NX-series Communications Interface Units

NX-CIF

P55I-E-02

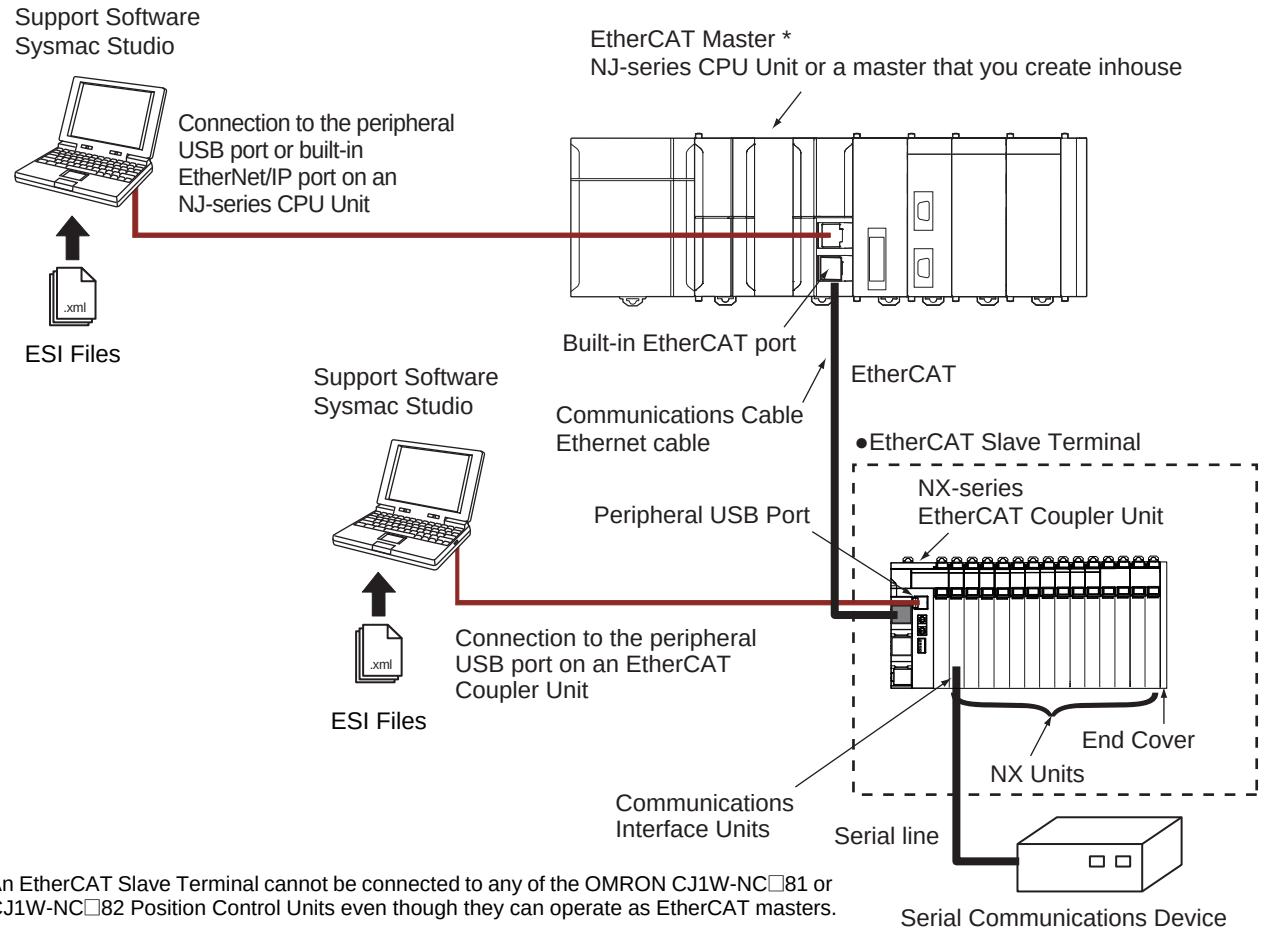
Provides simplicity and flexibility in connecting serial devices to EtherCAT

- Mount to the NX-series EtherCAT Coupler Unit and connect various types of serial devices.
- The serial line monitor on the Sysmac Studio helps easily and reliably connect serial devices.

