |

# Peripheral Devices

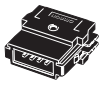
## ■ Communications Cables

| Name | Appearance | Specification | Model | Standards |
|---|---|---|---|---|
| Standard Flat Cable I |  | 4-conductor flat cable (UL2555)<br>Length: 100 m<br>Conductor diameters: 0.75 mm$^2$ × 2, 0.5 mm$^2$ × 2 | DCA4-4F10 | --- |
| Sheathed Flat Cable II |  | Sheathed 4-conductor flat cable (UL compliant)<br>Length: 100 m<br>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 Standard Flat Cable I

## ■ Connectors

| Name | Appearance | Application | Model | Standards |
|---|---|---|---|---|
| Flat Connector Socket |  | Use this Connector in a set with a DCN4-BR4 Flat Connector Plug for the following applications.<br>• Extending the trunk line or a sub-trunk line<br>• T-branching from the trunk line or a sub-trunk line<br>• T-branching a sub-branch line from a branch line | DCN4-TR4 | UC (pending) |
| | | Use this Connector independently for the following applications.<br>• Used when connecting a DCN4-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 DCN4-TR4 Flat Connector Socket for the following applications.<br>• Extending the trunk line or a sub-trunk line<br>• T-branching from the trunk line or a sub-trunk line<br>• T-branching a sub-branch line from a branch line | DCN4-BR4 | |
| | | Use this Connector independently for the following applications.<br>• Connecting Communications Cable to a Unit<br>• Connecting Communications Cable to a DCN4-MD4 Multidrop Connector (when a multidrop connection is used) | | |
| 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 | |

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

## ■ Terminating Resistance

| Name | Appearance | Application | Model | Standards |
|---|---|---|---|---|
| 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 | UC (pending) |

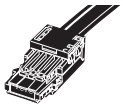
**Note:** The minimum quantity packaged is 10 Connectors. Order the Connectors in multiples of 10.

## ■ Special Tools

| Name | Appearance | Application | Model | Standards |
|---|---|---|---|---|
| Special Tools |  | Crimping Tool for DCN4-TR4 Flat Connector Socket or DCN4-BR4 Flat Connector Plug | DWT-A01 | --- |

## For Sheathed Flat Cable II

### ■ Connectors

| 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.<br>• Extending the trunk line or a sub-trunk line<br>• T-branching from the trunk line or a sub-trunk line<br>• T-branching a sub-branch line from a branch line | DCN5-TR4 | UC (pending) |
| | | Use this Connector independently for the following applications.<br>• 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.<br>• Extending the trunk line or a sub-trunk line<br>• T-branching from the trunk line or a sub-trunk line<br>• T-branching a sub-branch line from a branch line | DCN5-BR4 | |
| | | Use this Connector independently for the following applications.<br>• Connecting Communications Cable to a Unit | | |

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

### ■ Terminating Resistance

| Name | Appearance | Application | Model | Standards |
|---|---|---|---|---|
| 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 | UC (pending) |

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

### ■ Special Tools

| Name | Appearance | Application | Model | Standards |
|---|---|---|---|---|
| Special Tools |  | Crimping Tool for DCN5-TR4 Flat Connector Socket or DCN5-BR4 Flat Connector Plug | DWT-A02 | --- |

## When Using VCTF 2-conductor 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 | UC (pending) |
| 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.

# Related Manuals

## Manuals

| Cat. No. | Name | Contents |
|---|---|---|
| W457 | CompoNet Slave Units and Repeater Unit Operation Manual | Contains information on the specifications of CompoNet Slave Units and Repeater Units. |
| W456 | CJ1W-CRM21/CJ1W-CRM21 CompoNet Master Units Operation Manual | 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<br>SYSMAC One NSJ Series Communications Commands Reference Manual | Contains information on communications commands for CS/CJ-series Master Units. |

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