

Machine Automation Controller

NX1P



sysmac



Advanced motion control and networks

EtherNet/IP™

Open industrial Ethernet network

- Interface with HMI
- Peer-to-Peer controller communication
- Interface with Sysmac Studio
- Information network (host application)



SD memory card

- Back up, restore, and verify data in the controller



Option board

Add serial communications or analog control without increasing the size

- RS-232, RS-422A/485 (Modbus-RTU: 32 nodes max.)
- Analog I/O

EtherCAT®

The fast machine network for a wide range of field and motion devices.



Machine Automation Controller NX1P



Battery-free NX1P and 1S

The NX1P requires no battery to retain user program, set values, and variables during power interruption in the built-in memory. The 1S AC Servo System comes with a battery-free absolute encoder. They reduce machine maintenance.

Advanced motion control increases machine speed and precision

The NX1P provides advanced motion control which previously would require a dedicated controller or special unit. Continuous operation by use of electronic cams improves productivity and meets diverse production needs.



1S AC Servo System



Simplicity for advanced motion control



for onsite IoT in a compact controller

Build a cost effective weighing/measurement system using load cells.

• Load Cell Input Unit
NX-RS



Temperature control made easy - build a temperature control system with heater burnout detection

• Temperature Input Unit
NX-TS



• Heater Burnout Detection Unit
NX-HB



IO-Link Master Unit
NX-ILM400

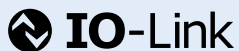


Reduce wiring time with Push-In Plus terminals

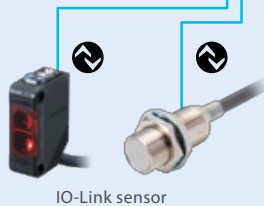
Push-In Plus terminals deliver the advantage of our "Value Design for Panel" concept to reduce space, time and cost.

IO-Link connectivity for communication down to the sensor level

Predictive maintenance minimizes downtime. Omron recommends to start from the point in your machine where failure often occurs.



IO-Link collects information held by sensors and actuators through the IO-Link master and via a fieldbus network into the host controller. It enables communication within the whole system and reduces time required for commissioning and maintenance.



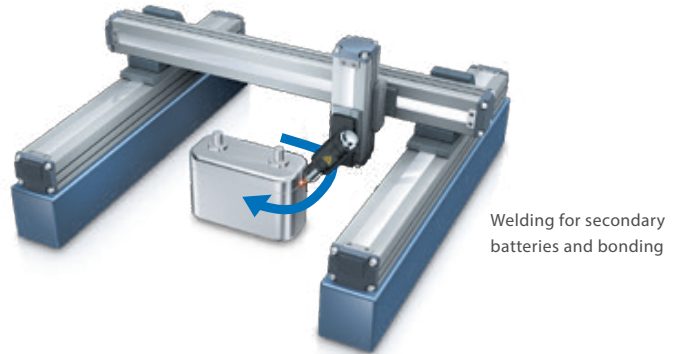
Advanced motion control

Built in EtherCAT and advanced motion control make machines faster and more precise

- EtherCAT simplifies the wiring to up to eight servo systems including for single-axis position control.
- Up to four axes of motion control. Increase machine speed and precision with electronic cams and interpolation.

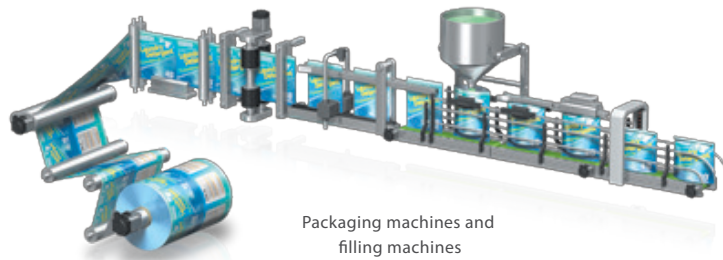
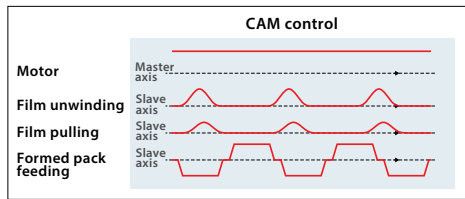
Interpolation

- Precise machining and high-speed handling with Linear and circular interpolation



Electronic cam

- High-speed and continuous machine operation using electronic cams
- Meet diverse production needs by using electronic cams instead of mechanical cams



EtherCAT

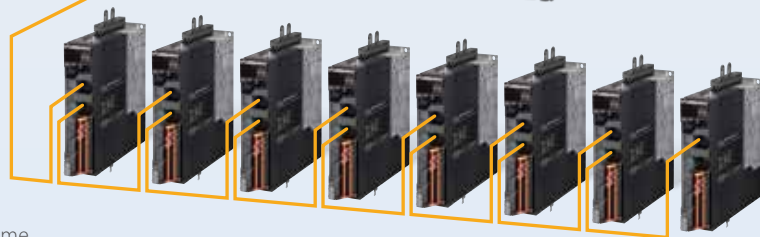
Data transmission delay is compensated to synchronize servomotors. Synchronized axes provide high-precision positioning.

