

# NX-series EtherNet/IP™ Coupler Unit

# NX-EIC

CSM\_NX-EIC\_DS\_E\_2\_2

## Connecting to open industrial network standard EtherNet/IP

- The EtherNet/IP Coupler Unit is the link between the EtherNet/IP multivendor network and the NX-series I/O Units and Safety Units. With wide variety of the I/O Units and Safety Units, the NX-series is the perfect match for the CJ-series and multivendor Controllers.

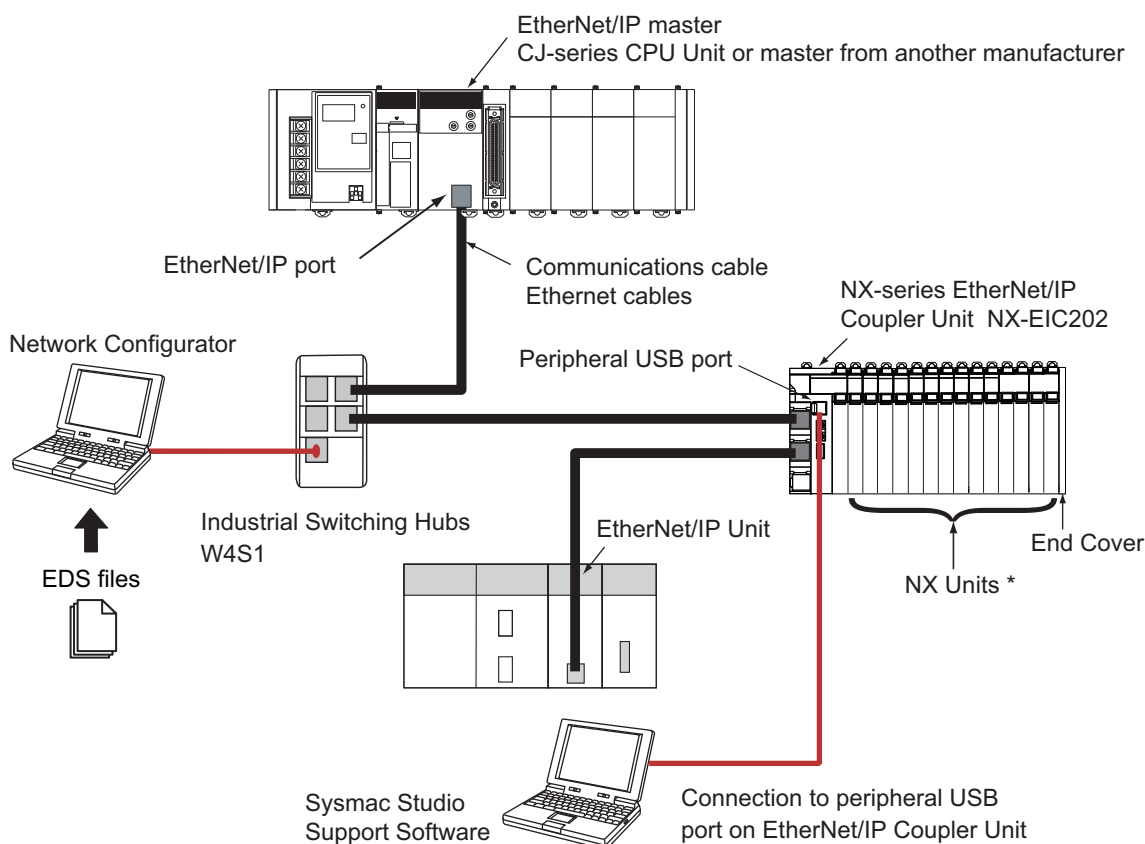


## Features

- Up to 63 NX-IO Units can be connected to one EtherNet/IP Coupler Unit. Standard and high-performance units can be mixed.\*
  - Each Coupler plus its I/O form just a single EtherCAT node on the network.
  - I/O control and safety control can be integrated by connecting Units for safety.
  - The IP address can be found on the label on the Unit, without using software.
  - Slave configuration by Sysmac Studio can be done centrally via the controller, or on-the-spot using the Coupler's built-in USB port.
- \* Input per Coupler Unit: Maximum 504 bytes, Output per Coupler Unit: Maximum 504 bytes

## System Configuration

### System Configuration of Slave Terminals



**Note:** Do not make a loop connection in the communications path between Ethernet switches.

\* Refer to *Configuration Unit* on page 8 for the NX Units that can be connected to the NX-series EtherNet/IP Coupler Unit.


