NX-series Position Interface Unit

NX-EC0/ECS/PG0

CSM_NX-EC0_ECS_PG0_DS_E_2_4

NX Units for fast and precise positioning control

- Incremental Encoder Input Unit (NX-EC0)
  More precise timing control by synchronizing the position data with the EtherCAT® Distributed Clock
- SSI Input Unit (NX-ECS)
  Synchronous Serial Interface (SSI) to connect external axes to the Sysmac system
- Pulse Output Unit (NX-PG0)
  Positioning control with pulse outputs to command stepper motor drives and other pulse input motor drives

NX-EC0122 NX-EC0142

NX-PG0242-5 NX-PG0342-5

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 or icing)
	Atmosphere	Must be free from corrosive gases.
	Ambient storage temperature	-25 to 70°C (with no condensation or icing)
	Altitude	2,000 m max.
	Pollution degree	Pollution degree 2 or less: Conforms to JIS B3502 and IEC 61131-2.
	Noise immunity	Conforms to IEC61000-4-4, 2 kV (power supply line)
	Overvoltage category	Category II: Conforms to JIS B3502 and IEC 61131-2.
	EMC immunity level	Zone B
	Vibration resistance	Conforms to IEC 60068-2-6. 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz, acceleration of 9.8 m/s^2, 100 min each in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)
	Shock resistance	Conforms to IEC 60068-2-27. 147 m/s^2, 3 times each in X, Y, and Z directions
Applicable standards *		cULus: Listed (UL508) or Listed (UL 61010-2-201), ANSI/ISA 12.12.01, EU: EN 61131-2, C-Tick or RCM, KC Registration, NK, LR

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

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EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.
EtherNet/IP™ is a trademark of ODVA.
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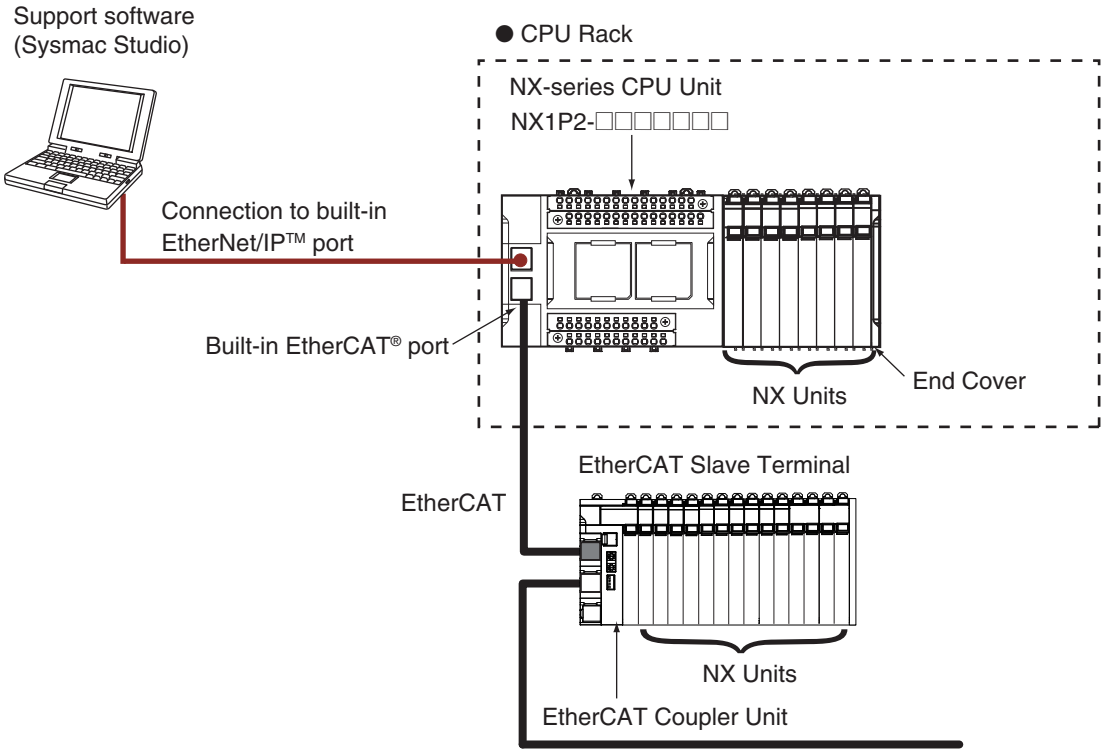
System Configurations

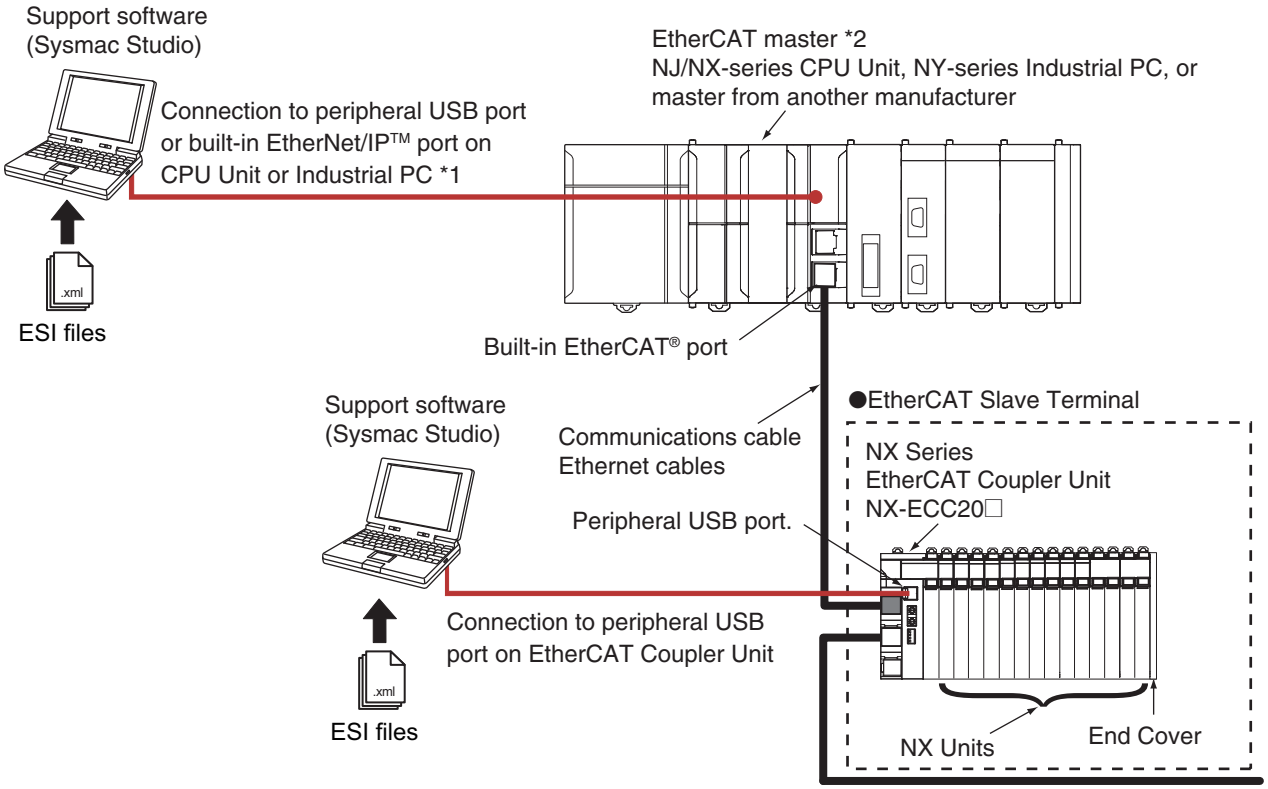
Connected to a CPU Unit

The following figure shows a system configuration when NX Units are connected to an NX-series CPU Unit.



Connected to an EtherCAT Coupler Unit

The following figure shows an example of the system configuration when an EtherCAT Coupler Unit is used as a Communications Coupler Unit.



*1. The connection method for the Sysmac Studio depends on the model of the CPU Unit or Industrial PC.
*2. An EtherCAT Slave Terminal cannot be connected to any of the OMRON CJ1W-NC□81/□82 Position Control Units even though they can operate as EtherCAT masters.

Note: To check whether NX Units can be connected to your CPU Unit or Communications Coupler Unit, refer to the version information.

Model Number Structure

NX-□□□□□□-□
(1) (2) (3) (4) (5)

(1) Unit type

No.	Specification
EC0	Incremental Encoder Input Unit
ECS	Serial Encoder Input Unit (SSI Input Unit)
PG0	Pulse Output Unit

(2) Number of Channels

No.	Specification
1	1 channel
2	2 channels
3	4 channels

(3) I/O Specifications

The I/O specifications depend on the Unit type.

(4) Additional Functions

No.	Specification
2	Supports synchronous refreshing

(5) External connection terminals

No.	Specification
None	Screwless clamping terminal block
-5	MIL connector

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.

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	Remarks	
Incremental Encoder Input Unit	1 (NPN)	3 (NPN)	500 kHz	• Free-Run refreshing • Synchronous I/O refreshing • Task period prioritized refreshing	1/1	24-V voltage input	**NX-EC0112**
	1 (PNP)	3 (PNP)					**NX-EC0122**
	1	3 (NPN)	4 MHz			Line receiver input	**NX-EC0132**
		3 (PNP)					**NX-EC0142**
	2 (NPN)	None	500 kHz		2/2	24-V voltage input	**NX-EC0212**
	2 (PNP)						**NX-EC0222**

* Refer to the *I/O Refreshing Methods in the USER'S MANUAL* (Cat. No. W524) for the communications cycles for each model.

Position Interface: SSI Input Units

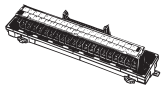
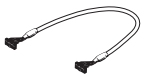
Product name	Specification					Model
	Number of channels	Input/Output form	Maximum data length	Encoder power supply	Type of external connections	
SSI Input Unit	1	EIA standard RS-422-A	32 bits	24 VDC, 0.3 A/CH	Screwless push-in terminal block (12 terminals)	**NX-ECS112**
	2	EIA standard RS-422-A	32 bits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

Cables and Connectors for Line Driver Output Units with MIL Connectors

Product name	Specification		Model
Connector-Terminal Block Conversion Unit	Flat Cable Connectors type (Terminal block with M3 screws) 34-terminals		XW2B-34G4
	Flat Cable Connectors type (Terminal block with M3.5 screws) 34-terminals		XW2B-34G5
	MIL Connectors type (Slim Connector) 34-terminals		XW2D-34G6
	MIL Connectors type (Phillips screw) 34-terminals		XW2R-J34GD-T
	MIL Connectors type (Slotted screw (rise up)) 34-terminals		XW2R-E34GD-T
	MIL Connectors type (Push-in spring) 34-terminals		XW2R-P34GD-T
Cable for Connector-Terminal Block Conversion Unit	MIL Connectors type 34-terminals 	Cable length: 0.5 m	XW2Z-050EE
		Cable length: 1 m	XW2Z-100EE
		Cable length: 1.5 m	XW2Z-150EE
		Cable length: 2 m	XW2Z-200EE
		Cable length: 3 m	XW2Z-300EE
		Cable length: 5 m	XW2Z-500EE

Note: Each of NX-PG0232-5 and NX-PG0242-5 has one MIL connector. Therefore, one Connector-Terminal Block Conversion Unit is required. Each of NX-PG0332-5 and NX-PG0342-5 has two MIL connectors. Therefore, two Connector-Terminal Block Conversion Units are required.

Optional Products

Product name	Specification	Model
Unit/Terminal Block Coding Pins	For 10 Units (Terminal Block: 30 pins, Unit: 30 pins)	NX-AUX02

Product name	Specification				Model
	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity	
Terminal Block	12	A/B	None	10 A	NX-TBA122
	16	A/B			NX-TBA162
	12	C/D			NX-TBB122

Accessories

Not included.

Version Information

Connected to a CPU Unit

Refer to the user's manual for the CPU Unit details on the CPU Units to which NX Units can be connected.

NX Units		Corresponding unit versions/versions	
Model	Unit version	CPU Unit	Sysmac Studio
NX-EC0112	Ver. 1.1	Ver. 1.13	Ver. 1.17
	Ver. 1.2		
NX-EC0122	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-EC0132	Ver. 1.1	Ver. 1.13	Ver. 1.17
	Ver. 1.2		
NX-EC0142	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-EC0212	Ver. 1.1	Ver. 1.13	Ver. 1.17
	Ver. 1.2		
NX-EC0222	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-ECS112	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-ECS212	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
NX-PG0112	Ver. 1.1	Ver. 1.13	Ver. 1.17
	Ver. 1.2		
	Ver. 1.3		Ver. 1.19
NX-PG0122	Ver. 1.0	Ver. 1.13	Ver. 1.17
	Ver. 1.1		
	Ver. 1.2		
	Ver. 1.3		Ver. 1.19
NX-PG0232-5	Ver. 1.2	Ver. 1.13	Ver. 1.17
	Ver. 1.3		Ver. 1.19
NX-PG0242-5	Ver. 1.2	Ver. 1.13	Ver. 1.17
	Ver. 1.3		Ver. 1.19
NX-PG0332-5	Ver. 1.2	Ver. 1.13	Ver. 1.17
	Ver. 1.3		Ver. 1.19
NX-PG0342-5	Ver. 1.2	Ver. 1.13	Ver. 1.17
	Ver. 1.3		Ver. 1.19

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

Connected to an EtherCAT Coupler Unit

NX Units		Corresponding unit versions/versions		
Model	Unit version	EtherCAT Coupler Unit	CPU Unit or Industrial PC	Sysmac Studio
NX-EC0112	Ver. 1.1	Ver. 1.1 *1	Ver. 1.06 *1	Ver. 1.10
	Ver. 1.2	Ver. 1.3 *2*3		Ver. 1.13
NX-EC0122	Ver. 1.0	Ver. 1.1 *1	Ver. 1.06 *1	Ver. 1.07
	Ver. 1.1			Ver. 1.08
	Ver. 1.2	Ver. 1.3 *2*3		Ver. 1.13
NX-EC0132	Ver. 1.1	Ver. 1.1 *1	Ver. 1.06 *1	Ver. 1.10
	Ver. 1.2	Ver. 1.3 *2*3		Ver. 1.13
NX-EC0142	Ver. 1.0	Ver. 1.1 *1	Ver. 1.06 *1	Ver. 1.07
	Ver. 1.1			Ver. 1.08
	Ver. 1.2	Ver. 1.3 *2*3		Ver. 1.13
NX-EC0212	Ver. 1.1	Ver. 1.1 *1	Ver. 1.06 *1	Ver. 1.10
	Ver. 1.2	Ver. 1.3 *2*3		Ver. 1.13
NX-EC0222	Ver. 1.0	Ver. 1.1 *1	Ver. 1.06 *1	Ver. 1.07
	Ver. 1.1			Ver. 1.08
	Ver. 1.2	Ver. 1.3 *2*3		Ver. 1.13
NX-ECS112	Ver. 1.0	Ver. 1.1 *1	Ver. 1.06 *1	Ver. 1.07
	Ver. 1.1			Ver. 1.08
	Ver. 1.2	Ver. 1.3 *2*3		Ver. 1.13
NX-ECS212	Ver. 1.0	Ver. 1.1 *1	Ver. 1.06 *1	Ver. 1.07
	Ver. 1.1			Ver. 1.08
	Ver. 1.2	Ver. 1.3 *2*3		Ver. 1.13
NX-PG0112	Ver. 1.1	Ver. 1.0	Ver. 1.05	Ver. 1.10
	Ver. 1.2	Ver. 1.3 *2*4		Ver. 1.13
	Ver. 1.3			Ver. 1.19
NX-PG0122	Ver. 1.0	Ver. 1.0	Ver. 1.05	Ver. 1.06
	Ver. 1.1			Ver. 1.08
	Ver. 1.2	Ver. 1.3 *2*4		Ver. 1.13
	Ver. 1.3			Ver. 1.19
NX-PG0232-5	Ver. 1.2	Ver. 1.3 *2*4	Ver. 1.05	Ver. 1.15
	Ver. 1.3			Ver. 1.19
NX-PG0242-5	Ver. 1.2	Ver. 1.3 *2*4	Ver. 1.05	Ver. 1.15
	Ver. 1.3			Ver. 1.19
NX-PG0332-5	Ver. 1.2	Ver. 1.3 *2*4	Ver. 1.05	Ver. 1.15
	Ver. 1.3			Ver. 1.19
NX-PG0342-5	Ver. 1.2	Ver. 1.3 *2*4	Ver. 1.05	Ver. 1.15
	Ver. 1.3			Ver. 1.19

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

*1. You can use the following versions if time stamp refreshing is not used.

*2. To use task period prioritized refreshing, you must use the NX-ECC203.

*3. If you do not use task period prioritized refreshing, you can use EtherCAT Coupler Units which support Position Interface Units with unit version 1.1 or earlier.

*4. If you do not use task period prioritized refreshing, you can use EtherCAT Coupler Units with unit version 1.0.

