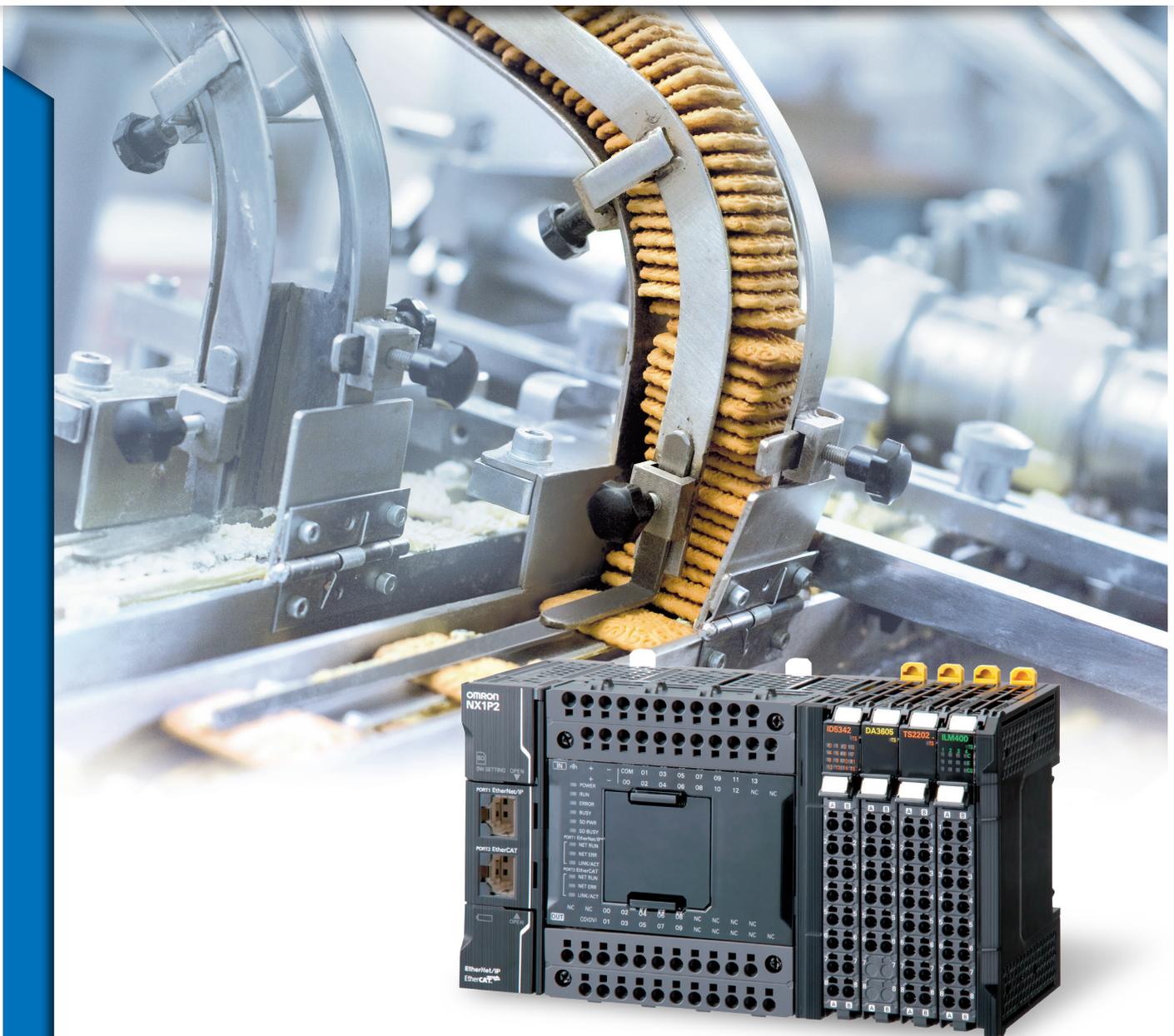


Advanced Control for Compact Machines

NX1 Machine Controller



- Increase productivity and quality
- Reuse your engineering time by scalability
- Save time on wiring and programming