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

## EtherNet/IP Coupler Unit

Unit type	Product name	Current consumption	Maximum I/O power supply current	Model	Standards
NX-series Communications Coupler Unit	EtherNet/IP Coupler Unit 	1.60 W or lower	10 A	<b>NX-EIC202</b>	UC1, CE, RCM, KC

## 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			Model	Standards
		Number of licenses	Media		
Sysmac Studio NX-I/O Edition Ver.1.□□ *1 *2	Sysmac Studio NX-I/O Edition is a limited license that provides selected functions required for EtherNet/IP Coupler settings. Because this product is a license only, you need the Sysmac Studio Standard Edition DVD media to install it.	1 license	---	<b>SYSMAC-NE001L</b>	---
Sysmac Studio Standard Edition Ver.1.□□ *2	The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX-series CPU Units, NY-series Industrial PC, EtherCAT Slave, and the HMI.  Sysmac Studio runs on the following OS. 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)  This software provides functions of the Vision Edition. Refer to Sysmac Catalog (P072) for details such as supported models and functions.	--- (Media only)	DVD	<b>SYSMAC-SE200D</b>	---

\*1. The Sysmac Studio Standard Edition with license(s) (SYSMAC-SE□□□L) provides functions of the NX-I/O Edition (SYSMAC-NE001L).

\*2. With the Sysmac Studio Standard Edition with license(s) (SYSMAC-SE□□□L) version 1.10 or higher, you can use the setup functions for the EtherNet/IP Coupler.

## Connecting Cable

### Peripheral (USB) Port

Use commercially available USB cable.





Specifications: USB 1.1 or 2.0 cable (A connector - B connector), 5.0 m max.

## Recommended EtherNet/IP Communications Cables

Use STP (shielded twisted-pair) cable of category 5 or higher for EtherNet/IP.

In the table, materials indicated available for EtherNet/IP 100BASE-TX are available for both of 100BASE-TX and 10BASE-T.

### Cable with Connectors

Item	Appearance	Recommended manufacturer	Cable length (m)	Model
Cable with Connectors on Both Ends (RJ45/RJ45) Standard RJ45 plugs type *1 Wire Gauge and Number of Pairs: AWG26, 4-pair Cable Cable Sheath material: LSZH *2 Cable color: Yellow *3		OMRON	0.3	XS6W-6LSZH8SS30CM-Y
			0.5	XS6W-6LSZH8SS50CM-Y
			1	XS6W-6LSZH8SS100CM-Y
			2	XS6W-6LSZH8SS200CM-Y
			3	XS6W-6LSZH8SS300CM-Y
			5	XS6W-6LSZH8SS500CM-Y
Cable with Connectors on Both Ends (RJ45/RJ45) Rugged RJ45 plugs type *1 Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Light blue		OMRON	0.3	XS5W-T421-AMD-K
			0.5	XS5W-T421-BMD-K
			1	XS5W-T421-CMD-K
			2	XS5W-T421-DMD-K
			5	XS5W-T421-GMD-K
			10	XS5W-T421-JMD-K
Cable with Connectors on Both Ends (M12 Straight/M12 Straight) Shield Strengthening Connector cable *4 M12/Smartclick Connectors Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black		OMRON	0.5	XS5W-T421-BM2-SS
			1	XS5W-T421-CM2-SS
			2	XS5W-T421-DM2-SS
			3	XS5W-T421-EM2-SS
			5	XS5W-T421-GM2-SS
			10	XS5W-T421-JM2-SS
Cable with Connectors on Both Ends (M12 Straight/RJ45) Shield Strengthening Connector cable *4 M12/Smartclick Connectors Rugged RJ45 plugs type Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black		OMRON	0.5	XS5W-T421-BMC-SS
			1	XS5W-T421-CMC-SS
			2	XS5W-T421-DMC-SS
			3	XS5W-T421-EMC-SS
			5	XS5W-T421-GMC-SS
			10	XS5W-T421-JMC-SS


\*1. Standard type cables length 0.2, 0.3, 0.5, 1, 1.5, 2, 3, 5, 7.5, 10, 15 and 20 m are available. Rugged type cables length 0.3, 0.5, 1, 2, 3, 5, 10 and 15 m are available. For details, refer to Cat.No.G019.