Features

- Just 12 mm wide, saving space in your cabinet.
- Three models are available with a choice of one RS-422A/485, one RS-232C, or two RS-232C ports.
- Screwless push-in terminal block (1-port model) and D-Sub connector (2-port model) significantly reduce wiring work.
- No-protocol communications are supported as the communications protocol.
- The maximum baud rate is 230.4 kbps. The baud rate can be selected to match the connected serial devices.
- The settings are backed up and saved in the EtherCAT Coupler Unit. This facilitates commissioning and maintenance.
- The serial line monitor enables you to check the communications status with serial devices on the Sysmac Studio for easy and reliable startup of the devices.

System Configuration



* An EtherCAT Slave Terminal cannot be connected to any of the OMRON CJ1W-NC□81 or CJ1W-NC□82 Position Control Units even though they can operate as EtherCAT masters.

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, CE: EC Directives, RCM: Regulatory Compliance Mark, and KC: KC Registration.
- Contact your OMRON representative for further details and applicable conditions for these standards.

Communications Interface Units

Unit type	Product Name	Serial interface	External connection terminals	Number of serial ports	Communications protocol	Model	Standards
NX-series communications Interface Units	**Communications Interface Units**	RS-232C	Screwless Clamping Terminal Block	1 port	No-protocol Signal lines	**NX-CIF101**	UL, CE, RCM, KC
		RS-422A/485				**NX-CIF105**	
		RS-232C	D-Sub connector	2 ports		**NX-CIF210**	

Option

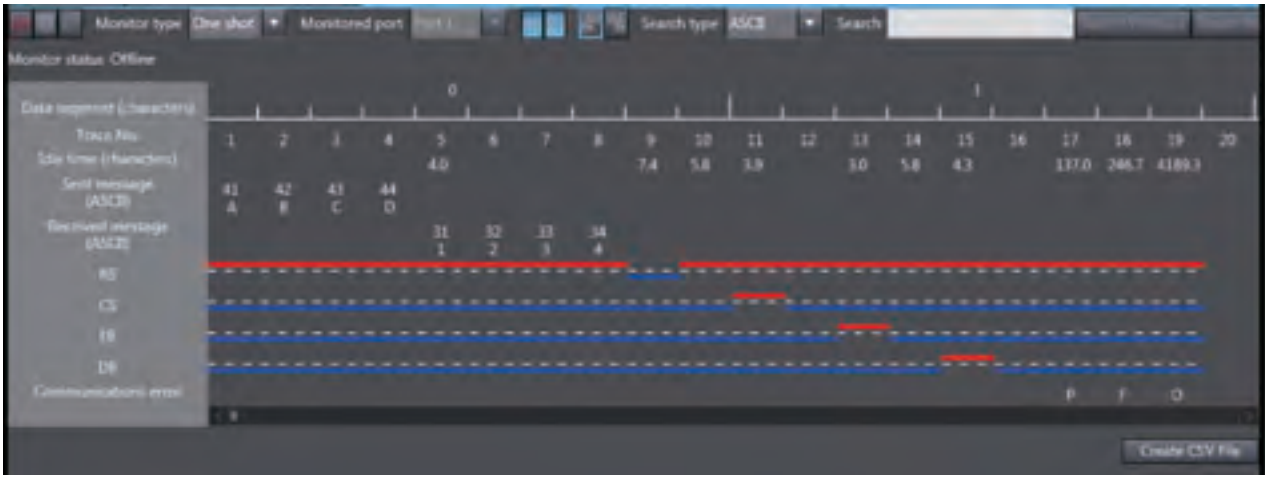
Product name	Specification	Model	Standards
Unit/Terminal Block Coding Pins	Pins for 10 Units (30 terminal block pins and 30 Unit pins)	**NX-AUX02**	---

Product Name	Specification				Model	Standards
	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity		
Terminal Block *	16	A/B	Present	10 A	**NX-TBC162**	---

* These options can be used with the NX-CIF101 and NX-CIF105. (They cannot be used with the NX-CIF210.)

Serial Line Monitor

On the Sysmac Studio, the monitor data is displayed in the CIF Serial Line Monitor tab page. The configuration of the CIF Serial Line Monitor tab page is shown below. The data values are shown from left to right along a time scale. The left edge is the starting point of the monitor.