Connected to an EtherNet/IP Coupler Unit

NX Units		Corresponding unit versions/versions					
Model	Unit version	Application with an NJ/NX/NY-series Controller *1			Application with a CS/CJ/CP-series PLC *2		
		EtherNet/IP Coupler Unit	CPU Unit or Industrial PC	Sysmac Studio	EtherNet/IP Coupler Unit	Sysmac Studio	NX-IO Configurator *3
NX-EC0112	Ver. 1.1	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.2					Ver. 1.13	
NX-EC0122	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1						
	Ver. 1.2					Ver. 1.13	
NX-EC0132	Ver. 1.1	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.2					Ver. 1.13	
NX-EC0142	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1						
	Ver. 1.2					Ver. 1.13	
NX-EC0212	Ver. 1.1	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.2					Ver. 1.13	
NX-EC0222	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1						
	Ver. 1.2					Ver. 1.13	
NX-ECS112	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1						
	Ver. 1.2					Ver. 1.13	
NX-ECS212	Ver. 1.0	Ver. 1.2	Ver. 1.14	Ver. 1.19	Ver. 1.0	Ver. 1.10	Ver. 1.00
	Ver. 1.1						
	Ver. 1.2					Ver. 1.13	
NX-PG0112	Ver. 1.1	---	---	---	---	---	---
	Ver. 1.2						
	Ver. 1.3						
NX-PG0122	Ver. 1.0	---	---	---	---	---	---
	Ver. 1.1						
	Ver. 1.2						
	Ver. 1.3						
NX-PG0232-5	Ver. 1.2	---	---	---	---	---	---
	Ver. 1.3						
NX-PG0242-5	Ver. 1.2	---	---	---	---	---	---
	Ver. 1.3						
NX-PG0332-5	Ver. 1.2	---	---	---	---	---	---
	Ver. 1.3						
NX-PG0342-5	Ver. 1.2	---	---	---	---	---	---
	Ver. 1.3						

Note: 1. Some Units do not have all of the versions given in the above table. If a Unit does not have the specified version, support is provided by the oldest available version after the specified version. Refer to the user's manuals for the specific Units for the relation between models and versions.

2. You cannot connect the relevant NX Unit or use the relevant NX Unit function if "---" is shown in the corresponding unit versions/versions column.

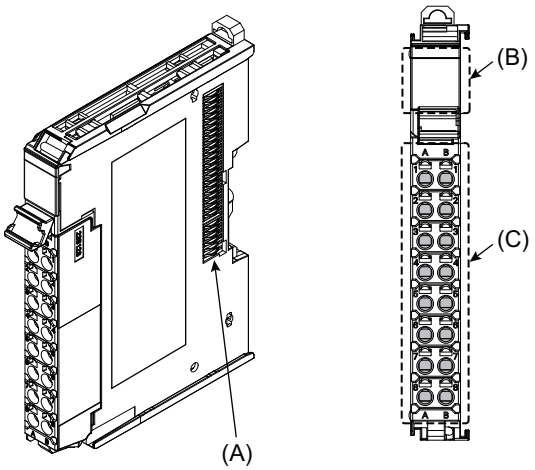
*1. Refer to the user's manual of the EtherNet/IP Coupler Unit for the unit versions of EtherNet/IP Units corresponding to EtherNet/IP Coupler Units.

*2. Refer to the user's manual of the EtherNet/IP Coupler Unit for the unit versions of CPU Units and EtherNet/IP Units corresponding to EtherNet/IP Coupler Units.

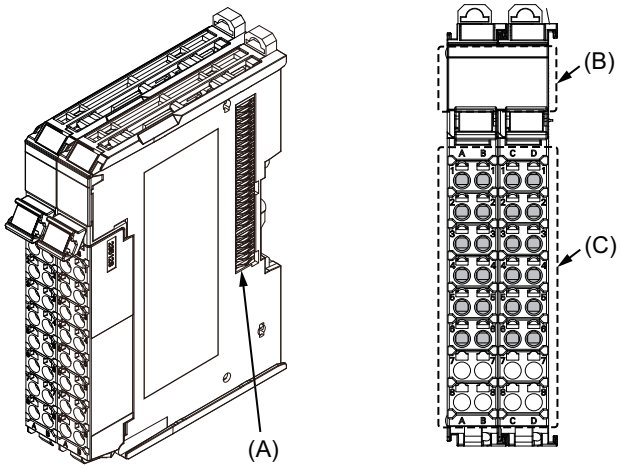
*3. For connection to an EtherNet/IP Coupler Unit with unit version 1.0, connection is supported only for a connection to the peripheral USB port on the EtherNet/IP Coupler Unit. You cannot connect by any other path. If you need to connect by another path, use an EtherNet/IP Coupler Unit with unit version 1.2 or later.

Screwless Clamping Terminal Block Type

12 mm Width

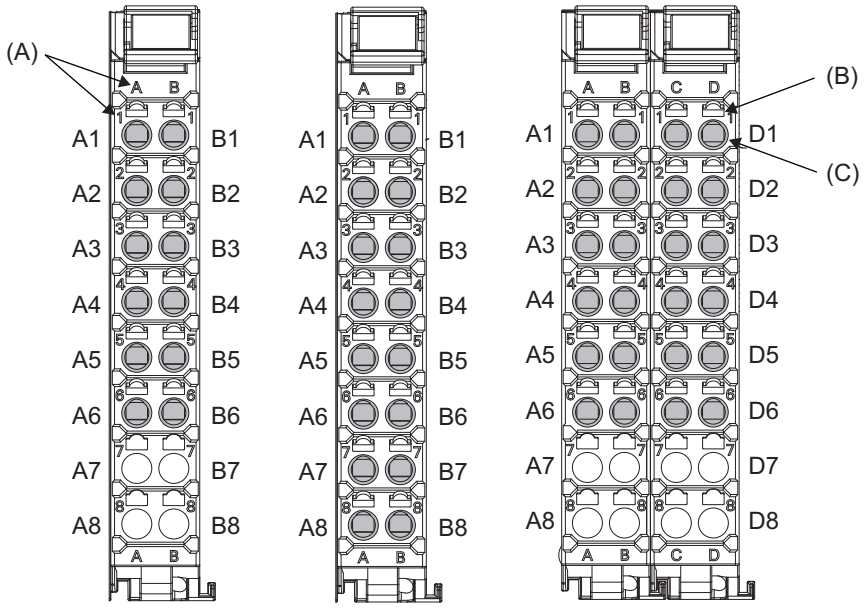


24 mm Width



Letter	Item	Specification
(A)	NX bus connector	This connector is used to connect to another Unit.
(B)	Indicators	The indicators show the current operating status of the Unit.
(C)	Terminal block	The terminal block is used to connect to external devices. The number of terminals depends on the Unit.

Terminal Blocks



Letter	Item	Specification
(A)	Terminal number indication	The terminal number is identified by a column (A through D) and a row (1 through 8). Therefore, terminal numbers are written as a combination of columns and rows, A1 through A8 and B1 through B8. For a 24-mm-wide terminal block, the left side contains terminals A1 through A8 and B1 through B8. The right side contains terminals C1 through C8 and D1 through D8. The terminal number indication is the same regardless of the number of terminals on the terminal block, as shown above.
(B)	Release hole	A flat-blade screwdriver is inserted here to attach and remove the wiring.
(C)	Terminal hole	The wires are inserted into these holes.

Applicable Terminal Blocks for Each Unit Model

Unit model	Terminal Blocks				
	Model	No. of terminals	Terminal number indications	Ground terminal mark	Terminal current capacity
NX-EC0122	NX-TBA162	16	A/B	None	10 A
NX-EC0222	NX-TBA122	12	A/B	None	10 A
NX-EC0142	NX-TBA122	12	A/B	None	10 A
	NX-TBB122		C/D		
NX-ECS122	NX-TBA122	12	A/B	None	10 A
NX-ECS212	NX-TBA122	12	A/B	None	10 A
NX-PG0112	NX-TBA162	16	A/B	None	10 A
NX-PG0122					

Applicable Wires

Using Ferrules

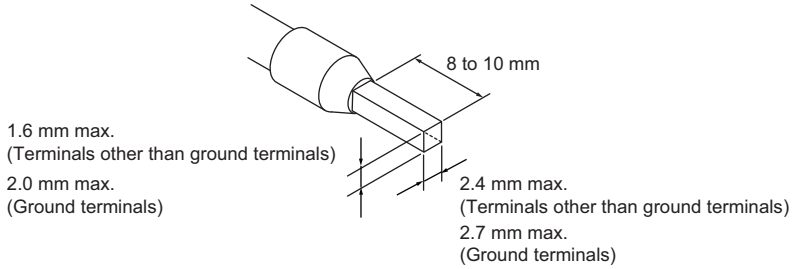
If you use ferrules, attach the twisted wires to them.
Observe the application instructions for your ferrules for the wire stripping length when attaching ferrules.
Always use plated one-pin ferrules. Do not use unplated ferrules or two-pin ferrules.

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

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

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

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

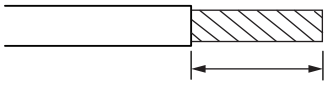


Using Twisted Wires/Solid Wires

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

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

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

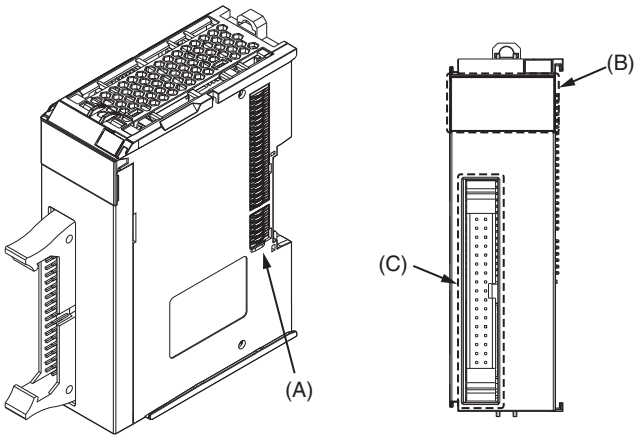


Conductor length (stripping length)

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

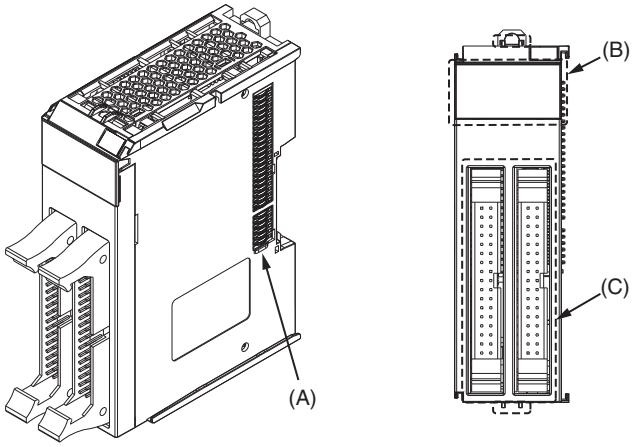
MIL Connector Type (1 Connector with 34 terminals)

30 mm Width



MIL Connector Type (2 Connectors with 34 terminals)

30 mm Width

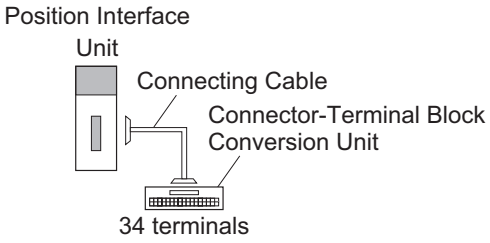


Letter	Item	Specification
(A)	NX bus connector	This connector is used to connect to another Unit.
(B)	Indicators	The indicators show the current operating status of the Unit.
(C)	Terminal block	The connectors are used to connect to external devices. The number of connectors with 34 terminals depends on the Unit.

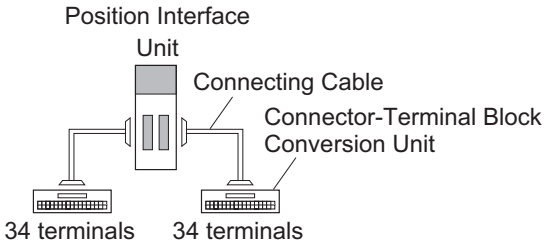
Connecting to Connector-Terminal Block Conversion Units

Connection Examples

(a) NX-PG0232-5 and NX-PG0242-5



(b) NX-PG0332-5 and NX-PG0342-5



Connecting Cable

The table below shows applicable connecting cables.

Model	Manufacturer
XW2Z-□□□EE	OMRON Corporation

The cable length from the Unit to an external device connected through the Connector-Terminal Block Conversion Units should not be longer than the specified cable length for the Unit.
Refer to the Specification for each units.

Connector-Terminal Block Conversion Unit

The table below shows applicable Connector-Terminal Block Conversion Units.

Model	Manufacturer
XW2B-34G4	OMRON Corporation
XW2B-34G5	
XW2D-34G6	
XW2R-J34GD-T	
XW2R-E34GD-T	
XW2R-P34GD-T	

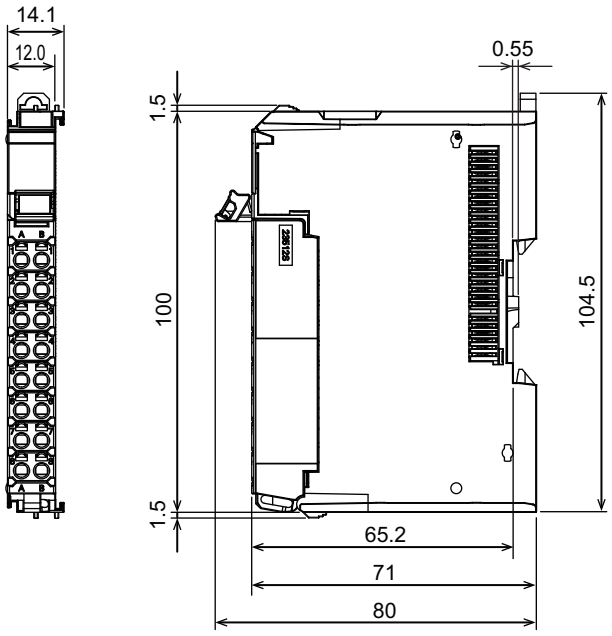
Each of NX-PG0232-5 and NX-PG0242-5 has one MIL connector. Therefore, one Connector-Terminal Block Conversion Unit is required.
Each of NX-PG0332-5 and NX-PG0342-5 has two MIL Connectors. Therefore, two Connector-Terminal Block Conversion Units are required.

Dimensions

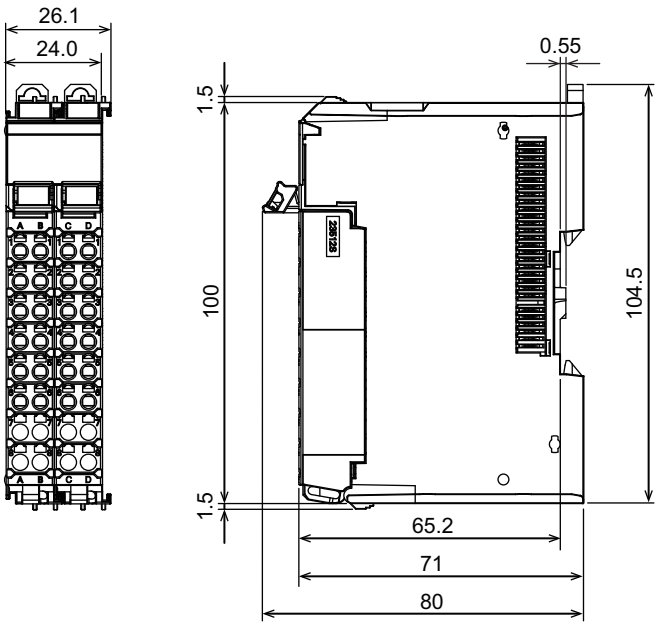
(Unit: mm)

Screwless Clamping Terminal Block Type

12 mm Width

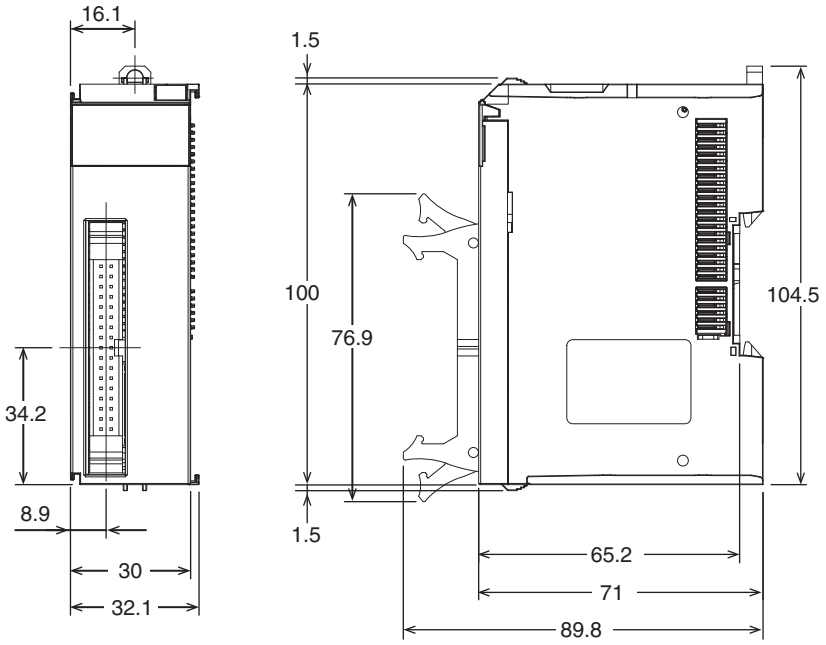


24 mm Width



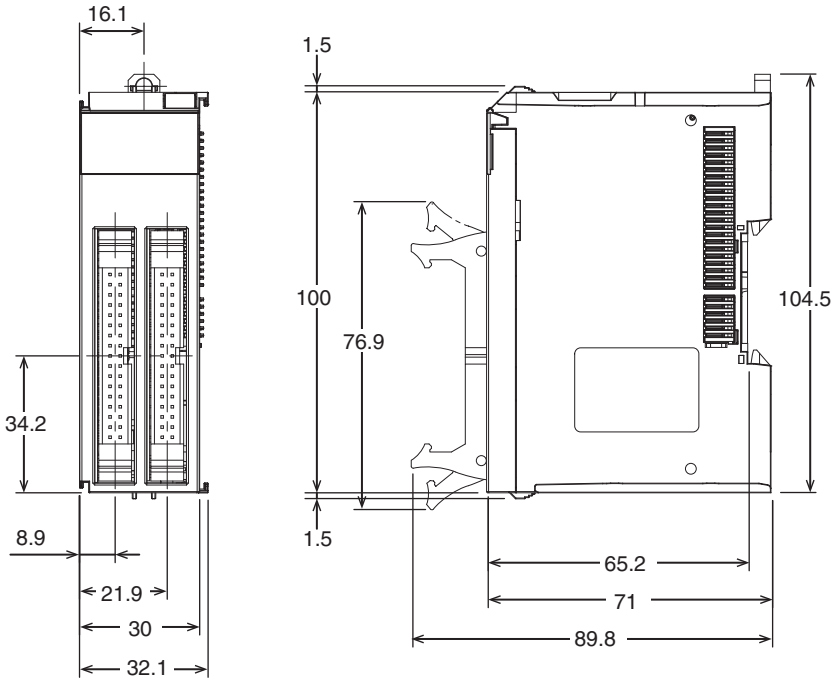
MIL Connector Type (1 Connector with 34 terminals)

30 mm Width



MIL Connector Type (2 Connectors with 34 terminals)

30 mm Width



Related Manual

Man. No	Model	Manual	Application	Description
W524	NX-EC0□□□ NX-ECS□□□ NX-PG0□□□	NX-series Position Interface Units User's Manual	Learning how to use NX-series Position Interface Units	The hardware, setup methods, and functions of the NX-series Incremental Encoder Input Units, SSI Input Units, and Pulse Output Unit are described.

