

Sysmac Automation Platform
One Connection, One Software, One Controller



Sysmac: Complete Automation Control



SYSMAC
always in control



SYSMAC
always in control

Over 90 Years of Industry Experience In One Platform

The Sysmac platform has been built with the sole purpose of maximizing automation performance. Combining the strengths of open protocols, Sysmac achieves performance through robust system architectures while gathering more process data. This pursuit for performance creates automation that can be designed, commissioned, and scaled with confidence.

With one software, one controller, and one connection, Sysmac is always in control.

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SYSMAC
always in control

Sysmac: A Fully Integrated Platform

Integration and Functionality

Sysmac is an integrated automation platform dedicated to providing complete control and management of your automation plant. At the core of this platform, the Machine Controller series offers synchronous control of all machine devices and advanced functionality such as motion, robotics and database connectivity. This multidisciplinary concept allows you to simplify solution architecture, reduce programming and optimize productivity.

- One Machine Controller**
 Complete integration of motion and logic sequence



FACTORY AUTOMATION

Machine Automation Controller / Industrial PC with Sysmac Machine Control

MACHINE CONTROL

Motion



- Motion Control is integrated within the IDE, and operating in real-time
- Standard PLCopen Function Blocks plus Omron generated motion FB's
- Direct synchronous control for position, speed and torque

Safety



- All safety related data is synchronized with the whole network
- The PLCopen® FBD simplifies and accelerates the development process through structuring safety circuits and enhancing reuse.

Vision



- Higher resolution images available without increasing the vision processing time
- Shape search technology provides more stable and accurate object detection for Pick & Place projects

Robot



- Function Blocks in the Adept Robot Control Library enable robot control from the NJ/NX/ NY Controller using Ladder and Structured Text

Sensing



- Full control of the process parameter setting and predictive maintenance functions
- High precision detection and positioning data synchronized on the network



INFORMATION TECHNOLOGIES



Smart factory



IT devices



Offices HQ



Sales force



Information



One Machine Connection:

By seamlessly combining the strengths of globally open industrial protocols, Sysmac empowers facilities to use networks as they were designed to achieve more efficient results quicker.

One Connection

Sysmac Architecture

Efficiency through simplicity. Simplicity is using protocols as they were designed.

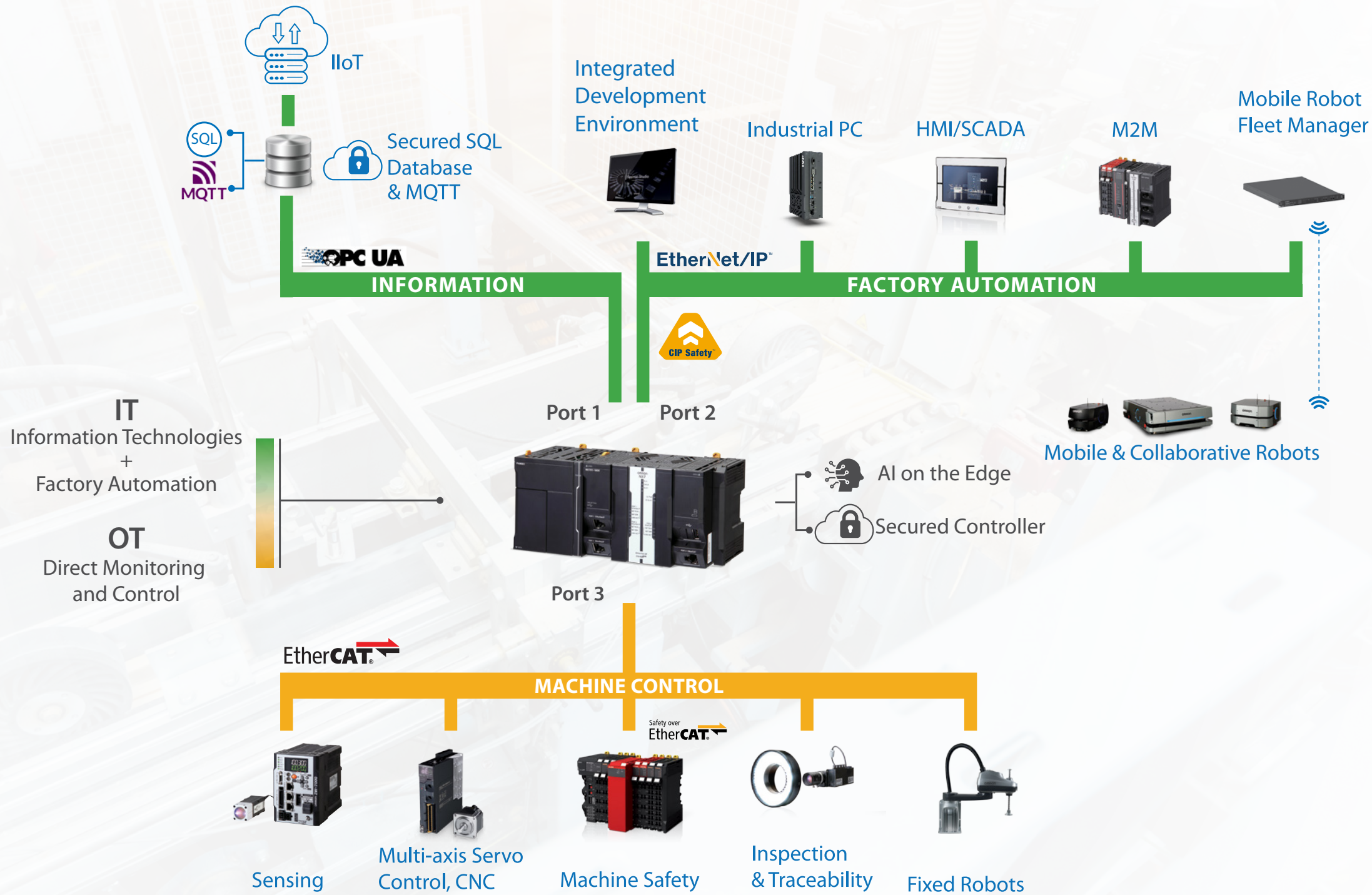
Single machine controller architecture with one connection and one software is how we define the Sysmac automation platform. The Machine Automation Controller integrates logic, motion, safety, robotics, vision, information, visualization and networking under one software, Sysmac Studio. This one software provides a true Integrated Development Environment (IDE). The machine controller comes standard with built-in EtherCAT™ and EtherNet/IP™. The two networks provide the perfect match between fast real time machine control and factory scale data management in a single unified connection..