General Specification

Item		Specification
Enclosure		Mounted in a panel.
Grounding method		Ground of 100 Ω or less. If a conductive DIN Track is used, a Communications Interface Units is grounded through the DIN Track from the System Power Supply Unit. If a non-conductive DIN Track is used, a Communications Interface Units is grounded from the FG terminal.
Operating environment	**Ambient operating temperature**	0 to 55°C
	Ambient operating humidity	10% to 95% (with no condensation or icing)
	Atmosphere	Must be free from corrosive gases.
	Ambient storage temperature	-25 to 70°C (with no condensation or icing)
	Altitude	2,000 m max.
	Pollution degree	2 or less: Conforms to JIS B 3502 and IEC 61131-2.
	Noise immunity	2 kV on power supply line (Conforms to IEC 61000-4-4.)
	Overvoltage category	Category II: Conforms to JIS B 3502 and IEC 61131-2.
	EMC immunity level	Zone B
	Vibration resistance	Conforms to IEC 60068-2-6. 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz, Acceleration of 9.8 m/s^2, 100 min in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)
	Shock resistance	Conforms to IEC 60068-2-27. 147 m/s^2, 3 times each in X, Y, and Z directions
	Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)
	Dielectric strength	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
Applicable standards		cULus: Listed (UL508), ANSI/ISA 12.12.01, EC: EN 61131-2, RCM, and KC: KC Registration

Specifications of Individual Units

NX-CIF101

Item		Specification
Number of ports		1
Communications ports		RS-232C
Communications protocol		No-protocol
Communications specifications	**Communications method**	Full duplex
	Signal lines *1	---
	Baud rate [bps] *1	1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200, or 230,400
	Data length [bits] *1	7 or 8
	Parity *1	Even, odd, or none
	Start bits [bits]	Always 1.
	Stop bits [bits] *1	1 or 2
	Flow control *1	None, RS/CS flow control, or Xon/Xoff control
	Flow control target *1	Send/receive, send only, or receive only
	Initial RS signal value *1 *2	ON or OFF
	Number of characters to determine the end *1 *3	0 to 10,000 (in increments of 0.1 character)) 0: The end is not detected.
	Maximum communications distance [m]	15 *4
	Connection configuration	1:1
I/O refreshing method		Free-Run refreshing only
PDO data size [bytes] *1		Inputs or outputs: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, or 80
Transmission buffering enable/disable setting *1		Enabled or disabled
Functions to back up data		Provided. *5
Terminating resistance setting		---
Isolation method		No isolation
Power consumption		900 mW max.
Weight		66 g max.
Installation orientation and restrictions		Installation orientation: 6 possible orientations Restrictions: There are no restrictions.

*1. Setting is possible in the Unit operation settings of the Sysmac Studio.
*2. This is the value of the RS signal when the port enters the Operational state or immediately after the port is restarted. The initial value is disabled when RS/CS flow control is set.
*3. This setting is provided for communications protocols that assume the end of the data if data is not received for a specific period of time. For example, if the number of characters to determine the end is set to 35, the end of the data will be assumed if data is not received for the time required to receive 3.5 characters.
*4. If the baud rate is set to higher than 19,200 bps, refer to the manual for the remote communications device.
*5. The settings that are backed up are saved in memory in the Communications Coupler Unit. The settings that are backed up are not saved in the Communications Interface Units.

NX-CIF105

Item		Specification
Number of ports		1
Communications ports		RS-422A/485
Communications protocol		No-protocol
Communications specifications	**Communications method**	Half duplex for two-wire connection, Full duplex for four-wire connection
	Signal lines *1	Two lines or four lines
	Baud rate [bps] *1	1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200, or 230,400
	Data length [bits] *1	7 or 8
	Parity *1	Even, odd, or none
	Start bits [bits]	Always 1.
	Stop bits [bits] *1	1 or 2
	Flow control *1	None or Xon/Xoff control
	Flow control target *1	Send/receive, send only, or receive only
	Initial RS signal value *1 *2	ON or OFF
	Number of characters to determine the end *1 *3	0 to 10,000 (in increments of 0.1 character)) 0: The end is not detected.
	Maximum communications distance [m]	1,200 *4
	Connection configuration	1:N Maximum value of N is 32. You can change between two-wire and four-wire connections.
I/O refreshing method		Free-Run refreshing only
PDO data size [bytes] *1		Inputs or outputs: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, or 80
Transmission buffering enable/disable setting *1		Enabled or disabled
Functions to back up data		Provided. *5
Terminating resistance setting		Possible
Isolation method		Power supply: transformer and photocoupler Signals: Digital isolators
Power consumption		1,450 mW max.
Weight		69 g max.
Installation orientation and restrictions		Installation orientation: 6 possible orientations Restrictions: There are no restrictions.

