NX-series PROFINET® Coupler Unit
NX-PNC

CSM_NX-PNC_DS_E_1_1

Connecting to open industrial network standard PROFINET RT.

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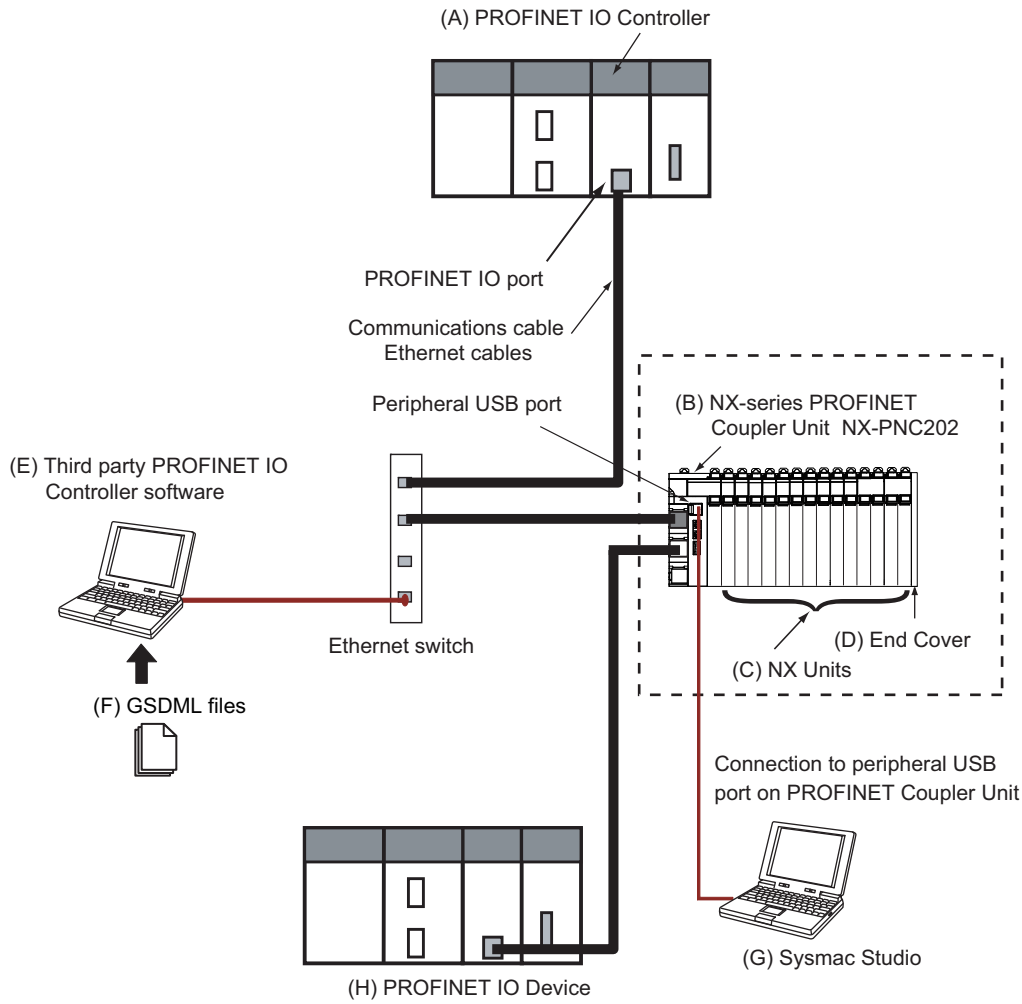
Features

- Up to 63 NX-IO Units can be connected to one PROFINET Coupler Unit. Standard and high-performance units can be mixed. *1
- Each Coupler plus its I/O form just a single PROFINET IO device unit on the network.
- PROFINET IO device configuration by Sysmac Studio can be done on-the-spot using the Coupler's built-in USB port.

*1. Input per Coupler Unit: Maximum 512 bytes, Output per Coupler Unit: Maximum 512 bytes

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System Configuration

An example of a system configuration for a PROFINET IO Device Terminal is shown below.