\*2. The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use. Although the LSZH cable is single shielded, its communications and noise characteristics meet the standards.

\*3. Cables colors are available in blue, yellow, or Green.

\*4. For details, contact your OMRON representative.

### Cables / Connectors

Item		Recommended manufacturer	Model	
Products for EtherNet/IP (100BASE-TX)	Wire Gauge and Number of Pairs: AWG24, 4-pair Cable	Cables	Hitachi Cable, Ltd.	NETSTAR-C5E SAB 0.5 × 4P *1
			Kuramo Electric Co.	KETH-SB *1
			SWCC Showa Cable Systems Co.	FAE-5004 *1
	RJ45 Connectors	Panduit Corporation	MPS588-C *1	
Products for EtherNet/IP (100BASE-TX)	Wire Gauge and Number of Pairs: AWG22, 2-pair Cable	Cables	Kuramo Electric Co.	KETH-PSB-OMR *2
			JMACS Japan Co., Ltd.	PNET/B *2
			OMRON	XS6G-T421-1 *2
	RJ45 Assembly Connector			

\*1. We recommend you to use above cable for EtherNet/IP and RJ45 Connector together.

\*2. We recommend you to use above cable for EtherNet/IP and RJ45 Assembly Connector together.

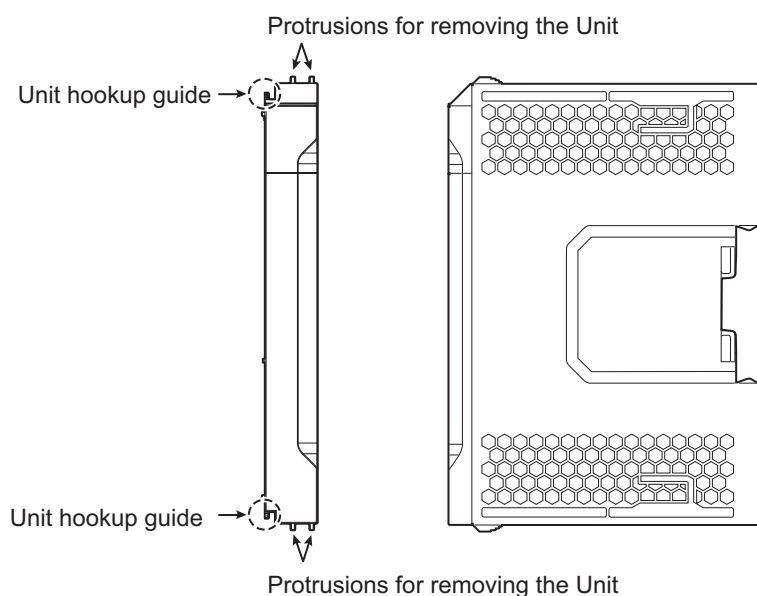
## Optional Products

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	8	A/B	Provided	10 A	NX-TBC082

## Accessories

### End Cover (NX-END01)

One End Cover is provided together with the EtherNet/IP Coupler Unit.



## General Specification

Item	Specification	
Enclosure	Mounted in a panel	
Grounding method	Ground to 100 Ω or less	
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	Pollution degree 2 or less: Conforms to JIS B 3502 and IEC 61131-2.
	Noise immunity	Conforms to IEC 61000-4-4. 2 kV (power supply line)
	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 <sup>2</sup> , 100 min each in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total) *1
Shock resistance	Conforms to IEC 60068-2-27. 147 m/s <sup>2</sup> , 3 times each in X, Y, and Z directions *1	
Applicable standards *2	cULus: Listed UL508, ANSI/ISA 12.12.01 EU: EN 61131-2, C-Tick or RCM, KC: KC Registration	

\*1. Refer to the *NX-series Digital I/O Units User's Manual* (Cat. No. W521) for the vibration and shock resistance specifications of the Relay Output Unit.

\*2. Refer to the OMRON website (<http://www.ia.omron.com/>) or consult your OMRON representative for the most recent applicable standards for each model.

