CS1W-CRM21

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

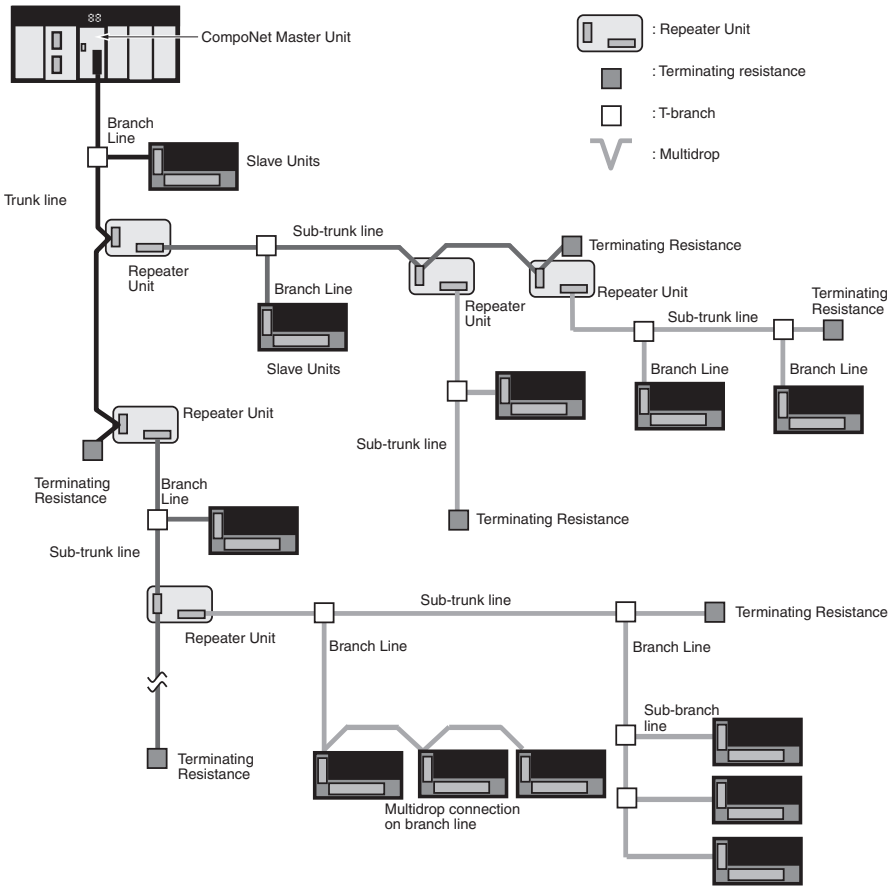
- The CS-series CompoNet Master Unit manages the CompoNet network, controls communications between the PLC and Slave Units, and handles I/O data and message data.

CS1W-CRM21

Features

- 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.

