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.

NX-series NX1P2 CPU Units

Product Name	Program capacity	Memory capacity for variables	Maximum number of used real axes			Total number of built-in I/O points			Model
				Used motion control servo axes *1	Used single-axis position control servo axes *1		Number of input points	Number of output points	
NX1P2 CPU Unit 	1.5 MB	32 KB (Retained during power interruptions) or 2 MB (Not retained during power interruptions)	8 axes	4 axes	4 axes	40 points	24 points	16 points, NPN transistor	**NX1P2-1140DT**
								16 points, PNP transistor *2	**NX1P2-1140DT1**
			6 axes	2 axes	4 axes			16 points, NPN transistor	**NX1P2-1040DT**
								16 points, PNP transistor *2	**NX1P2-1040DT1**
			4 axes	0 axes	4 axes	24 points	14 points	10 points, NPN transistor	**NX1P2-9024DT**
								10 points, PNP transistor *2	**NX1P2-9024DT1**

Note: One NX-END02 End Cover is provided with the NX1P2 CPU Unit.

*1. The following table shows the enabled functions.

Motion control function	Motion control servo axes	Single-axis position control servo axes
Single-axis position control	Yes	Yes
Single-axis synchronized control	Yes	No
Single-axis velocity control	Yes	Yes *
Single-axis torque control	Yes	No
Multi-axes coordinated control	Yes	No

*You can use only the MC_MoveVelocity (Velocity Control) instruction.

*2. With the load short-circuit protection.

Option Boards (For CPU Units)

The Option Boards are mounted to the option board slot on the CPU Unit.

Product Name	Specification	Supported protocol	Model
Serial Communications Option Board 	One RS-232C port. Transmission distance: 15 m. Connection type: Screwless clamping terminal block (9 terminals).	Host link, Modbus-RTU master, and no-protocol	**NX1W-CIF01**
	One RS-422A/485 port. Transmission distance: 50 m. Connection type: Screwless clamping terminal block (5 terminals)		**NX1W-CIF11**
	One RS-422A/485 port (isolated). Transmission distance: 500 m. Connection type: Screwless clamping terminal block (5 terminals)		**NX1W-CIF12**
Analog I/O Option Board 	Analog input: 2 Voltage input: 0 to 10 V (Resolution: 1/4,000). Current input: 0 to 20 mA (1/2,000) Connection type: Screwless clamping terminal block (5 terminals)		**NX1W-ADB21**
	Analog output: 2 Voltage output: 0 to 10 V (Resolution: 1/4,000) Connection type: Screwless clamping terminal block (3 terminals)		**NX1W-DAB21V**
	Analog input: 2/Analog output: 2 Voltage input: 0 to 10 V (Resolution: 1/4,000). Current input: 0 to 20 mA (1/2,000) Voltage output: 0 to 10 V (Resolution: 1/4,000) Screwless clamping terminal block (8 terminals)		**NX1W-MAB221**

NX Units

Up to eight NX Units can be connected to an NX1P2 CPU Unit.

Digital Input Units

Product Name	Specification					Model
	Number of points	Internal I/O common	Rated input voltage	I/O refreshing method	ON/OFF response time	
DC Input Unit  (Screwless Clamping Terminal Block, 12 mm Width/24 mm Width)	4 points	NPN	12 to 24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	20 μs max./400 μs max.	**NX-ID3317**
			24 VDC		100 ns max./100 ns max.	**NX-ID3343**
				Input refreshing with input changed time only *		**NX-ID3344**
		PNP	12 to 24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	20 μs max./400 μs max.	**NX-ID3417**
			24 VDC		100 ns max./100 ns max.	**NX-ID3443**
				Input refreshing with input changed time only *		**NX-ID3444**
	8 points	NPN		Switching Synchronous I/O refreshing and Free-Run refreshing	20 μs max./400 μs max.	**NX-ID4342**
		PNP				**NX-ID4442**
	16 points	NPN				**NX-ID5342**
		PNP				**NX-ID5442**
	32 points	NPN				**NX-ID6342**
		PNP				**NX-ID6442**
DC Input Unit  (M3 Screw Terminal Block, 30 mm Width)	16 points	For both NPN/PNP	24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	20 μs max./400 μs max.	**NX-ID5142-1**
DC Input Unit  (MIL Connector, 30 mm Width)	16 points	For both NPN/PNP	24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	20 μs max./400 μs max.	**NX-ID5142-5**
	32 points					**NX-ID6142-5**
DC Input Unit  (Fujitsu Connector, 30 mm Width)	32 points	For both NPN/PNP	24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	20 μs max./400 μs max.	**NX-ID6142-6**
AC Input Unit  (Screwless Clamping Terminal Block, 12 mm Width)	4 points	200 to 240 VAC, 50/60 Hz (170 to 264 VAC, ±3 Hz)		Free-Run refreshing	10 ms max./40 ms max.	**NX-IA3117**

* To use input refreshing with input changed time, the EtherCAT Coupler Unit with unit version 1.1 or later and the Sysmac Studio version 1.07 or higher are required.

Digital output Units

Product Name	Specification						Model
	Number of points	Internal I/O common	Maximum value of load current	Rated voltage	I/O refreshing method	ON/OFF response time	
Transistor Output Unit  (Screwless Clamping Terminal Block, 12 mm Width/24 mm Width)	2 points	NPN	0.5 A/point, 1 A/Unit	24 VDC	Output refreshing with specified time stamp only *	300 ns max./ 300 ns max.	**NX-OD2154**
		PNP					**NX-OD2258**
	4 points	NPN	0.5 A/point, 2 A/Unit	12 to 24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	0.1 ms max./ 0.8 ms max.	**NX-OD3121**
				24 VDC		300 ns max./ 300 ns max.	**NX-OD3153**
		PNP				0.5 ms max./ 1.0 ms max.	**NX-OD3256**
						300 ns max./ 300 ns max.	**NX-OD3257**
			2 A/point, 8 A/Unit			0.5 ms max./ 1.0 ms max.	**NX-OD3268**
	8 points	NPN	0.5 A/point, 4 A/Unit	12 to 24 VDC		0.1 ms max./ 0.8 ms max.	**NX-OD4121**
		PNP		24 VDC		0.5 ms max./ 1.0 ms max.	**NX-OD4256**
	16 points	NPN		12 to 24 VDC		0.1 ms max./ 0.8 ms max.	**NX-OD5121**
		PNP		24 VDC		0.5 ms max./ 1.0 ms max.	**NX-OD5256**
	32 points	NPN	0.5 A/point, 4 A/terminal block, 8 A/Unit	12 to 24 VDC		0.1 ms max./ 0.8 ms max.	**NX-OD6121**
		PNP		24 VDC		0.5 ms max./ 1.0 ms max.	**NX-OD6256**
Transistor Output Unit  (M3 Screw Terminal Block, 30 mm Width)	16 points	NPN	0.5 A/point, 5 A/Unit	12 to 24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	0.1 ms max./ 0.8 ms max.	**NX-OD5121-1**
		PNP		24 VDC		0.5 ms max./ 1.0 ms max.	**NX-OD5256-1**
Transistor Output Unit  (MIL Connector, 30 mm Width)	16 points	NPN	0.5 A/point, 2 A/Unit	12 to 24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	0.1 ms max./ 0.8 ms max.	**NX-OD5121-5**
		PNP		24 VDC		0.5 ms max./ 1.0 ms max.	**NX-OD5256-5**
	32 points	NPN	0.5 A/point, 2 A/common, 4 A/Unit	12 to 24 VDC		0.1 ms max./ 0.8 ms max.	**NX-OD6121-5**
		PNP		24 VDC		0.5 ms max./ 1.0 ms max.	**NX-OD6256-5**
Transistor Output Unit  (Fujitsu Connector, 30 mm Width)	32 points	NPN	0.5 A/point, 2 A/common, 4 A/Unit	12 to 24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	0.1 ms max./ 0.8 ms max.	**NX-OD6121-6**
Relay Output Unit  (Screwless Clamping Terminal Block, 12 mm Width/24 mm Width)	2 points	N.O.	250 VAC/2 A (cosϕ=1) 250 VAC/2 A (cosϕ=0.4) 24 VDC/2 A 4 A/Unit		Free-Run refreshing	15 ms max./15 ms max.	**NX-OC2633**
		N.O.+N.C.					**NX-OC2733**
	8 points	N.O.	250 VAC/2 A (cosϕ=1) 250 VAC/2 A (cosϕ=0.4) 24 VDC/2 A 8 A/Unit		Free-Run refreshing	15 ms max./15 ms max.	**NX-OC4633**

* To use input refreshing with input changed time, the EtherCAT Coupler Unit with unit version 1.1 or later and the Sysmac Studio version 1.07 or higher are required.

Digital Mixed I/O Units

Product Name	Specification					Model
	Number of points	Internal I/O common	Maximum value of load current	I/O refreshing method	ON/OFF response time	
DC Input/Transistor Output Unit  (MIL Connector, 30 mm Width)	Outputs: 16 points Inputs: 16 points	Outputs: NPN Inputs: For both NPN/PNP	Outputs: 12 to 24 VDC Inputs: 24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	Outputs: 0.1 ms max./0.8 ms max. Inputs: 20 μs max./400 μs max.	**NX-MD6121-5**
		Outputs: PNP Inputs: For both NPN/PNP	Outputs: 24 VDC Inputs: 24 VDC		Outputs: 0.5 ms max./1.0 ms max. Inputs: 20 μs max./400 μs max.	**NX-MD6256-5**
DC Input/Transistor Output Unit  (Fujitsu Connector, 30 mm Width)	Outputs: 16 points Inputs: 16 points	Outputs: NPN Inputs: For both NPN/PNP	Outputs: 12 to 24 VDC Inputs: 24 VDC	Switching Synchronous I/O refreshing and Free-Run refreshing	Outputs: 0.1 ms max./0.8 ms max. Inputs: 20 μs max./400 μs max.	**NX-MD6121-6**

High-speed Analog Input Units

Product name	Specifications								Model
	Number of points	Input range	Resolution	Input method	Conversion time	Trigger input section		I/O refreshing method	
						Number of points	Internal I/O common		
High-speed Analog Input Unit 	4	-10 to 10 V -5 to 5 V 0 to 10 V 0 to 5 V 1 to 5 V 0 to 20 mA 4 to 20 mA	• Input range of -10 to 10 V or -5 to 5 V: 1/64,000 (full scale) • Other input range: 1/32,000 (full scale)	Differential input	5 μs per channel	4	NPN	Synchro-nous I/O refreshing	**NX-HAD401**
							PNP		**NX-HAD402**

Analog Input Units

Product Name	Specification									Model
	Number of points	Input range	Resolution	Conversion value, decimal number (0 to 100%)	Over all accuracy (25°C)	Input method	Conversion time	Input impedance	I/O refreshing method	
Voltage Input Unit 	2 points	-10 to +10 V	1/8000	-4000 to 4000	±0.2% (full scale)	Single-ended input	250 µs/ point	1 MΩ min.	Free-Run refreshing	**NX-AD2603**
						Differential Input				**NX-AD2604**
			1/30000	-15000 to 15000	±0.1% (full scale)	Differential Input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-AD2608**
	4 points		1/8000	-4000 to 4000	±0.2% (full scale)	Single-ended input	250 µs/ point		Free-Run refreshing	**NX-AD3603**
						Differential Input				**NX-AD3604**
			1/30000	-15000 to 15000	±0.1% (full scale)	Differential Input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-AD3608**
	8 points		1/8000	-4000 to 4000	±0.2% (full scale)	Single-ended input	250 µs/ point		Free-Run refreshing	**NX-AD4603**
						Differential Input				**NX-AD4604**
			1/30000	-15000 to 15000	±0.1% (full scale)	Differential Input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-AD4608**
Current Input Unit 	2 points	4 to 20 mA	1/8000	0 to 8000	±0.2% (full scale)	Single-ended input	250 µs/ point	250 Ω	Free-Run refreshing	**NX-AD2203**
						Differential Input				**NX-AD2204**
			1/30000	0 to 30000	±0.1% (full scale)	Differential Input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-AD2208**
	4 points		1/8000	0 to 8000	±0.2% (full scale)	Single-ended input	250 µs/ point		Free-Run refreshing	**NX-AD3203**
						Differential Input				**NX-AD3204**
			1/30000	0 to 30000	±0.1% (full scale)	Differential Input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-AD3208**
	8 points		1/8000	0 to 8000	±0.2% (full scale)	Single-ended input	250 µs/ point	85 Ω	Free-Run refreshing	**NX-AD4203**
						Differential Input				**NX-AD4204**
			1/30000	0 to 30000	±0.1% (full scale)	Differential Input	10 µs/ point		Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-AD4208**

Analog Output Units

Product Name	Specification							Model
	Number of points	Input range	Resolution	Output setting value, decimal number (0 to 100%)	Over all accuracy (25°C)	Conversion time	I/O refreshing method	
Voltage Output Unit 	2 points	-10 to +10 V	1/8000	-4000 to 4000	±0.3% (full scale)	250 µs/point	Free-Run refreshing	**NX-DA2603**
			1/30000	-15000 to 15000	±0.1% (full scale)	10 µs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-DA2605**
	4 points		1/8000	-4000 to 4000	±0.3% (full scale)	250 µs/point	Free-Run refreshing	**NX-DA3603**
			1/30000	-15000 to 15000	±0.1% (full scale)	10 µs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-DA3605**
Current Output Unit 	2 points	4 to 20 mA	1/8000	0 to 8000	±0.3% (full scale)	250 µs/point	Free-Run refreshing	**NX-DA2203**
			1/30000	0 to 30000	±0.1% (full scale)	10 µs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-DA2205**
	4 points		1/8000	0 to 8000	±0.3% (full scale)	250 µs/point	Free-Run refreshing	**NX-DA3203**
			1/30000	0 to 30000	±0.1% (full scale)	10 µs/point	Selectable Synchronous I/O refreshing or Free-Run refreshing	**NX-DA3205**

Temperature Control Units

Product name	Specifications								Model
	Number of channels	Input type	Output	Number of output points	Number of CT input points	Control type	Conversion time	I/O refreshing method	
Advanced Temperature Control Unit 	4	Universal input (themocouple, resistance thermometer, analog voltage, analog current)	Voltage output (for driving SSR)	4	4	Heating/cooling control	50 ms	Free-Run refreshing	**NX-HTC3510-5**
			Linear current putput						
	8		Voltage output (for driving SSR)	8	8	Standard control			**NX-HTC4505-5**
Temperature Control Unit 2-channel Type 	2	Universal input (thermocouple, resistance thermometer)	Voltage output (for driving SSR)	2	2	Standard control			**NX-TC2405**
					None	Standard control			**NX-TC2406**
			Voltage output (for driving SSR)	4	None	Heating/cooling control			**NX-TC2407**
			Linear current output	2	None	Standard control			**NX-TC2408**
Temperature Control Unit 4-channel Type 	4		Voltage output (for driving SSR)	4	4	Standard control			**NX-TC3405**
					None	Standard control			**NX-TC3406**
			Voltage output (for driving SSR)	8	None	Heating/cooling control			**NX-TC3407**
			Linear current output	4	None	Standard control			**NX-TC3408**

Temperature Input Units

Product Name	Specification							Model
	Number of points	Input type	Resolution (25°C)	Over all accuracy (25°C)	Conversion time	I/O refreshing method	Terminals	
Thermocouple Input type 	2 points	Thermocouple	0.1°C max. *1	Refer to your OMRON website for details.	250 ms/Unit	Free-Run refreshing	16 Terminals	**NX-TS2101**
	4 points						16 Terminals x 2	**NX-TS3101**
	2 points		0.01°C max.		10 ms/Unit		16 Terminals	**NX-TS2102**
	4 points						16 Terminals x 2	**NX-TS3102**
	2 points		0.001°C max.		60 ms/Unit		16 Terminals	**NX-TS2104**
	4 points						16 Terminals x 2	**NX-TS3104**
Resistance Thermometer Input type 	2 points	Resistance Thermometer (Pt100/Pt1000, three-wire) *2	0.1°C max.		250 ms/Unit		16 Terminals	**NX-TS2201**
	4 points						16 Terminals x 2	**NX-TS3201**
	2 points		0.01°C max.		10 ms/Unit		16 Terminals	**NX-TS2202**
	4 points						16 Terminals x 2	**NX-TS3202**
	2 points		0.001°C max.		60 ms/Unit		16 Terminals	**NX-TS2204**
	4 points						16 Terminals x 2	**NX-TS3204**

*1. The resolution is 0.2°C max. when the input type is R, S, or W.
*2. The NX-TS2202 and NX-TS3202 only supports Pt100 three-wire sensor.

Heater Burnout Detection Units

Product Name	Specification							Model
	CT input section		Control output section					
	Number of inputs	Maximum heater current	Number of outputs	Internal I/O common	Maximum load current	Rated voltage	I/O refreshing method	
Heater Burnout Detection Unit 	4	50 AAC	4	NPN	0.1 A/point, 0.4 A/Unit	12 to 24 VDC	Free-Run refreshing	**NX-HB3101**
				PNP		24 VDC		**NX-HB3201**

Load Cell Input Unit

Product Name	Specification					Model
	Number of Model Standards points	Conversion cycle	I/O refreshing method *	Load cell excitation voltage	Input range	
Load Cell Input Unit 	1	125 µs	• Free-Run refreshing • Synchronous I/O refreshing • Task period prioritized refreshing	5 VDC ± 10%	-5.0 to 5.0 mV/V	**NX-RS1201**

* Refer to the *NX-series Load Cell Input Unit User's Manual* (W565) for detailed information on I/O refresh cycle.

Position interface: Incremental Encoder Input Units

Product Name	Specification					Model
	Number of channels	External inputs	Maximum response frequency	I/O refreshing method	Number of I/O entry mappings	
Incremental Encoder Input Unit 	1 (NPN)	3 (NPN)	500 kHz	• Free-Run refreshing • Synchronous I/O refreshing	1/1	**NX-EC0112**
	1 (PNP)	3 (PNP)				**NX-EC0122**
	1	3 (NPN)	4 MHz			**NX-EC0132**
		3 (PNP)				**NX-EC0142**
	2 (NPN)	None	500 kHz		2/2	**NX-EC0212**
	2 (PNP)					**NX-EC0222**

Position interface: SSI Input Units

Product Name	Specification					Model
	Number of channels	Input/Output form	Maximum data length	Encoder power supply	Type of external connections	
SSI Input Unit 	1	EIA standard RS-422-A	32 bits	24 VDC, 0.3 A/CH	Screwless push-in terminal block (12 terminals)	**NX-ECS112**
	2	EIA standard RS-422-A	32 bits	24 VDC, 0.3 A/CH	Screwless push-in terminal block (12 terminals)	**NX-ECS212**

Position interface: Pulse Output Units

Product Name	Specification							Model
	Number of channels *1	External inputs	External outputs	Maximum pulse output speed	I/O refreshing method	Number of I/O entry mappings	Control output interface	
Pulse Output Unit 	1 (NPN)	2 (NPN)	1 (NPN)	500 kpps	• Synchronous I/O refreshing • Task period prioritized refreshing *2	1/1	Open collector output	**NX-PG0112**
	1 (PNP)	2 (PNP)	1 (PNP)					**NX-PG0122**
	2	5 inputs/CH (NPN)	3 outputs/CH (NPN)	4 Mpps		2/2	Line driver output	**NX-PG0232-5**
		5 inputs/CH (PNP)	3 outputs/CH (PNP)					**NX-PG0242-5**
	4	5 inputs/CH (NPN)	3 outputs/CH (NPN)			4/4		**NX-PG0332-5**
		5 inputs/CH (PNP)	3 outputs/CH (PNP)					**NX-PG0342-5**

*1. This is the number of pulse output channels.
*2. Unit version 1.2 or later and an NX-ECC203 EtherCAT Coupler Unit are required.

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

Communications Interface Units

Product Name	Serial interface	External connection terminals	Number of serial ports	Communications protocol	Model
Communications Interface Unit 	RS-232C	Screwless Clamping Terminal Block	1 port	• No-protocol • Signal lines	**NX-CIF101**
	RS-422A/485				**NX-CIF105**
	RS-232C	D-Sub connector	2 ports		**NX-CIF210**

RFID Units

Product name	Amplifier/Antenna	No. of unit numbers used	Model
RFID Unit (1Ch) 	V680 series	1	**NX-V680C1**
RFID Unit (2Ch) 		2	**NX-V680C2**

IO-Link Master Unit

Product Name	Specification			Model
	Number of IO-Link ports	I/O refreshing method	I/O connection terminals	
IO-Link Master Unit 	4	Free-Run refreshing	Screwless clamping terminal block	**NX-ILM400**

System Units

Product Name	Specification	Model
Additional NX Unit Power Supply Unit 	Power supply voltage: 24 VDC (20.4 to 28.8 VDC) NX Bus power supply capacity: 10 W max.	**NX-PD1000**
Additional I/O Power Supply Unit 	Power supply voltage: 5 to 24 VDC (4.5 to 28.8 VDC) I/O power feed maximum current: 4 A	**NX-PF0630**
	Power supply voltage: 5 to 24 VDC (4.5 to 28.8 VDC) I/O power feed maximum current: 10 A *	**NX-PF0730**
I/O Power Supply Connection Unit 	Number of I/O power terminals: IOG: 16 terminals Current capacity of I/O power terminal: 4 A/terminal max.	**NX-PC0010**
	Number of I/O power terminals: IOV: 16 terminals Current capacity of I/O power terminal: 4 A/terminal max.	**NX-PC0020**
	Number of I/O power terminals: IOV: 8 terminals, IOG: 8 terminals Current capacity of I/O power terminal: 4 A/terminal max	**NX-PC0030**
Shield Connection Unit 	Number of shield terminals: 14 terminals (The following two terminals are functional ground terminals.)	**NX-TBX01**

* Use the NX-PF0730 at 4 A or less on the CPU Rack where the NX1P2 CPU Unit is mounted.

EtherNet/IP Coupler Unit

Product name	Current consumption	Maximum I/O power supply current	Model
EtherNet/IP Coupler Unit *1 	1.60 W or lower	10 A	**NX-EIC202**

*1. One End Cover NX-END01 is provided with the EtherCAT Coupler Unit.

EtherCAT Coupler Units

NX-series Units on previous pages and NX-series Safety Units can be used by connecting to the EtherCAT Coupler Unit that is connected to the built-in EtherCAT port on the NX1P2 CPU Unit.

Product Name	Communications cycle in DC Mode	Current consumption	Maximum I/O power supply current	Model
EtherCAT Coupler Unit *1 	250 to 4000 μs *2	1.45 W max.	4 A	**NX-ECC201**
	250 to 4000 μs *2		10 A	**NX-ECC202**
	125 to 10000 μs *2	1.25 W max.		**NX-ECC203**

*1. One End Cover NX-END01 is provided with the EtherCAT Coupler Unit.
*2. This depends on the specifications of the EtherCAT master. For example, the values are as follows when the EtherCAT Coupler Unit is connected to the built-in EtherCAT port on an NJ5-series CPU Unit: 500 μs, 1,000 μs, 2,000 μs, and 4,000 μs. Refer to the *NJ/NX-series CPU Unit Built-in EtherCAT Port User' Manual* (Cat. No. W505) for the specifications of the built-in EtherCAT ports on NJ/NX-series CPU Units. This also depends on the unit configuration.

Safety CPU Units

Appearance	Specification					Model
	Maximum number of safety I/O points	Program capacity	Number of safety master connections	I/O refreshing method	Unit version	
	256 points	512 KB	32	Free-Run refreshing	Ver.1.1	**NX-SL3300**
	1024 points	2048 KB	128	Free-Run refreshing	Ver.1.1	**NX-SL3500**

Note: Connect the Safety CPU Unit to the NX1P2 CPU Unit via the EtherCAT Coupler Unit.

Safety Input Units

Appearance	Specification								Model
	Number of safety input points	Number of test output points	Internal I/O common	Rated input voltage	OMRON special safety input devices	Number of safety slave connections	I/O refreshing method	Unit version	
	4 points	2 points	Sinking inputs (PNP)	24 VDC	Can be connected.	1	Free-Run refreshing	Ver.1.1	**NX-SIH400**
	8 points	2 points	Sinking inputs (PNP)	24 VDC	Cannot be connected.	1	Free-Run refreshing	Ver.1.0	**NX-SID800**

Note: Connect the Safety Input Unit to the NX1P2 CPU Unit via the EtherCAT Coupler Unit.

Safety Output Units

Appearance	Specification							Model
	Number of Model safety output points	Internal I/O common	Maximum load current	Rated voltage	Number of safety slave connections	I/O refreshing method	Unit version	
	2 points	Sourcing outputs (PNP)	2.0 A/point, 4.0 A/Unit at 40°C, and 2.5A/Unit at 55°C The maximum load current depends on the installation orientation and ambient temperature.	24 VDC	1	Free-Run refreshing	Ver.1.0	**NX-SOH200**
	4 points	Sourcing outputs (PNP)	0.5 A/point and 2.0 A/Unit	24 VDC	1	Free-Run refreshing	Ver.1.0	**NX-SOD400**

Note: Connect the Safety Output Unit to the NX1P2 CPU Unit via the EtherCAT Coupler Unit.

Optional Products/Maintenance Products/DIN Track Accessories

Product Name	Specification		Model
EtherCAT junction slaves *1	3 ports. Power supply voltage: 20.4 to 28.8 VDC (24 VDC -15 to +20%). Current consumption (A): 0.08		**GX-JC03**
	6 ports. Power supply voltage: 20.4 to 28.8 VDC (24 VDC -15 to +20%). Current consumption (A): 0.17		**GX-JC06**
Industrial Switching Hubs for EtherNet/IP and Ethernet *2	Quality of Service (QoS): EtherNet/IP control data priority 10/100BASE-TX, Auto-Negotiation	5 ports. Current consumption (A): 0.07 Power supply connector included.	**W4S1-05D**
Memory Cards	SD memory card, 2 GB		**HMC-SD292**
	SDHC memory card, 4 GB		**HMC-SD492**
	SDHC memory card, 16GB		**HMC-SD1A2 *3**
Battery	The battery is not mounted when the product is shipped. To turn OFF the power supply to the equipment for a certain period of time by using the clock data for programming, event logs, etc., you need a separately-sold battery to retain the clock data. Refer to the *Battery* page for details.		**CJ1W-BAT01**
End Cover (For NX1P2 CPU Unit) *4	Must be connected to the right end of the CPU Rack. One End Cover is provided with the CPU Unit.		**NX-END02**
End Cover (For EtherCAT Coupler Unit) *4	One End Cover is provided with the EtherCAT Coupler Unit.		**NX-END01**
DIN Tracks	Length: 0.5 m; Height: 7.3 mm		**PFP-50N**
	Length: 1 m; Height: 7.3 mm		**PFP-100N**
End Plate	There are 2 stoppers provided with CPU Units and I/O Interface Units as standard accessories to secure the Units on the DIN Track.		**PFP-M**
Unit/Terminal Block Coding Pins	For 10 Units (Terminal Block: 30 pins, Unit: 30 pins)		**NX-AUX02**
DIN Track Insulation Spacers	A Spacer to insulate the control panel from the DIN Track. To insulate the EtherCAT Slave Terminal from the control panel, use Din Track Insulation Spacers.		**NX-AUX01**

Product Name	Specification				Model
	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity	
Terminal Blocks	8	A/B	None	10 A	**NX-TBA082**
	12	A/B			**NX-TBA122**
	16	A/B			**NX-TBA162**
	16	C/D			**NX-TBB162**
	12	C/D			**NX-TBB122**
	16	C/D			**NX-TBB162**
	8	A/B	Provided		**NX-TBC082**
	16	A/B			**NX-TBC162**

*1. EtherCAT junction slaves cannot be used for EtherNet/IP and Ethernet.
*2. Industrial switching hubs cannot be used for EtherCAT.
*3. 16 GB memory card can be used for a CPU Unit with unit version 1.21 or later.
*4. Use the NX-END02 End Cover only for the CPU Unit and the NX-END01 End Cover only for the EtherCAT Coupler Unit.

Electrical and Mechanical Specifications

Item		Specification	
Model		NX1P2-1□40DT□	NX1P2-9024DT□
Enclosure		Mounted in a panel	
Dimensions (mm) *1		154 × 100 × 71 mm (W×H×D)	130 × 100 × 71 mm (W×H×D)
Weight *2		NX1P2-1□40DT: 650 g NX1P2-1□40DT1: 660 g	NX1P2-9024DT: 590 g NX1P2-9024DT1: 590 g
Unit power supply	**Power supply voltage**	24 VDC (20.4 to 28.8 VDC)	
	Unit power consumption *3	NX1P2-1□40DT: 7.05 W NX1P2-1□40DT1: 6.85 W	NX1P2-9024DT: 6.70 W NX1P2-9024DT1: 6.40 W
	Inrush current *4	For cold start at room temperature: 10 A max./0.1 ms max. and 2.5 A max./150 ms max.	
	Current capacity of power supply terminal *5	4 A max.	
	Isolation method	No isolation: between the Unit power supply terminal and internal circuit	
Power supply to the NX Unit power supply	**NX Unit power supply capacity**	10 W max.	
	NX Unit power supply efficiency	80 %	
	Isolation method	No isolation: between the Unit power supply terminal and NX Unit power supply	
I/O Power Supply to NX Units		Not provided *6	
External connection terminals	**Communication connector**	RJ45 for EtherNet/IP Communications × 1 RJ45 for EtherCAT Communications × 1	
	Screwless clamping terminal block	For Unit power supply input, grounding, and input signal: 1 (Removable) For output signal: 1 (Removable)	
	Output terminal (service supply)	Not provided	
	RUN output terminal	Not provided	
	NX bus connector	8 NX Units can be connected	
	Option board slot	2	1

*1. Includes the End Cover, and does not include projecting parts.
*2. Includes the End Cover. The weight of the End Cover is 82 g.
*3. Includes the SD Memory Card and Option Board. The NX Unit power consumption to NX Units is not included.
*4. The inrush current may vary depending on the operating condition and other conditions. Therefore, select fuses, breakers, and external power supply devices that have enough margin in characteristic and capacity, considering the condition under which the devices are used.
*5. The amount of current that can be passed constantly through the terminal. Do no exceed this current value when you use a through-wiring for the Unit power supply.
*6. When the type of the I/O power supply to NX Units you use is the supply from NX bus, an Additional I/O Power Supply Unit is required. The maximum I/O power supply current from an Additional I/O Power Supply Unit is 4 A. Refer to the *NX-series NX1P2 CPU Unit Hardware User's Manual* (Cat. No. W578) for details.

General Specifications

Item		Specification
Enclosure		Mounted in a panel
Grounding method		Ground to less than 100 Ω.
Operating environment	**Ambient operating temperature**	0 to 55°C
	Ambient operating humidity	10% to 95% (with no condensation)
	Atmosphere	Must be free from corrosive gases.
	Ambient storage temperature	-25 to 70°C (excluding battery)
	Altitude	2,000 m max.
	Pollution degree	2 or less: Meets IEC 61010-2-201.
	Noise immunity	2 kV on power supply line (Conforms to IEC 61000-4-4.)
	Overvoltage category	Category II: Meets IEC 61010-2-201.
	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)
	Shock resistance	Conforms to IEC 60068-2-27. 147 m/s^2, 3 times in X, Y, and Z directions
Battery	**Life**	5 years (Power ON time rate 0% (power OFF))
	Model	CJ1W-BAT01 (sold separately)
Applicable standards *	**EU Directives**	EN 61131-2
	cULus	Listed UL 61010-2-201 and ANSI/ISA 12.12.01
	Shipbuilding Standards	NK, LR
	Other than the above.	RCM, KC, EAC

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

Performance Specifications

Item				NX1P2-		
				11□□□□/ 11□□□□1	10□□□□/ 10□□□□1	90□□□□/ 90□□□□1
Processing time	Instruction execution times	LD instruction		3.3 ns		
		Math instructions (for long real data)		70 ns or more		
Programming	Program capacity *1	Size		1.5 MB		
		Quantity	Number of POU definitions	450		
			Number of POU Instances	1,800		
	Memory capacity for variables *2	Retain attributes	Size	32 kB		
			Number of variables	5,000		
		No Retain attributes	Size	2 MB		
			Number of variables	90,000		
	Data types	Number of data types		1,000		
	Memory for CJ-series Units (Can be specified with AT specifications for variables.)	CIO Area		0 to 6,144 channel (0 to 6,143) *3		
		Work Area		0 to 512 channel (W0 to W511) *3		
		Holding Area		0 to 1,536 channel (H0 to H1,535) *4		
		DM Area		0 to 16,000 channel (D0 to F15,999) *4		
		EM Area		---		
Motion control	Number of controlled axes *5	Maximum number of controlled axes		12 axes	10 axes	4 axes
			Motion control axes	8 axes	6 axes	---
			Single-axis position control axes	4 axes	4 axes	4 axes
		Maximum number of used real axes		8 axes	6 axes	4 axes
			Used motion control servo axes	4 axes	2 axes	---
			Used single-axis position control servo axes	4 axes	4 axes	4 axes
		Maximum number of axes for linear interpolation axis control		4 axes per axes group		---
		Number of axes for circular interpolation axis control		2 axes per axes group		---
	Maximum number of axes groups			8 axes groups		---
	Motion control period			Same as the period for primary periodic task		
	Cams	Number of cam data points	Maximum points per cam table	65,535 points		---
			Maximum points for all cam tables	262,140 points		---
		Maximum number of cam tables		80 tables		---
	Position units			Pulse, mm, μm, nm, degree, and inch		
	Override factors			0.00% or 0.01% to 500.00%		
Built-in EtherNet/IP port	Number of ports			1		
	Physical layer			10BASE-T, 100BASE-TX		
	Frame length			1,514 bytes max.		
	Media access method			CSMA/CD		
	Modulation			Baseband		
	Topology			Star		
	Baud rate			100 Mbps/s (100BASE-TX)		
	Transmission media			STP (shielded, twisted-pair) cable of Ethernet category 5, 5e or higher		
	Maximum transmission distance between Ethernet switch and node			100 m		
	Maximum number of cascade connections			There are no restrictions if an Ethernet switch is used.		
	CIP service: Tag data links (cyclic communications)	Maximum number of connections		32		
		Packet interval *6		Can be set for each connection. 2 to 10,000 ms in 1-ms increments		
		Permissible communications band		3,000 pps *7 (including heartbeat)		
		Maximum number of tag sets		32		
		Tag types		Network variables CIO/WR/HR/DM		
		Number of tags per connection (i.e., per tag set)		8 (7 tags if Controller status is included in the tag set.)		
		Maximum number of tags		256		
		Maximum link data size per node (total size for all tags)		19,200 bytes		
		Maximum data size per connection		600 bytes		
		Maximum number of registrable tag sets		32 (1 connection = 1 tag set)		
		Maximum tag set size		600 bytes (Two bytes are used if Controller status is included in the tag set.)		
		Multi-cast packet filter *8		Supported.		

Item				NX1P2-		
				11□□□□/ 11□□□□1	10□□□□/ 10□□□□1	90□□□□/ 90□□□□1
Built-in EtherNet/IP port	CIP message service: Explicit messages	Class 3 (number of connections)		32 (clients plus server)		
		UCMM (non-connection type)	Maximum number of clients that can communicate at one time	32		
			Maximum number of servers that can communicate at one time	32		
	Number of TCP sockets			30		
	Secure Socket Service	Maximum number of Secure Socket		30		
		TLS Version		1.2		
Built-in EtherCAT port	Communications standard			IEC 61158 Type12		
	EtherCAT master specifications			Class B (Feature Pack Motion Control compliant)		
	Physical layer			100BASE-TX		
	Modulation			Baseband		
	Baud rate			100 Mbps (100BASE-TX)		
	Duplex mode			Auto		
	Topology			Line, daisy chain, branching and ring *9		
	Transmission media			Twisted-pair cable of category 5 or higher (double-shielded straight cable with aluminum tape and braiding)		
	Maximum transmission distance between nodes			100 m		
	Maximum number of slaves			16		
	Range of node addresses that can be set			1 to 192		
	Maximum process data size			Input: 1,434 bytes Output: 1,434 bytes *10		
	Maximum process data size per slave			Input: 1,434 bytes Output: 1,434 bytes		
	Communications cycle			2,000 μs to 8,000 μs in 250-μs increments		
	Sync jitter			1 μs max.		
Serial Communications (Serial Communications Option Board)	Communications method			half duplex		
	Synchronization			Start-stop		
	Baud rate			1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2 kbps		
	Transmission distance			Depends on Option Board.		
	Supported protocol			Host link, Modbus-RTU master, and no-protocol		
Unit configuration	Maximum number of connectable Units	Maximum number of NX Units that can be mounted to the CPU Unit		8		
		Maximum number of NX Units for entire controller		24 On CPU Rack: 8 On EtherCAT Slave Terminals: 16		
	Power supply	Model		A non-isolated power supply for DC input is built into the CPU Unit.		
		Power OFF detection time		2 to 8 ms		
Option Board	Number of slots			2	2	1
Built-in I/O	Input	Number of points		24	24	14
	Output	Number of points		16	16	10
		Load short-circuit protection		11□□DT/10□□DT/9024DT: Not provided (NPN) 11□□DT1/10□□DT1/9024DT1: Provided (PNP)		
Internal clock	Accuracy			At ambient temperature of 55°C: -3.5 to 0.5 min error per month At ambient temperature of 25°C: -1.5 to 1.5 min error per month At ambient temperature of 0°C: -3 to 1 min error per month		
	Retention time of built-in capacitor			At ambient temperature of 40°C: 10 days		

*1. Execution objects and variable tables (including variable names)
*2. Memory used for CJ-series Units is included.
*3. The value can be set in 1 ch increments. The value is included in the total size of variables without a Retain attribute.
*4. The value can be set in 1 ch increments. The value is included in the total size of variables with a Retain attribute.
*5. Refer to the *NJ/NX-series CPU Unit Motion Control User's Manual* (Cat. No. W507) for the description of this term.
*6. Data will be refreshed at the set interval, regardless of the number of nodes.
*7. "pps" means packets per second, i.e., the number of communications packets that can be sent or received in one second.
*8. As the EtherNet/IP port implements the IGMP client, unnecessary multi-cast packets can be filtered by using an Ethernet switch that supports IGMP Snooping.
*9. Ring topology is supported with the project version 1.40 or later.
Slaves on a ring topology should support a ring topology. If Omron slaves, please see the user's manual of slaves.
*10. For project unit version earlier than 1.40, the data must be within one frame.

Function Specifications

Item				NX1P2
Tasks	Function			I/O refresh and the user program are executed in units that are called tasks. Tasks are used to specify execution conditions and execution priority.
		Periodically Executed Tasks	Maximum Number of Primary Periodic Tasks	1
			Maximum Number of Periodic Tasks	2
		Conditionally Executed Tasks	Maximum Number of Event Tasks	32
			Execution Condition	When Activate Event Task instruction is executed or when condition expression for variable is met
	Setup	System Service Monitoring Settings		Not supported
Programming	POUs (programorganization units)	Programs		POUs that are assigned to tasks.
		Function Blocks		POUs that are used to create objects with specific conditions.
		Functions		POUs that are used to create an object that determine unique outputs for the inputs, such as for data processing.
	Programming Languages	Types		Ladder diagrams * and structured text (ST)
	Namespaces			Namespaces are used to create named groups of POU definitions.
	Variables	External Access of variables	Network Variables	The function which allows access from the HMI, host computers, or other Controllers
	Data Types	Data types	Boolean	BOOL
			Bit Strings	BYTE, WORD, DWORD, LWORD
			Integers	INT, SINT, DINT, LINT, UINT, USINT, UDINT, ULINT
			Real Numbers	REAL and LREAL
			Durations	TIME
			Dates	DATE
			Times of Day	TIME_OF_DAY
			Date and Time	DATE_AND_TIME
			Text Strings	STRING
		Derivative Data Types		Structures, Unions, and Enumerations
		Structures	Function	A derivative data type that groups together data with different data types.
			Maximum Number of Members	2048
			Nesting Maximum Levels	8
			Member Data Types	Basic data types, structures, unions, enumerations, array variables
			Specifying Member Offsets	You can use member offsets to place structure members at any memory locations.
		Union	Function	A derivative data type that enables access to the same data with different data types.
			Maximum Number of Members	4
			Member Data Types	BOOL, BYTE, WORD, DWORD, and LWORD
		Enumeration	Function	A derivative data type that uses text strings called enumerators to express variable values.
	Data Type Attributes	Array Specifications	Function	An array is a group of elements with the same data type. You specify the number (subscript) of the element from the first element to specify the element.
			Maximum Number of Dimensions	3
			Maximum Number of Elements	65535
			Array Specifications for FB Instances	Supported
		Range Specifications		You can specify a range for a data type in advance. The data type can take only values that are in the specified range.
		Libraries		You can use user libraries.
Motion Control	Control Modes			Position control, Velocity control, and Torque control
	Axis Types			Servo axes, Virtual servo axes, Encoder axes, and Virtual encoder axes
	Positions that can be managed			Command positions and actual positions

Item				NX1P2
Motion Control	Single Axes	Single-Axis Position Control	Absolute Positioning	Positioning is performed for a target position that is specified with an absolute value.
			Relative Positioning	Positioning is performed for a specified travel distance from the command current position.
			Interrupt Feeding	Positioning is performed for a specified travel distance from the position where an interrupt input was received from an external input.
			Cyclic Synchronous Absolute Positioning	A positioning command is output each control period in Position Control Mode.
		Single-axis Velocity Control	Velocity Control	Velocity control is performed in Position Control Mode.
			Cyclic Synchronous Velocity Control	A velocity command is output each control period in Velocity Control Mode.
		Single-axis Torque Control	Torque Control	The torque of the motor is controlled.
		Single-axis Synchronized Control	Starting Cam Operation	A cam motion is performed using the specified cam table.
			Ending Cam Operation	The cam motion for the axis that is specified with the input parameter is ended.
			Starting Gear Operation	A gear motion with the specified gear ratio is performed between a master axis and slave axis.
			Positioning Gear Operation	A gear motion with the specified gear ratio and sync position is performed between a master axis and slave axis.
			Ending Gear Operation	The specified gear motion or positioning gear motion is ended.
			Synchronous Positioning	Positioning is performed in sync with a specified master axis.
			Master Axis Phase Shift	The phase of a master axis in synchronized control is shifted.
			Combining Axes	The command positions of two axes are added or subtracted and the result is output as the command position.
		Single-axis Manual Operation	Powering the Servo	The Servo in the Servo Drive is turned ON to enable axis motion.
			Jogging	An axis is jogged at a specified target velocity.
		Auxiliary Functions for Single-axis Control	Resetting Axis Errors	Axes errors are cleared.
			Homing	A motor is operated and the limit signals, home proximity signal, and home signal are used to define home.
			Homing with specified parameters	The parameters are specified, the motor is operated, and the limit signals, home proximity signal, and home signal are used to define home.
			High-speed Homing	Positioning is performed for an absolute target position of 0 to return to home.
			Stopping	An axis is decelerated to a stop.
			Immediately Stopping	An axis is stopped immediately.
			Setting Override Factors	The target velocity of an axis can be changed.
			Changing the Current Position	The command current position or actual current position of an axis can be changed to any position.
			Enabling External Latches	The position of an axis is recorded when a trigger occurs.
			Disabling External Latches	The current latch is disabled.
			Zone Monitoring	You can monitor the command position or actual position of an axis to see when it is within a specified range (zone).
			Enabling Digital Cam Switches	You can turn a digital output ON and OFF according to the position of an axis
			Monitoring Axis Following Error	You can monitor whether the difference between the command positions or actual positions of two specified axes exceeds a threshold value.
			Resetting the Following Error	The error between the command current position and actual current position is set to 0.
			Torque Limit	The torque control function of the Servo Drive can be enabled or disabled and the torque limits can be set to control the output torque.
			Slave Axis Position Compensation	This function compensates the position of the slave axis currently in synchronized control.
			Cam monitor	Outputs the specified offset position for the slave axis in synchronous control.
			Start Velocity	You can set the initial velocity when axis motion starts.

Item				NX1P2
Motion Control	Axes Groups	Multi-axes Coordinated Control	Absolute Linear Interpolation	Linear interpolation is performed to a specified absolute position.
			Relative Linear Interpolation	Linear interpolation is performed to a specified relative position.
			Circular 2D Interpolation	Circular interpolation is performed for two axes.
			Axes Group Cyclic Synchronous Absolute Positioning	A positioning command is output each control period in Position Control Mode.
		Auxiliary Functions for Multi-axes Coordinated Control	Resetting Axes Group Errors	Axes group errors and axis errors are cleared.
			Enabling Axes Groups	Motion of an axes group is enabled.
			Disabling Axes Groups	Motion of an axes group is disabled.
			Stopping Axes Groups	All axes in interpolated motion are decelerated to a stop.
			Immediately Stopping Axes Groups	All axes in interpolated motion are stopped immediately.
			Setting Axes Group Override Factors	The blended target velocity is changed during interpolated motion.
			Reading Axes Group Positions	The command current positions and actual current positions of an axes group can be read.
			Changing the Axes in an Axes Group	The Composition Axes parameter in the axes group parameters can be overwritten temporarily.
	Common Items	Cams	Setting Cam Table Properties	The end point index of the cam table that is specified in the input parameter is changed.
			Saving Cam Tables	The cam table that is specified with the input parameter is saved in non-volatile memory in the CPU Unit.
			Generating Cam Tables	The cam table is generated from the cam property and cam node that is specified in input parameters.
		Parameters	Writing MC Settings	Some of the axis parameters or axes group parameters are overwritten temporarily.
			Changing Axis Parameters	You can access and change the axis parameters from the user program.
	Auxiliary Functions	Count Modes		You can select either Linear Mode (finite length) or Rotary Mode (infinite length).
		Unit Conversions		You can set the display unit for each axis according to the machine.
		Acceleration/ Deceleration Control	Automatic Acceleration/ Deceleration Control	Jerk is set for the acceleration/deceleration curve for an axis motion or axes group motion.
			Changing the Acceleration and Deceleration Rates	You can change the acceleration or deceleration rate even during acceleration or deceleration.
		In-Position Check		You can set an in-position range and in-position check time to confirm when positioning is completed.
		Stop Method		You can set the stop method to the immediate stop input signal or limit input signal.
		Re-execution of Motion Control Instructions		You can change the input variables for a motion control instruction during execution and execute the instruction again to change the target values during operation.
		Multi-execution of Motion Control Instructions (Buffer Mode)		You can specify when to start execution and how to connect the velocities between operations when another motion control instruction is executed during operation.
		Continuous Axes Group Motions (Transition Mode)		You can specify the Transition Mode for multi-execution of instructions for axes group operation.
		Monitoring Functions	Software limits	The movement range of an axis is monitored.
			Following Error	The error between the command current value and the actual current value is monitored for each axis.
			Velocity, Acceleration Rate, Deceleration Rate, Torque, Interpolation Velocity, Interpolation Acceleration Rate, and Interpolation Dceleration Rate	You can set and monitor warning values for each axis and each axes group.
		Absolute Encoder Support		You can use an OMRON 1S-series Servomotor or G5-series Servomotor with an Absolute Encoder to eliminate the need to perform homing at startup.
		Input Signal Logic Inversion		You can inverse the logic of immediate stop input signal, positive limit input signal, negative limit input signal, or home proximity input signal.