(A) PROFINET IO Controller

PROFINET IO port

Communications cable
Ethernet cables

Peripheral USB port

(E) Third party PROFINET IO
Controller software

Ethernet switch

(F) GSDML files

(B) NX-series PROFINET
Coupler Unit NX-PNC202

(D) End Cover

(C) NX Units

Connection to peripheral USB
port on PROFINET Coupler Unit

(G) Sysmac Studio

(H) PROFINET IO Device

Letter	Item	Description
(A)	PROFINET IO Controller	The PROFINET IO Controller manages the PROFINET network, monitors the status of the IO Devices, and exchanges IO data with the IO Devices.
(B)	PROFINET Coupler Unit	The PROFINET Coupler Unit is an interface that performs IO refresh communications between a group of NX Units and the PROFINET Unit over a PROFINET network. The IO data for the NX Units is first accumulated in the PROFINET Coupler Unit and then all of the data is exchanged with the PROFINET Unit at the same time. You can connect up to 63 NX Units.
(C)	NX Units *1	The NX Units perform IO processing with connected external devices. The NX IO Units perform IO refresh communications with the PROFINET IO Controller through the PROFINET Coupler Unit.
(D)	End Cover	The End Cover is attached to the end of the IO Device Terminal.
(E)	Third party PROFINET IO Controller Software	The Third party PROFINET IO Controller Software runs on a personal computer and it is used to configure the PROFINET IO Controller and the connected PROFINET IO network with all IO Devices.
(F)	GSDML file	The GSDML file of the PROFINET Coupler Unit allows the user to configure the IO Controller Unit and the network for I/O data exchange with the PROFINET Coupler Unit and the NX IO System.
(G)	Sysmac Studio	Use Sysmac Studio to adjust the settings of the IO Device Terminal with the configuration and operation settings of the NX Units and PROFINET Coupler Unit.
(H)	PROFINET IO Device	The PROFINET IO Units that are coupled to the PROFINET IO Controller by means of the PROFINET Coupler Unit.

*1. For whether an NX Unit can be connected to the PROFINET Coupler Unit, refer to the version information in the user's manual for the NX Unit.

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Ordering Information

Applicable standards
Refer to the OMRON website (www.ia.omron.com) or ask your OMRON representative for the most recent applicable standards for each model.

PROFINET Coupler Unit

Product name	Current consumption	Maximum I/O power supply current	Model
PROFINET Coupler Unit	1.60 W or lower	10 A	**NX-PNC202**

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
Sysmac Studio Standard Edition Ver.1.□□	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, NYseries Industrial PC, EtherCAT Slave, and the HMI.	--- (Media only)	Sysmac Studio (32-bit) DVD	**SYSMAC-SE200D**
	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) *1	--- (Media only)	Sysmac Studio (64-bit) DVD	**SYSMAC-SE200D-64**
	This software provides functions of the Vision Edition. Refer to your OMRON website for details such as supported models and functions.	1 license *2*3*4	---	**SYSMAC-SE201L**

*1. Model "SYSMAC-SE200D-64" runs on Windows 10 (64 bit).
*2. The Sysmac Studio Standard Edition with license(s) (SYSMAC-SE□□□L) provides functions of the NX-I/O Edition (SYSMAC-NE001L).
*3. With the Sysmac Studio Standard Edition with license(s) (SYSMAC-SE□□□L) version 1.45 or higher, you can use the setup functions for the PROFINET Coupler.
*4. Multi licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses).

Recommended PROFINET Communications Cables

Cable with Connectors

Item	Appearance	Recommended manufacturer	Cable length (m)	Model
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**

*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.

Cables / Connectors

Item			Recommended manufacturer	Model
Products for PROFINET (100BASE-TX)	Wire Gauge and Number of Pairs: AWG22, 2-pair Cable	Cables	Kuramo Electric Co.	**KETH-PSB-OMR** *1
			JMACS Japan Co., Ltd.	**PNET/B** *1
		RJ45 Assembly Connector	OMRON	**XS6G-T421-1** *1

*1. We recommend you to use above cable for PROFINET and RJ45 Assembly Connector together.
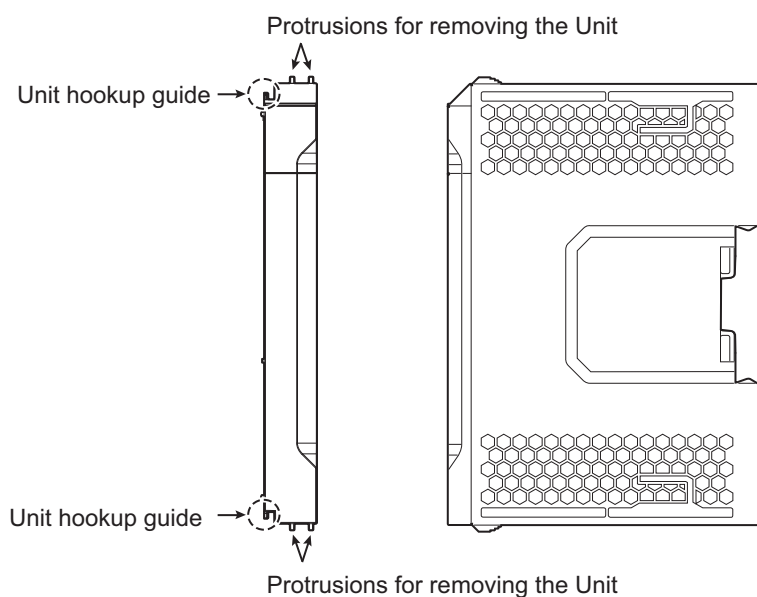
Optional Products

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

Product name	Specification				Model
	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 PROFINET Coupler Unit.

Protrusions for removing the Unit

Unit hookup guide →

Unit hookup guide →

Protrusions for removing the Unit

General Specifications

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	2 or less: Conforms to JIS B3502 and IEC 61131-2.
	Noise immunity	2 kV on power supply line (Conforms to IEC61000-4-4.)
	Overvoltage category	Category II: Conforms to JIS B3502 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 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^2, 3 times each in X, Y, and Z directions *1
Applicable standards *2		cULus: Listed UL508 and ANSI/ISA 12.12.01 EC: EN 61131-2, C-Tick or RCM, KC

*1. Refer to the *NX-series Digital IO 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.

NX-PNC

PROFINET Specifications

Item		Specification
Name		NX-PNC202
Manufacture ID		0x0264
Device ID		0x1500
PROFINET version		2.41
Application Relationship		Max 1
Send Data Interval		64, 128, 256, 512 ms
Data Size (In)	Status	Max 28 Bytes
	NX Unit In	512 Bytes *1
Data Size (Out)	Unit Control	2 Bytes
	NX Unit Out	512 Bytes *1
PROFINET interface	Protocol	PROFINET IO
	PROFINET unit type	PROFINET IO Device
	Isochronous mode	No
	Alarms	No
	Conformance Class	Class-A
Link speed		100 Mbps
Physical layer		100BASE-TX
Topology		Line, Tree, Star
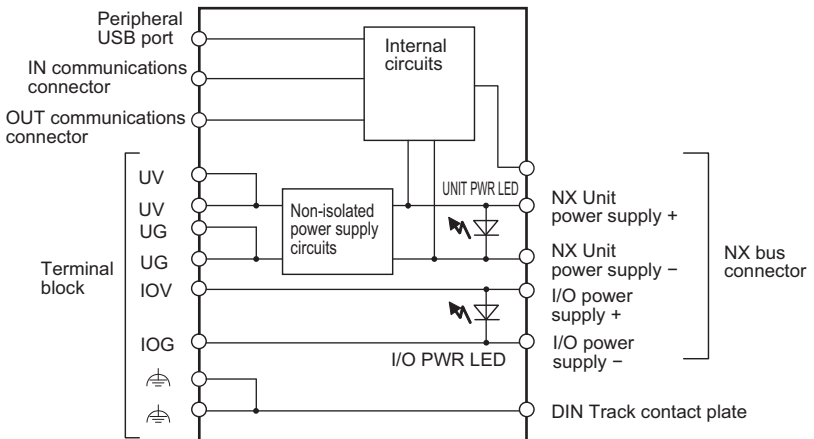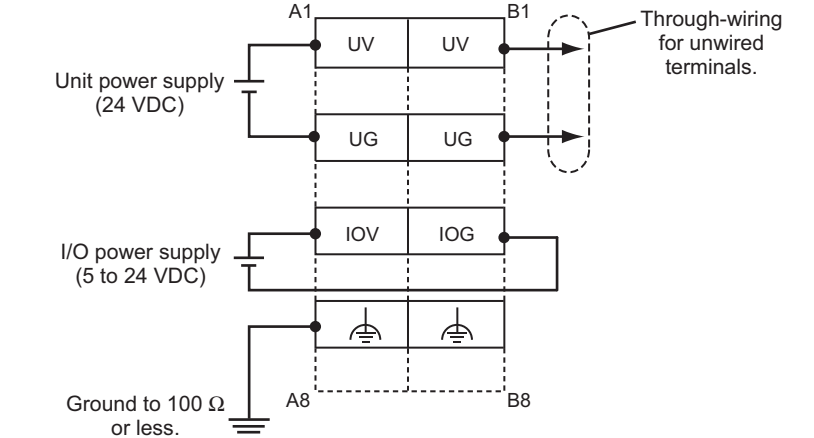
*1. NX Unit data size is fixed 512Bytes. If this is not enough the shortage data is filled with padding data. The data in the padding part will be zero.

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PROFINET Coupler Unit Specifications

Item		Specification
Model		NX-PNC202
Number of connectable NX Units		63 Units max
Refreshing method		Free-run Refreshing
NX bus I/O data size		Input: up to 512 bytes Output: up to 512 bytes
Ethernet connection		RJ45(2 port) with switching hub (Layer 2), 100 Mbps, full-duplex, auto-negotiate *1 Max length of Ethernet cable: 100 m
Unit power supply	Power supply voltage	24 VDC (20.4 to 28.8 VDC)
	NX Unit power supply capacity	10 W max. Refer to *Installation orientation and restrictions* for details.
	NX Unit power supply efficiency	70%
	Isolation method	No isolation between NX Unit power supply and Unit power supply terminals
	Current capacity of power supply terminals	4 A max.
I/O power supply	Power supply voltage	5 to 24 VDC (4.5 to 28.8 VDC)
	Maximum I/O power supply current	10 A Refer to *Installation orientation and restrictions* for details.
	Current capacity of power supply terminals	10 A max.
NX Unit power consumption		1.60 W max.
Current consumption from I/O power supply		10 mA max. (for 24 VDC)
Dielectric strength		510 VAC for 1 min, leakage current: 5 mA max. (between isolated circuits)
Insulation resistance		100 VDC, 20 MΩ min. (between isolated circuits)
USB port		USB 2.0-compliant, Type-B, Max. 5m
Dimensions (width height depth)		46 mm * 100 mm * 71 mm
Weight		150 g max

*1. It is not supported to change duplex mode (full/half) and link speed (100/10 Mbps) manually.

Item	Specification
Installation orientation and restrictions	Installation orientation: 6 possible orientations Restrictions: • Used in the upright installation orientation. Unit power supply [W] — 10 W output, 40°C — 8.5 W output, 55°C • Used in any other orientation than the upright installation orientation. Unit power supply [W] — 10 W output, 40°C — 6.0 W output, 55°C I/O power supply [A] — 10 A current, 45°C — 6 A current, 55°C

Item	Specification
Circuit layout	
Terminal arrangement	
Accessory	End Cover (NX-END01): 1

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Configuration Unit

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

PROFINET Coupler Unit

Unit	Model
PROFINET Coupler Unit	NX-PNC202

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-OD6121-6 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	–	–	–

Temperature Control Units

Unit	Model	
	2CH	4CH
Temperature Control Unit	NX-TC2405, NX-TC2406, NX-TC2407, NX-TC2408	NX-TC3405, NX-TC3406, NX-TC3407, NX-TC3408

