OMRON

NX-series EtherCAT® Slave Unit
NX-ECT101

CSM_NX-ECT101_DS_E_1_2

High-speed data exchange based on EtherCAT

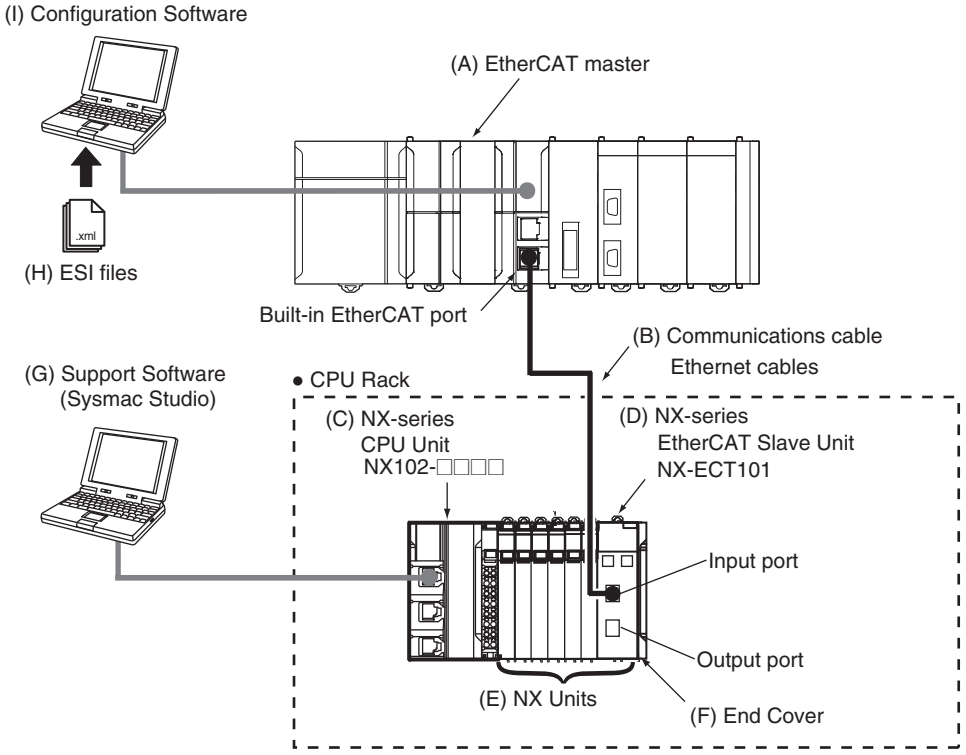
- NX Series available as subsystem controller on EtherCAT

Features

- Data exchange between EtherCAT master and CPU unit.
- Adjustable data exchange sizes.
- Troubleshooting with event codes.

System Configuration

An example of a system configuration for an NX-Series EtherCAT Slave Unit is shown below.
The following figure shows an example when an NX-series NX102 CPU Unit is used for the NX-series CPU Unit.
Refer to the user's manual for the connected CPU Unit when an NX-series CPU Unit other than the NX102 CPU Unit is used.



Letter	Item	Description
(A)	EtherCAT master ✻1	The EtherCAT master manages the EtherCAT network, monitors the status of the slaves and exchanges I/O data with the slaves.
(B)	Communications cable	Use a double-shielded cable with aluminum tape and braiding of category 5 (100BASE-TX) or higher, and use straight wiring.
(C)	NX-series CPU Unit ✻2	The Unit that serves as the center of control for a Machine Automation Controller. It executes tasks, refreshes I/O for other Units and slaves, etc. NX Units can be connected to an NX102 CPU Unit.
(D)	NX-series EtherCAT Slave Unit (NX-ECT101)	The NX-series EtherCAT Slave Unit can perform the following functions over an EtherCAT network. • Process data communications with the EtherCAT master • Message communications (SDO communications) with the EtherCAT master • Exchange data between the NX-series CPU Unit and the EtherCAT master
(E)	NX Units	The NX Units perform I/O processing with connected external devices. The NX Units exchange data with the CPU Unit through I/O refreshing. The NX-ECT101 is applicable to an NX Unit.
(F)	End Cover	The End Cover is attached to the end of the CPU Rack.
(G)	Support Software (Sysmac Studio) ✻3	A computer software application for setting, programming, debugging, and troubleshooting NJ/NX/NY-series Controllers. For an NX102 CPU Unit, this application performs setting operation by making a connection to a built-in EtherNet/IP port.
(H)	ESI (EtherCAT Slave Information) file	The ESI file contains information that is unique to an EtherCAT slave in XML format. You can load an ESI file into the EtherCAT master Configuration Software to easily allocate slave process data and make other settings. The ESI files for OMRON EtherCAT slaves are already installed in the Sysmac Studio. You can update the Sysmac Studio to get the ESI files for the most recent models.
(I)	Configuration Software	Configuration Software runs on a personal computer and it is used to configure the EtherCAT network and EtherCAT slaves.

Note: 1. The EtherCAT Slave Unit can be connected to the NX-series CPU Unit only. It cannot be connected to the NX bus of the following Units.
- NX-series Communications Coupler Unit
- NX-series Communication Control Unit

✻1. An EtherCAT Slave Unit cannot be connected to any of the OMRON CJ1W-NC□81/□82 Position Control Units even though they can operate as EtherCAT masters.
✻2. Refer to *NX-series EtherCAT Slave Unit User's Manual* (W626) for information on the unit versions of the NX-series CPU Unit that can use the NX-series EtherCAT Slave Units.
✻3. Refer to *NX-series EtherCAT Slave Unit User's Manual* (W626) for information on the versions of the Sysmac Studio that you can use to configure the NX-series EtherCAT Slave Units.

Ordering Information

EtherCAT Slave Unit

Product name	Specifications		Model
	Send/receive PDO data sizes ✻1	Refreshing method	
EtherCAT Slave Unit 	• Data input by the EtherCAT master (TxPDOs) 1,204 bytes max. • Data output by the EtherCAT master (RxPDOs) 1,200 bytes max.	Free-Run Mode	**NX-ECT101**

✻1. The following shows the contents of the TxPDO data.
- I/O data set from the CPU Unit to the EtherCAT master: 1,200 bytes or less
- Status to notify the EtherCAT master: 4 bytes or less

Recommended EtherCAT Communications Cable

Use a double-shielded cable with aluminum tape and braiding of category 5 (100BASE-TX) or higher, and use straight wiring.

Cable with Connectors

Item	Appearance	Recommended manufacturer	Cable length [m] ✻1	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

Wire Gauge and Number of Pairs: AWG24, 4-pair Cable

Item	Appearance	Recommended manufacturer	Model
Cables	----	Hitachi Metals, Ltd.	**NETSTAR-C5E SAB 0.5 × 4P CP ✻1**
	----	Kuramo Electric Co., Ltd.	**KETH-SB ✻1**
RJ45 Connectors	----	Panduit Corporation	**MPS588-C ✻1**

✻1. We recommend you to use above cable and connector together.

Wire Gauge and Number of Pairs: AWG22, 2-pair Cable

Item	Appearance	Recommended manufacturer	Model
Cables	----	Kuramo Electric Co., Ltd.	**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 and connector together.
Note: 1. Connect both ends of cable shielded wires to the connector hoods.