System Configuration



Communication Specifications

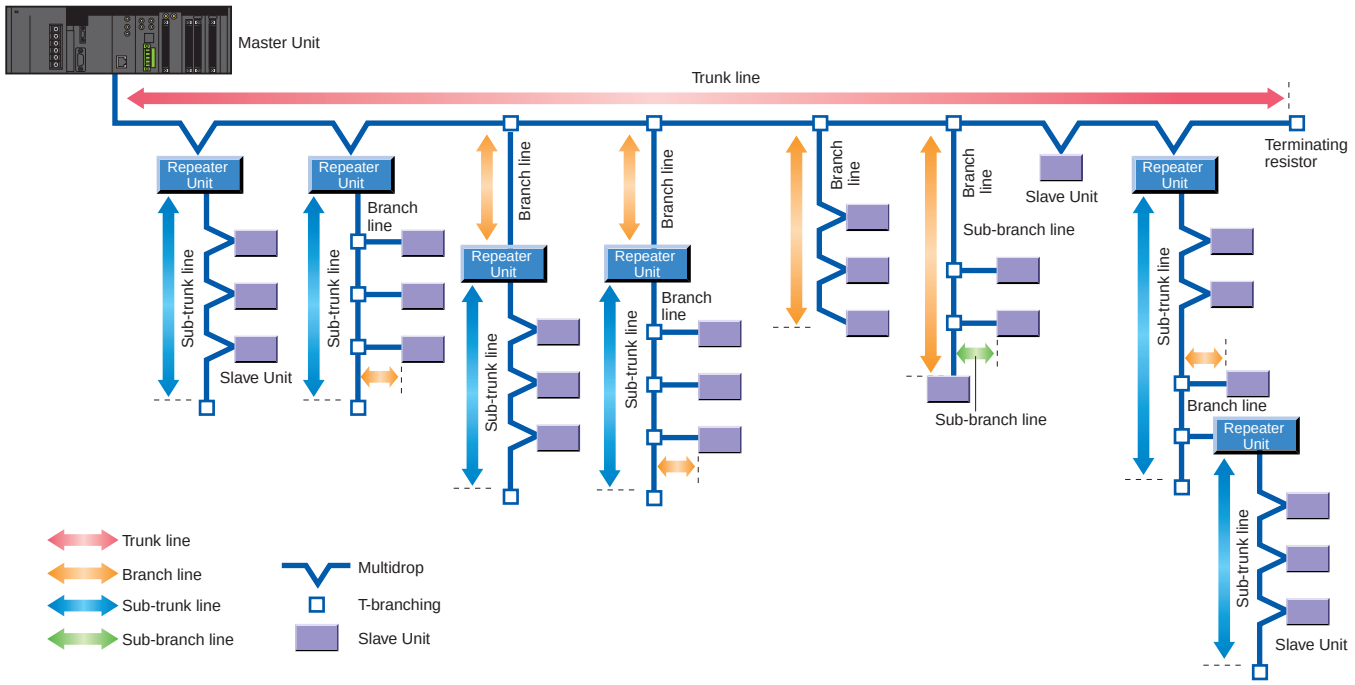
Item	Specification
Communications protocol	CompoNet Network protocol
Types of communications	Remote I/O communications (programless, constant sharing of data with Slave Units) and message communications (explicit message communications as required with Slave Units and FINS message communications as required with PLCs)
Baud rate	4 Mbits/s *1, 3 Mbits/s, 1.5 Mbits/s, 93.75 kbits/s
Modulation	Base-band
Coding	Manchester code
Error control	Manchester code rules, CRC
Communications media	The following media can be used. *2 Round cable I (JIS C 3306, 2-conductor 0.75 mm^2) Round cable II (JIS C3306 4-conductor 0.75 mm^2) Flat Cable I (DCA4-4F10 Standard Flat Cable) Flat Cable II (DCA5-4F10 Sheathed Flat Cable)
Communications distance and wiring	Refer to *Cable Types, Baud Rates, and Maximum Distances* on page 3.
Connectable Master Units	CompoNet Master Units
Connectable Slave Units	CompoNet Slave Units
Maximum I/O capacity	Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total) Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total)
Maximum number of nodes	Word Slave Units: 64 input nodes and 64 output nodes Bit Slave Units: 128 input nodes and 128 output nodes Repeater Units: 64 nodes
Bits allocated per node address	Word Slave Units: 16 bits Bit Slave Units: 2 bits
Maximum number of nodes per trunk line or sub-trunk line	32 nodes (including Repeater Units)
Applicable node addresses	Word Slave Units: IN0 to IN63 and OUT0 to OUT63 Bit Slave Units: IN0 to IN127 and OUT0 to OUT127 Repeater Units: 0 to 63
Repeater Unit application conditions	Up to 64 Repeater Units can be connected per network. 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) • 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 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 *3 or manual startup using the Remote I/O Communications Start Switch in I/O Communications Manual Start Mode. • In Registered Slave Unit Participation Standby Mode, communications is not started until all registered Slave Units are participating in the network. • 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 CX-Integrater 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. *4
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.
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.
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.

Item		Specification
Slave Unit status	**Without registration table**	Participation Flag and Communications Error Flag for each Slave Unit • Participation Flag: Turns ON and remains ON if the Slave Unit joins the network even one time after system power is turned ON. • 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.) 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 • Registration Table Verification Error Flags • All Registered Slave Units Participating Flag

Note: 1. Drop-line connections are not supported with a baud rate of 4 Mbits/s, so Slaves with prewired cables (Bit Slaves) cannot be used.
2. Round cable, Flat Cable, 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.
3. 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:
4. Communications will not stop for verification errors for registration tables or duplicated address settings.
5. This error will also occur if a Slave Unit leaves the network and then a different type of Slave Unit joins the network.
6. The Registered Slave Unit Participation Monitoring Time can be set (verification error check timing).
Registered Slave Unit Participation Standby Mode can be set. (Remote I/O communications will not start until all registered Slave Units are participating.)