Factory Automation with EtherNet/IP™

- Peer-to-Peer controller communication interface with Sysmac Studio , NA HMI or SCADA software
- Database connection for Microsoft SQL Server, Oracle, IBM DB2, MySQL and Firebird
- One connection includes safety over CIP Safety™

Direct Monitoring and Control with EtherCAT™

- Fast and precise: Fastest cycle time of 125 μs, synchronization with 1 μs jitter
- Embedded in OMRON servo drives, inverters, I/O, Safety, Vision and Sensing
- One connection includes safety over Fail Safe Over EtherCAT™





Design

 Minimize time to market

Collaborate as a team

- Coordinated development in large decentralized teams is possible. Sysmac Studio integrates a unique graphic interface with a GIT version control system. Take full control of your code and variations and take advantage of the most popular version control software (GIT) and its possibilities for team collaboration, not only during the design phase but also the commissioning and operation phases.

Backwards Compatible

- No matter the version of Sysmac Studio, the software is compatible with all firmware versions of products in the Omron portfolio. Extending product life in the field.



Commissioning

 Reduce installation costs

3D Simulation

- Import and control CAD data to simulate a machine using standard ladder logic, structured text and function block commands. Sysmac Studio can fully simulate HMI, controller and machine operation in one software.

Motion Simulation

- More than 50 PLC open and Proprietary Motion FB's available in controller to develop single, synchronous and coordinated motion applications. Rich graphic cam editor including multiple interpolation methods as standard. Motion Program Simulation does not require any hardware connection.

Sysmac Troubleshooter

- Sysmac Studio troubleshooter handles not only Sysmac Controller but complete Sysmac system troubleshooting in a single reporting tool. Commissioning time is dramatically reduced as any Controller, Network, or Slave problem will be detected with all suitable information available for you to control.

Production

 Boost Productivity

Automatic Data Playback

- The Sysmac Automation Playback is the convergence of data, video, program structure, and ladder logic. All playback is time synced and event triggered to allow local and remote team members to quickly and accurately diagnose issues without interrupting production.

Ever Ready Security

- Future updates are part of the Sysmac ethos. Automatic software updates continuously improve software security. Combining updates with backwards compatibility firmware allows for quicker deployment of updates.