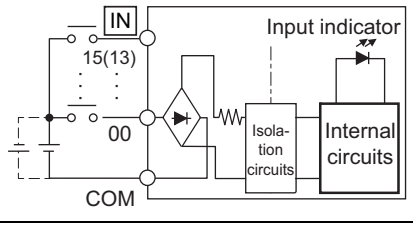
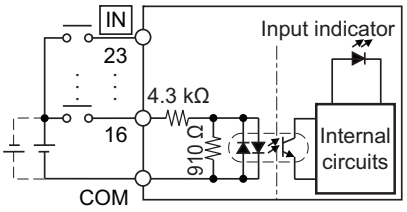
Item				NX1P2
Motion Control	External Interface Signals			The Servo Drive input signals listed on the right are used. Home signal, home proximity signal, positive limit signal, negative limit signal, immediate stop signal, and interrupt input signal
Unit (I/O) Management	EtherCAT slaves	Maximum Number of Slaves		16
	CJ-Series Units	Maximum Number of Units		Not supported
Communications	Peripheral USB Port			Not supported
	Built-in EtherNet/IP Port	Communications Protocol		TCP/IP and UDP/IP
		CIP Communications Service	Tag Dta Links	Programless cyclic data exchange is performed with the devices on the EtherNet/IP network.
			Message Communications	CIP commands are sent to or received from the devices on the EtherNet/IP network.
		TCP/IP Applications	Socket Services	Data is sent to and received from any node on Ethernet using the UDP or TCP protocol. Socket communications instructions are used.
			Secure Socket service (Client)	Establishes a TLS session with the TCP protocol, and sends and receives arbitrary data to and from the server and any node on the Ethernet using instructions for secure socket communication.
			FTP Client	Files are transferred via FTP from the CPU Unit to computers or Controllers at other Ethernet nodes. FTP client communications instructions are used.
			FTP Server	Files can be read from or written to the SD Memory Card in the CPU Unit from computers at other Ethernet nodes.
			Automatic Clock Adjustment	Clock information is read from the NTP server at the specified time or at a specified interval after the power supply to the CPU Unit is turned ON. The internal clock time in the CPU Unit is updated with the read time.
			SNMP Agent	Built-in EtherNet/IP port internal status information is provided to network management software that uses an SNMP manager.
	EtherCAT Port	Supported Services	Process Data Communications	A communications method to exchange control information in cyclic communications between the EtherCAT master and slaves. This communications method is defined by CoE.
			SDO Communications	A communications method to exchange control information in noncyclic event communications between EtherCAT master and slaves. This communications method is defined by CoE.
		Network Scanning		Information is read from connected slave devices and the slave configuration is automatically generated.
		DC (Distributed Clock)		Time is synchronized by sharing the EtherCAT system time among all EtherCAT devices (including the master).
		Enable/Disable Settings for Slaves		The slaves can be enabled or disabled as communications targets.
		Disconnecting/Connecting Slaves		Temporarily disconnects a slave from the EtherCAT network for maintenance, such as for replacement of the slave, and then connects the slave again.
		Supported Application Protocol	CoE	SDO messages of the CAN application can be sent to slaves via EtherCAT
	Serial Communication	Protocol		Host link (FINS), no-protocol, and Modbus-RTU master (when connected to the Serial Communications Option Board)
	Communications Instructions			FTP client instructions, CIP communications instructions, socket communications instructions, SDO message instructions, noprotocol communications instructions, and Modbus RTU protocol instructions
Operation Management	RUN Output Contacts			Not supported
System Management	Event Logs	Function		Events are recorded in the logs
	Maximum Number of Events	System Event Log		576 *2
		Access Event Log		528 *3
		User-defined Event Log		512
Debugging	Online Editing	Single		Programs, function blocks, functions, and global variables can be changed online. More than one operators can change POUs individually via network.
	Forced Refreshing			The user can force specific variables to TRUE or FALSE.
		Maximum Number of Forced Variables	Device Variables for EtherCAT Slaves	64
			Device Variables for CJ-series Units and Variables with AT Specifications	Not supported
	MC Test Run			Motor operation and wiring can be checked from the Sysmac Studio.
	Synchronizing			The project file in the Sysmac Studio and the data in the CPU Unit can be made the same when online.
	Differentiation Monitoring			You can monitor when a variable changes to TRUE or changes to FALSE.
		Maximum Number of Contacts		8

Item				NX1P2
Debugging	Data Tracing	Types	Single Triggered Trace	When the trigger condition is met, the specified number of samples are taken and then tracing stops automatically.
			Continuous Trace	Data tracing is executed continuously and the trace data is collected by the Sysmac Studio.
		Maximum Number of Simultaneous Data Traces		2
		Maximum Number of Records		10000
		Maximum Number of Sampled Variables		48 variables
		Timing of Sampling		Sampling is performed for the specified task period, at the specified time, or when a sampling instruction is executed.
		Triggered Traces		Trigger conditions are set to record data before and after an event.
			Trigger Conditions	When BOOL variable changes to TRUE or FALSE Comparison of non-BOOL variable with a constant Comparison Method: Equals (=), Greater than (>), Greater than or equals (≥), Less Than (<), Less than or equals (≤), Not equal (≠)
			Delay	Trigger position setting: A slider is used to set the percentage of sampling before and after the trigger condition is met.
	Simulation			The operation of the CPU Unit is emulated in the Sysmac Studio.
Reliability functions	Self-Diagnosis	Controller Errors	Levels	Major faults, partial faults, minor faults, observation, and information
			Maximum number of message languages	9 (Sysmac Studio) 2 (NS-series PT)
		User-defined Errors	Function	User-defined errors are registered in advance and then records are created by executing instructions.
			Levels	8
			Maximum number of message languages	9
Security	Protecting Software Assets and Preventing Operating Mistakes	CPU Unit Names and Serial IDs		When going online to a CPU Unit from the Sysmac Studio, the CPU Unit name in the project is compared to the name of the CPU Unit being connected to.
		Protection	User Program Transfer with no Restoration Information	You can prevent reading data in the CPU Unit from the Sysmac Studio.
			CPU Unit Write Protection	You can prevent writing data to the CPU Unit from the Sysmac Studio or SD Memory Card.
			Overall Project File Protection	You can use passwords to protect .smc files from unauthorized opening on the Sysmac Studio.
			Data Protection	You can use passwords to protect POUs on the Sysmac Studio.
		Verification of Operation Authority		Online operations can be restricted by operation rights to prevent damage to equipment or injuries that may be caused by operating mistakes.
			Number of Groups	5
		Verification of User Program Execution ID		The user program cannot be executed without entering a user program execution ID from the Sysmac Studio for the specific hardware (CPU Unit).
SD Memory Card functions	Storage Type			SD Memory Card, SDHC Memory Card
	Application	Automatic Transfer from SD Memory Card		When the power supply to the Controller is turned ON, the data that is stored in the autoload directory of the SD Memory Card is transferred to the Controller.
		Program transfer from SD Memory Card		With the specification of the system-defined variable, you can transfer a program that is stored in the SD Memory Card to the Controller.
		SD Memory Card Operation Instructions		You can access SD Memory Cards from instructions in the user program.
		File Operations from the Sysmac Studio		You can perform file operations for Controller files in the SD Memory Card and read/write general-purpose document files on the computer.
		SD Memory Card Life Expiration Detection		Notification of the expiration of the life of the SD Memory Card is provided in a system-defined variable and event log.
Backing up data	SD Memory Card backups	Operating methods	CPU Unit front panel DIP switch	Backup, verification, and restoration operations are performed by manipulating the front-panel DIP switch on the CPU Unit.
			Specification with system-defined variables	Backup, verification, and restoration operations are performed by manipulating system-defined variables.*4
			SD Memory Card Window in Sysmac Studio	Backup and verification operations are performed from the SD Memory Card Window of the Sysmac Studio.
			Special instruction	The special instruction is used to backup data.
		Protection	Disabling backups to SD Memory Cards	Backing up data to a SD Memory Card is prohibited.
	Sysmac Studio Controller backups			The Sysmac Studio is used to backup, restore, or verify Controller data.

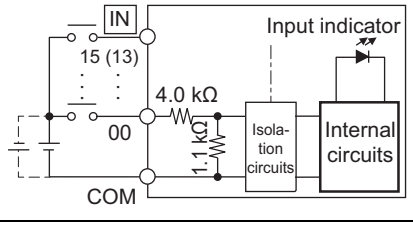
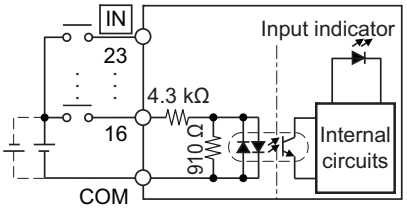
*1. Inline ST is supported. (Inline ST is ST that is written as an element in a ladder diagram.)
*2. This is the total of 512 events for the CPU Unit and 64 events for the NX Unit.
*3. This is the total of 512 events for the CPU Unit and 16 events for the NX Unit.
*4. Restore is supported with unit version 1.14 or later.

Input Specifications

The specifications depends on the input terminal numbers of the model. *1

Item	Specification	
Input type	**General-purpose input A**	**General-purpose input B**
Input terminal number	**NX1P2-1□40DT□: 00 to 15 NX1P2-9024DT□: 00 to 13**	**NX1P2-1□40DT□: 16 to 23 NX1P2-9024DT□: None**
Internal I/O common	For both NPN/PNP	
Input voltage	24 VDC (15 to 28.8 VDC)	
Connected sensor	Two-wire or three-wire sensors	
Input impedance	–––	4.3 kΩ
Input current	4.22 mA	5.3 mA typical
ON voltage	15 VDC min.	
OFF voltage/current	5 VDC max./1 mA max.	
ON response time *2	2.5 μs max.	1 ms max.
OFF response time *2	2.5 μs max.	1 ms max.
ON/OFF filter time *3	No filter, 0.25 ms, 0.5 ms, 1 ms (default), 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, 256 ms	
Circuit configuration		

*1. The following specifications apply to models with lot number 18321M (products produced in March 2021) or earlier.