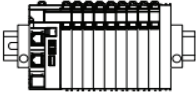
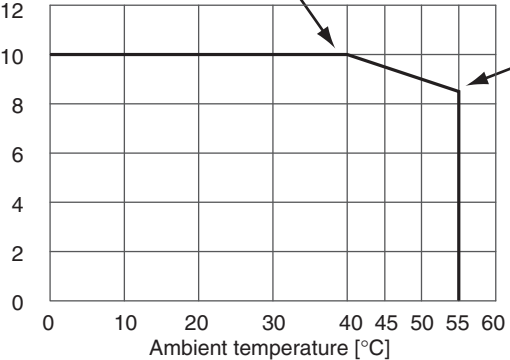
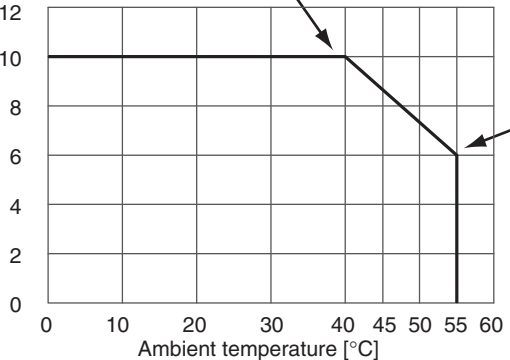
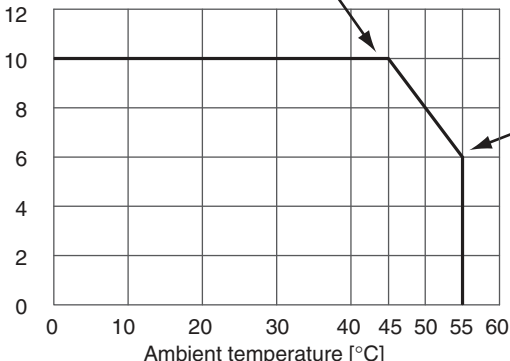
## EtherNet/IP Coupler Unit Specifications

Item		Specification
<b>Model</b>		NX-EIC202
<b>Number of connectable NX Units</b>		63 Units max.*1
<b>Communications protocols</b>		EtherNet/IP
		UDP/IP and TCP/IP (Message Services) <ul style="list-style-type: none"> <li>Number of buffers (sockets):               <ul style="list-style-type: none"> <li>• 8 message buffers for server</li> <li>• No message buffers for client</li> <li>• Shared buffers for UDP/IP messages and TCP/IP messages</li> </ul> </li> <li>Maximum message size:               <ul style="list-style-type: none"> <li>• Request: 492 bytes</li> <li>• Response: 496 bytes</li> </ul> </li> <li>Maximum NX output data size:               <ul style="list-style-type: none"> <li>• 490 bytes</li> </ul> </li> <li>Maximum NX input data size:               <ul style="list-style-type: none"> <li>• 496 bytes</li> </ul> </li> </ul>
<b>Modulation</b>		Baseband
<b>Link speed</b>		100 Mbps
<b>Physical layer</b>		100BASE-TX (IEEE 802.3)
<b>Number of connections</b>		8
<b>Received Packet Interval (RPI, refresh cycle)</b>		4 to 1,000 ms
<b>Allowed communications bandwidth addressing to the local node</b>		1,000 pps
<b>Topology</b>		Line, Tree, Star
<b>Ethernet Switch</b>		Layer 2 Ethernet switch
<b>Transmission media</b>		Category 5 or higher twisted-pair cable (Recommended cable: double-shielded cable with aluminum tape and braiding)
<b>Transmission distance</b>		Distance between nodes: 100 m or less
<b>NX bus I/O data size</b>		Input: 512 bytes max. (including input data, status, and unused areas) Output: 512 bytes max. (including output data and unused areas)
<b>EtherNet/IP I/O connection size</b>		Input: 504 bytes max. (including input data, status, and unused areas) Output: 504 bytes max. (including output data and unused areas)
<b>Refreshing methods</b>		Free-Run refreshing
<b>Unit power supply *2</b>	<b>Power supply voltage</b>	24 VDC (20.4 to 28.8 VDC)
	<b>NX Unit power supply capacity</b>	10 W max. (Refer to <i>Installation orientation and restrictions</i> for details.)
	<b>NX Unit power supply efficiency</b>	70%
	<b>Isolation method</b>	No isolation between NX Unit power supply and Unit power supply terminals
<b>I/O power supply *2</b>	<b>Power supply voltage</b>	5 to 24 VDC (4.5 to 28.8 VDC) *3
	<b>Maximum I/O power supply current</b>	10 A (Refer to <i>Installation orientation and restrictions</i> for details.)
	<b>Current capacity of power supply terminals</b>	10 A max.
<b>NX Unit power consumption</b>		1.60 W max.
<b>Current consumption from I/O power supply</b>		10 mA max. (for 24 VDC)
<b>Dielectric strength</b>		510 VAC for 1 min, leakage current: 5 mA max. (between isolated circuits)
<b>Insulation resistance</b>		100 VDC, 20 MΩ min. (between isolated circuits)
<b>External connection terminals</b>		Communications Connector For EtherNet/IP communications. <ul style="list-style-type: none"> <li>• RJ45 × 2 (shielded)</li> </ul>
		Screwless Clamping Terminal Block For Unit power supply, I/O power supply, and grounding. Removable.
		Peripheral USB Port For Sysmac Studio connection. <ul style="list-style-type: none"> <li>• Physical layer: USB 2.0-compliant, B-type connector</li> <li>• Transmission distance: 5 m max.</li> </ul>
<b>Dimensions</b>		46 × 100 × 71 mm (W×H×D)
<b>Weight</b>		150 g max.

