

Machine Automation Controller

NX1P



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 previously done by 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 Sysmac entry model

Build a cost saving weighing/measurement system by using load cells

• Load Cell Input Unit
NX-RS



The controller makes temperature control easy. Build a temperature control system with heater burnout detection

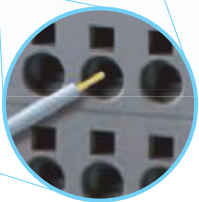
• Temperature Input Unit
NX-TS



• Heater Burnout Detection Unit
NX-HB



IO-Link Master Unit
NX-ILM400



Time saving wiring by Push-In Plus terminals

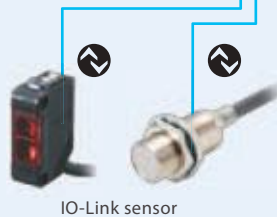
Corresponding to our shared **Value Design for Panel** concept for the specifications of products.

Start small-scale onsite IoT with IO-Link

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.



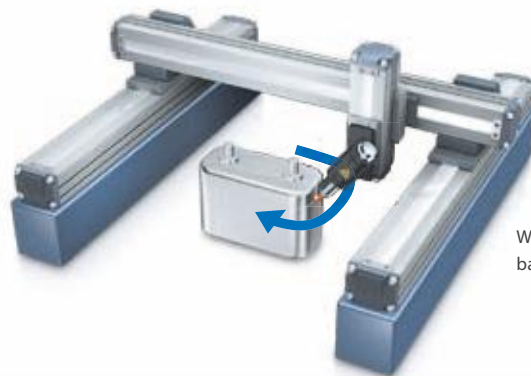
Advanced motion control

The built-in EtherCAT port 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. Electronic cams and interpolation increase machine speed and precision.

Interpolation

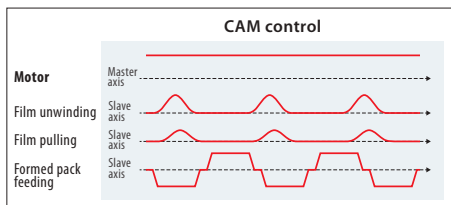
- Linear interpolation and circular interpolation for precise machining and high-speed handling



Welding for secondary batteries and bonding

Electronic cam

- Electronic cam enables continuous and high-speed machine operation
- Electronic cam can meet diverse production needs, which is difficult with mechanical cam



Packaging machines and filling machines

EtherCAT

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

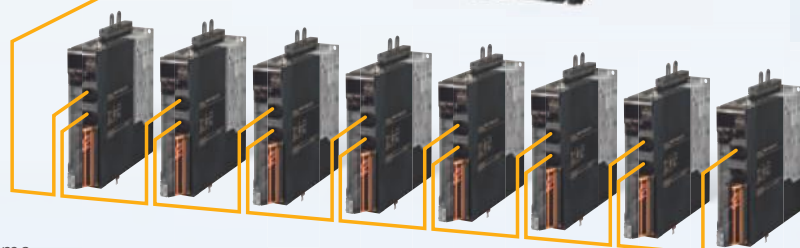
- EtherCAT enables one cable to connect the NX1P with servo drives, reducing wiring work.



Machine Automation Controller NX1P

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

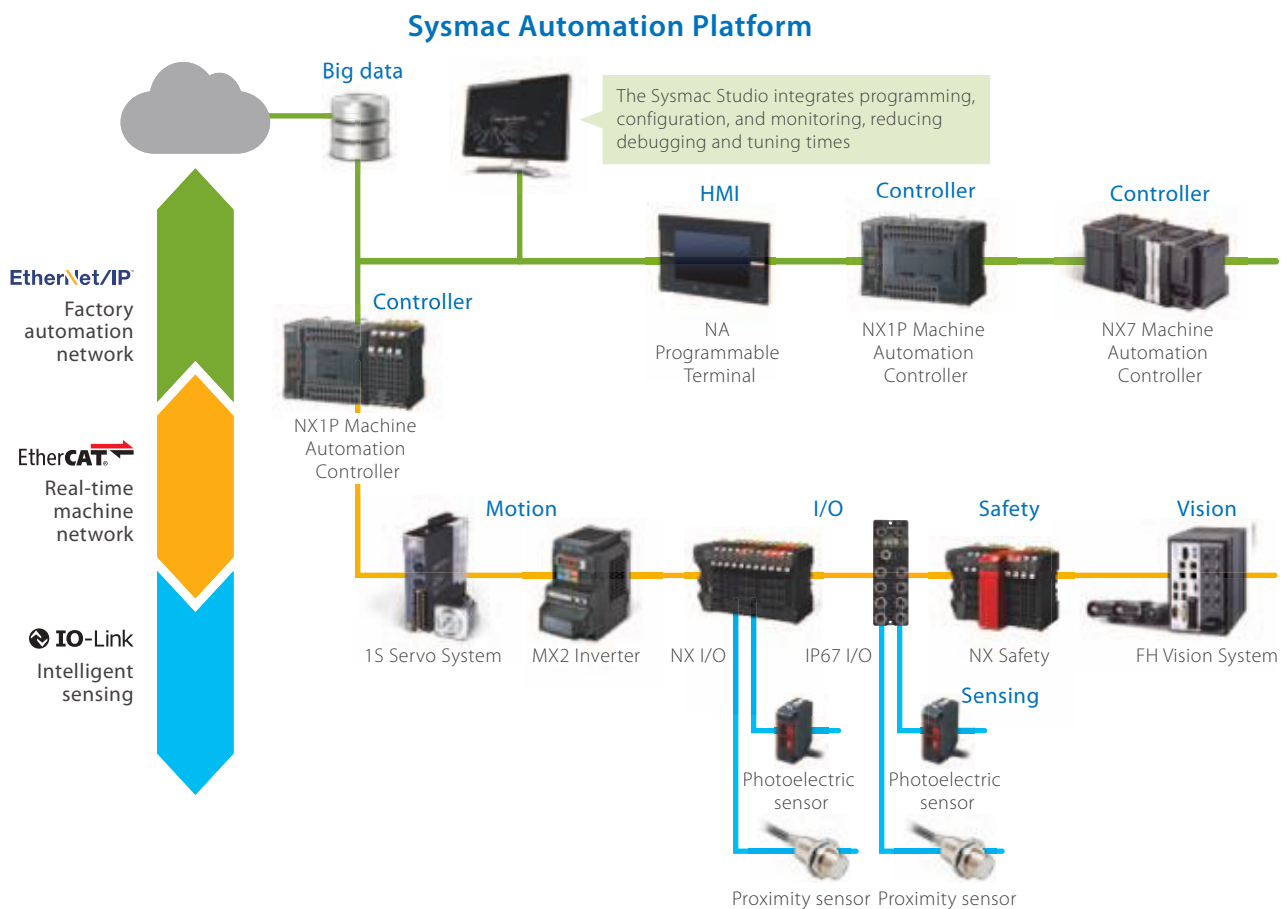


1S AC Servo System

Networks for onsite IoT

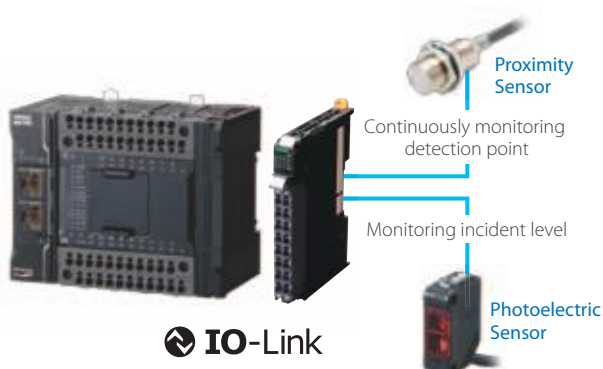
IO-Link brings IoT to the sensor level

- 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

You can start predictive maintenance with visualization of the status of a small-sized machine. IO-Link functionality can be added to existing machines.



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/
DAB21V/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

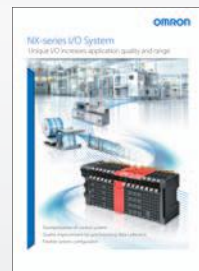


IO-Link

IO-Link Master Unit
NX-ILM400



System Units
NX-PD/PF/
PC/TBX



NX-series I/O system
Cat. No. R183

Automation Software Sysmac Studio

SYSMAC-SE2□□□

Significantly reduced
startup time
(Ver. 1.17 or higher)



The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX 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

Sysmac is a trademark or registered trademark of OMRON Corporation in Japan and other countries for OMRON factory automation products.

Windows is either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

EtherNet/IP™ is the trademarks of ODVA.

Other company names and product names in this document are the trademarks or registered trademarks of their respective companies.

The product photographs and figures that are used in this catalog may vary somewhat from the actual products.



Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation.

Ordering Information

International Standards

- The standards are abbreviated as follows: UC1: cULus (Class I Division 2 Products for Hazardous Locations), L: Lloyd, CE: EU Directives, RCM: Regulatory Compliance 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	
				Used motion control servo axes	Used single-axis position control servo axes		Number of input points	Number of output points			
40-point type	 1.5MB	32 KB (Retained during power interruptions) or 2 MB (Not retained during power interruptions)	8 axes	4 axes	4 axes	40 points	24 points	16 points, NPN transistor	NX1P2-1140DT	UC1, L, CE, RCM, KC	
					16 points, PNP transistor *			NX1P2-1140DT1			
			6 axes	2 axes	4 axes			16 points, NPN transistor	NX1P2-1040DT		
								16 points, PNP transistor *	NX1P2-1040DT1		
24-point type				4 axes	0 axes	4 axes	24 points	14 points	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.

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, L, 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	
	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) 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 any 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 HMIs (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).

Terms and Conditions Agreement

Read and understand this catalog.

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

Warranties.

- (a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.
- (b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability; Etc.

OMRON COMPANIES SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, NEGLIGENCE OR STRICT LIABILITY.

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

Note: Do not use this document to operate the Unit.

OMRON Corporation Industrial Automation Company
Kyoto, JAPAN

Contact: www.ia.omron.com

Regional Headquarters

OMRON EUROPE B.V.

Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands

Tel: (31)2356-81-300/Fax: (31)2356-81-388

OMRON ELECTRONICS LLC

2895 Greenspoint Parkway, Suite 200
Hoffman Estates, IL 60169 U.S.A.

Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.

No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967

Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.

Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China

Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

Authorized Distributor:

© OMRON Corporation 2016 All Rights Reserved.
In the interest of product improvement,
specifications are subject to change without notice.

CSM_1_3_0917

Cat. No. P115-E1-01

0916(0916)