Item	Specification	
Input type	**General-purpose input A**	**General-purpose input B**
Input terminal number	**NX1P2-1□40DT□: 00 to 15 NX1P2-9024DT□: 00 to 13**	**NX1P2-1□40DT□: 16 to 23 NX1P2-9024DT□: None**
Internal I/O common	For both NPN/PNP	
Input voltage	24 VDC (15 to 28.8 VDC)	
Connected sensor	Two-wire or three-wire sensors	
Input impedance	4.0 kΩ	4.3 kΩ
Input current	5.8 mA typical	5.3 mA typical
ON voltage	15 VDC min.	
OFF voltage/current	5 VDC max./1 mA max.	
ON response time *2	2.5 μs max.	1 ms max.
OFF response time *2	2.5 μs max.	1 ms max.
ON/OFF filter time *3	No filter, 0.25 ms, 0.5 ms, 1 ms (default), 2 ms, 4 ms, 8 ms, 16 ms, 32 ms, 64 ms, 128 ms, 256 ms	
Circuit configuration		

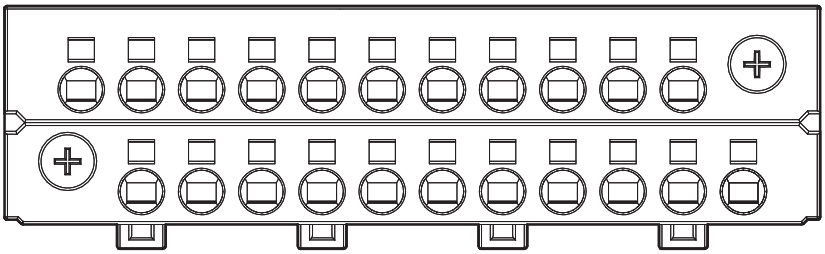
*2. These values are the fixed response time needed by the hardware. A value from 0 to 32 ms (default: 1 ms) that is set on the Support Software is added to these values.
*3. Set the filter time for every 4 points.

Output Terminal Block

Terminal Arrangement

The description is given for each CPU Unit model.

NX1P2-1□40DT



NC	NC	00	02	04	06	NC	08	10	12	14	
	C0 (0V)	01	03	05	07	C1 (0V)	09	11	13	15	NC

Symbol	Terminal name	Description	Reference
C0 (0V), C1 (0V)	Common terminal	Connected to the 0-V side of the I/O power supply. C0 (0V) and C1 (0V) are independent from each other inside the CPU Unit.	Refer to the *Output Specifications* page.
00 to 15	Output terminals	NPN (sinking) type output	
NC	NC	Do not connect anything.	---

NX1P2-1□40DT1

The appearance of the terminal block is the same as NX1P2-1□40DT.

NC	C0 (+V)	00	02	04	06	C1 (+V)	08	10	12	14	
	0V0	01	03	05	07	0V1	09	11	13	15	NC

Symbol	Terminal name	Description	Reference
C0 (+V), C1 (+V)	Common terminal	Connected to the 24-V side of the I/O power supply. C0 (+V) and C1 (+V) are independent from each other inside the CPU Unit.	Refer to the *Output Specifications* page.
0V0, 0V1	0 V terminal	Supplies 0 V for the internal circuits for driving. 0V0 and 0V1 are independent from each other inside the CPU Unit.	
00 to 15	Output terminals	PNP (sourcing) type output with the load short-circuit protection function	
NC	NC	Do not connect anything.	---

NX1P2-9024DT

The appearance of the terminal block is the same as NX1P2-1□40DT.

NC	NC	00	02	04	06	08	NC	NC	NC	NC	
	C0 (0V)	01	03	05	07	09	NC	NC	NC	NC	NC

Symbol	Terminal name	Description	Reference
C0 (0V)	Common terminal	Connected to the 0-V side of the I/O power supply.	Refer to the *Output Specifications* page.
00 to 09	Output terminals	NPN (sinking) type output	
NC	NC	Do not connect anything.	---

NX1P2-9024DT1

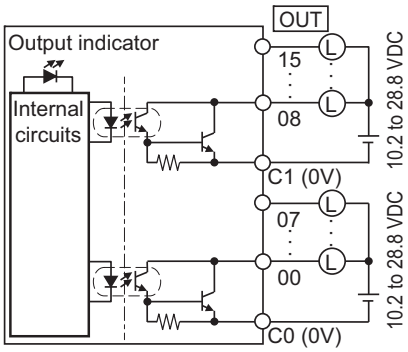
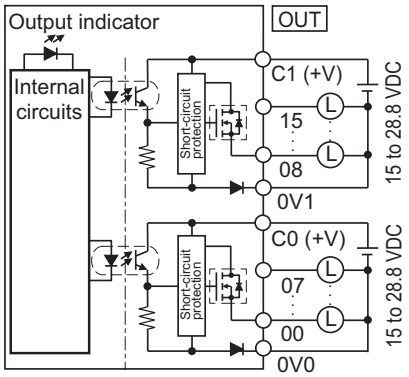
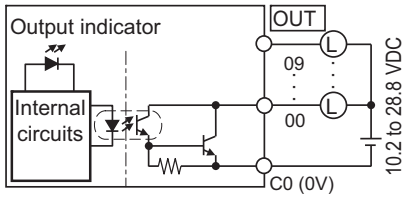
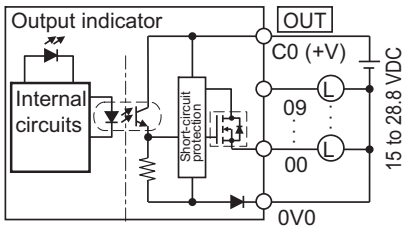
The appearance of the terminal block is the same as NX1P2-1□40DT.

NC	C0 (+V)	00	02	04	06	08	NC	NC	NC	NC	
	0V0	01	03	05	07	09	NC	NC	NC	NC	NC

Symbol	Terminal name	Description	Reference
C0 (+V)	Common terminal	Connected to the 24-V side of the I/O power supply.	Refer to the *Output Specifications* page.
0V0	0 V terminal	Supplies 0 V for the internal circuits for driving.	
00 to 09	Output terminals	PNP (sourcing) type output with the load short-circuit protection function	
NC	NC	Do not connect anything.	---

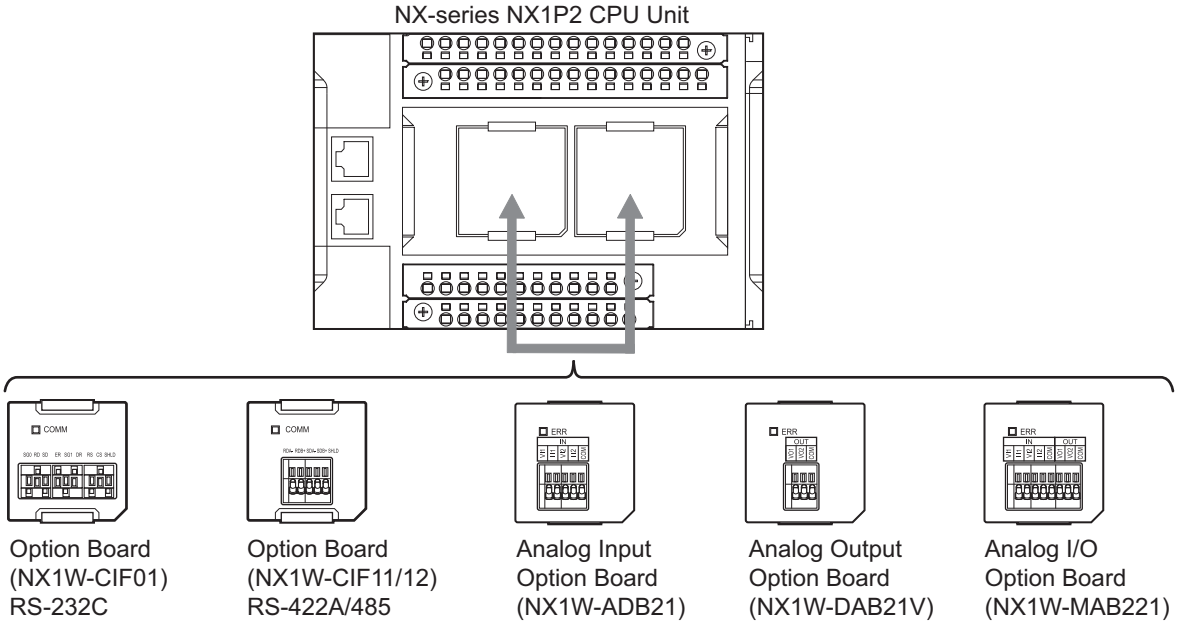
Output Specifications

The models of the CPU Units are divided according to the following two output types: the NPN (sinking) type and PNP (sourcing) type.
There is no difference in specifications between the models with different output terminal numbers.

Item	Specification	
	NX1P2-□□□□DT	**NX1P2-□□□□DT1**
Internal I/O common	NPN (sinking)	PNP (sourcing)
Maximum switching capacity	12 to 24 VDC (10.2 to 28.8 VDC), 300 mA per point	24 VDC (15 to 28.8 VDC), 300 mA per point
	NX1P2-1□40DT□: 1.8 A/common (3.6 A/Unit) NX1P2-9024DT□: 2.4 A/common (2.4 A/Unit)	
Minimum switching capacity	12 to 24 VDC (10.2 to 28.8 VDC), 1 mA	24 VDC (15 to 28.8 VDC), 1 mA
Leakage current	0.1 mA max.	
Residual voltage	1.5 V max.	
ON response time	0.1 ms max.	0.5 ms max.
OFF response time	0.8 ms max.	1.0 ms max.
Current consumption from I/O power supply *1	---	NX1P2-1□40DT1: 40 mA/common NX1P2-9024DT1: 50 mA/common
Load short-circuit protection	Not provided	Provided *2
Circuit configuration	NX1P2-1□40DT 	NX1P2-1□40DT1 
	NX1P2-9024DT 	NX1P2-9024DT1 

*1. The internally consumed current from I/O power supply. The current flows from the common terminal Cn (+V) to the 0Vn terminal. The current consumption of any external load is excluded.
*2. The load short-circuit protection is provided for each point of the PNP (sourcing) type output terminal. It protects the output circuits when a load short circuit occurs.