NX1 brings advanced control to compact machines

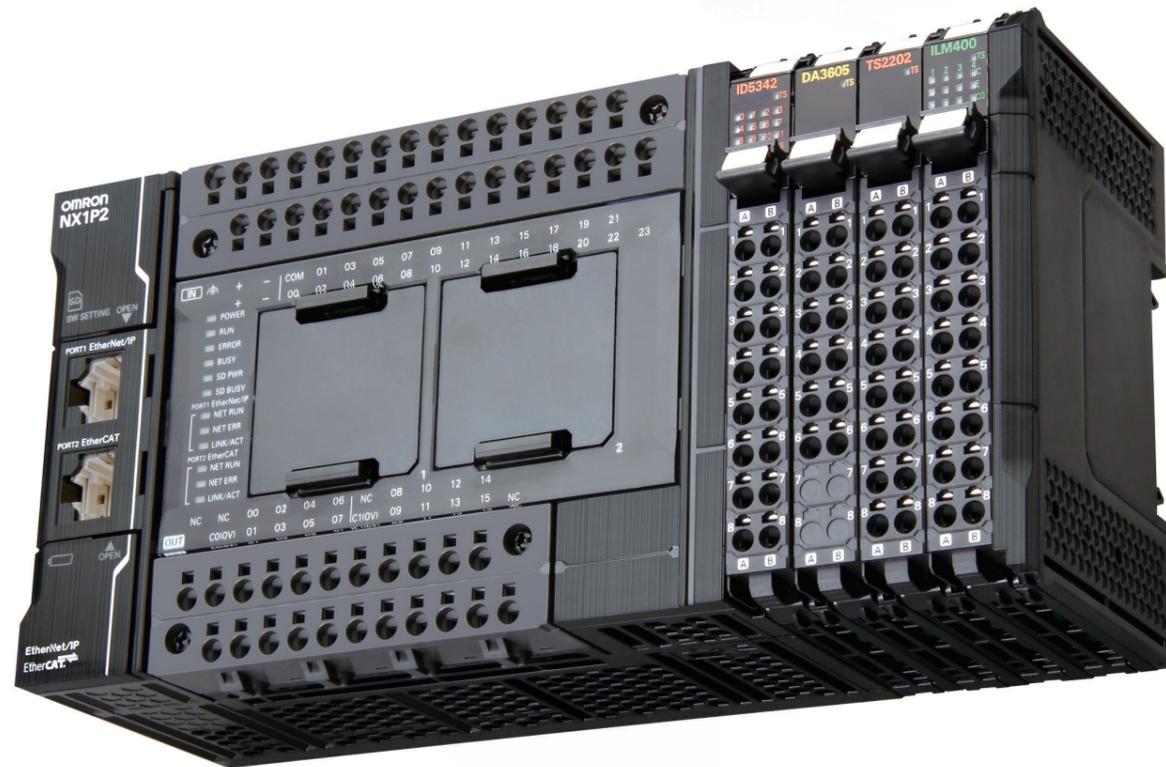
The manufacturing industry is striving to boost productivity and to improve quality. Although the use of high-end multi-functional machines is one of its solutions, flexible systems that leverage production data are required to satisfy diverse consumer needs by optimizing manufacturing processes. Omron industrial automation enables faster adaptability of the small-middle size machines to a flexible production line as a key for the next manufacturing processes. With this principle in mind we extended the Sysmac Machine Control portfolio with the NX1 Machine Controller.



The NX1 Machine Controller enables efficient manufacturing by providing functionalities to

- ✓ Increase machine performance without compromising on quality
- ✓ Faster adaptability to a flexible production
- ✓ Get results quickly by the use of an intuitive Integrated Development Environment

✓ The NX1 completes the Sysmac machine controller family offering the same functionality in a compact design.



Produce faster with same level of product quality

The NX1 integrates advanced motion control and sequence control. Synchronized motion improves productivity enabling continuous operation and meets diverse production needs.



Maximizing machine uptime

Vertical integration delivers production data from manufacturing process to IT systems. Device data collected via EtherCAT or IO-Link networks can be used to increase productivity and improve predictive maintenance or faster troubleshooting.



Integrated architecture from sensor level to factory network

The use of EtherCAT network enables safety controller, vision sensors, inverters and servomotors as well as I/O to be connected and synchronized within same system cycle time. One cable connection reduces design and installation works. The Integrated Development Environment Sysmac Studio makes designing and debugging easier. Remote maintenance can be performed by monitoring devices connected via EtherCAT through the NX1.