Cable Types, Baud Rates, and Maximum Distances

This section provides specifications on the maximum cable length and maximum number of nodes for each type of cable.
Do not exceed these specifications.



Restrictions (at Baud Rate of 4 Mbits/s (No Branch Lines))

Cable type	Maximum length per segment (maximum length with Repeater Units)	Branch line length	Total branch line length per segment	Branch location restrictions	Maximum number of Slave Units per segment *2
Round cable I	30 m (90 m)	0 m *1	0 m *1	–	32 nodes
Flat Cable I and Flat Cable II Round Cable II	30 m (90 m)	0 m *1	0 m *1	–	32 nodes

✻1. T-branches cannot be connected (only multidrop connections are possible).
✻2. Number of nodes including Repeater Units

Restrictions (at Baud Rate of 3 Mbits/s)

Cable type	Maximum length per segment (maximum length with Repeater Units)	Branch line length	Total branch line length per segment	Branch location restrictions	Maximum number of nodes per branch *1	Sub-branch line length	Total sub-branch line length per segment	Maximum number of Slave Units per segment *2
Round cable I	30 m (90 m)	0.5 m	8 m	3 branches/m	1 node	0 m	0 m	32 nodes
Flat Cable I and Flat Cable II Round Cable II	30 m (90 m)	0.5 m	8 m	3 branches/m	1 node	0 m	0 m	32 nodes

✻1. The maximum number of nodes per branch is the maximum number of Slave Units or Repeater Units that can be connected to one branch line using multidrop or T-branch connections (sub-branches).
✻2. Number of nodes including Repeater Units

Restrictions (at Baud Rate of 1.5 Mbits/s)

Cable type		Maximum length per segment (maximum length with Repeater Units)	Branch line length	Total branch line length per segment	Branch location restrictions	Maximum number of nodes per branch *1	Sub-branch line length	Total sub-branch line length per segment	Maximum number of Slave Units per segment *2
Round cable I	**Without branches**	100 m (300 m)	0 m *3	0 m *3	–	–	–	–	32 nodes
	With branches	30 m (90 m)	2.5 m	25 m	3 branches/m	3 nodes	0 m	0 m	32 nodes
Flat Cable I and Flat Cable II Round Cable II		30 m (90 m)	2.5 m	25 m	3 branches/m	3 nodes	0.1 m *4	2 m *4	32 nodes

✻1. The maximum number of nodes per branch is the maximum number of Slave Units or Repeater Units that can be connected to one branch line using multidrop or T-branch connections (sub-branches).
✻2. Number of nodes including Repeater Units
✻3. T-branches cannot be connected (only multidrop connections are possible).
✻4. T-branch connections from sub-branch lines.

Restrictions (at Baud Rate of 93.75 kbits/s)

Cable type	Maximum length per segment (maximum length with Repeater Units)	Branch line length	Total branch line length per segment	Branch location restrictions	Maximum number of nodes per branch *1	Sub-branch line length	Total sub-branch line length per segment	Maximum number of Slave Units per segment *2
Round cable I	500 m (1500 m)	6 m	120 m	3 branches/m	1 node	–	–	32 nodes
Flat Cable I and Flat Cable II Round Cable II	No restrictions to a total length per segment of 200 m							32 nodes

✻1. The maximum number of nodes per branch is the maximum number of Slave Units or Repeater Units that can be connected to one branch line using multidrop or T-branch connections (sub-branches).
✻2. Number of nodes including Repeater Units

Ordering Information

International Standards

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

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	26-V system		
CS1 Special I/O Unit		• Remote I/O communications • Message communications	Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total) Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total)	1, 2, 4, or 8	0.4	–	**CS1W-CRM21**	CE, U, U1, L, N

Product name	Specifications			Model	Standards
		Number of licenses	Media		
CX-One FA Integrated Tool Package Ver. 4.☐	The CX-One is a package that integrates the Support Software for OMRON PLCs and components. CX-One runs on the following OS. **Note:** Windows XP (Service Pack 3 or higher, 32-bit version) / Windows Vista (32-bit/64-bit version) / Windows 7 (32-bit/64-bit version) / Windows 8 (32-bit/64-bit version) / Windows 8.1 (32-bit/64-bit version) / Windows 10 (32-bit/64-bit version) CX-One Ver. 4.☐ includes CX-Integrator Ver. 2.☐. For details, refer to the CX-One catalog (Cat. No. R134).	1 license*	DVD	**CXONE-AL01D-V4**	–