*1. Setting is possible in the Unit operation settings of the Sysmac Studio.
*2. This is the value of the RS signal when the port enters the Operational state or immediately after the port is restarted. The initial value is disabled when RS/CS flow control is set. It is also disabled for the NX-CIF105.
*3. This setting is provided for communications protocols that assume the end of the data if data is not received for a specific period of time. For example, if the number of characters to determine the end is set to 35, the end of the data will be assumed if data is not received for the time required to receive 3.5 characters.
*4. The maximum total cable length for multidrop connections is 1,200 m.
*5. The settings that are backed up are saved in memory in the Communications Coupler Unit. The settings that are backed up are not saved in the Communications Interface Units.

NX-CIF210

Item		Specification
Number of ports		2
Communications ports		RS-232C
Communications protocol		No-protocol
Communications specifications	**Communications method**	Full duplex
	Signal lines *1	---
	Baud rate [bps] *1	1,200, 2,400, 4,800, 9,600, 19,200, 38,400, 57,600, 115,200, or 230,400
	Data length [bits] *1	7 or 8
	Parity *1	Even, odd, or none
	Start bits [bits]	Always 1.
	Stop bits [bits] *1	1 or 2
	Flow control *1	None, RS/CS flow control, or Xon/Xoff control
	Flow control target *1	Send/receive, send only, or receive only
	Initial RS signal value *1 *2	ON or OFF
	Number of characters to determine the end *1 *3	0 to 10,000 (in increments of 0.1 character)) 0: The end is not detected.
	Maximum communications distance [m]	15 *4
	Connection configuration	1:1
I/O refreshing method		Free-Run refreshing only
PDO data size [bytes] *1		Inputs or outputs: 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, or 80
Transmission buffering enable/disable setting *1		Enabled or disabled
Functions to back up data		Provided. *5
Terminating resistance setting		---
Isolation method		No isolation
Power consumption		900 mW max.
Weight		91 g max.
Installation orientation and restrictions		Installation orientation: 6 possible orientations Restrictions: There are no restrictions.

*1. Setting is possible in the Unit operation settings of the Sysmac Studio.
*2. This is the value of the RS signal when the port enters the Operational state or immediately after the port is restarted. The initial value is disabled when RS/CS flow control is set.
*3. This setting is provided for communications protocols that assume the end of the data if data is not received for a specific period of time. For example, if the number of characters to determine the end is set to 35, the end of the data will be assumed if data is not received for the time required to receive 3.5 characters.
*4. If the baud rate is set to higher than 19,200 bps, refer to the manual for the remote communications device.
*5. The settings that are backed up are saved in memory in the Communications Coupler Unit. The settings that are backed up are not saved in the Communications Interface Units.

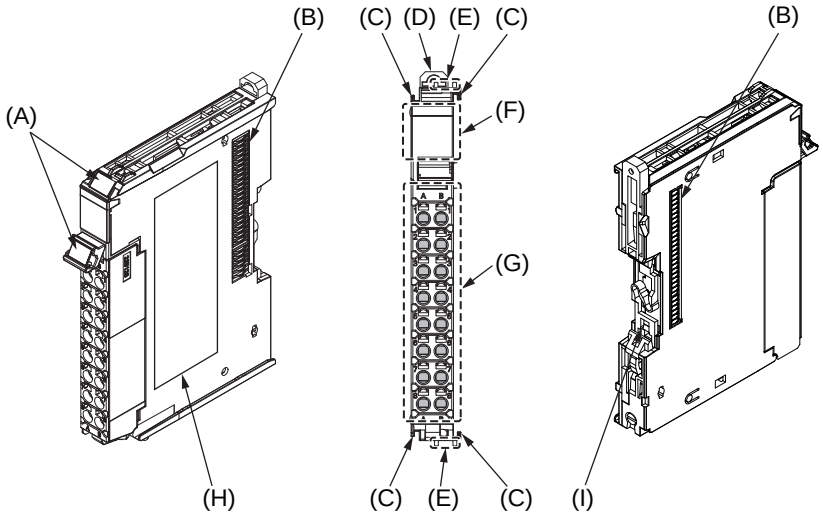
Version Information

Communications Interface Units		Corresponding version *		
Model number	**Unit version**	**EtherCAT Coupler Unit NX-ECC20□**	**NJ-series CPU Unit NJ501-□□□□ or NJ301-□□□□**	**Sysmac Studio**
NX-CIF101	Ver.1.0	Ver.1.0	Ver.1.10	Ver.1.12
NX-CIF105				
NX-CIF210				

* Some Units do not have all of the versions given in the above table. If a Unit does not have the specified version, support is provided by the oldest available version after the specified version. Refer to the user's manuals for the specific Units for the relation between models and versions.

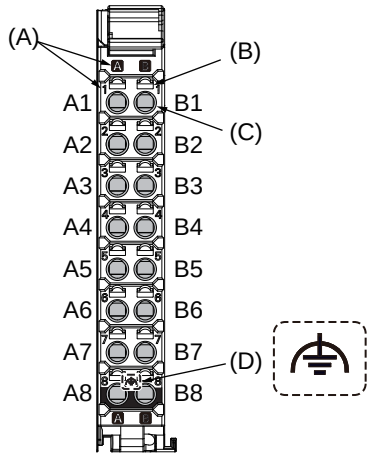
External Interface

NX-CIF101/-CIF105



Letter	Name	Description
(A)	Marker attachment location	This is where the markers are attached. OMRON markers are pre-installed at the factory. You can also install commercially available markers.
(B)	NX bus connector	This connector is used to connect each Unit.
(C)	Unit hookup guides	These guides are used to connect two Units.
(D)	DIN Track mounting hooks	These hooks are used to mount the NX Unit to a DIN Track.
(E)	Protrusions for removing the Unit	These protrusions are to hold onto when you need to pull out the Unit.
(F)	Indicators	The indicators show the current operating status of the Unit.
(G)	Terminal block	This terminal block is used to connect the external serial communications device.
(H)	Unit specifications	The specifications of the Unit are given here.
(I)	DIN Track contact plate	This plate is connected internally to the functional ground terminal on the terminalblock.

Terminal Block



Letter	Name	Description
(A)	Terminal number indication	The terminal numbers are given by column letters A and B, and row numbers 1 to 8. The combination of the column and row gives the terminal numbers from A1 to A8 and B1 to B8.
(B)	Release hole	Insert a flat-blade screwdriver into this hole to connect and remove the wire.
(C)	Terminal hole	The wire is inserted into this hole.
(D)	Ground terminal mark	This mark indicates the ground terminals.

Applicable Terminal Blocks for Each Unit Model

Model	Terminal Blocks				
	Terminal Block	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity
NX-CIF101	NX-TBC162	16	A/B	Present	10 A
NX-CIF105	NX-TBC162	16	A/B	Present	10 A

Applicable Wires

Using Ferrules

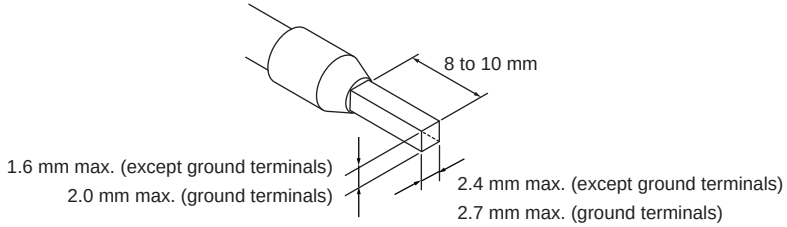
If you use ferrules, attach the twisted wires to them.
Observe the application instructions for your ferrules for the wire stripping length when attaching ferrules.
Always use plated one-pin ferrules. Do not use unplated ferrules or two-pin ferrules.

The applicable ferrules, wires, and crimping tool are given in the following table.

Terminal types	Manufacturer	Ferrule model	Applicable wire (mm^2 (AWG))	Crimping tool
Terminals other than ground terminals	Phoenix Contact	AI0,34-8	0.34 (#22)	Phoenix Contact (The figure in parentheses is the applicable wire size.) CRIMPFOX 6 (0.25 to 6 mm^2, AWG 24 to 10)
		AI0,5-8	0.5 (#20)	
		AI0,5-10		
		AI0,75-8	0.75 (#18)	
		AI0,75-10		
		AI1,0-8	1.0 (#18)	
		AI1,0-10		
		AI1,5-8	1.5 (#16)	
		AI1,5-10		
Ground terminals		AI2,5-10	2.0 *1	
Terminals other than ground terminals	Weidmuller	H0.14/12	0.14 (#26)	Weidmueller (The figure in parentheses is the applicable wire size.) PZ6 Roto (0.14 to 6 mm^2, AWG 26 to 10)
		H0.25/12	0.25 (#24)	
		H0.34/12	0.34 (#22)	
		H0.5/14	0.5 (#20)	
		H0.5/16		
		H0.75/14	0.75 (#18)	
		H0.75/16		
		H1.0/14	1.0 (#18)	
		H1.0/16		
		H1.5/14	1.5 (#16)	
		H1.5/16		

*1. Some AWG 14 wires exceed 2.0 mm^2 and cannot be used in the screwless clamping terminal block.

When you use any ferrules other than those in the above table, crimp them to the twisted wires so that the following processed dimensions are achieved.

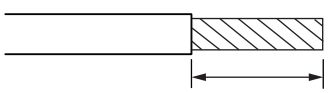


Using Twisted Wires/Solid Wires

If you use the twisted wires or the solid wires, use the following table to determine the correct wire specifications.

Terminals		Wire type				Wire size	Conductor length (stripping length)
		Twisted wires		Solid wire			
Classification	Current capacity	Plated	Unplated	Plated	Unplated		
All terminals except ground terminals	2 A max.	Possible	Possible	Possible	Possible	0.08 to 1.5 mm^2 AWG28 to 16	8 to 10 mm
	Greater than 2 A and 4 A or less		Not Possible	Possible *1	Not Possible		
	Greater than 4 A	Possible *1		Not Possible			
Ground terminals	---	Possible	Possible	Possible *2	Possible *2	2.0 mm^2	9 to 10 mm

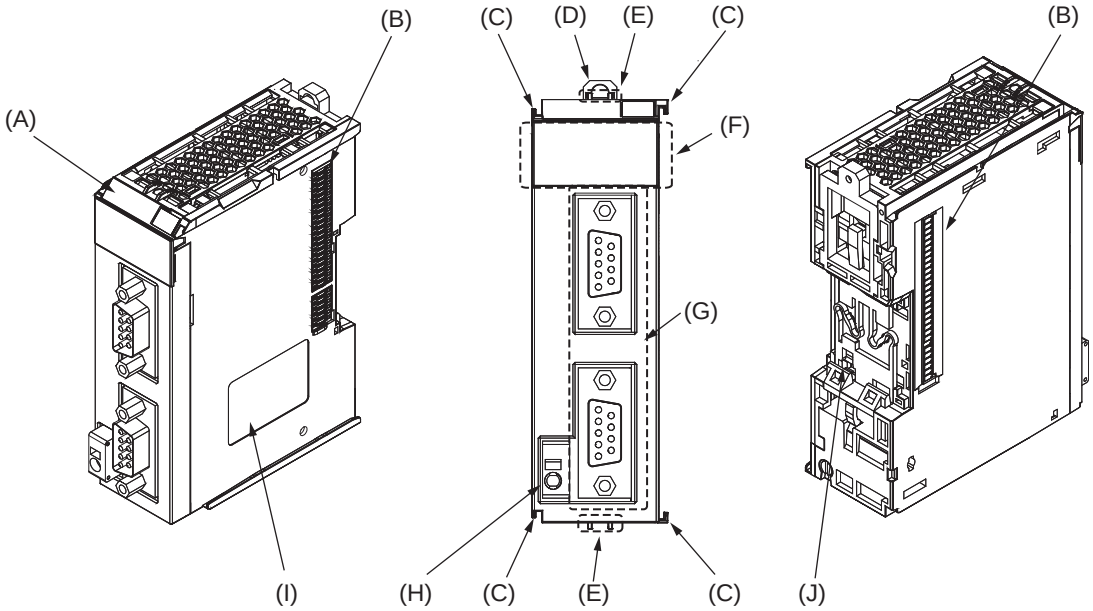
*1 Secure wires to the screwless clamping terminal block. Refer to the Securing Wires in the USER'S MANUAL for how to secure wires.
*2 With the NX-TB□□□1 Terminal Block, use twisted wires to connect the ground terminal. Do not use a solid wire.



Conductor length (stripping length)

<Additional Information> If more than 2 A will flow on the wires, use plated wires or use ferrules.

NX-CIF210

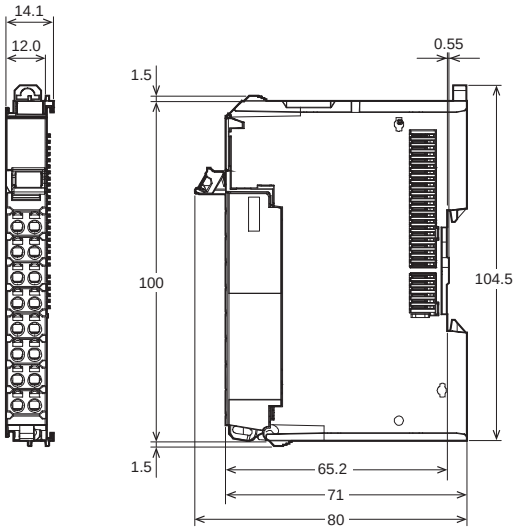


Letter	Name	Description
(A)	Marker attachment location	This is where the markers are attached. OMRON markers are pre-installed at the factory. You can also install commercially available markers.
(B)	NX bus connector	This connector is used to connect each Unit.
(C)	Unit hookup guides	These guides are used to connect two Units.
(D)	DIN Track mounting hooks	These hooks are used to mount the NX Unit to a DIN Track.
(E)	Protrusions for removing the Unit	These protrusions are to hold onto when you need to pull out the Unit.
(F)	Indicators	The indicators show the current operating status of the Unit.
(G)	D-Sub connector	This connector is used to connect the external serial communications device. This is the D-Sub connector plug.
(H)	FG terminal	This is the external ground connection terminal. It is a screwless clamping terminal.
(I)	Unit specifications	The specifications of the Unit are given here.
(J)	DIN Track contact plate	This plate is connected internally to the functional ground terminal on the terminal block.

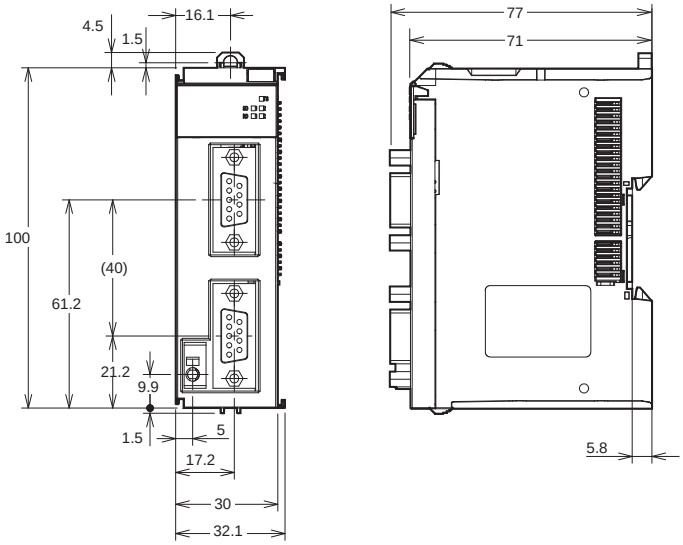
Dimensions

(Unit: mm)

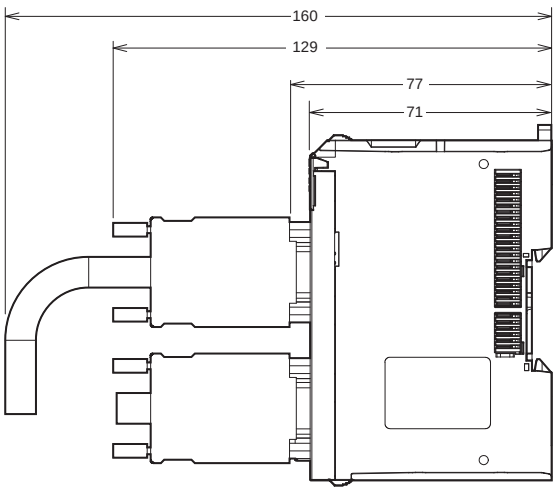
NX-CIF101 and NX-CIF105



NX-CIF210



Installation Heights



Related Manuals

Man. No	Model	Manual	Application	Description
W540	NX-CIF□□□	NX-series Communications Interface Units User's Manual	Learning how to use NX-series Communications Interface Units	The hardware, setup methods, and functions of the NX-series Communications Interface Unit are described.