NX-ECT101

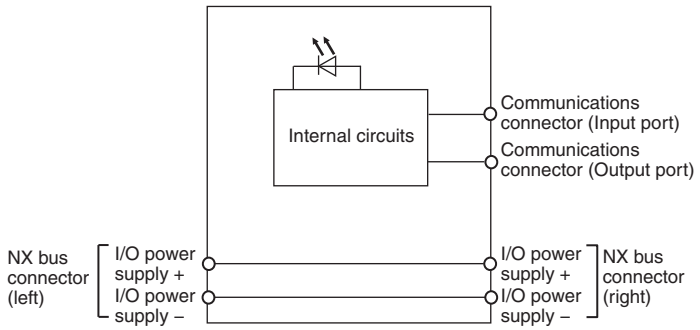
General Specifications

Item		Specification
Enclosure		Mounted in a panel
Grounding methods		Ground of 100 Ω or less
Operating environment	**Ambient operating temperature**	0 to 55℃
	Ambient operating humidity	10% to 95% RH (with no icing or condensation)
	Atmosphere	Must be free from corrosive gases.
	Ambient storage temperature	-25 to 70℃ (with no icing or condensation)
	Altitude	2,000 m max.
	Pollution degree	Pollution degree 2 or less: Conforms to IEC 61010-2-201.
	Noise immunity	Conforms to IEC 61000-4-4, 2 kV (power supply line)
	Overvoltage category	Category II: Conforms to IEC 61010-2-201.
	EMC immunity level	Zone B
	Vibration resistance	Conforms to IEC 60068-2-6. 5 to 8.4 Hz with amplitude of 3.5 mm, 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)
	Shock resistance	Conforms to IEC 60068-2-27, 147 m/s^2, 3 times each in X, Y, and Z directions
	Insulation resistance	Refer to the individual specifications of NX Units.
	Dielectric strength	Refer to the individual specifications of NX Units.
Applicable standards		cULus: Listed (UL61010-2-201), EU: EN 61131-2, RCM, KC (KC Registration), EAC, and UKCA

Note: 1. The gravitational acceleration of vibration resistance and shock resistance is G=9.8m/s^2.
2. The specifications of insulation resistance and dielectric strength vary with NX Unit Models.
3. Refer to the OMRON website (www.ia.omron.com) or ask your OMRON representative for the most recent applicable standards for each model.

Individual Specifications

Item		Specification
Transmission specifications	**Communications protocol**	EtherCAT protocol (only for slave)
	Modulation	Baseband
	Baud rate	100 Mbps
	Physical layer	100BASE-TX (IEEE 802.3)
	Topology	Depends on the specifications of the EtherCAT master ✻1
	Transmission media	Category 5 or higher twisted-pair cable (Recommended cable: double-shielded cable with aluminum tape and braiding)
	Transmission distance	Distance between nodes: 100 m or less
	Send/receive PDO data sizes ✻2	• Data input by the EtherCAT master (TxPDOs) 1,204 bytes max. • Data output by the EtherCAT master (RxPDOs) 1,200 bytes max. Data size that can be exchanged between the EtherCAT master and CPU Unit • TxPDO: 1,200 bytes max. • RxPDO: 1,200 bytes max.
	Mailbox	Emergency messages and SDO requests
	Mailbox data size	• Input: 400 bytes max. • Output: 400 bytes max.
	Refreshing method	Free-Run Mode
	Setting range of Explicit Device ID ✻3	• Hardware switch setting: 1 to 255 • Software setting: 1 to 65,535
I/O refreshing method		Free-Run refreshing
External connection terminals		EtherCAT communications connector • RJ45 × 2 (shielded) • IN: EtherCAT input data, OUT: EtherCAT output data
Dimensions		30 × 100 × 71 mm (W × H × D)
Isolation method		Between communications connector and NX bus: Pulse transformer
Insulation resistance		20 MΩ min. between isolated circuits (at 100 VDC)
Dielectric strength		510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method		No supply
Current capacity of I/O power supply terminals		Without I/O power supply terminals

Item	Specification
NX Unit power consumption	• Connected to a CPU Unit 1.75 W Connection to a Communications Coupler Unit or a Communication Control Unit is not possible.
Current consumption from I/O power supply	No consumption
Weight	110 g
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit Possible in upright installation. Restrictions: No restrictions Connection to a Communications Coupler Unit or a Communication Control Unit is not possible.
Circuit layout	

∗1. The EtherCAT Slave Unit conforms to the EtherCAT standards. Confirm the specifications of the connected EtherCAT master for the support topology. Note that the EtherCAT Slave Unit supports the ring topology.