\*1. Refer to the *NX-series Safety Control Unit User's Manual* (Cat. No. Z930) for the number of Safety Control Units that can be connected.

\*2. Refer to the *NX-series EtherNet/IP™ Coupler Unit User's Manual* (Cat. No. W536) for procedures for designing the Unit power supply system and I/O power supply system.

\*3. Use a voltage that is appropriate for the I/O circuits of the NX Units and the connected external devices.

Item	Specification
<p><b>Installation orientation and restrictions</b></p>	<p>Installation orientation: 6 possible orientations</p> <p>Restrictions:</p> <ul style="list-style-type: none"> <li>Used in the upright installation orientation.</li> </ul>  <p>Unit power supply [W]</p> <p>10 W output, 40°C</p> <p>8.5 W output, 55°C</p>  <p>Ambient temperature [°C]</p> <ul style="list-style-type: none"> <li>Used in any other orientation than the upright installation orientation.</li> </ul> <p>Unit power supply [W]</p> <p>10 W output, 40 °C</p> <p>6.0 W output, 55°C</p>  <p>Ambient temperature [°C]</p> <p>I/O power supply [A]</p> <p>10 A current, 45°C</p> <p>6 A current, 55°C</p>  <p>Ambient temperature [°C]</p>

Item	Specification
<p><b>Circuit layout</b></p>	
<p><b>Terminal arrangement</b></p>	
<p><b>Accessory</b></p>	<p>End Cover (NX-END01): 1</p>

## Configuration Unit

Refer to the user's manuals for information on the NX Units that can be connected to the NX-series EtherNet/IP Coupler Unit.

### EtherNet/IP Coupler Unit

Unit	Model
EtherNet/IP Coupler Unit	NX-EIC202

### I/O Units

Unit	Model				
	2-point Units	4-point Units	8-point Units	16-point Units	32-point Units
Digital Input Unit	-	NX-ID3317 NX-ID3343 NX-ID3417 NX-ID3443 NX-IA3117	NX-ID4342 NX-ID4442	NX-ID5142-1 NX-ID5142-5 NX-ID5342 NX-ID5442	NX-ID6142-5 NX-ID6142-6
Digital Output Unit	NX-OC2633 NX-OC2733	NX-OD3121 NX-OD3153 NX-OD3256 NX-OD3257 NX-OD3268	NX-OD4121 NX-OD4256 NX-OC4633	NX-OD5121 NX-OD5121-1 NX-OD5121-5 NX-OD5256 NX-OD5256-1 NX-OD5256-5	NX-OD6121-5 NX-OD6256-5
Digital Mixed I/O Unit	-	-	-	NX-MD6121-5 NX-MD6121-6 NX-MD6256-5	-
Analog Input Unit	NX-AD2603 NX-AD2604 NX-AD2608 NX-AD2203 NX-AD2204 NX-AD2208	NX-AD3603 NX-AD3604 NX-AD3608 NX-AD3203 NX-AD3204 NX-AD3208	NX-AD4603 NX-AD4604 NX-AD4608 NX-AD4203 NX-AD4204 NX-AD4208	-	-
Analog Output Unit	NX-DA2603 NX-DA2605 NX-DA2203 NX-DA2205	NX-DA3603 NX-DA3605 NX-DA3203 NX-DA3205	-	-	-
Temperature Input Unit	NX-TS2101 NX-TS2102 NX-TS2104 NX-TS2201 NX-TS2202 NX-TS2204	NX-TS3101 NX-TS3102 NX-TS3104 NX-TS3201 NX-TS3202 NX-TS3204	-	-	-
Heater Burnout Detection Unit	-	NX-HB3101 NX-HB3201	-	-	-

### Position Interface Units

Unit	Model	
	1CH	2CH
Incremental Encoder Input Unit	NX-EC0112, NX-EC0122, NX-EC0132, NX-EC0142	NX-EC0212, NX-EC0222
SSI Input Unit	NX-ECS112	NX-ECS212
Pulse Output Unit	NX-PG0112, NX-PG0122	-

### Load Cell Input Unit

Unit	Model
Load Cell Input Unit	NX-RS1201

### IO-Link Master Unit

Unit	Model
IO-Link Master Unit	NX-ILM400

### System Units

Unit	Model
Additional NX Unit Power Supply Unit	NX-PD1000
Additional I/O Power Supply Unit	NX-PF0630, NX-PF0730
I/O Power Supply Connection Unit	NX-PC0010, NX-PC0020, NX-PC0030
Shield Connection Unit	NX-TBX01

### Safety Control Units

Unit	Model
Safety CPU Unit	NX-SL3300 *1
Safety Input Unit	NX-SIH400 *2, NX-SID800
Safety Output Unit	NX-SOH200, NX-SOD400

\*1. Safety CPU Unit Ver.1.1 or higher.

\*2. Safety Input Unit Ver.1.1 or higher.

## Version Information

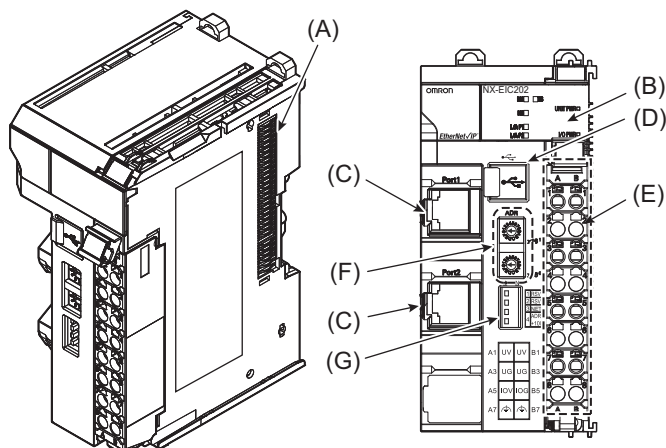
NX-series EtherNet/IP Coupler Unit and Sysmac Studio

NX Unit		version
Model	Unit Version	Sysmac Studio
NX-EIC202	Ver.1.2	Version 1.19 or higher
	Ver.1.0	Version 1.10 or higher



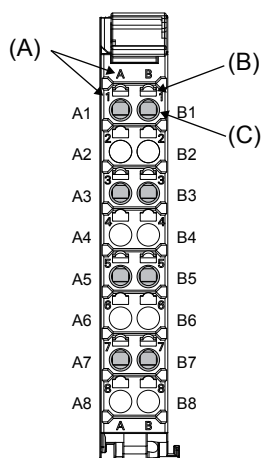
## External Interface

### EtherNet/IP Coupler Unit NX-EIC202



Letter	Name	Function
(A)	NX bus connector	This connector is used to connect the EtherNet/IP Coupler Unit to the NX Unit on the right of the Coupler Unit.
(B)	Indicators	The indicators show the current operating status of the Unit and the status of the power supply.
(C)	Communications connectors	These connectors are connected to the communications cables of the EtherNet/IP network.
(D)	Peripheral USB port	This port is used to connect to the Sysmac Studio.
(E)	Terminal block	The terminal block is used to connect to the power supply cables and ground wire.
(F)	Rotary switches	The rotary switches are used to set the last octet of the IP address of the EtherNet/IP Coupler Unit as an EtherNet/IP Slave. The address is set in hexadecimal.
(G)	DIP switch	The DIP switch is used to set the default node address of the EtherNet/IP Coupler Unit as an EtherNet/IP slave.

### Terminal Block



Eight-terminal Block

Symbol	Name	Function
(A)	Terminal number indications	The terminal numbers (A1 to A8 and B1 to B8) are displayed. The terminal number indicators are the same regardless of the number of terminals on the terminal block, as shown above.
(B)	Release holes	Insert a flat-blade screwdriver into these holes to connect and remove the wires.
(C)	Terminal holes	The wires are inserted into these holes.

## 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.

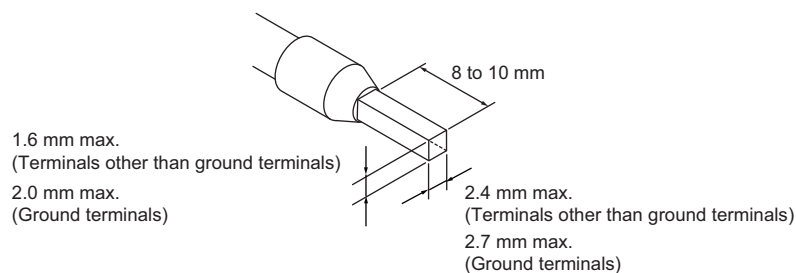
Always use plated one-pin ferrules. Do not use unplated ferrules or two-pin ferrules.

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

Terminal types	Manufacturer	Ferrule model	Applicable wire (mm <sup>2</sup> (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 <sup>2</sup> , 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)	Weidmuller (The figure in parentheses is the applicable wire size.) PZ6 Roto (0.14 to 6 mm <sup>2</sup> , 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<sup>2</sup> 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.



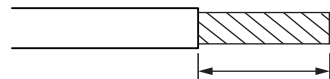
### Using Twisted Wires/Solid Wires

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 <sup>2</sup> 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	Possible	Not Possible	Possible		
Ground terminals	---	Possible	Possible	Possible *2	Possible *2	2.0 mm <sup>2</sup>	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.

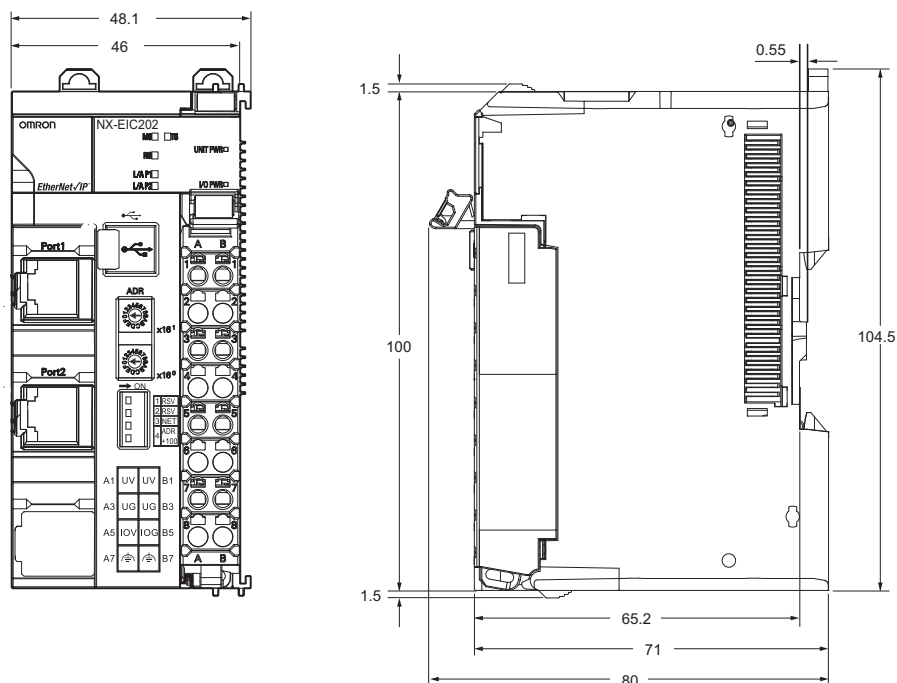


Conductor length (stripping length)