One Controller

Machine Automation Controller

The NX product line completely controls the machine architecture. Performance and quality are never compromised with OMRON controllers. Patented connector security with a range of available processors give OMRON controllers the ability to drive performance into every node in your architecture. By seamlessly combining the strengths of CIP Safety™, EtherCAT® motion, and EtherNET/IP™ connectivity, OMRON's controllers allow facilities to use networks as they were designed to achieve world class efficiency.

NX controllers use the full DIN Rail. The X BUS, on the left side of the central processing unit, uses high speed data transfer to meet both performance requirements and larger data packets of open networks. The X Bus decreases automation cost by allowing a single NX controller to manage network bandwidth through the creation of subnets. Maximizing performance without requiring multiple controllers.



Embedded SQL client and embedded OPC UA Server to remove complex middleware and minimize "Man in the Middle" Cyber vulnerabilities.



Over 120 local and remote IO for complete customization and expandability.

Up to 1 Gb/s Connection for both safe and non-safe devices to quickly integrate into native architectures.



Up to 32 GB on edge storage and onboard battery to back-up process data

Real time motion control for jitter free precision, reducing scrap.



Sysmac Family

Controllers

Jump into task control with the NX1P or machine control with the NX102 then scale with the NX502 for line control or NX701 for factory control.

Each Sysmac controller family shares compatible IO and all controllers use the same integrated development environment, Sysmac Studio, with backwards compatibility as standard. Simplifying automation scaling.

PORTFOLIO OF SCALABILITY

Automation Scale	Task Control	Machine Control	Line Control	Factory Control
Features and Functionality	NX1P2 NJ101	NX102 NJ3 01	NX502 NJ501	NX701

Industrial PCs

OMRON NY Series Industrial PCs are designed with the Sysmac principals of creating the highest degree of machine performance while empowering users through data. Visualization of data is the key to utilizing operations technology data to implement change and achieve next level process efficiency.

PORTFOLIO OF SCALABILITY

CPU Capability	Compact IPC Performance	System IPC Performance	Controller & IPC Performance
Features and Functionality	NYE IPC	NY Panel IPC NY Box IPC	NY5 IPC

Lineup

Series	NX Series				NJ Series			
Model	NX1P2-□□□□	NX102-□□□□	NX502-□□□□	NX701-□□□□	NJ101-□□□□	NJ101-□□20	NJ301-□□□□	NJ501-□□□□
Feature	Task level control with built-in IO	Complete machine control in a single unit.	Line Scale Automation Control	Factory scale motion control.	For simple machines		For small-scale control with up to 8 axes	For large-scale control with up to 64 axes
Appearance								
Instruction execution times (LD instruction)	3.3 ns	3.3 ns	0.53ns	0.37 ns	3.0 ns		1.6 ns	1.1 ns
Program capacity	1.5 MB	5 MB	80 MB	80 MB	3 MB		5 MB	20 MB
Variables capacity (No retain attribute)	2 MB	32 MB	256 MB	256 MB	2 MB		2 MB	4 MB
I/O capacity	40 points	—	—	—	2,560 points		2,560 points	2,560 points
Number of EtherCAT slaves	16	64	256	512	64		192	192
Number of motion axes	0, 2, 4	0, 2, 4, 8	16, 32, 64, 128, 256	128, 256	0, 2		4, 8	16, 32, 64
Functions	—	Database connection (NX102-□□20)	Database Connection for all Units	Database connection (NX701-1□20)	—	Database connection	—	—

Windows OS			Windows OS with RTOS Machine Control
NYE Compact IPC	NYB Box IPC	NYP Panel IPC	NY5 Box IPC
			
Available in 12" and 15"	Powered by 11th Generation CPU	Available in 12", 15" and 18"	Supports EtherCAT as standard
NYE with FH+V7 Software	Die cast aluminum casing	Powered by 11th Generation CPU	Die cast aluminum casing
NYE with Soft NA Software	Supports 2.5 Gbps Ethernet as standard	Supports 2.5 Gbps Ethernet as standard	Supports 2.5 Gbps Ethernet as standard
NYE with WeblinkPC/ Autovision Software	Zero fan design available	Zero fan design available	No heat pipes



Select Your OMRON IPC

Sysmac Family

Software

SYSMAC-SE2□□□

Sysmac Studio Automation Software

One software for programming, configuration, simulation and monitoring

- One software for motion, logic sequence, safety, vision and visualization
- Fully compliant with open standard IEC 61131-3
- Supports Ladder, Structured Text, and Function Block programming with a rich instruction set
- Advanced security function with 32 digit security password



SYSMAC-XR□□□

Sysmac Library

For Design, Commissioning, and Production

- