

CJ-series CompoNet Master Units

CJ1W-CRM21

CSM_CJ1W-CRM21_DS_E_11_3

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

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

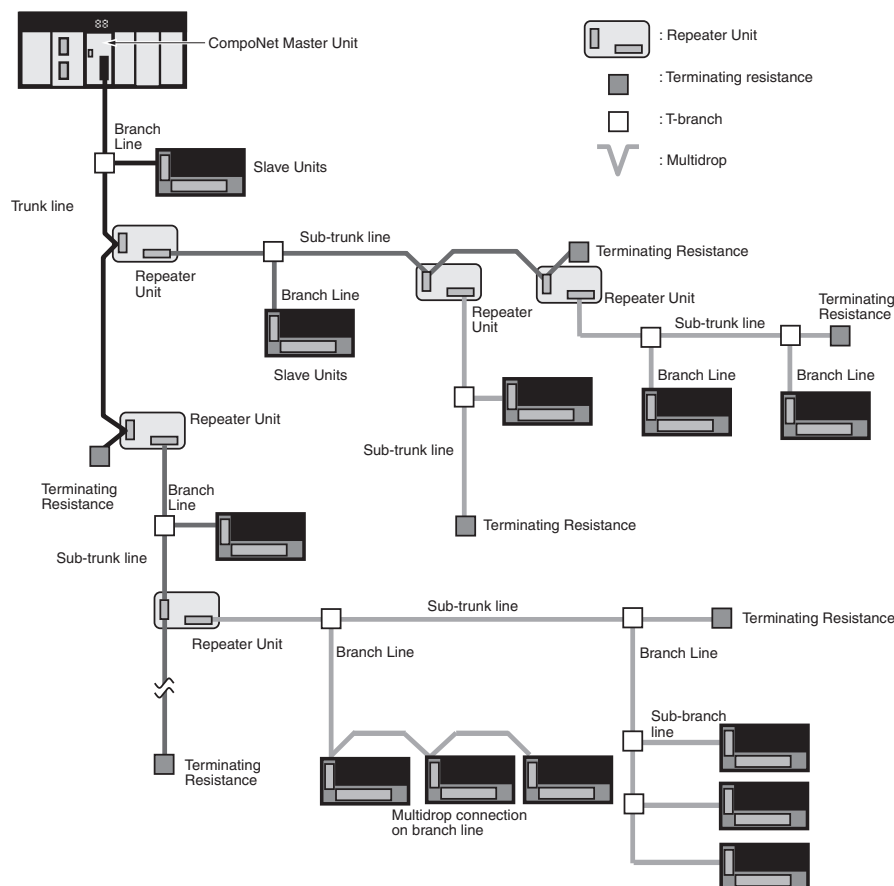


CJ1W-CRM21

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 Controllers *1)
Baud rate	4 Mbps *2, 3 Mbps, 1.5 Mbps, 93.75 kbps
Modulation	Base-band
Coding	Manchester code
Error control	Manchester code rules, CRC
Communications media	The following media can be used. *3 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 <i>Cable Types, Baud Rates, and Maximum Distances</i> 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 kbps: No restrictions Other cables or baud rates: Trunk line and branch lines Connections for Slave Units and Repeater Units: T-branch or multidrop connections

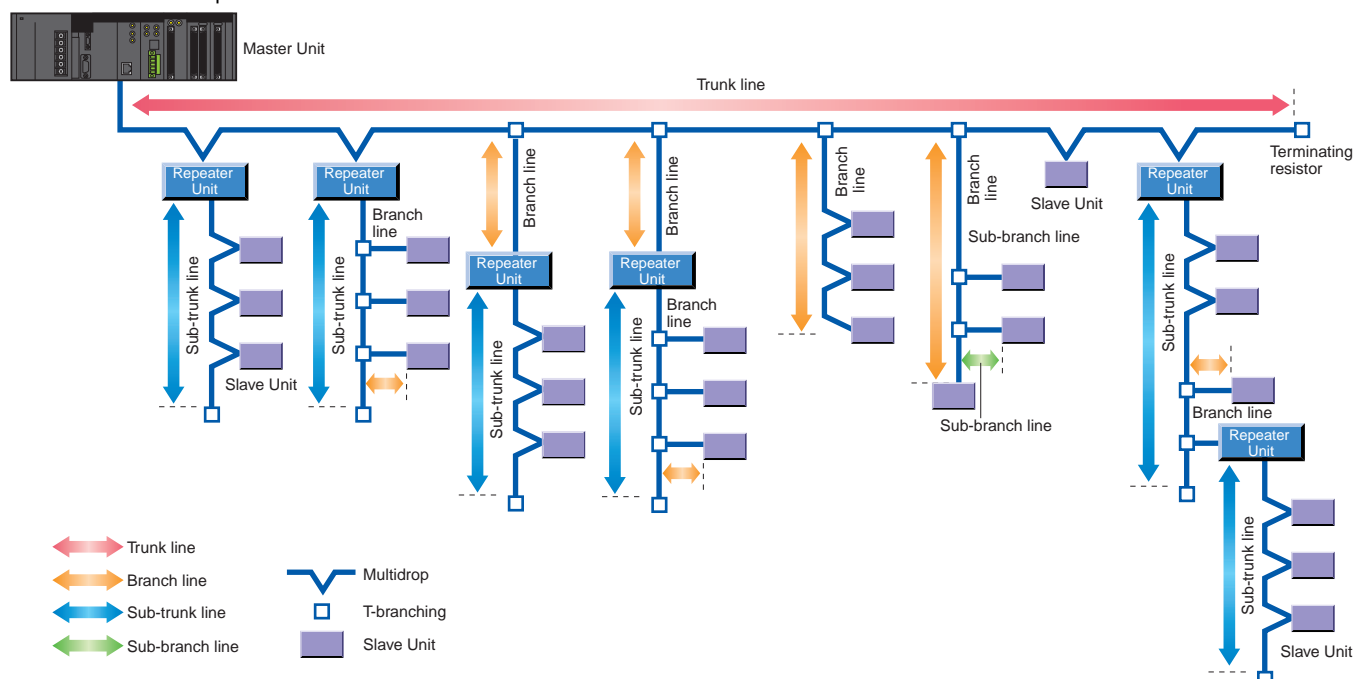
*1. FINS message communications are supported by CJ-series Controllers only.