Load Cell Input Unit

Unit	Model
Load Cell Input Unit	NX-RS1201, NX-RS1201-K

Position Interface Units

Unit	Model		
	1CH	2CH	4CH
Incremental Encoder Input Unit	NX-EC0112, NX-EC0122, NX-EC0132, NX-EC0142	NX-EC0212, NX-EC0222	–
SSI Input Unit	NX-ECS112	NX-ECS212	–

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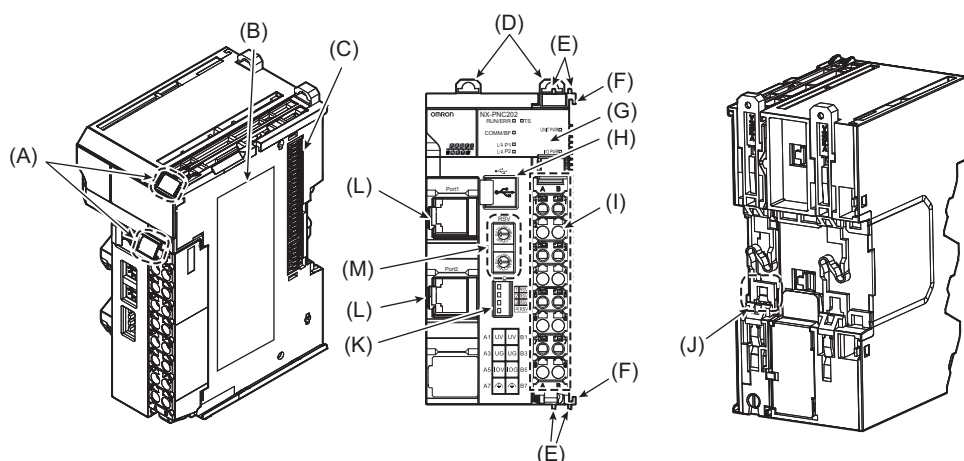
Unit	Model
Additional NX Unit Power Supply Unit	NX-PD1000
Additional I/O Power Supply Unit	NX-PF0630, NX-PF0730
I/O Power Supply Connection Unit	NX-PC0010, NX-PC0020, NX-PC0030
Shield Connection Unit	NX-TBX01

RFID Units

Unit	Model
RFID Unit	NX-V680C1, NX-V680C2

External Interface

PROFINET Coupler Unit NX-PNC202

| Letter	Name	Function
(A)	Marker attachment locations	The locations where markers are attached. The markers made by OMRON are installed for the factory setting. Commercially available markers can also be installed.
(B)	Unit specifications	The specifications of the Unit are engraved in the side of the casing.
(C)	NX bus connector	This connector is used to connect the PROFINET Coupler Unit to the NX Unit on the right of the Coupler Unit.
(D)	DIN Track mounting hooks	These hooks are used to mount the PROFINET Coupler Unit to a DIN Track.
(E)	Protrusions for removing the Unit	The protrusions to hold when removing the Unit.
(F)	Unit hookup guides	These guides are used to connect two Units.
(G)	Indicators	The indicators show the current operating status of the Unit and the status of the power supply.
(H)	Peripheral USB port	This port is used to connect to the Sysmac Studio.
(I)	Terminal block	The terminal block is used to connect to the power supply cables and ground wire.
(J)	DIN Track contact plate	This plate is connected internally to the functional ground terminal on the terminal block.
(K)	DIP switch	Not used
(L)	Communications connectors	These connectors are connected to the communications cables of the PROFINET network.
(M)	Rotary switches	Not used

Terminal Block
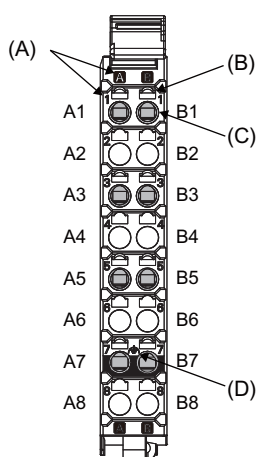
8-terminal type

Letter	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.
(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.
(D)	Ground terminal mark	This mark indicates the ground terminals.