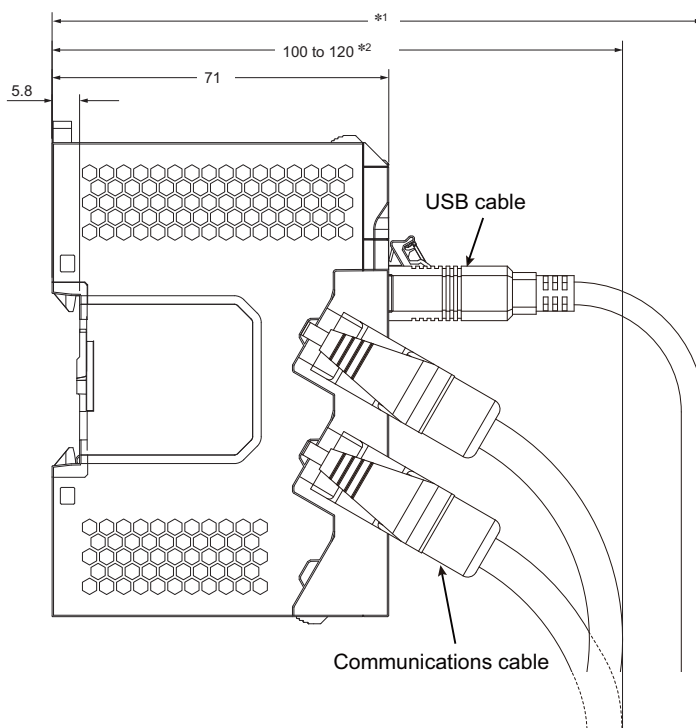
<Additional Information> If more than 2 A will flow on the wires, use plated wires or use ferrules.

## Dimensions

### ● EtherCAT Coupler Unit Only



### ● With Cables Connected

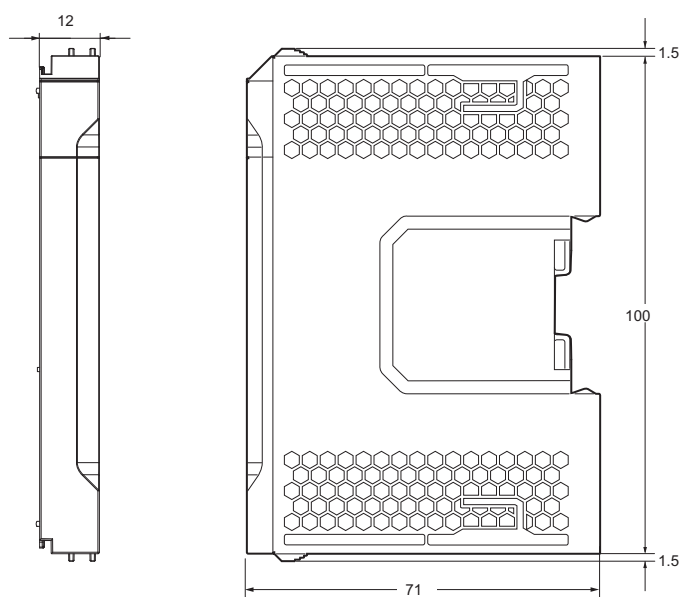


\*1. This dimension depends on the specifications of the commercially available USB cable. Check the specifications of the USB cable that is used.

\*2. This is the dimension from the back of the Unit to the communications cables.

- 100 mm: When an MPS588-C Connector is used.
- 120 mm: When an XS6G-T421-1 Connector is used.

● End Cover



Related Manuals

Man. No	Model	Manual	Application	Description
W536	NX-EIC□□□	NX-series EtherNet/IP Coupler Unit User's Manual	Learning how to use an NX-series Ether-Net/IP Coupler Unit and EtherNet/IP Slave Terminals	Introduces the system, configuration methods, Unit hardware, setting methods, and functions of EtherNet/IP Slave Terminals that consist of an EtherNet/IP Coupler Unit and NX Units.

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