- Reduce wiring work by using one EtherCAT cable to connect the NX1P and servo drives.



1S AC Servo System

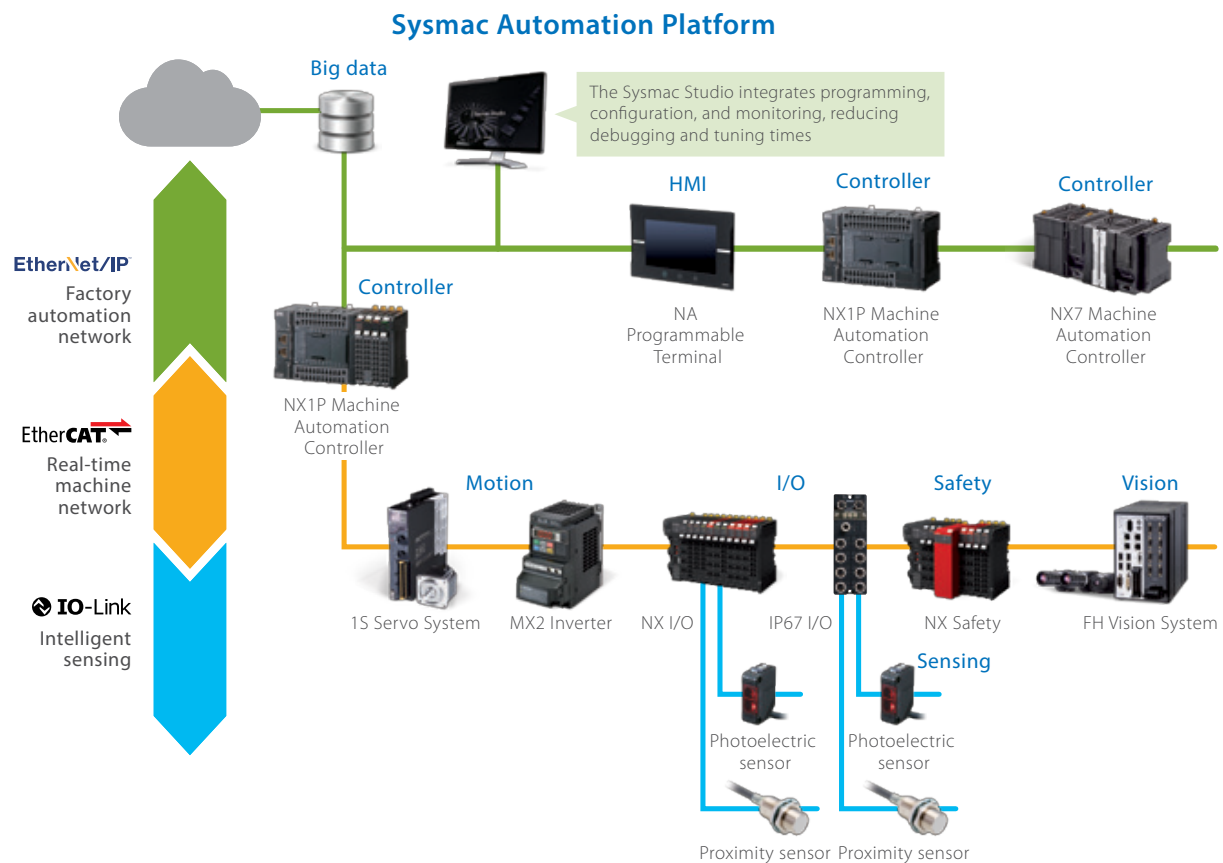
- No battery, no maintenance. No need for homing sequence improving machine uptime
- 23 bit high resolution encoder as standard
- Improved loop control for low overshoot and quick settling time
- Safety function: STO



Networks for onsite IoT

IO-Link brings IoT to the sensor level

- EtherCAT connects I/O devices, motion devices, safety controllers, and vision systems with a single cable. You can check machine information by monitoring the status of the connected components.
- EtherNet/IP enables communications with a host PC and data links between NJ/NX Controllers and CJ PLCs.



Predictive maintenance using IO-Link

With the controller's IO-Link connectivity, you can implement predictive maintenance that lets you visualize machine status at the sensor level.

IO-Link

Proximity Sensor

Continuous distance monitoring

Photoelectric Sensor

Continuous level monitoring

Wear and vibration of mechanical parts may cause problems

With an IO-Link Proximity Sensor you are notified if the target is too close or too far away, and the occurrence of sudden faults is greatly reduced.

The incident level drops due to dirt

With an IO-Link Photoelectric Sensor monitoring incident light level prevents false detection. The photoelectric sensor offers several instability settings, allowing you to communicate the incident light level and easily determine when maintenance must be performed.