Option Board



Option Board (NX1W-CIF01) RS-232C

Option Board (NX1W-CIF11/12) RS-422A/485

Analog Input Option Board (NX1W-ADB21)

Analog Output Option Board (NX1W-DAB21V)

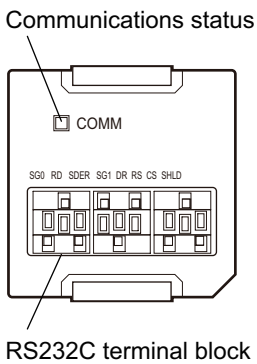
Analog I/O Option Board (NX1W-MAB221)

Specifications of Serial Communications Option Board

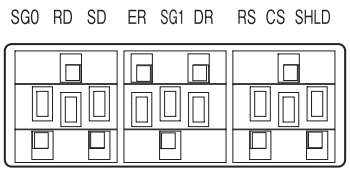
Item	Specification		
Model	NX1W-CIF01	NX1W-CIF11	NX1W-CIF12
Communications port	One RS-232C port	One RS-422A/485 port	One RS-422A/485 port (isolated)
Communications method	Half-duplex		
Synchronization method	Start-stop synchronization		
Baud rate	1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2 kbps		
Transmission distance	15 m	50 m	500 m
Supported protocol	Host link, Modbus-RTU master, and no-protocol		
Connection type	Screwless clamping terminal block (9 terminals)	Screwless clamping terminal block (5 terminals)	
Applicable wire size	AWG28 to 20	AWG24 to 20	
Dimensions (mm) *1	35.9 × 35.9 × 13.5 (W×H×D)		
Weight	16 g	13 g	14 g
Power consumption	Included in the CPU Unit power consumption. The Option Board power consumption is included in the definition of the CPU Unit power consumption.		
Isolation method	No isolation		Isolation *2

*1. Projecting parts such as a terminal block is not included. When the Option Board is mounted to the CPU Unit, it protrudes through the CPU Unit surface. Refer to the *NX-series NX1P2 CPU Unit Hardware User's Manual* (Cat. No. W578) for details.
*2. The terminals are isolated from the internal circuits of the CPU Unit.

RS-232C Option Board (NX1W-CIF01)



RS-232C Terminal Block



Abbreviation	Signal name	I/O
SG0	Signal grounding	---
RD	Receive data	Input
SD	Send data	Output
ER	Data terminal ready	Output
SG1	Signal grounding	---
DR	Data set ready	Input
RS	Send request	Output
CS	Data can be sent	Input
SHLD	Shield	---

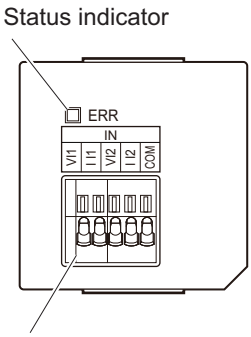
Note: 1. As the Option Board does not have a 5 V power supply terminal, it cannot be connected to external converters such as an CJ1W-CIF11 and NT-AL001, or an NV3W-M□20L Programmable Terminal.
2. The terminal block is not removable.

Specifications of Analog I/O Option Board

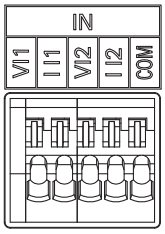
Item		Specification					
Model		NX1W-ADB21		NX1W-DAB21V		NX1W-MAB221	
I/O		Analog input		Analog output		Analog I/O	
	Voltage input	0 to 10 V	2 words total	---		0 to 10 V	2 words total
	Current input	0 to 20 mA		---		0 to 20 mA	
	Voltage output	---		0 to 10 V	2 words	0 to 10 V	2 words
Connection type		Screwless clamping terminal block (5 terminals)		Screwless clamping terminal block (3 terminals)		Screwless clamping terminal block (8 terminals)	
Applicable wire size		AWG24 to 20					
Dimensions (mm) *		35.9 × 35.9 × 28.2 (W×H×D)					
Weight		24 g		24 g		26 g	
Power consumption		Included in the CPU Unit power consumption. The Option Board power consumption is included in the definition of the CPU Unit power consumption.					
Isolation method		No isolation					

* Projecting parts such as a terminal block is not included. When the Option Board is mounted to the CPU Unit, it protrudes through the CPU Unit surface. Refer to the *NX-series NX1P2 CPU Unit Hardware User's Manual* (Cat. No. W578) for details.

Analog Input Option Board (NX1W-ADB21)



Analog Input Terminal Array



Abbreviation	Signal name
V I1	Voltage input 1
I I1	Current input 1
V I2	Voltage input 2
I I2	Current input 2
COM	Input common

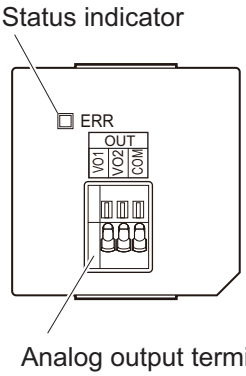
Note: When you use the current input, be sure to short-circuit V I1 with I I1, and short-circuit V I2 with I I2.

Analog Input Specifications

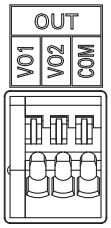
Item		Specification	
		Voltage input	**Current input**
Input method		Single-ended input	Single-ended input
Input range		0 to 10 V	0 to 20 mA
Input conversion range		0 to 10.24 V	0 to 30 mA
Absolute maximum rating		-1 to 15 V	-4 to 30 mA
Input impedance		200 kΩ min.	Approx. 250 Ω
Resolution		1/4,000 (full scale)	1/2,000 (full scale)
Overall accuracy	**25°C**	±0.5% (full scale)	±0.6% (full scale)
	0 to 55°C	±1.0% (full scale)	±1.2% (full scale)
Averaging processing		Not provided	
Conversion time		Internal sampling time: 2 ms per point *	

* Refer to the *NX-series NX1P2 CPU Unit Built-in I/O and Option Board User's Manual* (Cat. No. W579) for information on refresh time.

Analog Output Option Board (NX1W-DAB21V)



Analog Output Terminal Array



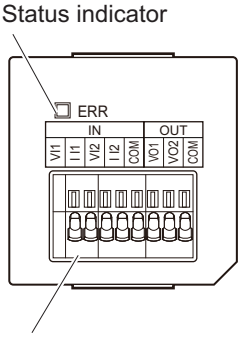
Abbreviation	Signal name
VO1	Voltage output 1
VO2	Voltage output 1
COM	Output common

Analog Output Specifications

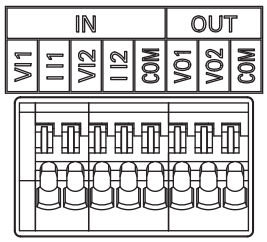
Item		Specification	
		Voltage output	Current output
Output range		0 to 10 V	---
Output conversion range		0 to 10.24 V	---
Allowable load resistance		2 kΩ min.	---
Output impedance		0.5 Ω max.	---
Resolution		1/4,000 (full scale: 4,000)	---
Overall accuracy	25°C	±0.5% (full scale)	---
	0 to 55°C	±1.0% (full scale)	---
Conversion time		Internal sampling time: 2 ms per point *	

* Refer to the *NX-series NX1P2 CPU Unit Built-in I/O and Option Board User's Manual* (Cat. No. W579) for information on refresh time.

Analog I/O Option Board (NX1W-MAB221)



Analog I/O Terminal Array



Abbreviation		Signal name
IN	VI1	Voltage input 1
	II1	Current input 1
	VI2	Voltage input 2
	II2	Current input 2
	COM	Input common
OUT	VO1	Voltage output 1
	VO2	Voltage output 2
	COM	Output common

Note: When you use the current input, be sure to short-circuit VI1 with II1, and short-circuit VI2 with II2.

Analog I/O Specifications

Item			Specification	
			Voltage I/O	Current I/O
Analog input section	Input method		Single-ended input	Single-ended input
	Input range		0 to 10 V	0 to 20 mA
	Input conversion range		0 to 10.24 V	0 to 30 mA
	Absolute maximum rating		-1 to 15 V	-4 to 30 mA
	Input impedance		200 kΩ min.	Approx. 250 Ω
	Resolution		1/4,000 (full scale)	1/2,000 (full scale)
	Overall accuracy	25°C	±0.5% (full scale)	±0.6% (full scale)
		0 to 55°C	±1.0% (full scale)	±1.2% (full scale)
	Averaging processing		Not provided	
Analog output section	Output range		0 to 10 V	---
	Output conversion range		0 to 10.24 V	---
	Allowable load resistance		2 kΩ min.	---
	Output impedance		0.5 Ω max.	---
	Resolution		1/4,000 (full scale)	---
	Overall accuracy	25°C	±0.5% (full scale)	---
		0 to 55°C	±1.0% (full scale)	---
Conversion time			Internal conversion time: 6 ms (Total of 4 channels) *	

* Refer to the *NX-series NX1P2 CPU Unit Built-in I/O and Option Board User's Manual* (Cat. No. W579) for information on refresh time.