Terms and Conditions of Sale

1. Offer; Acceptance. These terms and conditions (these "Terms") are deemed part of all quotes, agreements, purchase orders, acknowledgments, price lists, catalogs, manuals, brochures and other documents, whether electronic or in writing, relating to the sale of products or services (collectively, the "Products") by Omron Electronics LLC and its subsidiary companies ("Omron"). Omron objects to any terms or conditions proposed in Buyer's purchase order or other documents which are inconsistent with, or in addition to, these Terms.
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10. Force Majeure. Omron shall not be liable for any delay or failure in delivery resulting from causes beyond its control, including earthquakes, fires, floods, strikes or other labor disputes, shortage of labor or materials, accidents to machinery, acts of sabotage, riots, delay in or lack of transportation or the requirements of any government authority.
11. Shipping; Delivery. Unless otherwise expressly agreed in writing by Omron:
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    c. All sales and shipments of Products shall be FOB shipping point (unless otherwise stated in writing by Omron), at which point title and risk of loss shall pass from Omron to Buyer; provided that Omron shall retain a security interest in the Products until the full purchase price is paid;
    d. Delivery and shipping dates are estimates only; and
    e. Omron will package Products as it deems proper for protection against normal handling and extra charges apply to special conditions.
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14. 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.
15. Indemnities. Buyer shall indemnify and hold harmless Omron Companies and their employees from and against all liabilities, losses, claims, costs and expenses (including attorney's fees and expenses) related to any claim, investigation, litigation or proceeding (whether or not Omron is a party) which arises or is alleged to arise from Buyer's acts or omissions under these Terms or in any way with respect to the Products. Without limiting the foregoing, Buyer (at its own expense) shall indemnify and hold harmless Omron and defend or settle any action brought against such Companies to the extent based on a claim that any Product made to Buyer specifications infringed intellectual property rights of another party.
16. Property; Confidentiality. Any intellectual property in the Products is the exclusive property of Omron Companies and Buyer shall not attempt to duplicate it in any way without the written permission of Omron. Notwithstanding any charges to Buyer for engineering or tooling, all engineering and tooling shall remain the exclusive property of Omron. All information and materials supplied by Omron to Buyer relating to the Products are confidential and proprietary, and Buyer shall limit distribution thereof to its trusted employees and strictly prevent disclosure to any third party.
17. Export Controls. Buyer shall comply with all applicable laws, regulations and licenses regarding (i) export of products or information; (iii) sale of products to "forbidden" or other proscribed persons; and (ii) disclosure to non-citizens of regulated technology or information.
18. Miscellaneous. (a) Waiver. No failure or delay by Omron in exercising any right and no course of dealing between Buyer and Omron shall operate as a waiver of rights by Omron. (b) Assignment. Buyer may not assign its rights hereunder without Omron's written consent. (c) Law. These Terms are governed by the law of the jurisdiction of the home office of the Omron company from which Buyer is purchasing the Products (without regard to conflict of law principles). (d) Amendment. These Terms constitute the entire agreement between Buyer and Omron relating to the Products, and no provision may be changed or waived unless in writing signed by the parties. (e) Severability. If any provision hereof is rendered ineffective or invalid, such provision shall not invalidate any other provision. (f) Setoff. Buyer shall have no right to set off any amounts against the amount owing in respect of this invoice. (g) Definitions. As used herein, "including" means "including without limitation"; and "Omron Companies" (or similar words) mean Omron Corporation and any direct or indirect subsidiary or affiliate thereof.

Certain Precautions on Specifications and Use

1. Suitability of Use. Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases but the following is a non-exhaustive list of applications for which particular attention must be given:
   (i) Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this document.
   (ii) Use in consumer products or any use in significant quantities.
   (iii) Energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
   (iv) Systems, machines and equipment that could present a risk to life or property. Please know and observe all prohibitions of use applicable to this Product.
   NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON'S PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
2. Programmable Products. Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.
3. Performance Data. Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.
4. Change in Specifications. Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.
5. Errors and Omissions. Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.