NX-PNC

Dimensions (Unit: mm)

## PROFINET Coupler Unit Only
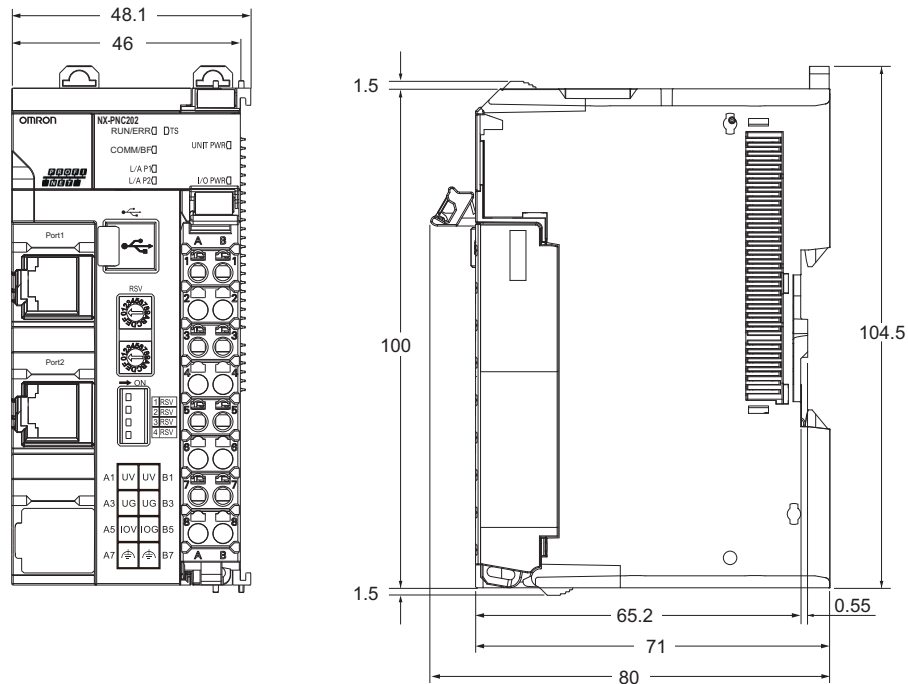
With Cables Connected
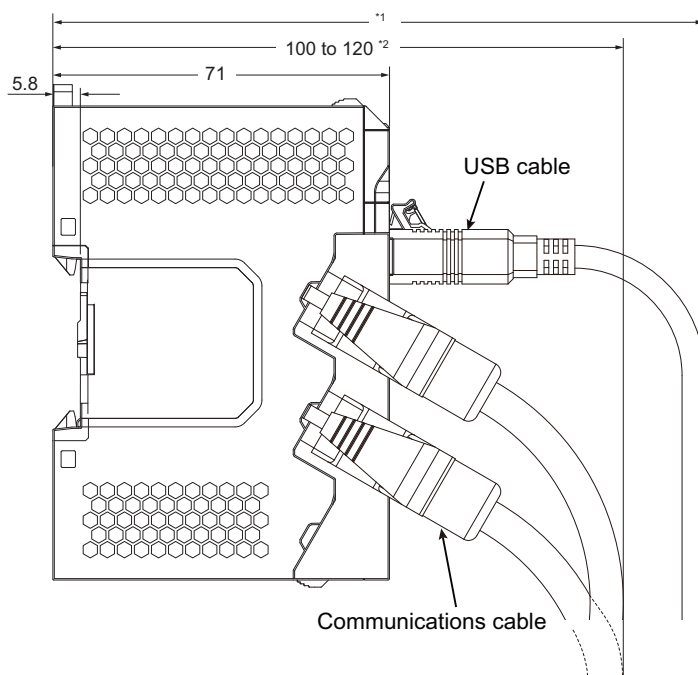
*1. This dimension depends on the specifications of the commercially available USB certified cable. Check the specifications of the USB cable that is used.