∗2. TxPDO is the data to send from the EtherCAT Slave Unit to the EtherCAT master. RxPDO is the data received by the EtherCAT Slave Unit from the EtherCAT master.
The following shows the contents of the TxPDO data.
· I/O data set from the CPU Unit to the EtherCAT master: 1,200 bytes or less
· Status to notify the EtherCAT master: 4 bytes or less

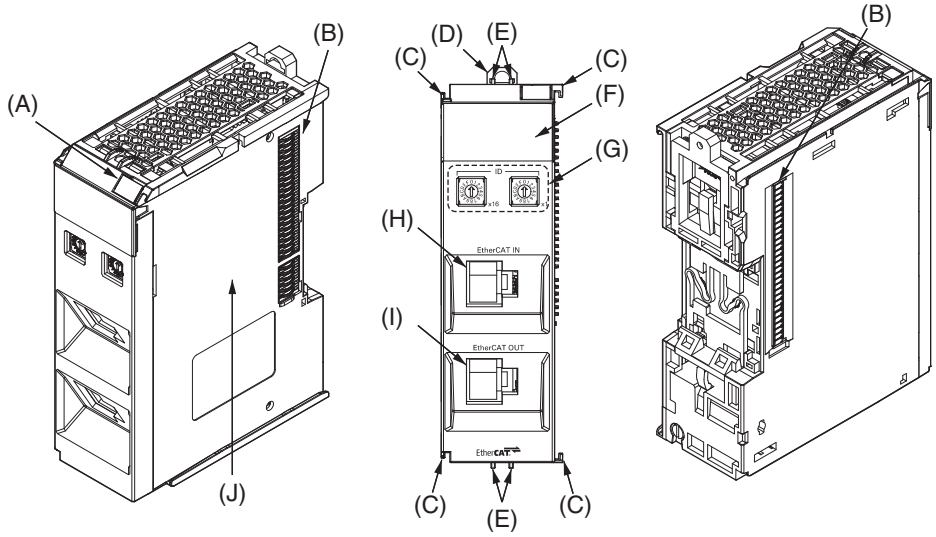
∗3. The setting range of ID depends on the specifications of the connected EtherCAT master. Confirm the specifications of the EtherCAT master for the setting range of ID for the EtherCAT master.

NX-ECT101

Version Information

NX Unit		Corresponding unit versions/versions	
Model	**Unit version**	**CPU Unit**	**Sysmac Studio**
NX-ECT101	Ver.1.0	Ver.1.13 or later	Ver.1.50 or higher

External Interface



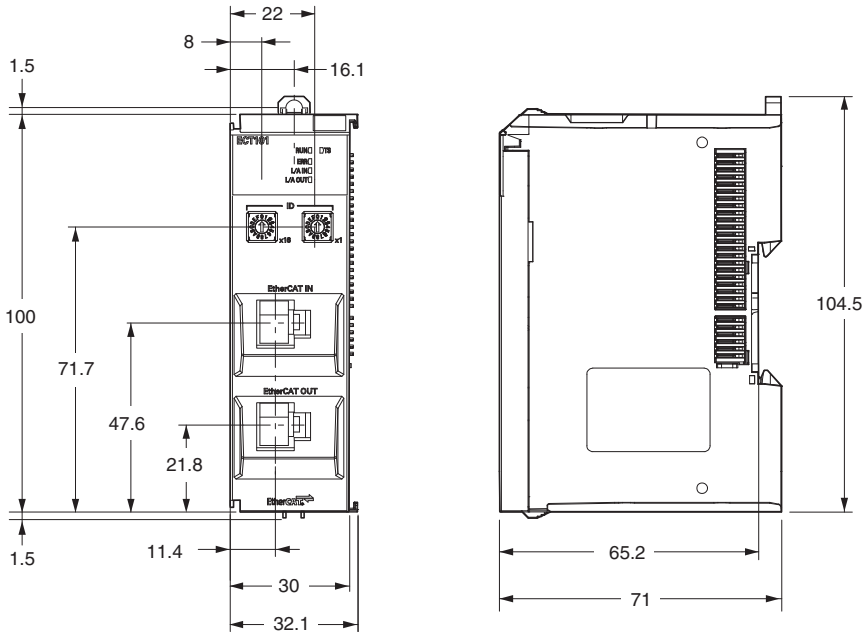
Letter	Name	Function
(A)	Marker attachment location	The location where a marker is attached. A marker made by OMRON is installed for the factory setting. A commercially available marker can also be installed.
(B)	NX bus connector	This connector is used to connect each Unit.
(C)	Unit hookup guides	These guides are used to connect two Units.
(D)	DIN Track mounting hook	This hook is used to mount the NX Unit to a DIN Track.
(E)	Protrusions for removing the Unit	The protrusions to hold when removing the Unit.
(F)	Indicators	The indicators show the current operating status of the Unit and connection status of the input port and output port of the EtherCAT.
(G)	ID switch	This switch sets the Explicit Device ID for the EtherCAT Slave Unit on the EtherCAT network as a two-digit hexadecimal value.
(H)	Communications connector (Input port)	This communications connector is the input port to connect the communications cable for the EtherCAT network.
(I)	Communications connector (Output port)	This communications connector is the output port to connect the communications cable for the EtherCAT network.
(J)	Unit specifications	The specifications of the Unit are given.

NX-ECT101

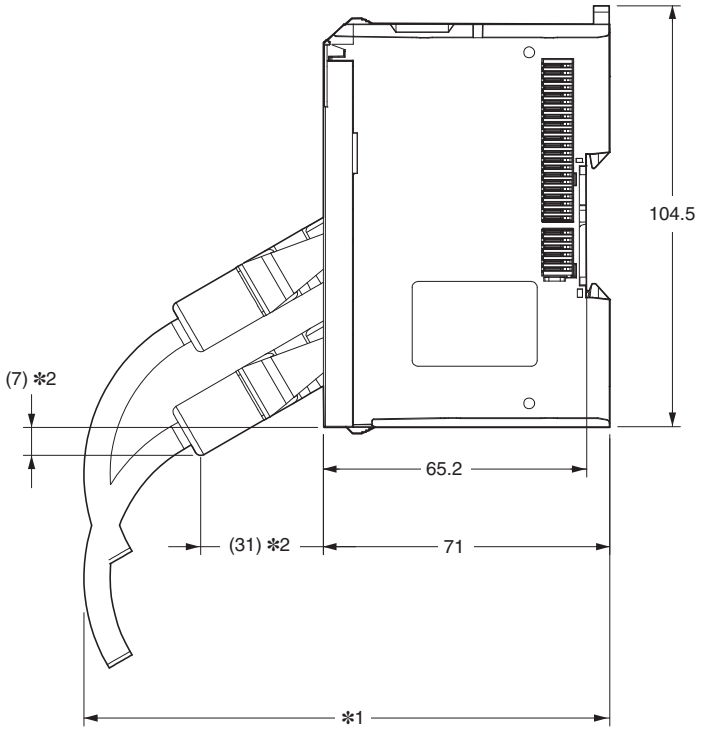
Dimensions

(Unit: mm)

30 mm Width



Installation Height



✻1. Depends on the connector to use.
For MPS588-C: Approximately 120 mm
For XS6G-T421-1: Approximately 130 mm

✻2. Dimension for XS6G-T421-1.
For MPS588-C, the connector does not protrude from the bottom of the Unit.

Related Manuals

The following table shows related manuals. Use these manuals for reference.