*2. Drop-line connections are not supported with a baud rate of 4 Mbps, so Slaves with prewired cables (Bit Slaves) cannot be used.

*3. 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.

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 Mbps (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 Mbps)

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 Mbps)

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 kbps)

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	24-V system		
CJ1 Special I/O Unit		<ul style="list-style-type: none"> Remote I/O communications Message communications 	Word Slave Units: 1,024 inputs and 1,024 outputs (2,048 I/O points total) Bit Slave Units: 256 inputs and 256 outputs (512 I/O points total)	1, 2, 4, or 8	0.4	—	CJ1W-CRM21	CE, U, U1, L, N

Note: Observe the following precautions if you use the CompoNet Master Unit in an NJ-series Machine Automation Controller.

- Supported only by the CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.
- You cannot use the simple backup function.
- You cannot send FINS commands to the CompoNet Master Unit.

Software

How to Select Required Support Software for Your Controller

The required Support Software depends on the Controller to connect. Please check the following table when purchasing the Support Software.

Item	Omron PLC System	Omron Machine Automation Controller System
Controller	CS, CJ, CP, and other series	NJ-series
Software	FA Integrated Tool Package CX-One	Automation Software Sysmac Studio

FA Integrated Tool Package CX-One

Product name	Specifications	Number of licenses	Media	Model	Standards
FA Integrated Tool Package CX-One Ver.4.□	The CX-One is a comprehensive software package that integrates Support Software for OMRON PLCs and components. CX-One runs on the following OS. OS: 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 Version 4.□ includes CX-Integrator Ver.3.□. 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.

Automation Software Sysmac Studio

Please purchase a DVD and required number of licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. Each model of licenses does not include any DVD.

Product name	Specifications	Number of licenses	Media	Model	Standards
Sysmac Studio Standard Edition Ver.1.□□	The Sysmac Studio provides an integrated development environment to set up, program, debug, and maintain NJ-series Controllers and other Machine Automation Controllers, as well as EtherCAT slaves. Sysmac Studio runs on the following OS. OS: Windows XP (Service Pack 3 or higher, 32-bit version) / Windows Vista (32-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)	— (Media only)	DVD	SYSMAC-SE200D	—
	The Sysmac Studio Standard Edition DVD includes Support Software to set up EtherNet/IP Units, DeviceNet slaves, Serial Communications Units, and Support Software for creating screens on HMIs (CX-Designer). For details, refer to the Sysmac Integrated Catalogue (P072).	1 license *	—	SYSMAC-SE201L	—

* Multi licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses).