*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

12

1.5

A

A*1

100

1.5

71
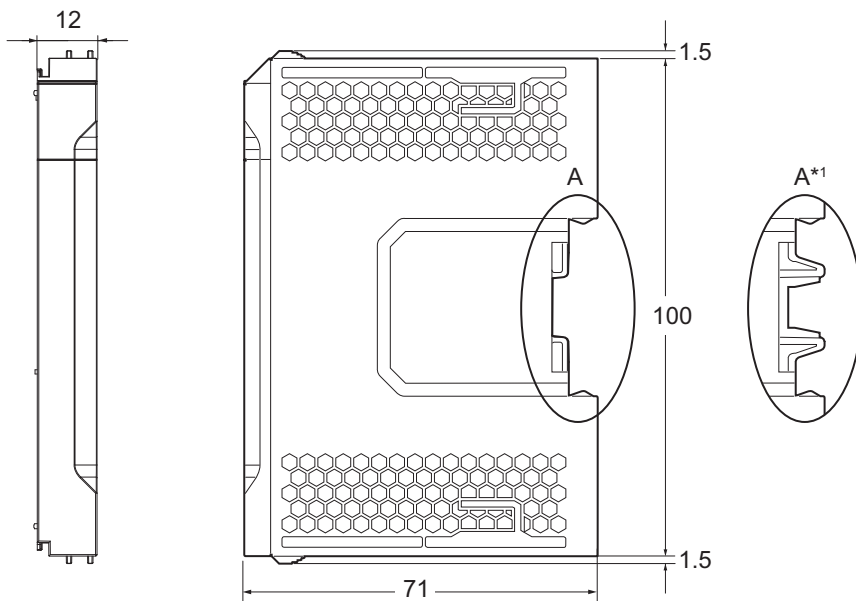
*1. This is the shape for Units with lot numbers through December 2014.

NX-PNC

Related Manuals

The following manuals are related. Use these manuals for reference.

Manual name	Cat. No.	Model numbers	Application	Description
NX-series PROFINET Coupler Unit User's Manual	W623	NX-PNC□□□	Learning how to use an NX-series PROFINET Coupler Unit	The following items are described: the overall system and configuration methods of a PROFINET Coupler Unit, and information on hardware, setup, and functions to set up, control, and monitor NX Units.
Sysmac Studio Version 1 Operation Manual	W504	SYSMAC-SE2□□□	Learning about the operating procedures and functions of the Sysmac Studio.	Describes the operating procedures of the Sysmac Studio.
NX-series Data Reference Manual	W525	NX-□□□□□□	Referencing lists of the data that is required to configure systems with NX-series Units	Lists of the power consumptions, weights, and other NX Unit data that is required to configure systems with NX-series Units are provided.
NX-series Digital IO Units User's Manual	W521	NX-ID□□□□ NX-IA□□□□ NX-OC□□□□ NX-OD□□□□	Learning how to use NX-series Digital IO Units	The hardware, setup methods, and functions of the NX-series Digital IO Units are described.
NX-series Analog IO Units User's Manual for Analog Input Units and Analog Output Units	W522	NX-AD□□□□ NX-DA□□□□	Learning how to use NX-series Analog Input Units and Analog Output Units	The hardware, setup methods, and functions of the NX-series Analog Input Units and Analog Output Units are described.
NX-series System Units User's Manual	W523	NX-PD1□□□ NX-PF0□□□ NX-PC0□□□ NX-TBX01	Learning how to use NX-series System Units	The hardware and functions of the NX-series System Units are described.
NX-series Position Interface Units User's Manual	W524	NX-EC0□□□ NX-ECS□□□ NX-PG0□□□	Learning how to use NX-series Position Interface Units	The hardware, setup methods, and functions of the NX-series Incremental Encoder Input Units, SSI Input Units, and Pulse Output Unit are described.
NX-series Load Cell Input Unit User's Manual	W565	NX-RS□□□□	Learning how to use NX-series Load Cell Input Unit	The hardware, setup methods, and functions of the NX-series Load Cell Input Unit are described.
NX-series Analog IO Units User's Manual for Temperature Input Units and Heater Burnout Detection Units	W566	NX-TS□□□□ NX-HB□□□□	Learning how to use NX-series Temperature Input Units and Heater Burnout Detection Units	The hardware, setup methods, and functions of the NX-series Temperature Input Units and Heater Burnout Detection Units are described.
NX-series Temperature Control Units User's Manual	H228	NX-TC□□□□	Learning how to use NX-series Temperature Control Units.	The hardware, setup methods, and functions of the NX-series Temperature Control Units are described.

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