NX-series Incremental Encoder Input Unit

NX-EC0□□□

More precise timing control by synchronizing the position data with the EtherCAT® Distributed Clock

- Process encoder input data using the MC Function Modules of the NJ/NX/NY5 Controllers
- Time-stamp inputs enables high-precision timing control in combination with time-stamp outputs

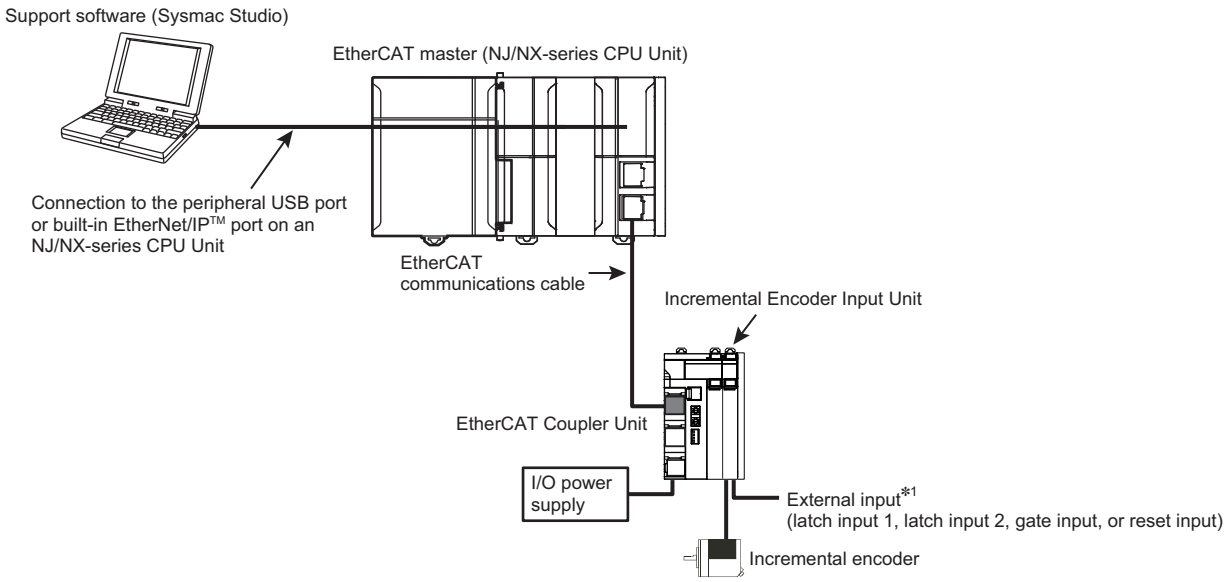
Features

- Open collector output type and line driver output type Incremental Encoders can be connected
- High-speed remote I/O control with communications cycle as fast as 125 μs*1
- Free-run refreshing, synchronous I/O refreshing, or task period prioritized refreshing*2 with the NX1P2 CPU Unit or EtherCAT Coupler Unit
- The MC Function Modules of the NJ/NX/NY5 Controllers allows the encoder to be used as a motion axis
- Latching (1 internal signal and 2 input signals from external devices)
- Pulse Period Measurement
- 32 bit counters (80000000 to 7FFFFFFF HEX)
- Maximum counting rate: 4 MHz (Line receiver: 4 MHz, Open collector: 500 kHz)
- Time Stamping
- Maximum and minimum counter value setting
- Connect to the CJ PLC using the EtherNet/IP™ bus coupler

*1. When using the NX-EC01□□ together with the NX701-□□□□ and NX-ECC203.
*2. Task Period Prioritized refreshing is available when the NX-ECC203 is used together.

System Configuration

The following figure shows a system configuration when an Incremental Encoder Input Unit is connected to an NJ/NX-series CPU Unit via an EtherCAT Coupler Unit.

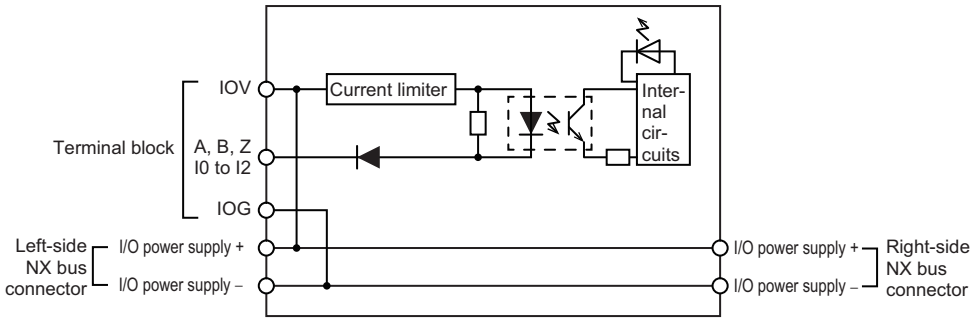


*1. You can specify functions for up to two external inputs to a One-input Incremental Encoder Input Unit. You cannot use external inputs for a Two-input Unit.

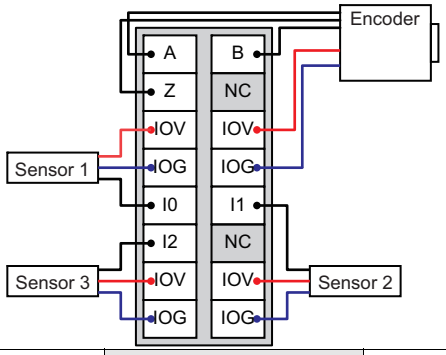
Incremental Encoder Input Unit Specifications

● Incremental Encoder Input Unit

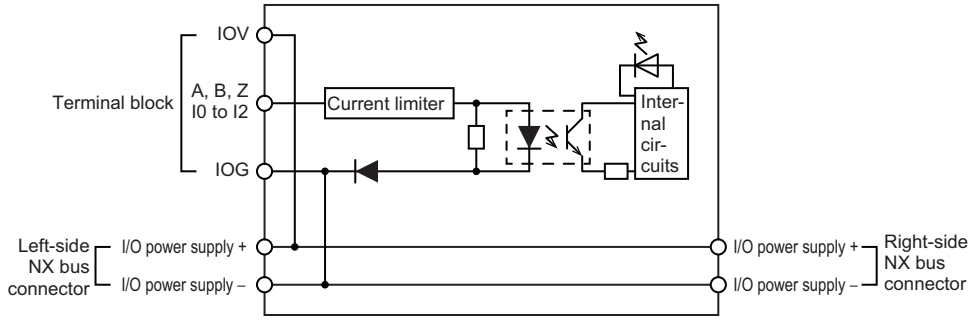
NX-EC0112

Unit name	Incremental Encoder Input Unit	**Model**	NX-EC0112
Number of channels	1 channel	**Type of external connections**	Screwless clamping terminal block (16 terminals)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators		**Input signals**	Counter: Phases A, B, and Z External Inputs: 3
Input form	Voltage input (24 V)		
Counting unit	Pulses		
Pulse input method	Phase differential pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	–2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Voltage input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/–15%)	**ON voltage**	19.6 VDC min./3 mA min.
Input current	4.2 mA typical (24 VDC)	**OFF voltage**	4.0 VDC max./1 mA max.
Maximum response frequency	Phases A and B: Single-phase 500 kHz (phase differential pulse input x4: 125 kHz), Phase Z: 125 kHz		
Internal I/O common processing	NPN		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%, –15%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	**OFF voltage/OFF current**	4.0 VDC max./1 mA max.
ON/OFF response time	1 μs max./2 μs max.		
Internal I/O common processing	NPN		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply method	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%, –15%)	**Current capacity of I/O power supply terminals**	IOV: 0.3 A max. per terminal for encoder supply section and 0.1 A max. per terminal for other sections IOG: 0.3 A max. per terminal for encoder supply section and 0.1 A max. per terminal for other sections
NX Unit power consumption	• Connected to a CPU Unit 1.15 W max. • Connected to a Communications Coupler Unit 0.85 W max.	**Current consumption from I/O power supply**	None
Weight	70 g max.		
Circuit layout	Encoder Input and External Inputs 		
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: There are no restrictions.		

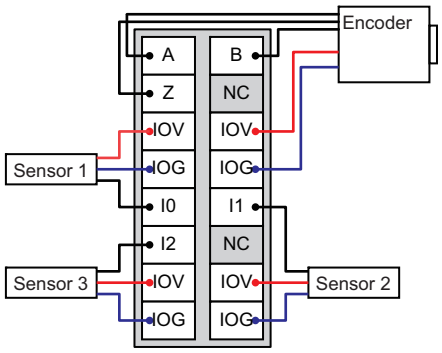
* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Terminal connection diagram			
Failure detection	None	**Protection**	None

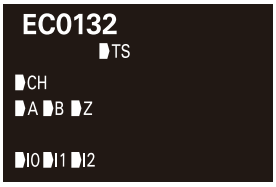
NX-EC0122

Unit name	Incremental Encoder Input Unit	**Model**	NX-EC0122
Number of channels	1 channel	**Type of external connections**	Screwless push-in terminal block (16 terminals)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators		**Input signals**	Counter: Phases A, B, and Z External Inputs: 3
Input form	Voltage input (24 V)		
Counting unit	Pulses		
Pulse input method	Phase difference pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	–2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Voltage input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/–15%)	**ON voltage**	19.6 VDC min./3 mA min.
Input current	4.2 mA typical (24 VDC)	**OFF voltage**	4.0 VDC max./1 mA max.
Maximum response frequency	Phases A and B: Single-phase 500 kHz (phase difference pulse input x4: 125 kHz), Phase Z: 125 kHz		
Internal I/O common processing	PNP		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/–15%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	**OFF voltage/OFF current**	4.0 VDC max./1 mA max.
ON/OFF response time	1 μs max./2 μs max.		
Internal I/O common processing	PNP		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/–15%)	**Current capacity of I/O power supply terminals**	IOV: 0.3 A max. per terminal for encoder supply section and 0.1 A max. per terminal for other sections IOG: 0.3 A max. per terminal for encoder supply section and 0.1 A max. per terminal for other sections
NX Unit power consumption	• Connected to a CPU Unit 1.30 W max. • Connected to a Communications Coupler Unit 0.95 W max.	**Current consumption from I/O power supply**	None
Weight	70 g max.		
Circuit layout	Encoder Input and External Inputs 		
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: There are no restrictions.		

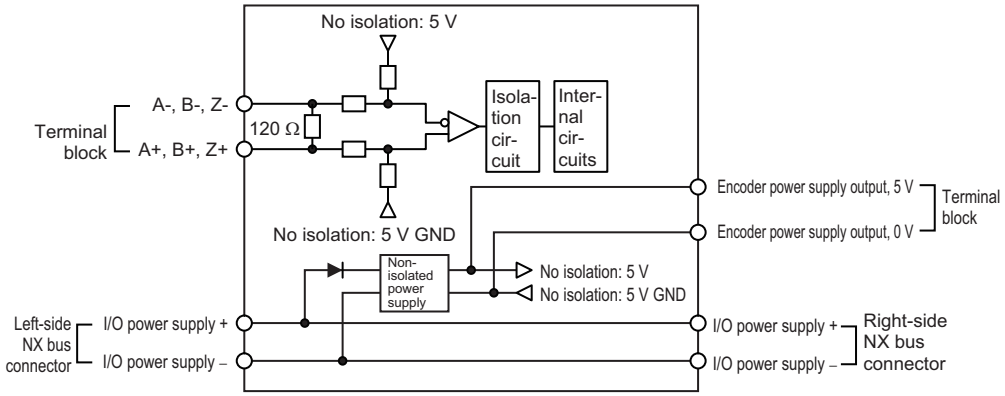
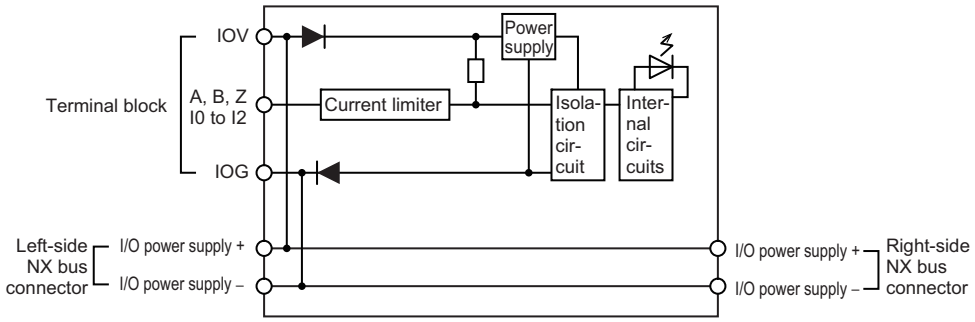
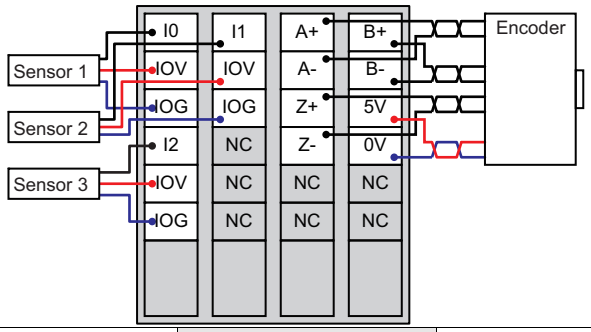
* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Terminal connection diagram			
Failure detection	None	**Protection**	None

NX-EC0132

Unit name	Incremental Encoder Input Unit	**Model**	NX-EC0132
Number of channels	1 channel	**Type of external connections**	Screwless clamping terminal block (12 terminals × 2)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators		**Input signals**	Counter: Phases A, B, and Z External Inputs: 3
Input form	Line receiver input		
Counting unit	Pulses		
Pulse input method	Phase differential pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	–2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Line driver specifications			
Input voltage	EIA standard RS-422-A line driver levels	**High level input voltage**	V_{IT+}: 0.1 V min.
Input impedance	120 Ω ± 5%	**Low level input voltage**	V_{IT-}: –0.1 V min.
Hysteresis voltage	Vhys ($V_{IT+} - V_{IT-}$): 60 mV		
Maximum response frequency	Phases A and B: Single-phase 4 MHz (phase differential pulse input x4: 1 MHz), Phase Z: 1 MHz		
5-V power supply for encoder	Output voltage: 5 VDC ±5% Output current: 500 mA max.		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%, –15%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	3.5 mA typical (24 VDC)	**OFF voltage/OFF current**	5.0 VDC max./1 mA max.
ON/OFF response time	1 μs max./1 μs max.		
Internal I/O common processing	NPN		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply method	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%, –15%)	**Current capacity of I/O power supply terminals**	IOV: 0.1 A max. per terminal IOG: 0.1 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.25 W max. • Connected to a Communications Coupler Unit 0.95 W max.	**Current consumption from I/O power supply**	Unit current consumption: 30 mA max. Consumption from encoder 5-V power supply: 0.28 × Encoder current consumption mA
Weight	130 g max.		

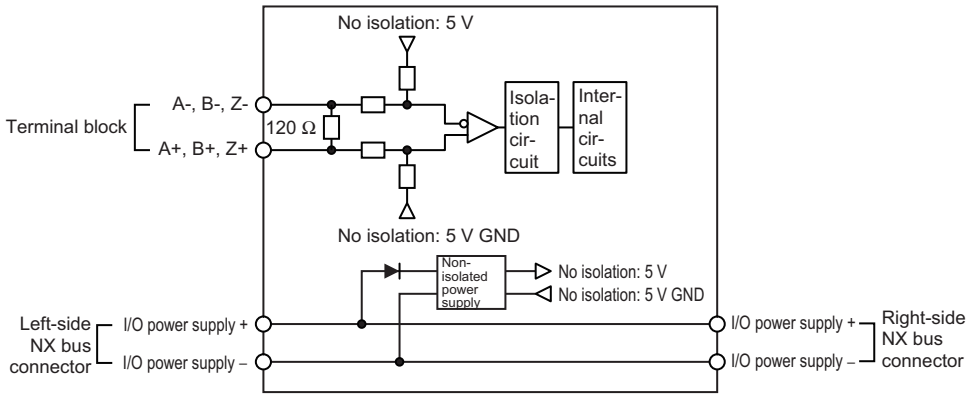
* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

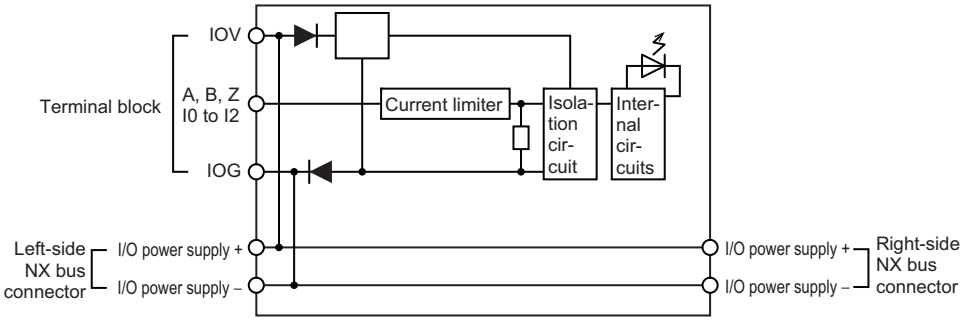
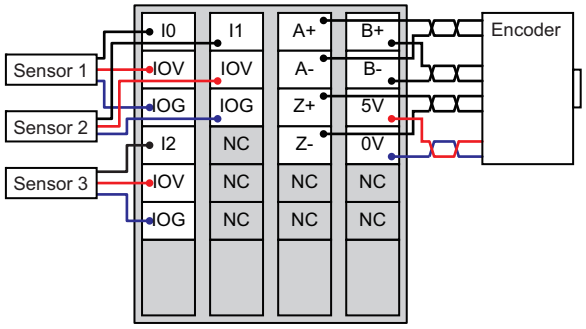
Circuit layout	Encoder Input  External Inputs 
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: There are no restrictions.
Terminal connection diagram	
Failure detection	None
Protection	None

NX-EC0142

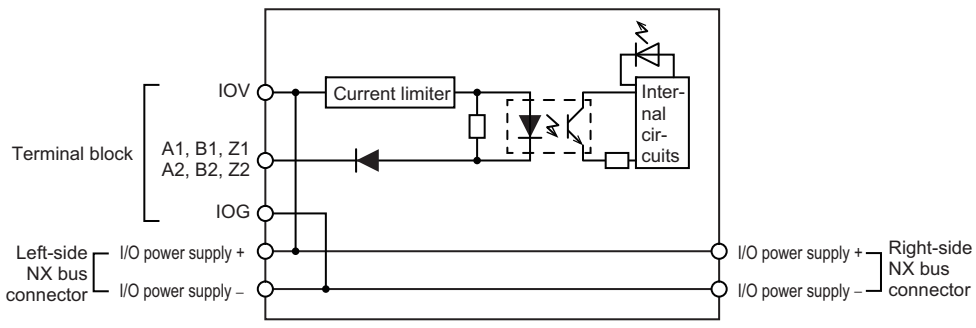
Unit name	Incremental Encoder Input Unit	**Model**	NX-EC0142
Number of channels	1 channel	**Type of external connections**	Screwless push-in terminal block (12 terminals × 2)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators		**Input signals**	Counter: Phases A, B, and Z External Inputs: 3
Input form	Line receiver input		
Counting unit	Pulses		
Pulse input method	Phase difference pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	–2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Line driver specifications			
Input voltage	EIA standard RS-422-A line driver levels	**High level input voltage**	V_{IT+}: 0.1 V min.
Input impedance	120 Ω ± 5%	**Low level input voltage**	V_{IT-}: –0.1 V min.
Hysteresis voltage	Vhys (V_{IT+} – V_{IT-}): 60 Mv		
Maximum response frequency	Phases A and B: Single-phase 4 MHz (phase difference pulse input x4: 1 MHz), Phase Z: 1 MHz		
5-V power supply for encoder	Output voltage: 5 VDC Output current: 500 mA max.		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/.15%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	3.5 mA typical (24 VDC)	**OFF voltage/OFF current**	4.0 VDC max./1 mA max.
ON/OFF response time	1 μs max./2 μs max.		
Internal I/O common processing	PNP		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/–15%)	**Current capacity of I/O power supply terminals**	IOV: 0.1 A max. per terminal IOG: 0.1 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.50 W max. • Connected to a Communications Coupler Unit 1.05 W max.	**Current consumption from I/O power supply**	Unit current consumption: 30 mA max. Consumption from encoder 5-V power supply: 0.28 × Encoder current consumption mA
Weight	130 g max.		

* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

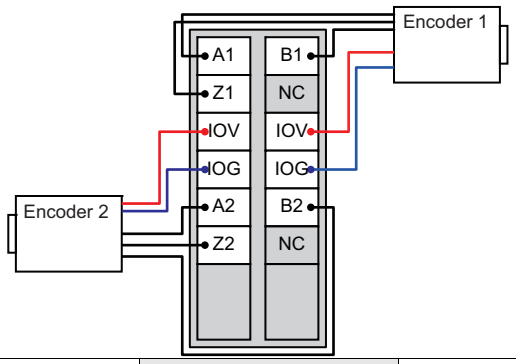
<table>
<tr><td>Circuit layout</td><td>Encoder Input
 

External Inputs
 
</td></tr>
<tr><td>Installation orientation and restrictions</td><td>Installation orientation:
• Connected to a CPU Unit: Possible in upright installation.
• Connected to a Communications Coupler Unit: Possible in 6 orientations.
Restrictions: There are no restrictions.</td></tr>
<tr><td>Terminal connection diagram</td><td> 
</td></tr>
<tr><td>Failure detection</td><td>None</td><td>Protection</td><td>None</td></tr>
</table>

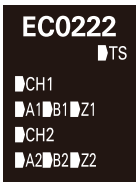
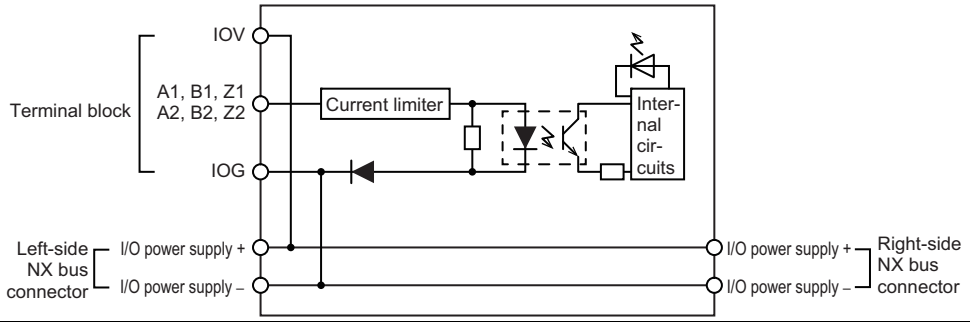
NX-EC0212

Unit name	Incremental Encoder Input Unit	**Model**	NX-EC0212
Number of channels	2 channels	**Type of external connections**	Screwless clamping terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators		**Input signals**	Counter: Phases A, B, and Z External Inputs: None
Input form	Voltage input (24 V)		
Counting unit	Pulses		
Pulse input method	Phase differential pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	–2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Voltage input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%, –15%)	**ON voltage**	19.6 VDC min./3 mA min.
Input current	4.2 mA typical (24 VDC)	**OFF voltage**	4.0 VDC max./1 mA max.
Maximum response frequency	Phases A and B: Single-phase 500 kHz (phase differential pulse input x4: 125 kHz), Phase Z: 125 kHz		
Internal I/O common processing	NPN		
External input specifications			
Input voltage	---	**ON voltage/ON current**	---
Input current	---	**OFF voltage/OFF current**	---
ON/OFF response time	---		
Internal I/O common processing	---		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply method	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%, –15%)	**Current capacity of I/O power supply terminals**	IOV: 0.3 A max. per terminal IOG: 0.3 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.15 W max. • Connected to a Communications Coupler Unit 0.85 W max.	**Current consumption from I/O power supply**	None
Weight	70 g max.		
Circuit layout	Encoder Input 		
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: There are no restrictions.		

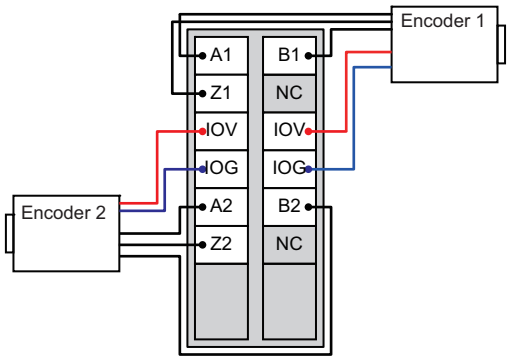
* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Terminal connection diagram			
Failure detection	None	**Protection**	None

NX-EC0222

Unit name	Incremental Encoder Input Unit	**Model**	NX-EC0222
Number of channels	2 channels	**Type of external connections**	Screwless push-in terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *		
Indicators		**Input signals**	Counter: Phases A, B, and Z External Inputs: None
Input form	Voltage input (24 V)		
Counting unit	Pulses		
Pulse input method	Phase difference pulse (multiplication x2/4), pulse + direction inputs, or up and down pulse inputs		
Counter range	–2,147,483,648 to 2,147,483,647 pulses		
Counter functions			
Counter type	Ring counter or linear counter		
Counter controls	Gate control, counter reset, and counter preset		
Latch function	Two external input latches and one internal latch		
Measurements	Pulse rate measurement and pulse period measurement		
Voltage input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/–15%)	**ON voltage**	19.6 VDC min./3 mA min.
Input current	4.2 mA typical (24 VDC)	**OFF voltage**	4.0 VDC max./1 mA max.
Maximum response frequency	Phases A and B: Single-phase 500 kHz (phase difference pulse input x4: 125 kHz), Phase Z: 125 kHz		
Internal I/O common processing	PNP		
External input specifications			
Input voltage	–––	**ON voltage/ON current**	–––
Input current	–––	**OFF voltage/OFF current**	–––
ON/OFF response time	–––		
Internal I/O common processing	–––		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	Photocoupler isolation
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/–15%)	**Current capacity of I/O power supply terminals**	IOV: 0.3 A max. per terminal IOG: 0.3 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.30 W max. • Connected to a Communications Coupler Unit 0.95 W max.	**Current consumption from I/O power supply**	None
Weight	70 g max.		
Circuit layout	Encoder Input 		
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: There are no restrictions.		

* The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.

Terminal connection diagram			
Failure detection	None	**Protection**	None

NX-series SSI Input Unit

NX-ECS□□□

Synchronous Serial Interface (SSI) to connect external axes to the Sysmac system

- Process SSI encoder input data using the MC Function Modules of the NJ/NX/NY5 Controllers
- SSI to connect an absolute encoder or linear encoder

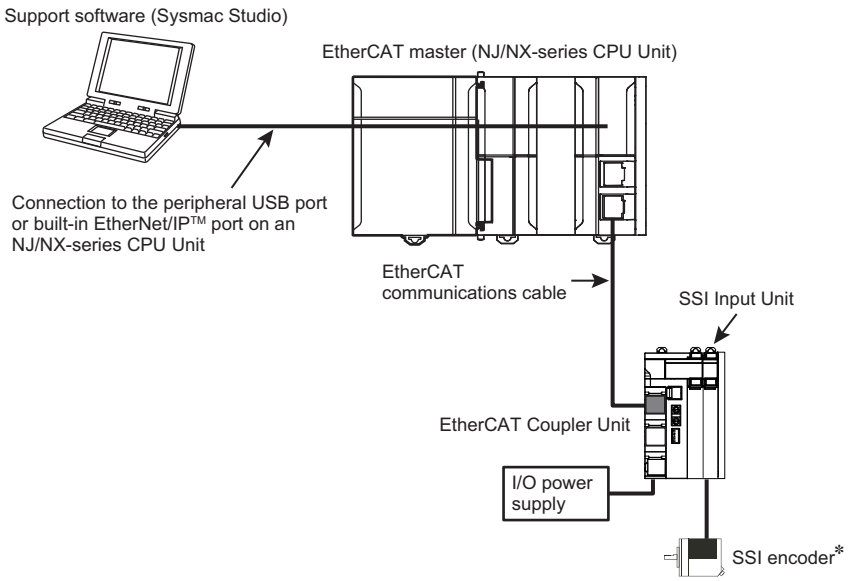
Features

- SSI clock frequency up to 2 MHz
- High-speed remote I/O control with communications cycle as fast as 125 μs*1
- Free-run refreshing, synchronous I/O refreshing, or task period prioritized refreshing*2 with the NX1P2 CPU Unit or EtherCAT Coupler Unit
- The MC Function Modules of the NJ/NX/NY5 Controllers allows the encoder to be used as a motion axis
- Choice of SSI Coding Methods (No conversion, binary code, or gray code)
- Time Stamping
- Multi-turn and single-turn encoders supported
- Data Refresh Status (Data refreshing can be checked on the host controller.)
- Maximum connecting SSI cable length: 400 m
- Connect to the CJ PLC using the EtherNet/IP™ bus coupler

*1. When using the NX-EC01□□ together with the NX701-□□□□ and NX-ECC203.
*2. Task Period Prioritized refreshing is available when the NX-ECC203 is used together.

System Configuration

The following figure shows a system configuration when an SSI Input Unit is connected to an NJ/NX-series CPU Unit via an EtherCAT Coupler Unit.



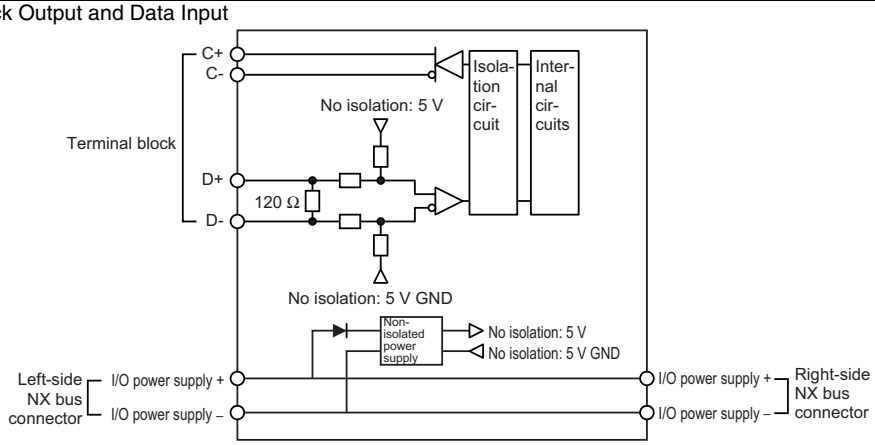
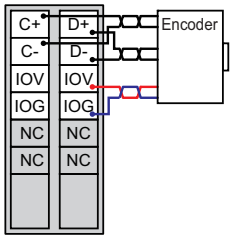
* The SSI encoder is supplied with 24-VDC power from the SSI Input Unit.

SSI Input Unit Specifications

SSI Input Unit 1 channel NX-ECS112

Unit name	SSI Input Unit	**Model**	NX-ECS112
Number of channels	1 channel	**Type of external connections**	Screwless push-in terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *1		
Indicators		**Input signals**	External inputs: 2 Data input (D+,D–) External outputs: 2 Clock output (C+, C–)
I/O interface	Synchronized serial interface (SSI)		
Clock output	EIA standard RS-422-A line driver levels		
Data input	EIA standard RS-422-A line receiver levels		
Maximum data length	32 bits (The single-turn, multi-turn, and status data length can be set.)		
Coding method	No conversion, binary code, or gray code		
Baud Rate	100 kHz, 200 kHz, 300 kHz, 400 kHz, 500 kHz, 1.0 MHz, 1.5 MHz, or 2.0 MHz		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/–15%)	**Current capacity of I/O power supply terminals**	IOV: 0.3 A max. per terminal IOG: 0.3 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.20 W max. • Connected to a Communications Coupler Unit 0.85 W max.	**Current consumption from I/O power supply**	20 mA

Maximum transmission distance *2	**Baud Rate**	**Maximum transmission distance**
	100 kHz	400 m
	200 kHz	190 m
	300 kHz	120 m
	400 kHz	80 m
	500 kHz	60 m
	1.0 MHz	25 m
	1.5 MHz	10 m
	2.0 MHz	5 m

Weight	65 g
Circuit layout	SSI Clock Output and Data Input 
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions
Terminal connection diagram	

Failure detection	None	**Protection**	None

*1. The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit. Refer to information on the I/O refreshing methods in the W524 manual for the communications cycles for each model.

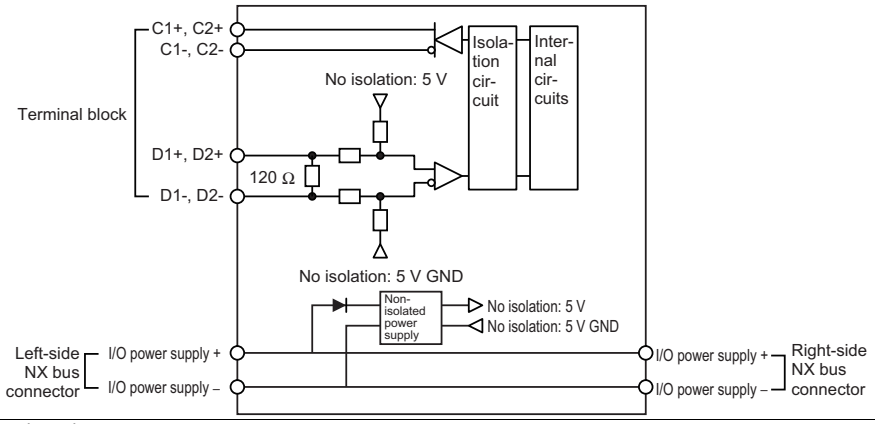
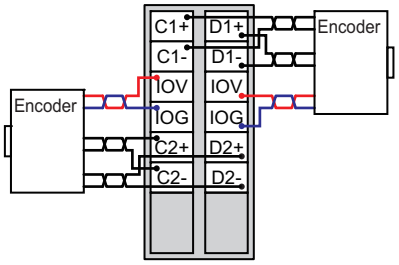
*2. The maximum transmission distance for an SSI Input Unit depends on the baud rate due to the delay that can result from the responsiveness of the connected encoder and cable impedance. The maximum transmission distance is only a guideline. Review the specifications for the cables and encoders in the system and evaluate the operation of the equipment before use.

SSI Input Unit 2 channel NX-ECS212

Unit name	SSI Input Unit	**Model**	NX-ECS212
Number of channels	2 channels	**Type of external connections**	Screwless push-in terminal block (12 terminals)
I/O refreshing method	Free-Run refreshing, synchronous I/O refreshing or task period prioritized refreshing *1		
Indicators		**Input signals**	External inputs: 2 Data input (D+, D–) External outputs: 2 Clock output (C+, C–)
I/O interface	Synchronized serial interface (SSI)		
Clock output	EIA standard RS-422-A line driver levels		
Data input	EIA standard RS-422-A line receiver levels		
Maximum data length	32 bits (The single-turn, multi-turn, and status data length can be set.)		
Coding method	No conversion, binary code, or gray code		
Baud Rate	100 kHz, 200 kHz, 300 kHz, 400 kHz, 500 kHz, 1.0 MHz, 1.5 MHz, or 2.0 MHz		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/–15%)	**Current capacity of I/O power supply terminals**	IOV: 0.3 A max. per terminal IOG: 0.3 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.25 W max. • Connected to a Communications Coupler Unit 0.9 W max.	**Current consumption from I/O power supply**	30 mA

Maximum transmission distance *2

Baud Rate	Maximum transmission distance
100 kHz	400 m
200 kHz	190 m
300 kHz	120 m
400 kHz	80 m
500 kHz	60 m
1.0 MHz	25 m
1.5 MHz	10 m
2.0 MHz	5 m

Weight	65 g
Circuit layout	SSI Clock Output and Data Input 
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: No restrictions
Terminal connection diagram	

Failure detection	None	**Protection**	None

*1. The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit. Refer to information on the I/O refreshing methods in the W524 manual for the communications cycles for each model.

*2. The maximum transmission distance for an SSI Input Unit depends on the baud rate due to the delay that can result from the responsiveness of the connected encoder and cable impedance. The maximum transmission distance is only a guideline. Review the specifications for the cables and encoders in the system and evaluate the operation of the equipment before use.

NX-series Pulse Output Unit

NX-PG0□□□

Positioning control with pulse outputs to command stepper motor drives and other pulse input motor drives

- The MC Function Modules of the NJ/NX/NY5 Controllers enable pulse outputs for motor control
- The same motion control instructions as those for Servomotor control can be used to program single-axis PTP control and interpolation
- Non-networked motors, such as DD motors, stepper motors, and DC motors, can be connected

Features

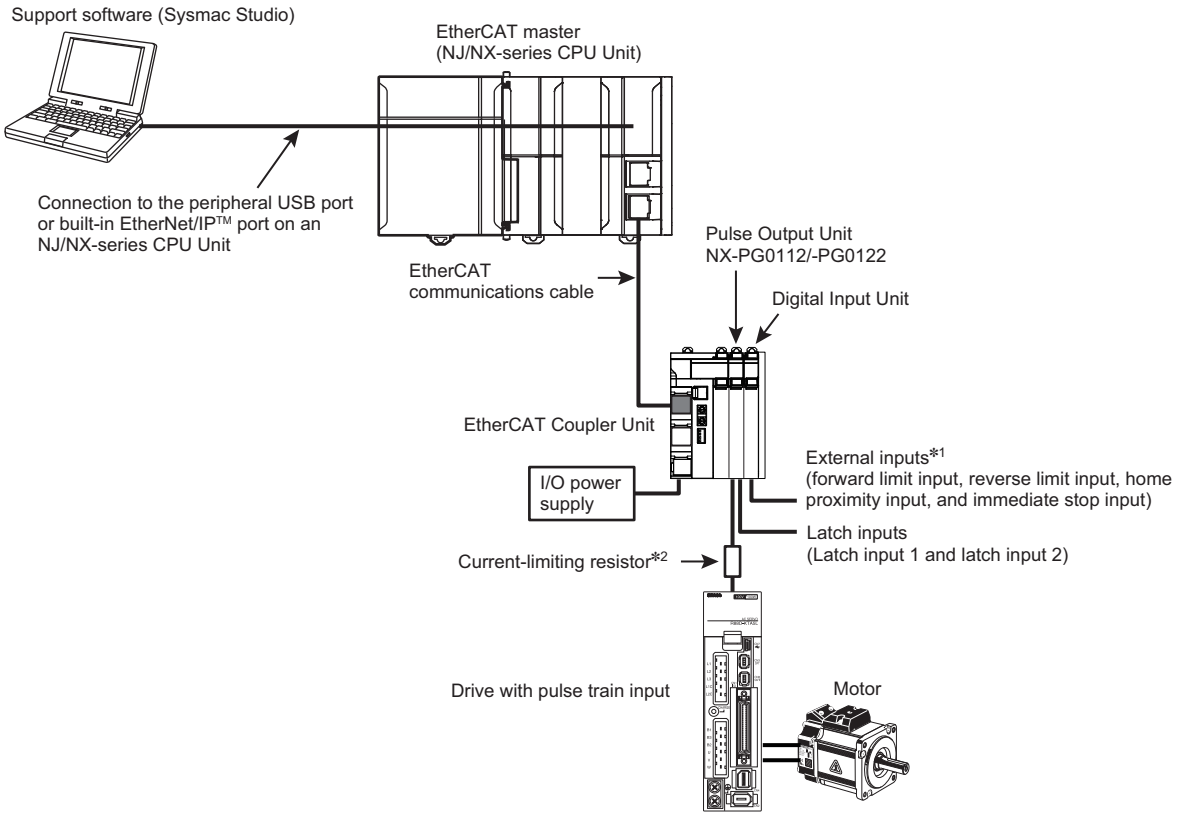
- The MC Function Modules of the NJ/NX/NY5 Controller allows you to connect with as many axes as the NJ/NX/NY5 Controller can control
- High-speed remote I/O control with communications cycle as fast as 125 μs*1
- Free-run refreshing or task period prioritized refreshing*2 with the EtherCAT Coupler Unit
- Latching (2 external latch inputs)
- Open collector pulse outputs up to 500 kHz or line driver pulse outputs up to 4 MHz
- Line driver output models with two or four channels

*1. When using the NX-EC01□□ together with the NX701-□□□□ and NX-ECC203.
*2. Task Period Prioritized refreshing is available when the NX-ECC203 is used together.

System Configurations

NX-PG0112/-PG0122

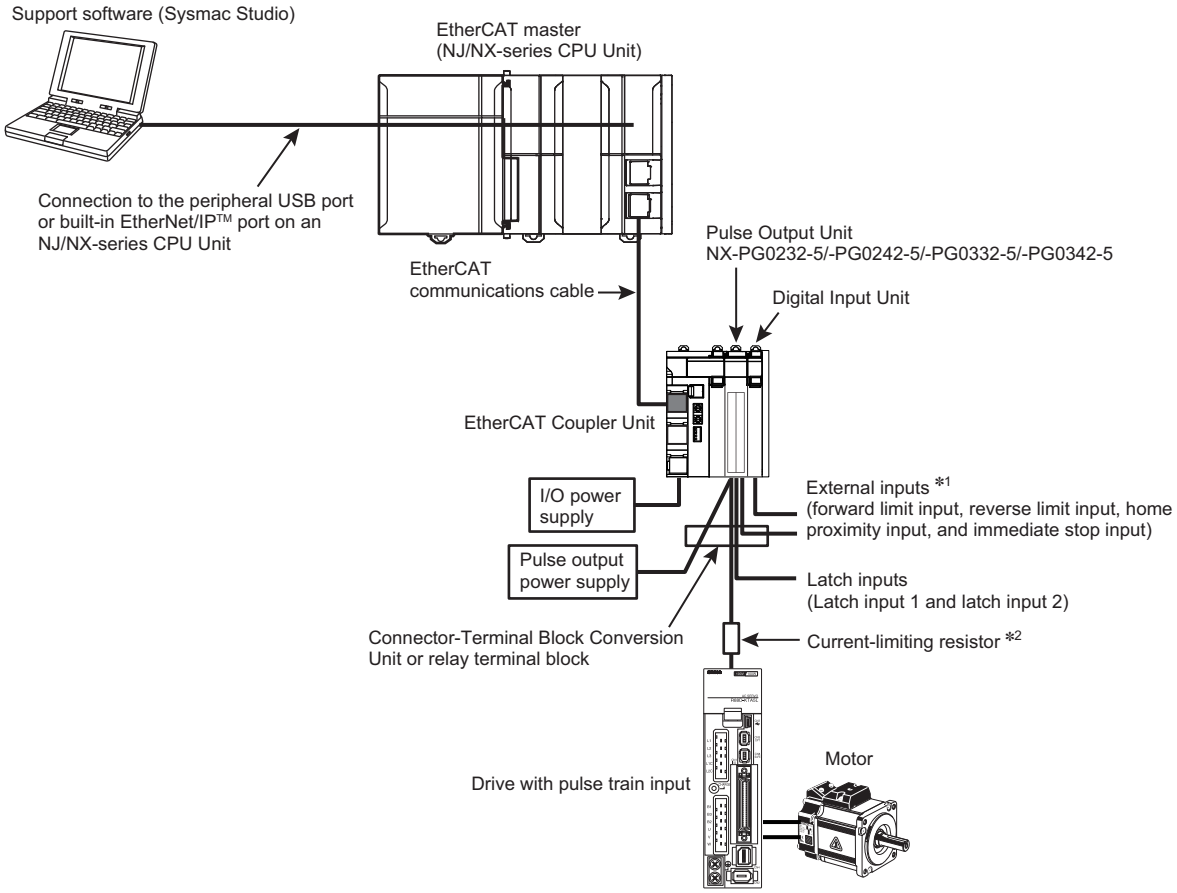
The following figure shows a system configuration when the NX-PG0112/-PG0122 Pulse Output Unit is connected to an NJ/NX-series CPU Unit via an EtherCAT Coupler Unit.



*1. When the Unit is connected to an NJ-series CPU, you can use these inputs by adding a Digital Input Unit and assigning MC Function Module functions.
*2. The pulse output from a Pulse Output Unit is a 24-VDC PNP open collector output. Connect an external current-limiting resistor according to the input specifications of the connected motor drive.
Example: For a G5-series Servo Drive, connect a 2-kΩ (1/2-W) resistor in series.

NX-PG0232-5/-PG0242-5/-PG0332-5/-PG0342-5

The following figure shows a system configuration when the NX-PG0232-5/-PG0242-5/-PG0332-5/-PG0342-5 Pulse Output Unit is connected to an NJ/NX-series CPU Unit via an EtherCAT Coupler Unit.



*1. When the Unit is connected to an NJ/NX-series CPU, you can use these inputs by assigning MC Function Module functions to external inputs inside a Pulse Output Unit or to inputs of a Digital Input Unit that is added. For information on Digital Input Units, refer to the *NX-series Digital I/O Units User's Manual* (Cat. No. W521). For NX-PG0232-5, NX-PG0242-5, NX-PG0332-5, and NX-PG0342-5 Pulse Output Units, the number of available external inputs that can be used in always ON status is restricted by ambient operating temperature and installation orientation.

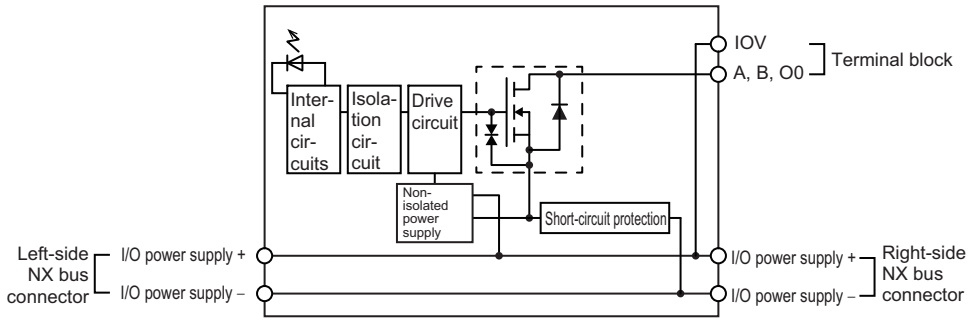
*2. The pulse output from a Pulse Output Unit is a 24-VDC open collector output. When it is used as a control output for a motor drive such as an error counter reset output, connect an external current-limiting resistor according to the input specifications of the connected motor drive. A line drive output does not need a current limiting resistor.

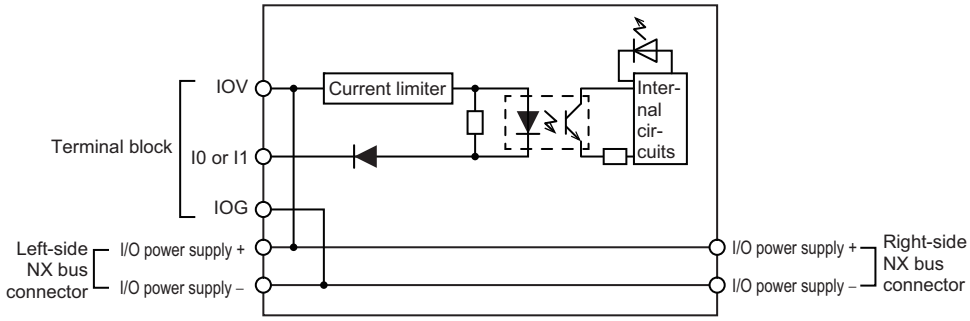
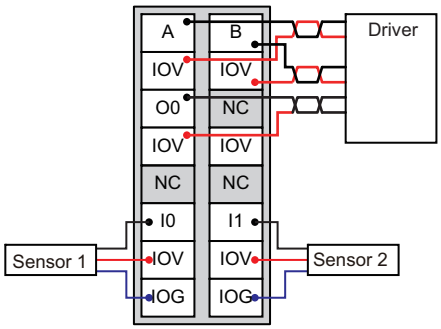
Pulse Output Unit Specifications

Pulse Output Unit (Open collector output, NPN type) NX-PG0112

Unit name	Pulse Output Unit	**Model**	NX-PG0112
Number of axes	1	**Type of external connections**	Screwless clamping terminal block (16 terminals)
I/O refreshing method *1	Synchronous I/O refreshing or task period prioritized refreshing		
Indicators		**I/O signals**	Inputs: 2, External inputs Outputs: 3, The outputs are the forward direction pulse output, reverse direction pulse output, and external output (one of each output).
Control method	Open-loop control through pulse string output		
Controlled drive	Servo drive with a pulse string input or a stepper motor drive		
Pulse output form	Open collector output		
Unit of control	Pulses		
Maximum pulse output speed	500 kpps		
Pulse output method	Forward/reverse direction outputs or Pulse + direction outputs		
Position control range	–2,147,483,648 to 2,147,483,647 pulses		
Velocity control range	1 to 500,000 pps		
Positioning *2			
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding		
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)		
Single-axis synchronized control	Cam operation and gear operation		
Single-axis manual operation	Jogging		
Auxiliary function for single-axis control	Homing, stopping, and override changes		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/–15%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	**OFF voltage/OFF current**	4.0 VDC max./1 mA max.
ON/OFF response time	1 μs max./2 μs max.		
Internal I/O common processing	NPN		
Pulse output and external output specifications			
Rated voltage	24 VDC		
Load voltage range	15 to 28.8 VDC	**Residual voltage**	1.0 V max.
Maximum load current	30 mA	**Leakage current**	0.1 mA max.
ON/OFF response time	Pulse output: Refer to "*NX-series Position Interface Units User's Manual* (W524-E1)". External output: 5 μs max./5 μs max.		
Internal I/O common processing	NPN		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply method	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%, –15%)	**Current capacity of I/O power supply terminals**	IOV: 0.1 A max. per terminal IOG: 0.1 A max. per terminal
NX Unit power consumption	• Connected to a CPU Unit 1.15 W max. • Connected to a Communications Coupler Unit 0.80 W max.	**Current consumption from I/O power supply**	20 mA max.
Weight	70 g max.	**Cable length**	3 m max.

*1. The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.
*2. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.
A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.
Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

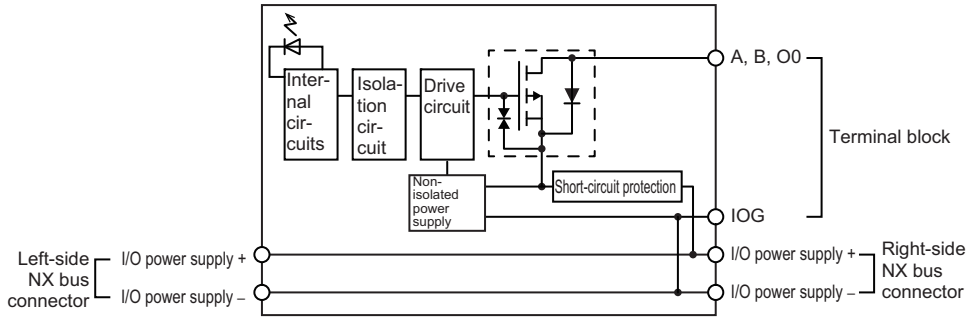
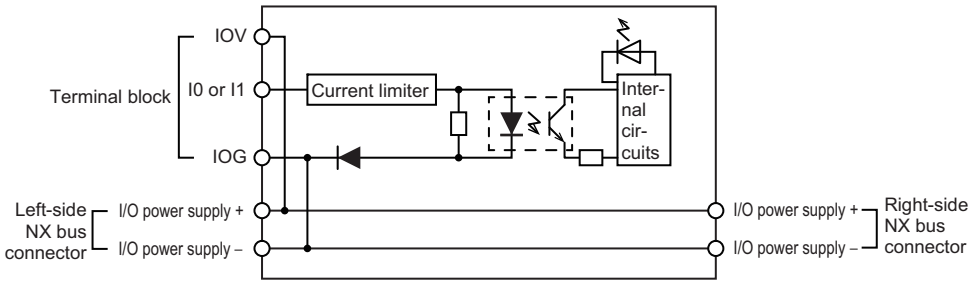
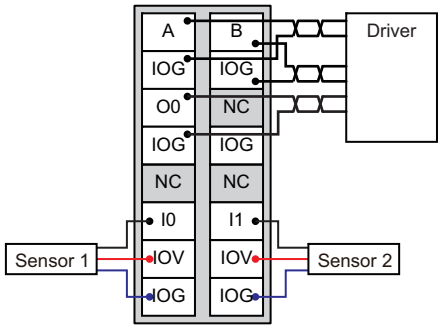
<table>
<tr><td>Circuit layout</td><td>Pulse Output and External Output
 

External Inputs
 
</td></tr>
<tr><td>Installation orientation and restrictions</td><td>Installation orientation:
• Connected to a CPU Unit: Possible in upright installation.
• Connected to a Communications Coupler Unit: Possible in 6 orientations.
Restrictions: There are no restrictions.</td></tr>
<tr><td>Terminal connection diagram</td><td> 
</td></tr>
<tr><td>Failure detection</td><td>None</td><td>Protection</td><td>None</td></tr>
</table>

Pulse Output Unit (Open collector output, NPN type) NX-PG0122

Unit name	Pulse Output Unit	**Model**	NX-PG0122
Number of axes	1	**Type of external connections**	Screwless push-in terminal block (16 terminals)
I/O refreshing method *1	Synchronous I/O refreshing or task period prioritized refreshing		
Indicators		**I/O signals**	Inputs: 2, External inputs *2 Outputs: 3, The outputs are the forward direction pulse output, reverse direction pulse output, and external output *3 (one of each output).
Control method	Open-loop control through pulse string output		
Controlled drive	Servo drive with a pulse train input or a stepper motor drive		
Pulse output form	Open collector output		
Control unit	Pulses		
Maximum pulse output speed	500 kpps		
Pulse output method	Forward/reverse direction pulse outputs or pulse + direction outputs		
Position control range	–2,147,483,648 to 2,147,483,647 pulses		
Velocity control range	1 to 500,000 pps		
Positioning *4			
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding		
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)		
Single-axis synchronized control	Cam operation and gear operation		
Single-axis manual operation	Jogging		
Auxiliary function for single-axis control	Homing, stopping, and override changes		
External input specifications			
Input voltage	20.4 to 28.8 VDC (24 VDC +20%/–15%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	**OFF voltage/OFF current**	4.0 VDC max./1 mA max.
ON/OFF response time	1 μs max./2 μs max.		
Internal I/O common processing	PNP		
External output specifications			
Rated voltage	24 VDC		
Load voltage range	15 to 28.8 VDC	**Residual voltage**	1.0 V max.
Maximum load current	30 mA	**Leakage current**	0.1 mA max.
ON/OFF response time	Pulse output: Refer to "*NX-series Position Interface Units User's Manual* (W524-E1)". 5 μs max./5 μs max.		
Internal I/O common processing	PNP		
Dimensions	12 × 100 × 71 mm (W×H×D)	**Isolation method**	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute with leakage current of 5 mA max.
I/O power supply source	Supplied from the NX bus. 20.4 to 28.8 VDC (24 VDC +20%/–15%)	**Current capacity of I/O power supply terminals**	IOV: 0.1 A max. per terminal IOG: 0.1 A max. per terminal

*1. The I/O refreshing method is automatically set according to the connected CPU Unit or Communications Coupler Unit.
*2. You can use the external inputs as latch inputs.
*3. You can use the external output as error counter reset outputs.
*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.
A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.
Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

NX Unit power consumption	• Connected to a CPU Unit 1.30 W max. • Connected to a Communications Coupler Unit 0.90 W max.	**Current consumption from I/O power supply**	20 mA max.
Weight	70 g max.	**Cable length**	3 m max.
Circuit layout	Pulse Output and External Output  External Inputs 		
Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: There are no restrictions.		
Terminal connection diagram			
Failure detection	None	**Protection**	None

Pulse Output Unit (Line driver output, NPN type) 2 channels NX-PG0232-5

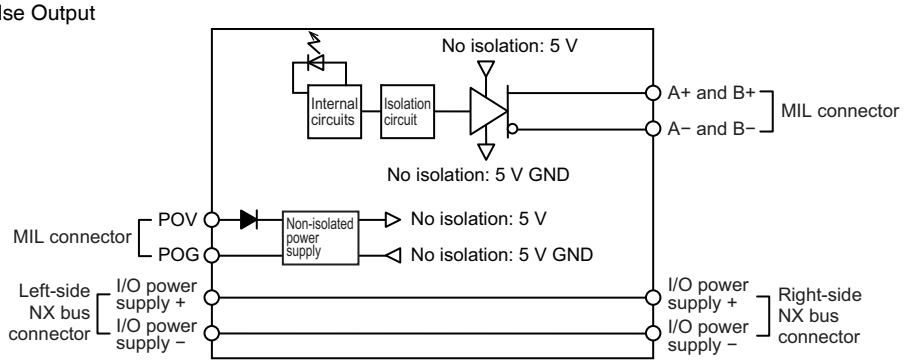
Unit name	Pulse Output Unit	**Model**	NX-PG0232-5
Number of channels	2 channels	**Type of external connections**	MIL connector (34 terminals ×1)
I/O refreshing method *1	Synchronous I/O refreshing or task period prioritized refreshing		
Indicators		**I/O signals**	Inputs: 5 per channel. External inputs *2 Outputs: 5 per channel. 1 forward direction pulse output, 1 reverse direction pulse output, and 3 external outputs (per channel) *3
Control method	Open-loop control through pulse string output		
Controlled drive	Servo drive with a pulse string input or a stepper motor drive		
Pulse output form	Line driver output		
Unit of control	Pulses		
Maximum pulse output speed	4 Mpps		
Pulse output method	Forward/reverse direction pulse outputs, Pulse + direction outputs, or Phase differential pulse output multiplication x1/2/4		
Position control range	–2,147,483,648 to 2,147,483,647 pulses		
Velocity control range	1 to 4,000,000 pps		
Positioning *4			
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding		
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)		
Single-axis synchronized control	Cam operation and gear operation		
Single-axis manual operation	Jogging		
Auxiliary function for single-axis control	Homing, stopping, and override changes		
External input specifications (except for line receiver inputs)			
Input voltage	21.6 to 26.4 VDC (24 VDC +10%, –10%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	**OFF voltage/OFF current**	4.0 VDC max./1 mA max.
ON/OFF response time	External inputs 0 and 1: 1 μs max./2 μs max. External inputs 2 to 4: 20 μs max./400 μs max.		
Internal I/O common processing	NPN		
External input specifications (line receiver inputs)			
Input voltage	EIA standard RS–422–A line driver levels	**High level input voltage**	V_{IT+}: 0.1 V min.
Input impedance	120 Ω ± 5%	**Low level input voltage**	V_{IT-}: –0.1 V max.
Hysteresis voltage	Vhys (V_{IT+} – V_{IT-}): 60 mV		
Line driver output specifications			
Output voltage	RS-422-A line driver level (equivalent to AM26C31)		
Maximum load current	20 mA		
Maximum output frequency	4 Mpps		
External output specifications			
Rated voltage	24 VDC		
Load voltage range	15 to 28.8 VDC	**Residual voltage**	1.0 V max.
Maximum load current	30 mA	**Leakage current**	0.1 mA max.
ON/OFF response time	External output 0: 5 μs max./5 μs max. External outputs 1 and 2: 0.5 ms max./1 ms max.		
Internal I/O common processing	NPN		

*1. The I/O refreshing method is automatically set according to the connected Communications Coupler Unit and CPU Unit.
*2. You can use the external input 0 as a latch input.
*3. You can use the external output 0 as an error counter reset output.
*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.
A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.
Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

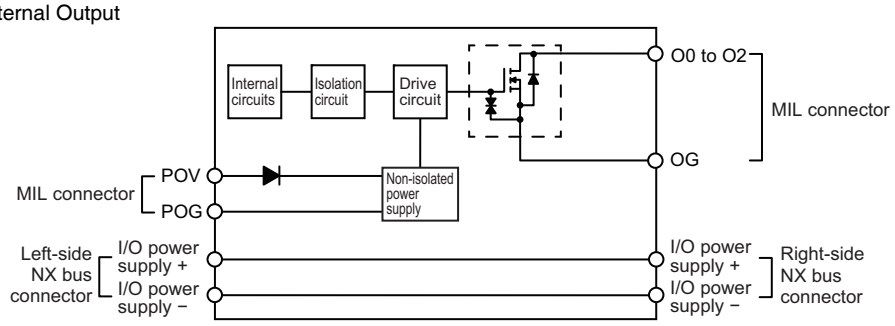
Dimensions	30 × 100 × 71 mm (W×H×D)	**Isolation method**	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from external source 20.4 to 28.8 VDC (24 VDC +20%, -15%)	**Current capacity of I/O power supply terminals**	Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.55 W max. • Connected to a Communications Coupler Unit 1.20 W max.	**Current consumption from I/O power supply**	50 mA max.
Weight	110 g max.	**Cable length**	Line driver outputs: 10 m max. Other I/O: 3 m max.

Circuit layout

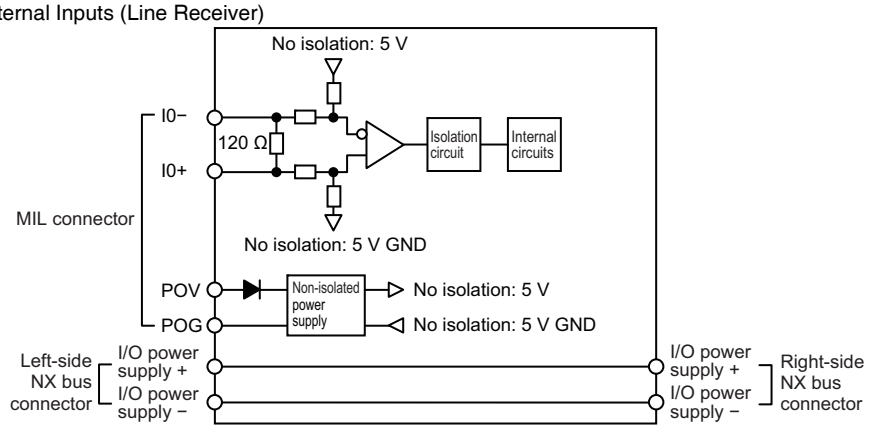
Pulse Output



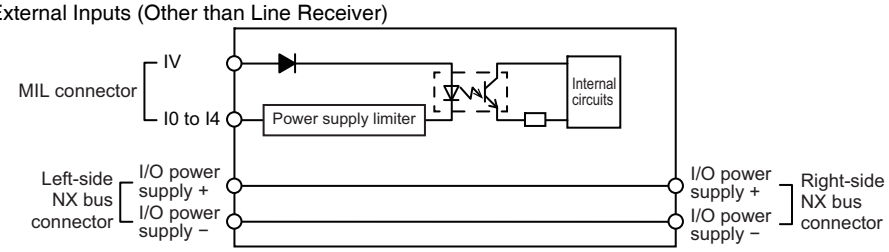
External Output

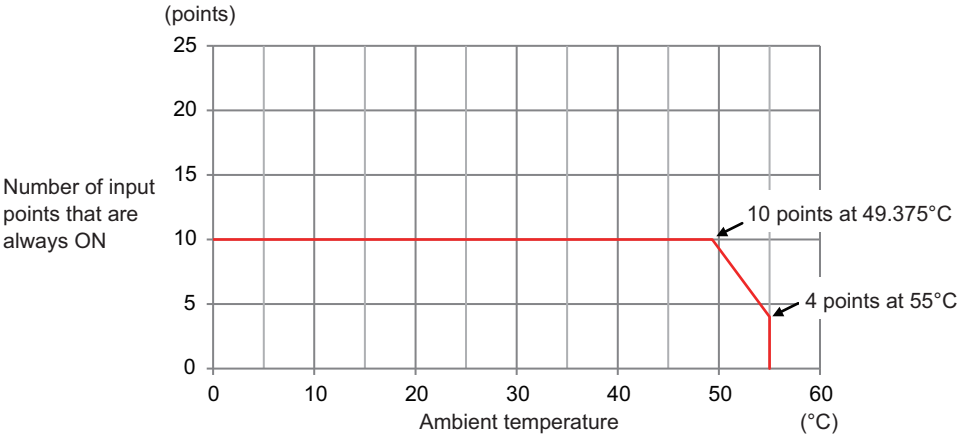
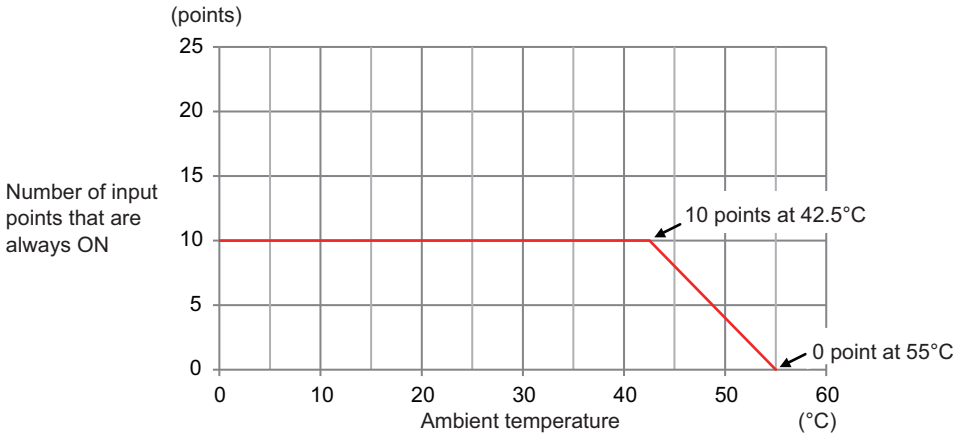


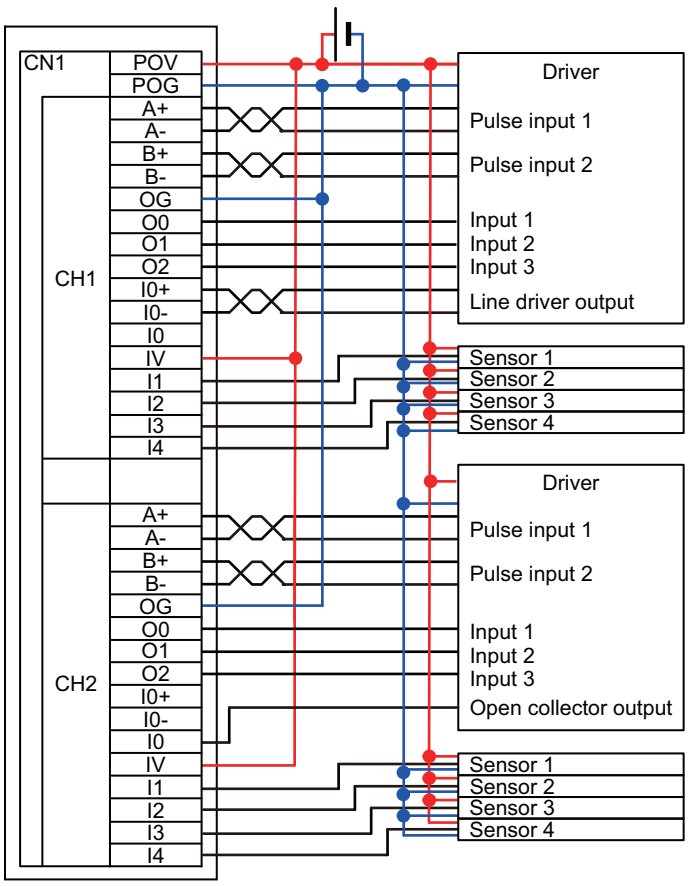
External Inputs (Line Receiver)



External Inputs (Other than Line Receiver)



Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: The number of external inputs that can be always ON is restricted as shown below. • For upright installation  • For any installation other than upright 

Terminal connection diagram			
Failure detection	None	**Protection**	None

Pulse Output Unit (Line driver output, PNP type) 2 channels NX-PG0242-5

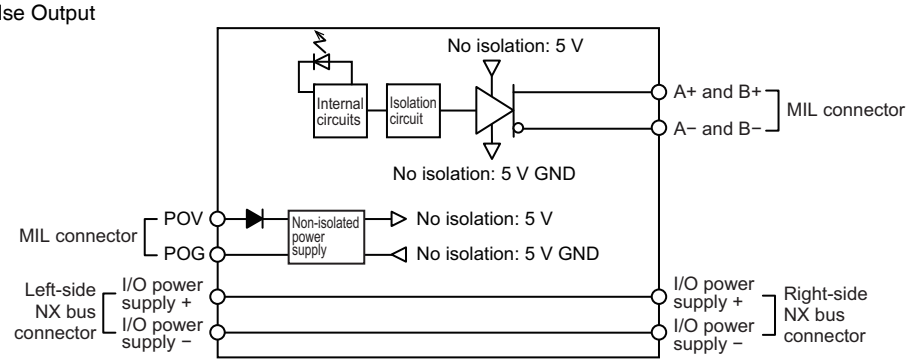
Unit name	Pulse Output Unit	**Model**	NX-PG0242-5
Number of channels	2 channels	**Type of external connections**	MIL connector (34 terminals ×1)
I/O refreshing method *1	Synchronous I/O refreshing or task period prioritized refreshing		
Indicators		**I/O signals**	Inputs: 5 per channel. External inputs *2 Outputs: 5 per channel. 1 forward direction pulse output, 1 reverse direction pulse output, and 3 external outputs (per channel) *3
Control method	Open-loop control through pulse string output		
Controlled drive	Servo drive with a pulse string input or a stepper motor drive		
Pulse output form	Line driver output		
Unit of control	Pulses		
Maximum pulse output speed	4 Mpps		
Pulse output method	Forward/reverse direction pulse outputs, Phase + direction outputs, or Phase differential pulse output multiplication x1/2/4		
Position control range	–2,147,483,648 to 2,147,483,647 pulses		
Velocity control range	1 to 4,000,000 pps		
Positioning*4			
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding		
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)		
Single-axis synchronized control	Cam operation and gear operation		
Single-axis manual operation	Jogging		
Auxiliary function for single-axis control	Homing, stopping, and override changes		
External input specifications (except for line receiver inputs)			
Input voltage	21.6 to 26.4 VDC (24 VDC +10%, –10%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	**OFF voltage/OFF current**	4.0 VDC max./1 mA max.
ON/OFF response time	External inputs 0 and 1: 1 μs max./2 μs max. External inputs 2 to 4: 20 μs max./400 μs max.		
Internal I/O common processing	PNP		
External input specifications (line receiver inputs)			
Input voltage	EIA standard RS–422–A line driver levels	**High level input voltage**	V_{IT+}: 0.1 V min.
Input impedance	120 Ω ± 5%	**Low level input voltage**	V_{IT-}: –0.1 V max.
Hysteresis voltage	Vhys (V_{IT+} – V_{IT-}): 60 mV		
Line driver output specifications			
Output voltage	RS-422-A line driver level (equivalent to AM26C31)		
Maximum load current	20 mA		
Maximum output frequency	4 Mpps		
External output specifications			
Rated voltage	24 VDC		
Load voltage range	15 to 28.8 VDC	**Residual voltage**	1.0 V max.
Maximum load current	30 mA	**Leakage current**	0.1 mA max.
ON/OFF response time	External output 0: 5 μs max./200 μs max. External outputs 1 and 2: 0.5 ms max./1 ms max.		
Internal I/O common processing	PNP		

*1. The I/O refreshing method is set according to the connected Communications Coupler Unit and CPU Unit.
*2. You can use the external input 0 as a latch input.
*3. You can use the external output 0 as an error counter reset output.
*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.
A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.
Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

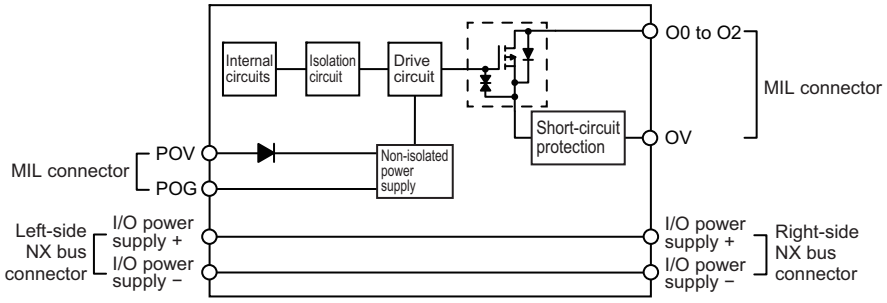
Dimensions	30 × 100 × 71 mm (W×H×D)	**Isolation method**	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from external source 20.4 to 28.8 VDC (24 VDC +20%, -15%)	**Current capacity of I/O power supply terminals**	Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.55 W max. • Connected to a Communications Coupler Unit 1.20 W max.	**Current consumption from I/O power supply**	50 mA max.
Weight	110 g max.	**Cable length**	Line driver outputs: 10 m max. Other I/O: 3 m max.

Circuit layout

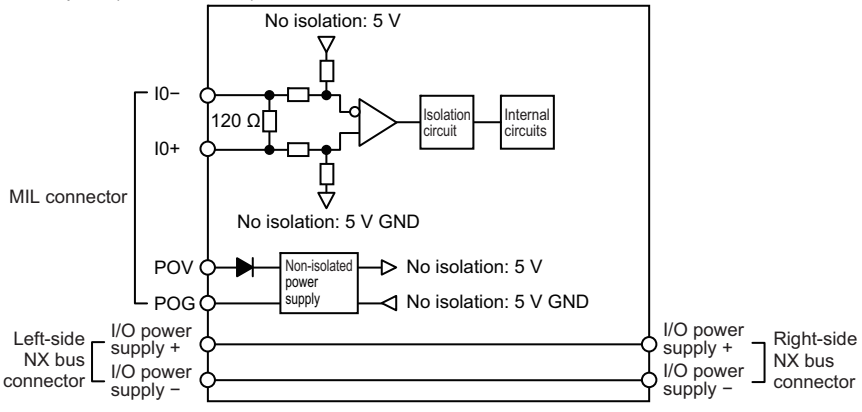
Pulse Output



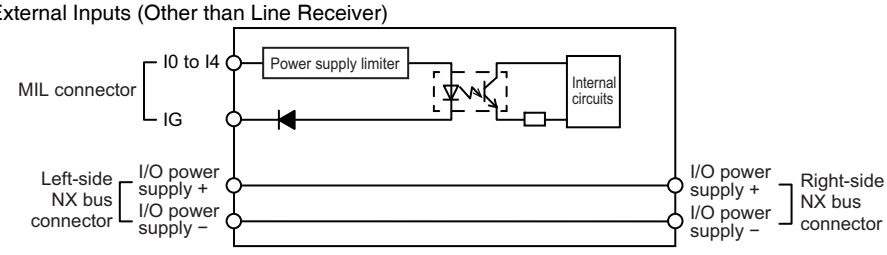
External Output

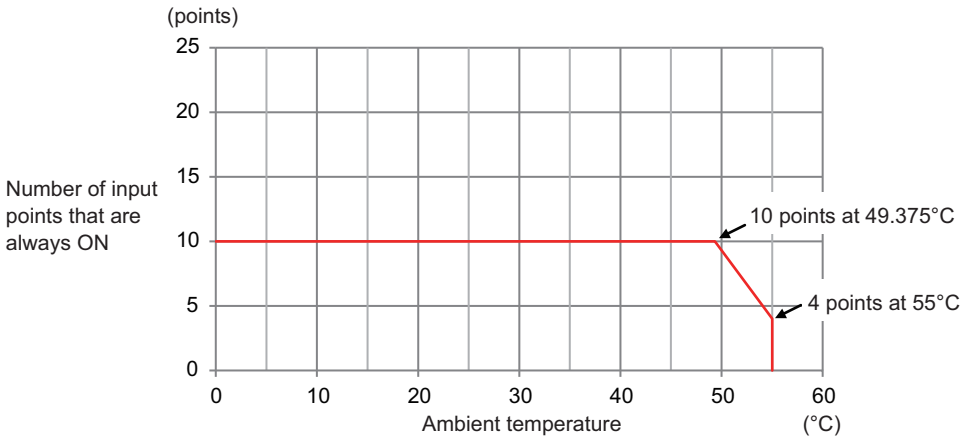
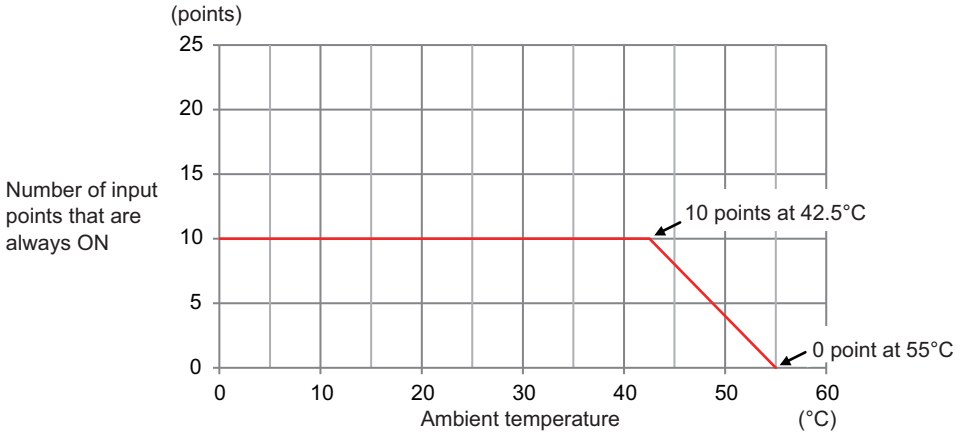


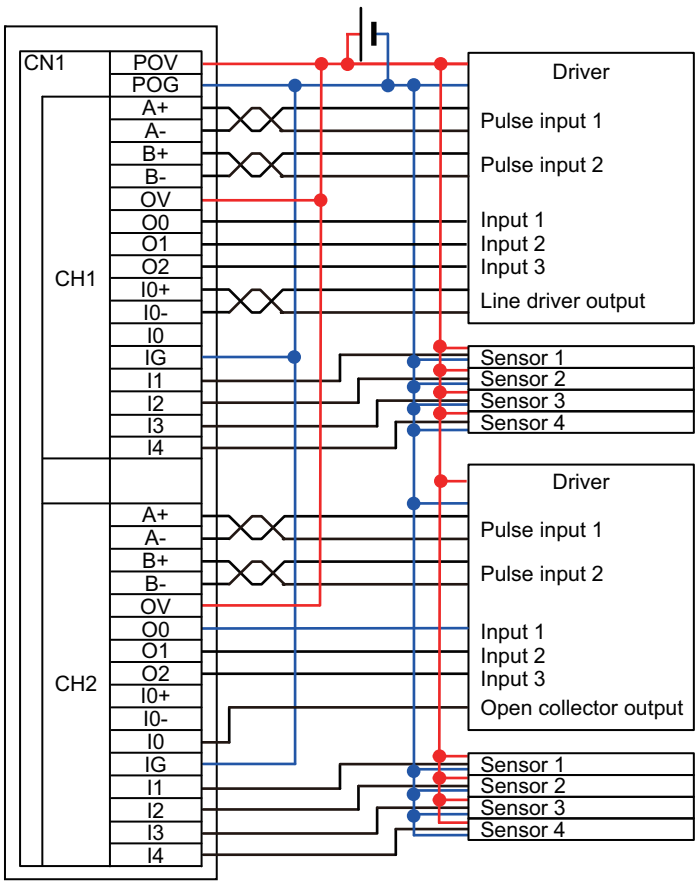
External Inputs (Line Receiver)



External Inputs (Other than Line Receiver)

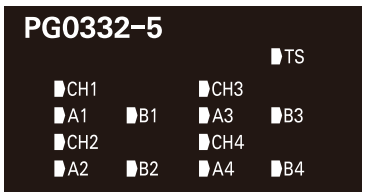


Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: The number of external inputs that can be always ON is restricted as shown below. • For upright installation  • For any installation other than upright 

Terminal connection diagram	

Failure detection	None	**Protection**	None

Pulse Output Unit (Line driver output, NPN type) 4 channels NX-PG0332-5

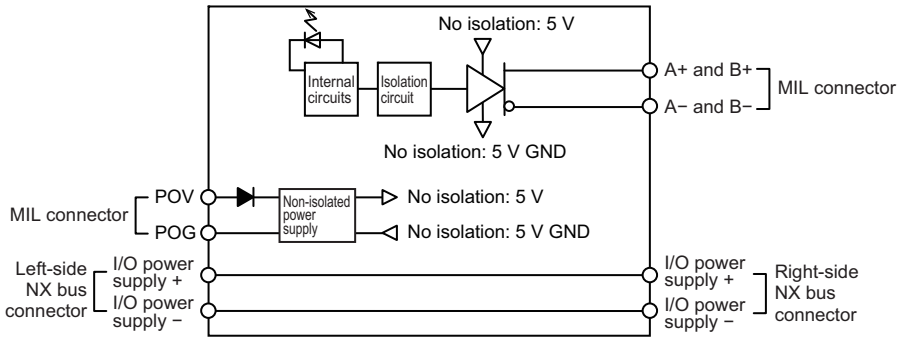
Unit name	Pulse Output Unit	**Model**	NX-PG0332-5
Number of channels	4 channels	**Type of external connections**	MIL connector (34 terminals ×2)
I/O refreshing method *1	Synchronous I/O refreshing or task period prioritized refreshing		
Indicators		**I/O signals**	Inputs: 5 per channel. External inputs*2 Outputs: 5 per channel. 1 forward direction pulse output, 1 reverse direction pulse output, and 3 external outputs (per channel)*3
Control method	Open-loop control through pulse string output		
Controlled drive	Servo drive with a pulse string input or a stepper motor drive		
Pulse output form	Line driver output		
Unit of control	Pulses		
Maximum pulse output speed	4 Mpps		
Pulse output method	Forward/reverse direction pulse outputs, Pulse + direction outputs, or Phase differential pulse output multiplication x1/2/4		
Position control range	–2,147,483,648 to 2,147,483,647 pulses		
Velocity control range	1 to 4,000,000 pps		
Positioning *4			
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding		
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)		
Single-axis synchronized control	Cam operation and gear operation		
Single-axis manual operation	Jogging		
Auxiliary function for single-axis control	Homing, stopping, and override changes		
External input specifications (except for line receiver inputs)			
Input voltage	21.6 to 26.4 VDC (24 VDC +10%, –10%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	**OFF voltage/OFF current**	4.0 VDC max./1 mA max.
ON/OFF response time	External inputs 0 and 1: 1 μs max./2 μs max. External inputs 2 to 4: 20 μs max./400 μs max.		
Internal I/O common processing	NPN		
External input specifications (line receiver inputs)			
Input voltage	EIA standard RS–422–A line driver levels	**High level input voltage**	V_{IT+}: 0.1 V min.
Input impedance	120 Ω ± 5%	**Low level input voltage**	V_{IT-}: –0.1 V max.
Hysteresis voltage	Vhys (V_{IT+} – V_{IT-}): 60 mV		
Line driver output specifications			
Output voltage	RS-422-A line driver level (equivalent to AM26C31)		
Maximum load current	20 mA		
Maximum output frequency	4 Mpps		
External output specifications			
Rated voltage	24 VDC		
Load voltage range	15 to 28.8 VDC	**Residual voltage**	1.0 V max.
Maximum load current	30 mA	**Leakage current**	0.1 mA max.
ON/OFF response time	External output 0: 5 μs max./5 μs max. External outputs 1 and 2: 0.5 ms max./1 ms max.		
Internal I/O common processing	NPN		

*1. The I/O refreshing method is set according to the connected Communications Coupler Unit and CPU Unit.
*2. You can use the external input 0 as a latch input.
*3. You can use the external output 0 as an error counter reset output.
*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.
A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.
Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

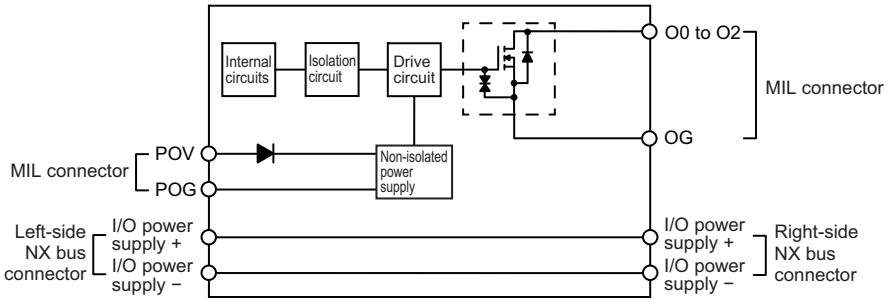
Dimensions	30 × 100 × 71 mm (W×H×D)	**Isolation method**	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from external source 20.4 to 28.8 VDC (24 VDC +20%, -15%)	**Current capacity of I/O power supply terminals**	Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.65 W max. • Connected to a Communications Coupler Unit 1.30 W max.	**Current consumption from I/O power supply**	50 mA/CN max.
Weight	150 g max.	**Cable length**	Line driver outputs: 10 m max. Other I/O: 3 m max.

Circuit layout

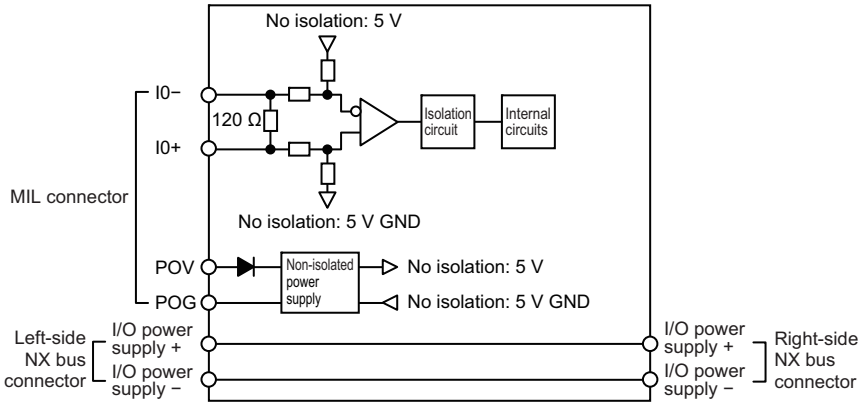
Pulse Output



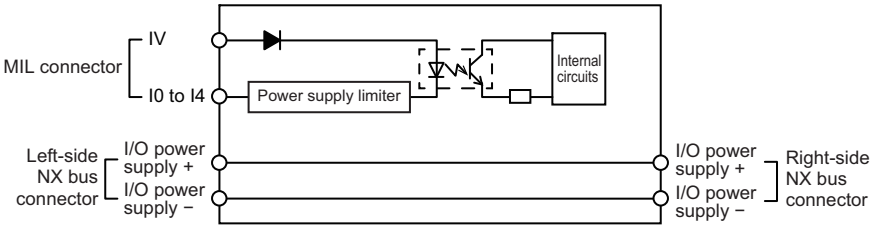
External Output

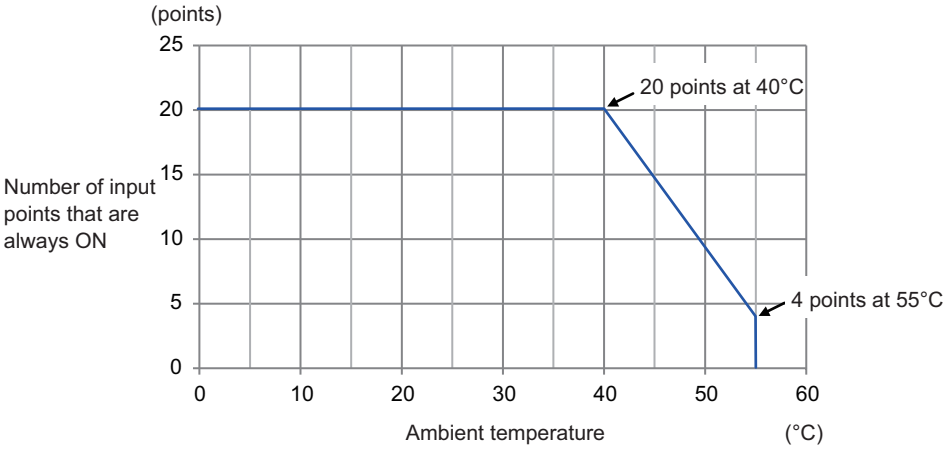
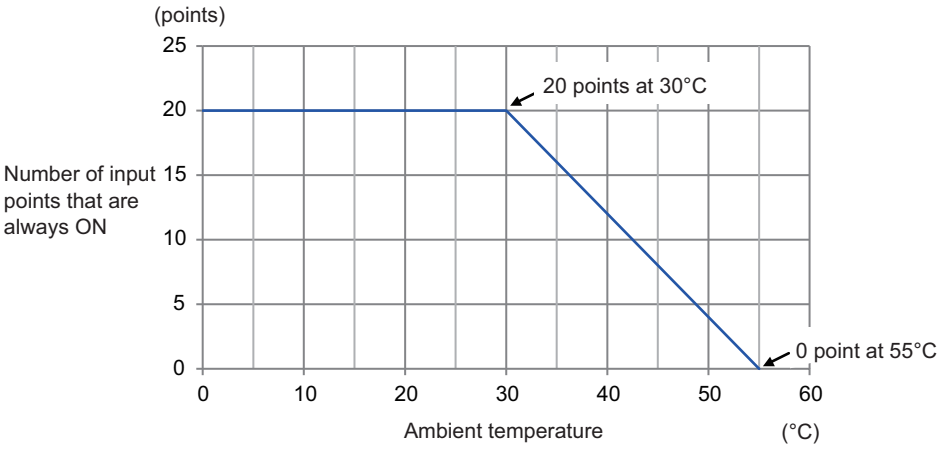


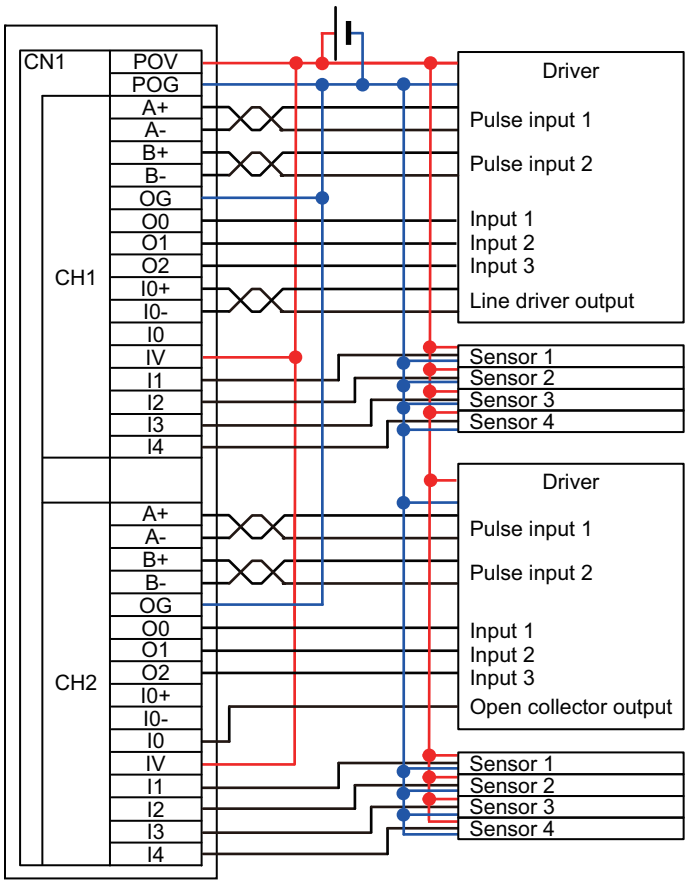
External Inputs (Line Receiver)



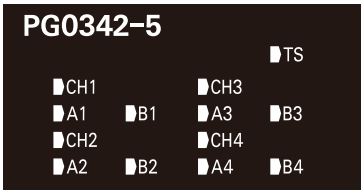
External Inputs (Other than Line Receiver)



Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: The number of external inputs that can be always ON is restricted as shown below. • For upright installation  • For any installation other than upright 

Terminal connection diagram	 • The connection diagram for CN2 is the same as the one for CN1.
Failure detection	None
Protection	None

Pulse Output Unit (Line driver output, PNP type) 4 channels NX-PG0342-5

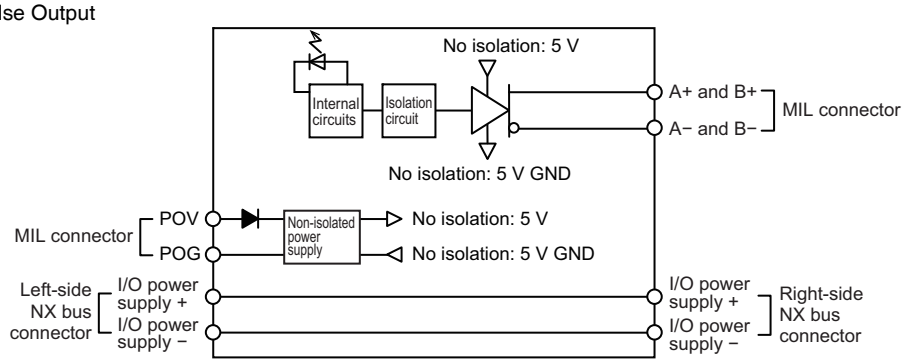
Unit name	Pulse Output Unit	**Model**	NX-PG0342-5
Number of channels	4 channels	**External connection terminals**	MIL connector (34 terminals ×2)
I/O refreshing method *1	Synchronous I/O refreshing or task period prioritized refreshing		
Indicators		**I/O signals**	Inputs: 5 per channel. External inputs *2 Outputs: 5 per channel. 1 forward direction pulse output, 1 reverse direction pulse output, and 3 external outputs (per channel) *3
Control method	Open-loop control through pulse string output		
Controlled drive	Servo drive with a pulse string input or a stepper motor drive		
Pulse output form	Line driver output		
Unit of control	Pulses		
Maximum pulse output speed	4 Mpps		
Pulse output method	Forward/reverse direction pulse outputs, Pulse + direction outputs, or Phase differential pulse output multiplication x1/2/4		
Position control range	–2,147,483,648 to 2,147,483,647 pulses		
Velocity control range	1 to 4,000,000 pps		
Positioning *4			
Single-axis position control	Absolute positioning, relative positioning, and interrupt feeding		
Single-axis velocity control	Velocity control (velocity feeding in Position Control Mode)		
Single-axis synchronized control	Cam operation and gear operation		
Single-axis manual operation	Jogging		
Auxiliary function for single-axis control	Homing, stopping, and override changes		
External input specifications (except for line receiver inputs)			
Input voltage	21.6 to 26.4 VDC (24 VDC +10%, –10%)	**ON voltage/ON current**	15 VDC min./3 mA min.
Input current	4.6 mA typical (24 VDC)	**OFF voltage/OFF current**	4.0 VDC max./1 mA max.
ON/OFF response time	External inputs 0 and 1: 1 μs max./2 μs max. External inputs 2 to 4: 20 μs max./400 μs max.		
Internal I/O common processing	PNP		
External input specifications (line receiver inputs)			
Input voltage	EIA standard RS–422–A line driver levels	**High level input voltage**	V_{IT+}: 0.1 V min.
Input impedance	120 Ω ± 5%	**Low level input voltage**	V_{IT-}: –0.1 V max.
Hysteresis voltage	Vhys (V_{IT+} – V_{IT-}): 60 mV		
Line driver output specifications			
Output voltage	RS-422-A line driver level (equivalent to AM26C31)		
Maximum load current	20 mA		
Maximum output frequency	4 Mpps		
External output specifications			
Rated voltage	24 VDC		
Load voltage range	15 to 28.8 VDC	**Residual voltage**	1.0 V max.
Maximum load current	30 mA	**Leakage current**	0.1 mA max.
ON/OFF response time	External output 0: 5 μs max./200 μs max. External outputs 1 and 2: 0.5 ms max./1 ms max.		
Internal I/O common processing	PNP		

*1. The I/O refreshing method is set according to the connected Communications Coupler Unit and CPU Unit.
*2. You can use the external input 0 as a latch input.
*3. You can use the external output 0 as an error counter reset output.
*4. These functions are supported when you also use the MC Function Module in the NJ/NX-series CPU Unit or the NY-series Industrial PC. For details, refer to the motion control user's manual for the connected CPU Unit or Industrial PC.
A Pulse Output Unit only outputs pulses during the control period based on commands received at a fixed period.
Target position calculations (distribution calculations) for acceleration/deceleration control or for each control period must be performed on the Controller.

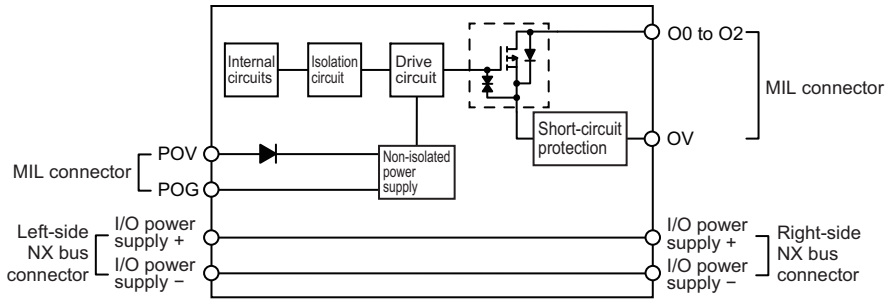
Dimensions	30 × 100 × 71 mm (W×H×D)	**Isolation method**	External inputs: Photocoupler isolation External outputs: Digital isolator
Insulation resistance	20 MΩ min. between isolated circuits (at 100 VDC)	**Dielectric strength**	510 VAC between isolated circuits for 1 minute at a leakage current of 5 mA max.
I/O power supply method	Supply from external source 20.4 to 28.8 VDC (24 VDC +20%, -15%)	**Current capacity of I/O power supply terminals**	Without I/O power supply terminals
NX Unit power consumption	• Connected to a CPU Unit 1.65 W max. • Connected to a Communications Coupler Unit 1.30 W max.	**Current consumption from I/O power supply**	50 mA/CN max.
Weight	150 g max.	**Cable length**	Line driver outputs: 10 m max. Other I/O: 3 m max.

Circuit layout

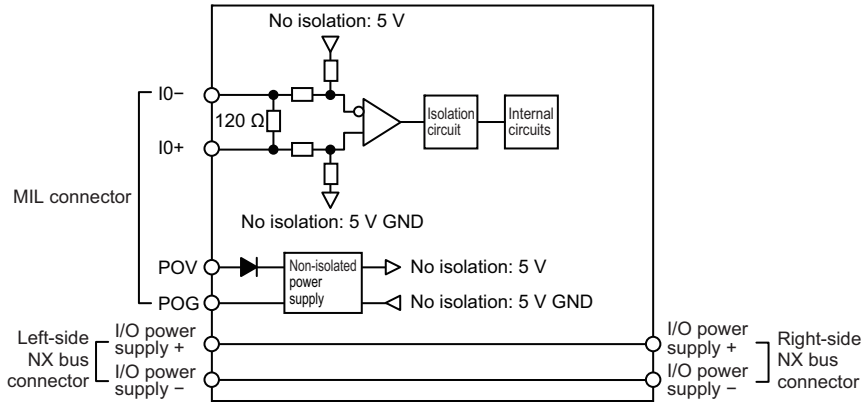
Pulse Output



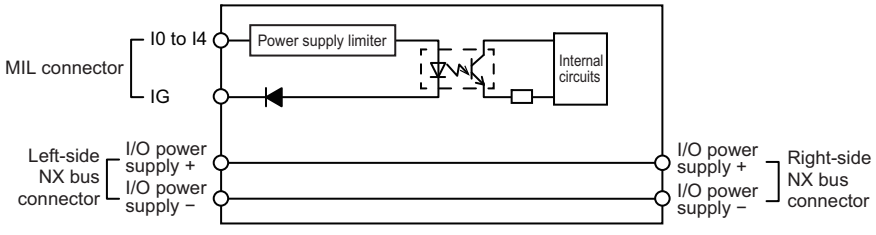
External Output

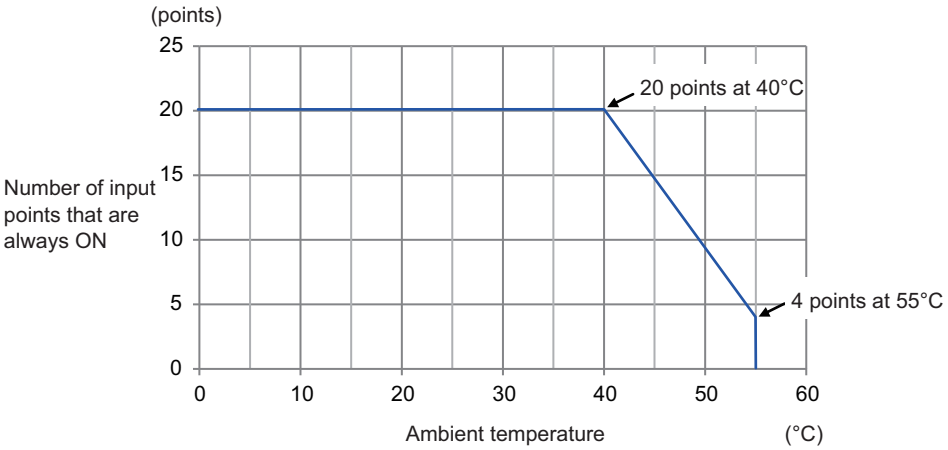
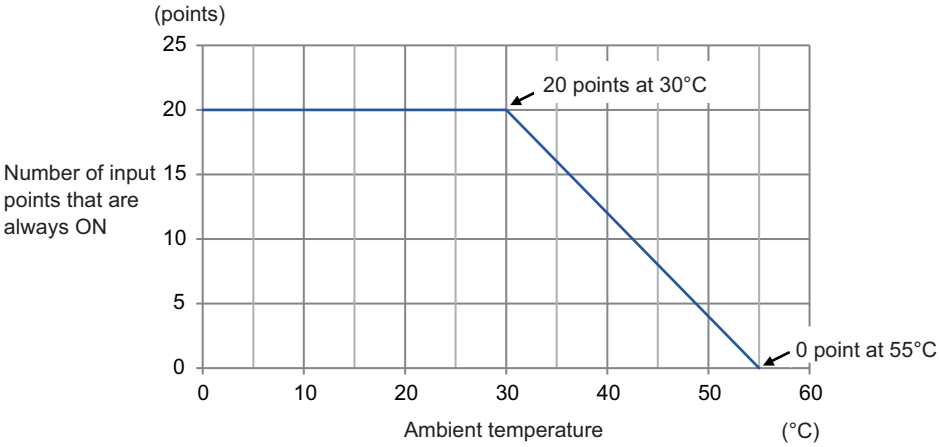


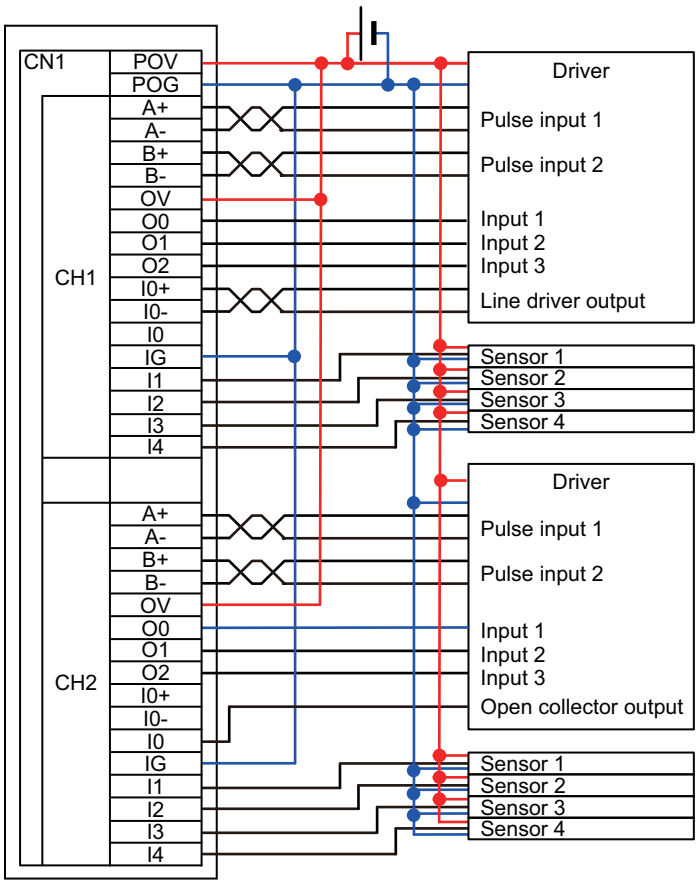
External Inputs (Line Receiver)



External Inputs (Other than Line Receiver)



Installation orientation and restrictions	Installation orientation: • Connected to a CPU Unit: Possible in upright installation. • Connected to a Communications Coupler Unit: Possible in 6 orientations. Restrictions: The number of external inputs that can be always ON is restricted as shown below. • For upright installation  • For any installation other than upright 

Terminal connection diagram	 • The connection diagram for CN2 is the same as the one for CN1.
Failure detection	None
Protection	None

*5.

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