Sysmac Integrated Platform

Integrated platform for total machine automation

The Sysmac automation platform together with the NX1 machine controller is aimed at providing a total solution in terms of functions and product variety for the small and middle size machines. It includes motion control of up to 8 axes and seamless integration of applications such as safety and vision resulting in a solution that simplifies machine installation and wiring. Through the vertical integration, the Sysmac Studio integrates programming, monitoring and diagnostics of all machine devices reducing engineering and debugging time. EtherCAT and IO-Link connectivity provides production data at sensor level for productivity improvement and predictive maintenance.



Optimized diagnostics and maintenance tasks through to manufacturing cells

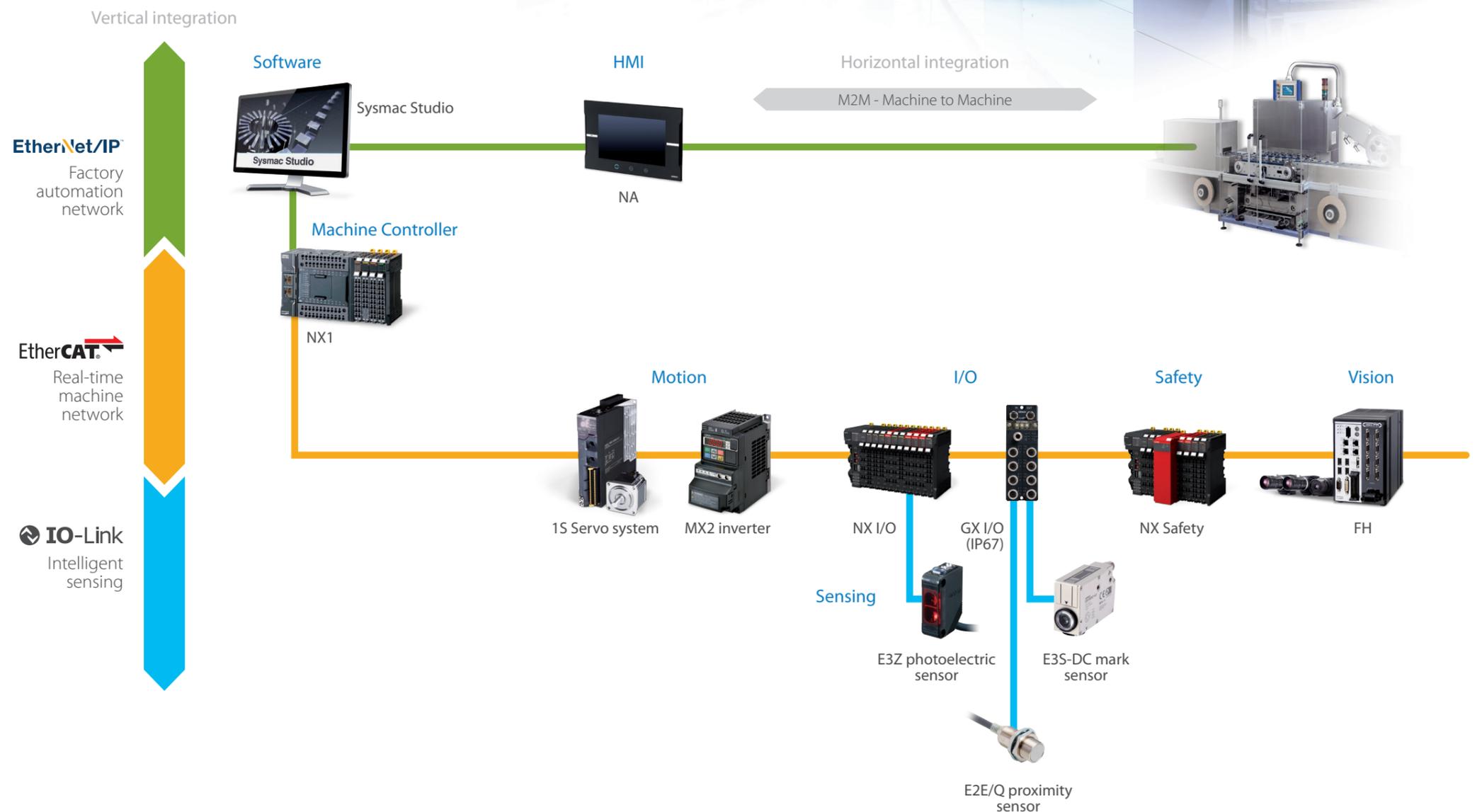
- OMAC standards for packaging machines
- Unified interface communication from machine to machine to IT systems
- PackML template

Integrated automation control

- 2 ms network cycle time including axes synchronization
- Advanced motion control with linear/circular interpolation and electronic CAM
- Safety over EtherCAT reduces safety devices and wiring

Proactive maintenance solution

- IO-Link provides communication at sensor level
- Set of Function Blocks available for condition monitoring of the actuators for predictive maintenance
- Backup and restore function of the complete system - project in the controller, slaves parameters and network settings- for quick product changeover



NX1 Machine Controller

Full Sysmac functionality in a compact machine controller

Compact in size, powerful in functionality

The NX1 completes the NX/NJ machine controller family offering the same functionality in a compact design. A controller that integrates the architecture from the Sysmac platform: built-in EtherCAT port for real-time control and built-in Ethernet port for standard factory network. The NX1 provides synchronized control of all machine devices such as motion, I/O, safety and vision under one Integrated Development Environment.

EtherNet/IP™

- Programming
- Auto connection (1:1) with Sysmac Studio
- Machine to machine
- HMI / Visualization
- Standard protocols and services: TCP/IP and UDP/IP, FTP client and server, NTP, SNMP
- CIP protocol

EtherCAT™

- Synchronous control of Motion, I/O, Safety, Sensing and Vision
- System cycle time: 2 ms
- Up to 16 EtherCAT slaves

SD memory card

- System backup and restore to reduce maintenance time
- Complete system backup: Project, network configuration and slaves parameter
- Parameter restore of individual EtherCAT slave

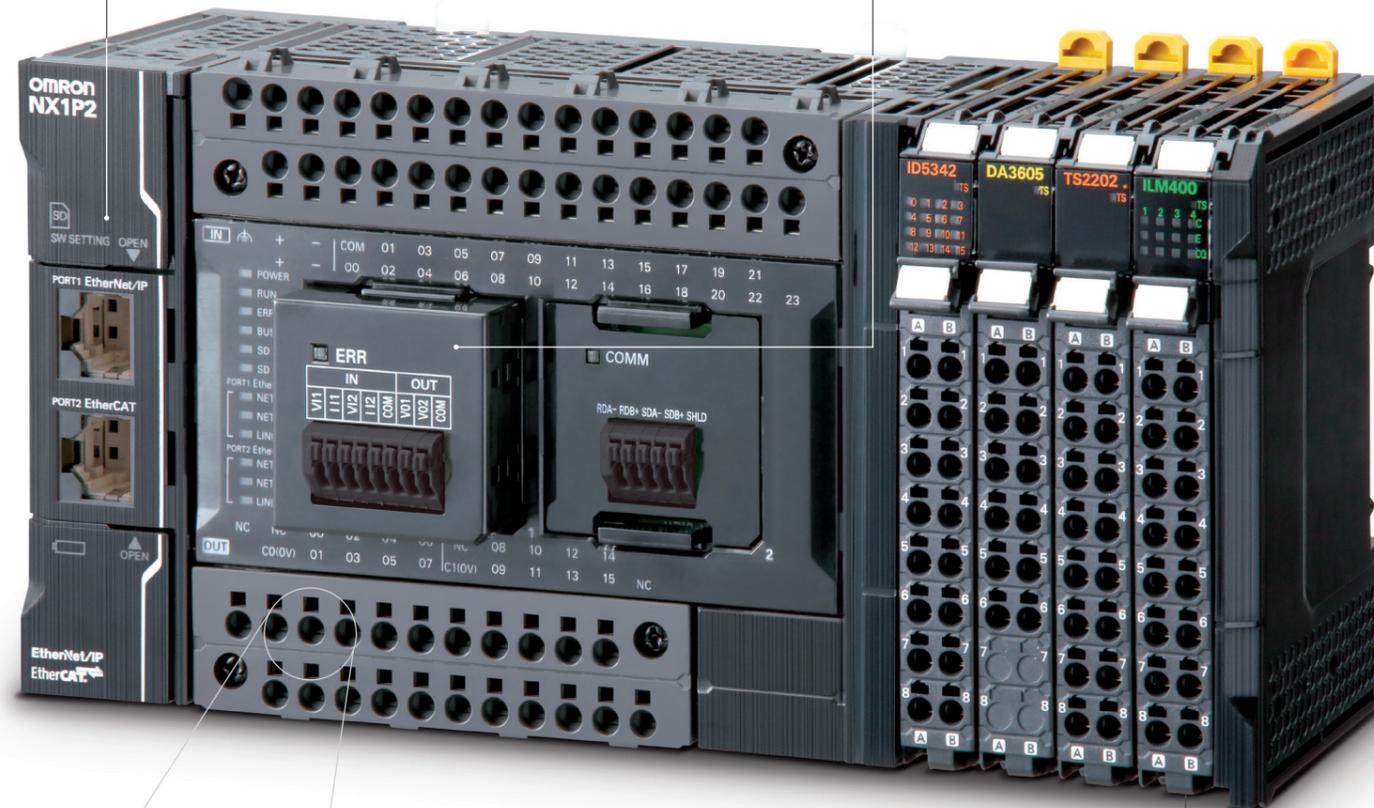
Option boards

- Up to 2 option boards
- Serial communication: R232C or RS-422A/485. Host link and Modbus-RTU master protocols
- Analog I/O: +/-10V voltage and 0-20 mA current signals
- Screw-less clamping terminals



Sysmac Library

- The Sysmac Library for fast engineering and optimized machine availability is packed with Omron's rich technical know-how on control programs. Omron offers Function Blocks for a wide range of applications: temperature control, motion control, and connection to servo drives or sensors.



NX1 CONTROLLER MODELS

40 built-in I/O points / 4 synchronous axes / 4 PTP axes

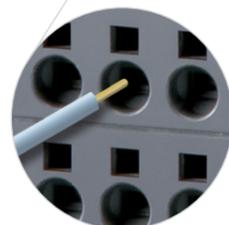
40 built-in I/O points / 2 synchronous axes / 4 PTP axes

24 built-in I/O points / 4 PTP axes



• Battery free operation for no maintenance *

• Push-In Plus connection reduces I/O wiring time



• Corresponding to our shared value design of the panel concept for the product specifications

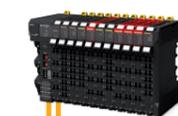
IO-Link

- IO-Link master unit to communicate with sensors



Up to 8 local NX I/O units

EtherCAT™



Remote NX I/O units



Remote NX I/O units

Up to 16 EtherCAT slaves

Safety over EtherCAT™

* A battery is necessary for RTC. The capacitor RTC backup 10 days/40 degree.

Sysmac motion engine now in a compact solution

The NX1 is fully designed according the Sysmac architecture, supporting sequence and motion core to control your machine faster with high accuracy. The built-in EtherCAT real-time network simplifies the wiring and provides synchronized axes control, remote I/O and safety devices within 2 ms cycle time. A rich set of Function Blocks for Motion Control and application libraries reduce your engineering time.

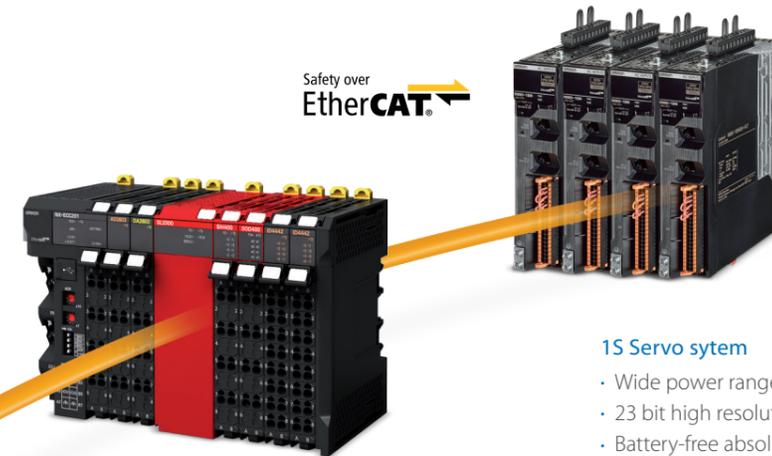
- ✓ The NX1 offers the motion functionality you need for advanced machine control