Product line up

Machine Automation Controller NX-series

NX1P2 CPU Units



EtherNet/IP
EtherCAT

Dimensions
(Unit: mm)

24-point type
130(W)×100(H)×71(D)

40-point type
154(W)×100(H)×71(D)

Option Boards



Serial Communications
NX1W-CIF01/
CIF11/CIF12



Analog I/O
NX1W-ADB21/
MAB221

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

Digital I/O Units
NX-ID/IA/
OD/OC/MD



Analog I/O Units
NX-AD/DA



Temperature Input/
Heater Burnout
Detection Units
NX-TS/HB



Load Cell Input
Unit
NX-RS



Position Interface
Units
NX-EC0/
ECS/PG0



Communications
Interface
Unit
NX-CIF



IO-Link

IO-Link
Master Unit
NX-ILM400



System Units
NX-PD/PF/
PC/TBX



Automation Software Sysmac Studio

SYSMAC-SE2 □ □ □



Sysmac Studio provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX CPU Units, EtherCAT Slave, and the HMI.

- Fully compliant with open standard IEC 61131-3 and Japanese standard JIS B3503
- Supports Ladder, Structured Text and Function Block programming with a rich instruction set
- CAM editor for easy programming of complex motion profiles
- One simulation tool for sequence and motion in a 3D environment
- Advanced security function with 32 digit security password

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Ordering Information

International Standards†

- The standards are abbreviated as follows: UC1: cULus (Class I Division 2 Products for Hazardous Locations), CE: EU Directives, RCM: RCM mark, and KC: KC Registration.
- Contact your OMRON representative for further details and applicable conditions for these standards.

NX1P2 CPU Units

Product name	Program capacity	Memory capacity for variables	Maximum number of used real axes			Total number of built-in I/O points			Model	Standards
				Motion control axes**	Single-axis position control***		Number of input points	Number of output points		
 40-point	1.5MB	32 KB (Retained during power interruptions) and 2 MB (Not retained during power interruptions)	8 axes	4 axes	4 axes	40 points	24 points	16 points, NPN transistor	NX1P2-1140DT	UC1, CE, RCM, KC
			6 axes	2 axes	4 axes			16 points, PNP transistor *	NX1P2-1140DT1	
								16 points, NPN transistor	NX1P2-1040DT	
 24-point			4 axes	0 axes	4 axes	24 points	14 points	16 points, PNP transistor *	NX1P2-1040DT1	
								10 points, NPN transistor	NX1P2-9024DT	
								10 points, PNP transistor *	NX1P2-9024DT1	

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

* With the load short-circuit protection.

**Motion control axes includes:

- Point to point positioning
- Synchronized motion (Gearing/Camming)
- Multi-Axes coordinated motion (Circular/Linear Interpolation)
- Axes grouping

***Single-axis position control includes:

- Only Point to point positioning
- No Synchronized motion (Gearing/Camming)
- No Multi-Axes coordinated motion (Circular/Linear Interpolation)
- No Axes grouping

Option Boards (For CPU Units)

Product name	Specification	Supported protocol	Model	Standards
 Serial Communications Option Board	One RS-232C port. Transmission distance: 15 m. Connection type: Screwless clamping terminal block (9 terminals).	Host link, Modbus-RTU master, and no-protocol	NX1W-CIF01	UC1, CE, RCM, KC
 Serial Communications Option Board	One RS-422A/485 port. Transmission distance: 50 m. Connection type: Screwless clamping terminal block (5 terminals)		NX1W-CIF11	
 Serial Communications Option Board	One RS-422A/485 port (isolated). Transmission distance: 500 m. Connection type: Screwless clamping terminal block (5 terminals)		NX1W-CIF12	
 Analog Input Option Board	Analog input: 2 Voltage input: 0 to 10 V (Resolution: 1/4,000). Current input: 0 to 20 mA (1/2,000) Connection type: Screwless clamping terminal block (5 terminals)	NX1W-ADB21		
 Analog Output Option Board	Analog output: 2 Voltage output: 0 to 10 V (Resolution: 1/4,000) Connection type: Screwless clamping terminal block (3 terminals)	NX1W-DAB21V		
 Analog I/O Option Board	Analog input: 2/Analog output: 2 Voltage input: 0 to 10 V (Resolution: 1/4,000). Current input: 0 to 20 mA (1/2,000) Voltage output: 0 to 10 V (Resolution: 1/4,000) Connection type: Screwless clamping terminal block (8 terminals)	NX1W-MAB221		

Automation Software Sysmac Studio

Please purchase a DVD and required number of licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. Each model of licenses does not include DVD.

Product name	Specification	Number of licenses	Media	Model
 Sysmac Studio Standard Edition Ver.1 □□	Sysmac Studio runs on the following OS: Windows 7 (32-bit/64-bit version)/Windows 8 (32-bit/64-bit version)/Windows 8.1 (32-bit/64-bit version)/Windows 10 (32-bit/64-bit version) The Sysmac Studio Standard Edition DVD includes Support Software to set up EtherNet/IP Units, DeviceNet slaves, Serial Communications Units, and Support Software for creating screens on HMI's (CXDesigner). For details, refer to the Sysmac Integrated Catalog (Cat. No. P072).	— (Media only)	DVD	SYSMAC-SE200D
		1 license *	—	SYSMAC-SE201L

* Multi licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses).

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