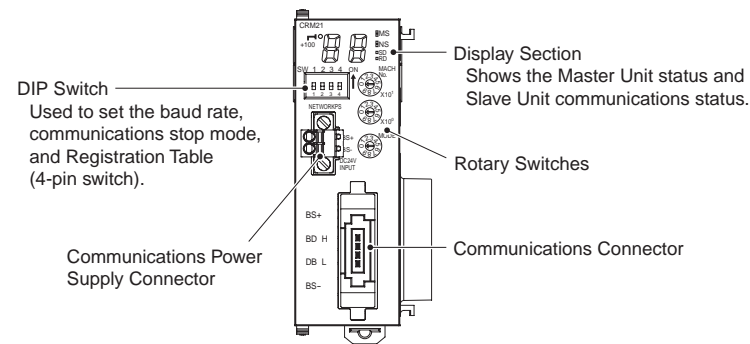
Specifications

Item	Model	CJ1W-CRM21
Applicable Controllers		NJ *1 /CJ Series
Unit classification		CJ-series Special I/O Unit
Current consumption (Power supplied from 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 *2
Communications power supply connector allowable current capacity		5 A max.
Maximum number of mountable Master Units		One word number assigned: 40 Units Two word numbers assigned: 40 Units Four word numbers assigned: 24 Units Eight word numbers assigned: 12 Units
Mounting location		According to NJ/CJ-series Special I/O Unit specifications.
Communications power ON/OFF monitoring		The ON/OFF status of the communications power supply can be detected at the communications power supply connector.
Data stored in Master Unit (built-in EEPROM)		1) The following device parameters: <ul style="list-style-type: none"> • Registration Table • Registration Table Check Type • Registered Slave Unit Participation Monitoring Time, Registered Slave Unit Participation Standby Mode, and Event Disable Setting • Software Settings Table • 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 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. <ul style="list-style-type: none"> • 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		130 g max. (Master Unit only)

*1. Supported only by the CPU Units with unit version 1.01 or later and the Sysmac Studio version 1.02 or higher.

*2. 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.

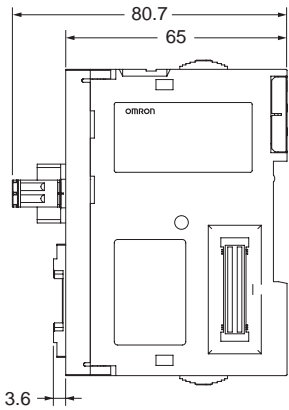
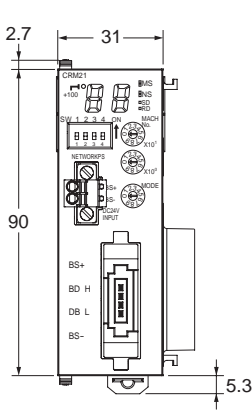
Model	Applicable wire size	Crimping tool	Manufacturer
AI0, 5-10 WH	0.5 mm/AWG20	CRIMPFOX UD6 (product number 1204436) or the CRIMPFOX ZA3 Series	Phoenix Contact K.K.
H 0.5/16 orange	0.5 mm/AWG20	Crimper PZ 1.5 (Product number 900599)	Weidmuller Co. Ltd.

The following screwdriver is recommended for removing ferrules.

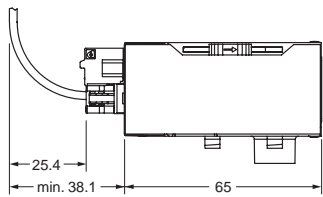
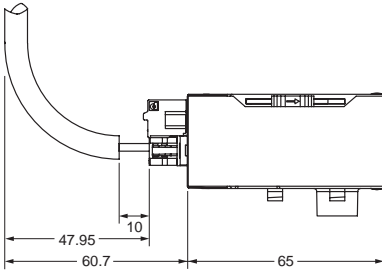
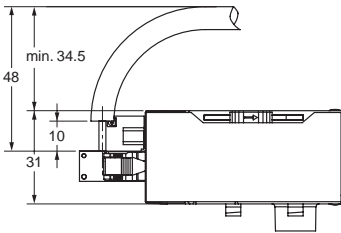
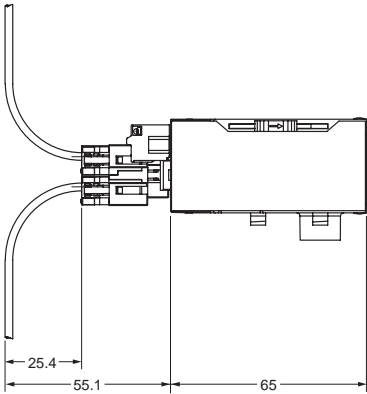
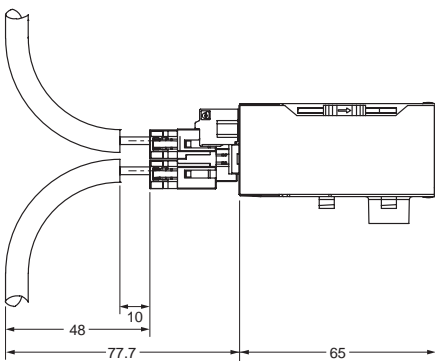
Model	Manufacturer
XW4Z-00C	OMRON Corporation

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 0.75 mm ² × 2 core
Flat 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 CJ 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.
W493	CJ-series CompoNet Master Unit Operation Manual for NJ-series CPU Unit	Contains information on the functions and operating procedures of a CJ-series CompoNet Master Unit when it is used in an NJ-series Controller.
W342	CS/CJ/CP Series 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.

Terms and Conditions Agreement

Read and understand this catalog.

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

Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.