Integrated logic sequence and motion control

- System cycle time of 2 ms
- Up to 8 axes control via EtherCAT
- Up to 4 synchronized axes
- PTP motion control for single-axis positioning
- Electronic CAM for continuous operation at high speed



EtherCAT



Safety over EtherCAT

1S Servo system

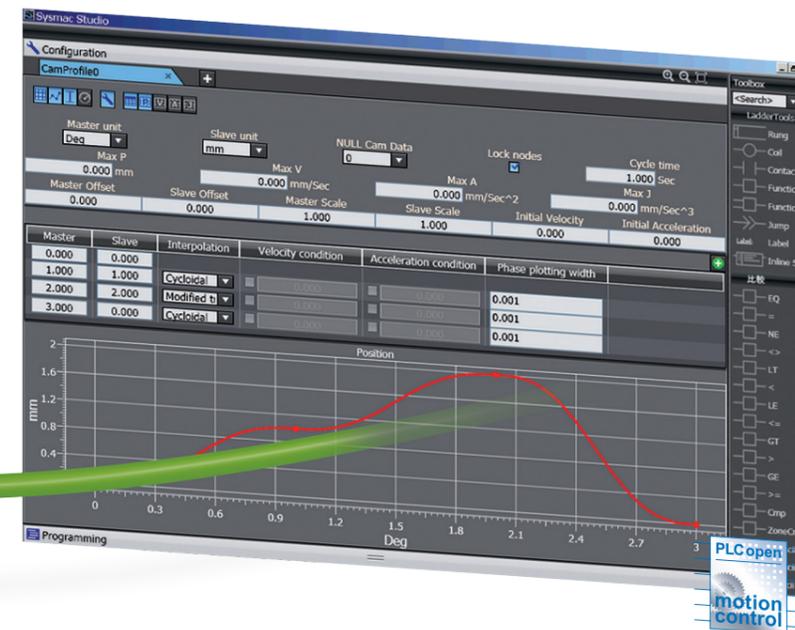
- Wide power range
- 23 bit high resolution encoder
- Battery-free absolute multi-turn encoder
- Safety over EtherCAT

NX I/O

- Freely mix Safety CPU and units with standard I/O
- The safety controller meets PLe (EN ISO 13849-1) and SIL3 (IEC 61508)
- Variables are part of the NX1 controller project



- Vertical form fill & seal machine with continuous feeding operation



Sysmac Studio Integrated Development Environment

- The Sysmac Studio integrates programming, configuration and monitoring of the complete system - logic sequence, motion and safety - . This Integrated Development Environment allows you to minimize servo setup, project debugging and commissioning time.
- A rich set of Function Blocks for Motion Control library are available to implement general purpose motion control. The Sysmac applications library such as rotary knife, winder, temperature control... provides fast engineering.



EtherNet/IP



MOTION CONTROL SCALABILITY

	AXES
PTP motion control	4
Synchronous control	2 or 4

- The graphical CAM editor allows quick implementation of complex motion profiles.

Family products

Machine Controller



NX1

Model	Built-in I/O	Real axes	
		Synchronous	PTP
NX1P2-1140DT[]	40	4	4
NX1P2-1040DT[]	40	2	4
NX1P2-9024DT[]	24	-	4

Local NX I/O



- Up to 8 local I/O units
- Digital and Analog I/O, temperature control, load cell input, pulse output, encoder input, IO-Link Master
- Detachable front connector with Push-In Plus technology

Option board



- Serial communication: R232C or RS-422A/485
- Host link and Modbus-RTU master protocols
- Analog I/O: +/-10V voltage and 0-20 mA current signals
- Screw-less clamping terminals

Software



Sysmac Studio Lite Edition

- Optimize your total cost of ownership by using the Sysmac Studio Lite Edition.
- Same functionality as Sysmac Studio Standard Edition supporting for the NX1 and NJ1 controllers
- Upgrading is possible from Lite Edition to Standard Edition
- Full functionality for logic sequence, motion, safety, vision and HMI
- IEC 61131-3 standard programming

Sysmac Library

- The Sysmac Library is a collection of software functional components that can be used in programs for the NJ/NX Machine Automation Controllers. Sample programs and HMI screen samples are also available.