Manual name	Cat. No.	Model	Application	Description
NX-series EtherCAT Slave Unit User's Manual	W626	NX-ECT101	Learning how to use an NX-series EtherCAT Slave Unit.	The hardware, setup methods, and functions of the NX-series EtherCAT Slave Unit are described.
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 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.
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.
NJ/NX-series Troubleshooting Manual	W503	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Learning about the errors that may be detected in an NJ/NX-series Controller.	Concepts on managing errors that may be detected in an NJ/NX-series Controller and information on individual errors are described.
NY-series Troubleshooting Manual	W564	NY532-□□□□ NY512-□□□□	Learning about the errors that may be detected in an NY-series Industrial PC.	Concepts on managing errors that may be detected in an NY-series Controller and information on individual errors are described.
NX-series CPU Unit Hardware User's Manual	W535	NX701-□□□□	Learning the basic specifications of the NX701 CPU Units, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NX701 system is provided along with the following information on the CPU Unit. • Features and system configuration • Introduction • Part names and functions • General specifications • Installation and wiring • Maintenance and inspection
NX-series NX102 CPU Unit Hardware User's Manual	W593	NX102-□□□□	Learning the basic specifications of the NX102 CPU Units, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NX102 system is provided along with the following information on the CPU Unit. • Features and system configuration • Introduction • Part names and functions • General specifications • Installation and wiring • Maintenance and inspection
NX-series NX1P2 CPU Unit Hardware User's Manual	W578	NX1P2-□□□□	Learning the basic specifications of the NX1P2 CPU Units, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NX1P2 system is provided along with the following information on the CPU Unit. • Features and system configuration • Introduction • Part names and functions • General specifications • Installation and wiring • Maintenance and inspection
NJ-series CPU Unit Hardware User's Manual	W500	NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Learning the basic specifications of the NJ-series CPU Units, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NJ-series system is provided along with the following information on the CPU Unit. • Features and system configuration • Introduction • Part names and functions • General specifications • Installation and wiring • Maintenance and inspection
NY-series IPC Machine Controller Industrial Panel PC Hardware User's Manual	W557	NY532-□□□□	Learning the basic specifications of the NY-series Industrial Panel PCs, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NY-series system is provided along with the following information on the Industrial Panel PC. • Features and system configuration • Introduction • Part names and functions • General specifications • Installation and wiring • Maintenance and inspection

Manual name	Cat. No.	Model	Application	Description
NY-series IPC Machine Controller Industrial Box PC Hardware User's Manual	W556	NY512-□□□□	Learning the basic specifications of the NY-series Industrial Box PCs, including introductory information, designing, installation, and maintenance. Mainly hardware information is provided.	An introduction to the entire NY-series system is provided along with the following information on the Industrial Box PC. • Features and system configuration • Introduction • Part names and functions • General specifications • Installation and wiring • Maintenance and inspection
NJ/NX-series CPU Unit Software User's Manual	W501	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Learning how to program and set up an NJ/NX-series CPU Unit. Mainly software information is provided.	The following information is provided on a Controller built with an NJ/NX-series CPU Unit. • CPU Unit operation • CPU Unit features • Initial settings • Programming based on IEC 61131-3 language specifications
NY-series IPC Machine Controller Industrial Panel PC / Industrial Box PC Software User's Manual	W558	NY532-□□□□ NY512-□□□□	Learning how to program and set up the Controller functions of an NY-series Industrial PC.	The following information is provided on the NY-series Controller functions. • Controller operation • Controller features • Controller settings • Programming based on IEC 61131-3 language specifications
NJ/NX-series CPU Unit Built-in EtherCAT® Port User's Manual	W505	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Using the built-in EtherCAT port on an NJ/NX-series CPU Unit.	Information on the built-in EtherCAT port is provided. This manual provides an introduction and provides information on the configuration, features, and setup.
NY-series IPC Machine Controller Industrial Panel PC / Industrial Box PC Built-in EtherCAT® Port User's Manual	W562	NY532-□□□□ NY512-□□□□	Using the built-in EtherCAT port in an NY-series Industrial PC.	Information on the built-in EtherCAT port is provided. This manual provides an introduction and provides information on the configuration, features, and setup.
NJ/NX-series Instructions Reference Manual	W502	NX701-□□□□ NX102-□□□□ NX1P2-□□□□ NJ501-□□□□ NJ301-□□□□ NJ101-□□□□	Learning detailed specifications on the basic instructions of an NJ/NX-series CPU Unit.	The instructions in the instruction set (IEC 61131-3 specifications) are described.
NY-series Instructions Reference Manual	W560	NY532-□□□□ NY512-□□□□	Learning detailed specifications on the basic instructions of an NY-series Industrial PC.	The instructions in the instruction set (IEC 61131-3 specifications) are described.

Terms and Conditions Agreement

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2022.10

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Industrial Automation Company

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