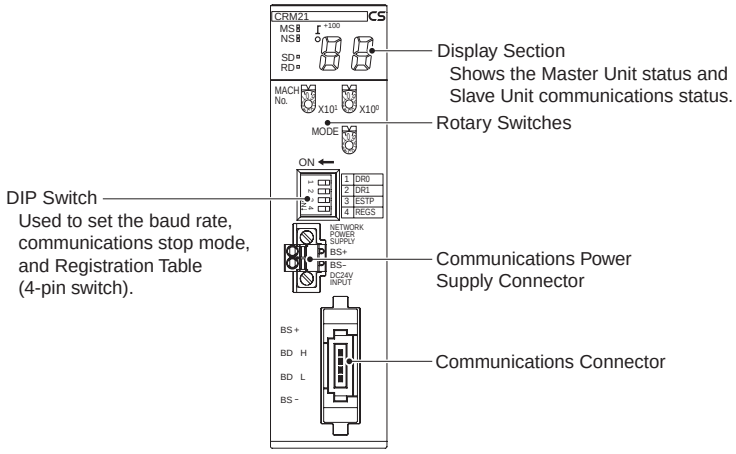
✻ Multi licenses (3, 10, 30, or 50 licenses) and DVD media without licenses are also available for the CX-One.

Specifications

Item / Model	CS1W-CRM21
Applicable PLC	All CS-series PLCs
Unit classification	CS-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 *
Communications power supply connector allowable current capacity	5 A max.
Maximum number of mountable Master Units	One word number assigned: 80 Units Two word numbers assigned: 48 Units Four word numbers assigned: 24 Units Eight word numbers assigned: 12 Units
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: • Registration Table • Registration Table Check Type • Registered Slave Unit Participation Monitoring Time, Registered Slave Unit Participation Standby Mode, and Event Disable Setting • Software Settings Table • Communications Error Communications Stop Mode • Communications Error Input Data Zero Clear Mode • Network settings 2) Part of error history (depends on type of error; mainly serious error related to communications stopping)
Noise immunity	Conforms to IEC 61000-4-4 2 kV (applied to PLC power supply).
Vibration resistance	10 to 61.2 Hz with single-amplitude of 0.1 mm, 61.2 to 150 Hz and 14.7 m/s^2 in X, Y, and Z directions for 80 min each (sweep time of 8 min × 10 sweeps = 80 min)
Shock resistance	196 m/s^2 (3 times each in X, Y, and Z directions)
Dielectric strength	1,000 VAC for 1 min, Leakage current: 1 mA max. • Between communications connector or external current supply connector and GR terminal on Power Supply Unit • Between communications connector or external current supply connector and all Unit connectors
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)

✻ The Master Unit does not required communications power.

External Interface



Communications Power Supply Connector

Connect this connector to a 24-VDC power supply when using Flat Cable (4-conductor).
Doing so will supply communications power to the Slave Units and Repeater Units on the trunk line from the communications connector through the Flat Cable.

BS+	Communications power +
BS–	Communications power –

Note: Do not connect anything to this connector when using Round Cable.

Ferrules

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

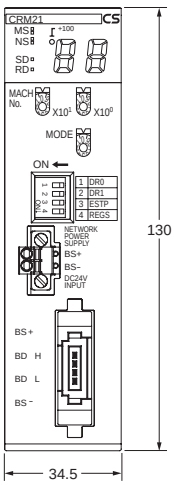
Model	Applicable wire size	Crimping tool	Manufacturer
AI0, 5-10 WH	0.5 mm/AWG20	CRIMPFOX UD6 (product number 1204436) or the CRIMPFOX ZA3 Series	Phoenix Contact K.K.
H 0.5/16 orange	0.5 mm/AWG20	Crimper PZ 1.5 (Product number 900599)	Weidmuller Co. Ltd.

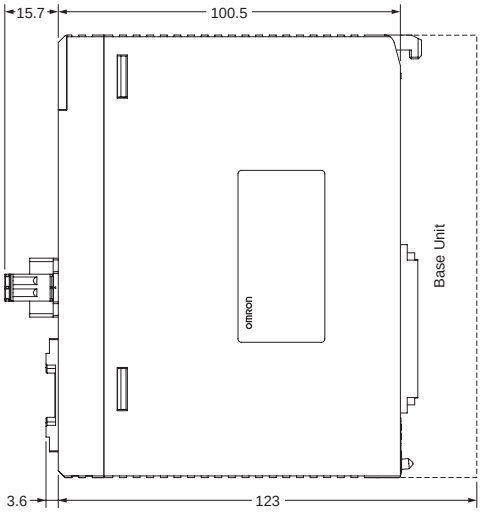
The following screwdriver is recommended for removing ferrules.

Model	Manufacturer
XW4Z-00C	OMRON Corporation

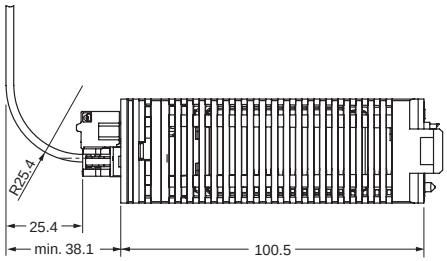
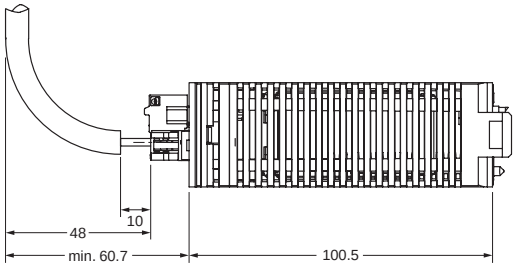
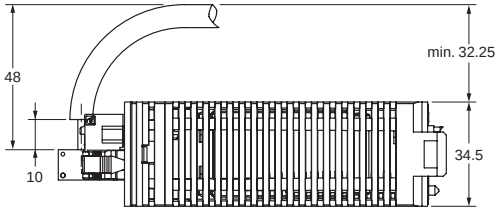
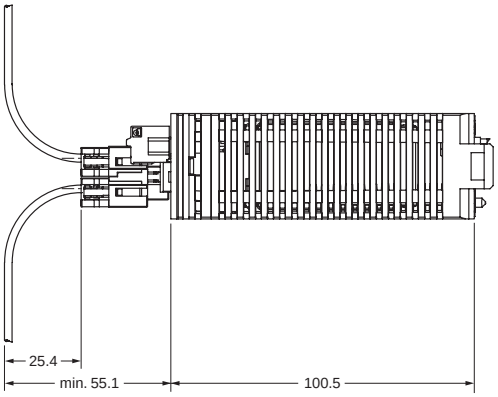
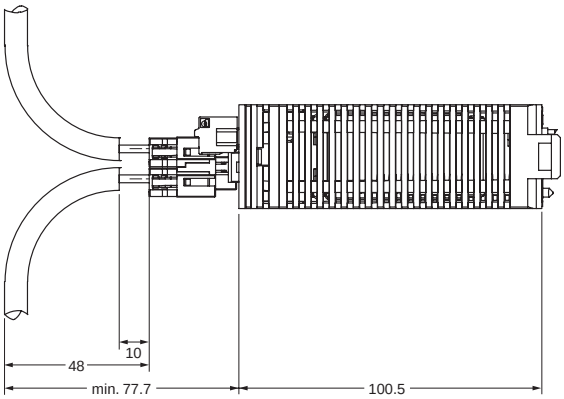
Dimensions

(Unit: mm)





Dimensions When the Cable is Attached

	Flat Cable I (w/o sheath) DCA4-4F10	Round Cable I (2 core) JIS C3306 compliant 0.75mm^2 × 2 core
Falt Connector Plug (DCN4-BR4)		
Open Type Connector (DCN4-TB4)	–	
Multidrop Connector (DCN4-MD4)		

Note: Minimum cable bend R

- Flat cable I (w/o sheath): The bend R should be 10 times (R25.4) of the external coating.
- Round Cable I (2 core): The bend R should be 5 times (R38) of the max. external coating.

Related Manual

The manuals related the CS Series CompoNet Master Unit are configured as in the following table. Please also refer to them.

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

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