Please download it from following URL and install to Sysmac Studio.
http://www.ia.omron.com/sysmac_library/



HMI



NA

- Wide screen across 7", 9", 12" and 15" range
- 1280 x 800 high resolution display for 12" and 15"
- 2 Ethernet ports for machine network and IT systems/programming
- NX1 controller variables (Tags) in the NA project
- Microsoft Visual Basic for versatile, flexible and advanced programming

Motion



1S servo system

- Up to 3 kW
- 23 bit high resolution encoder
- Battery-free absolute multi-turn encoder
- Safety built-in: Hardwired and Network STO

MX2

- Power range up to 15 kW
- Torque control in open loop
- 200% starting torque
- Double rating VT 120%/1 min and CT 150%/1 min

Remote I/O



NX I/O

- Digital and Analog I/O, temperature control, load cell input, pulse output, encoder input, safety, IO-Link Master
- I/O units with high-speed and time-stamp
- Detachable front connector with Push-In Plus technology

GX I/O

- IO-Link master
- IP67 protection class for wet and dusty environments
- Up to 8 sensors
- Photoelectric and Proximity sensors available

Sensing



IO-Link

E3Z photoelectric sensor

- IO-link functionalities with advanced diagnostics
- Transmission rate COM2 & COM3
- Rugged compact housing

E2E/Q proximity sensor

- IO-Link functionalities with advanced diagnostics
- Excessive proximity functionality
- Transmission rate COM2 & COM3
- Rugged compact housing

Safety



Safety over EtherCAT

NX Safety

- Freely mix with standard NX I/O
- The safety controller meets PLe (EN ISO 13849-1) and SIL3 (IEC 61508)
- Safety Function Blocks conforming with IEC 61131-3 standard programming
- Variables are part of the NX1 controller project
- High connectivity for direct connection to safety input devices

Vision



FH

- High speed controller (4 core) and standard (2 core)
- Up to 8 cameras
- Over 100 processing items (1/2D code and OCR)
- Inspection of scratches and defects
- Built-in port: EtherCAT and Ethernet (EtherNet/IP protocol)

FH-L

- Lite controller (2 core)
- Up to 4 cameras
- Over 100 processing items (1/2D code and OCR)
- Inspection of scratches and defects
- Built-in: Ethernet (EtherNet/IP protocol)

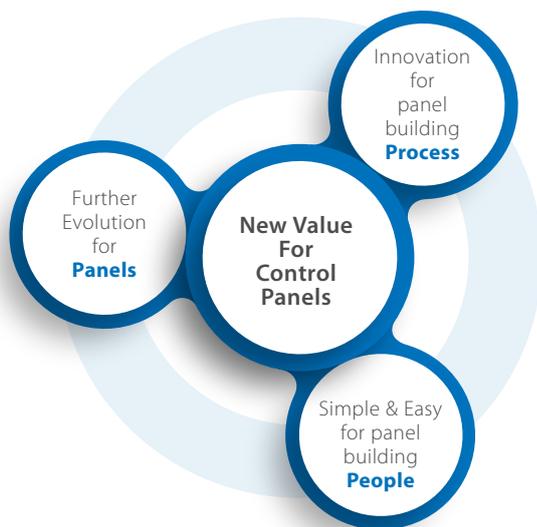
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Panels

- Space saving
- Vibration resistance
- Improve airflow

Process

- Designing with CAD & Eplan Library
- Swift customisation
- Express delivery within Europe

People

- Front-in and front-release Easy wiring

Our Panelbuilding portfolio

NEW 2016 Released In October



Switch Mode Power Supplies (High-capacity models)



Sockets for Safety Relays



Push-In Plus Series Pushbutton Switches



Power Monitors (Mounted On-Panel)



Machine Automation Controller

2016 Released In April



Switch Mode Power Supplies (60/120W)



Solid-state Timers



Measuring and Monitoring Relays



Power Monitors (DIN Track mounting)



Common Sockets (for MY/H3Y(N)-B)



Common Sockets (for G2R-S/H3RN-B/K7L-B)



Slim I/O Relays



Solid-state Timers



Solid-state Timers



Liquid Leakage Sensor Amplifiers



I/O Relay Terminals



DIN Track Terminal Blocks

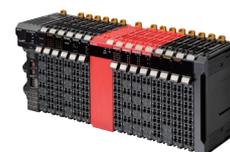
2015 Released



Digital Temperature Controllers



Solid State Relays for Heaters



EtherCAT Slave Terminals



Uninterruptible Power Supply (UPS)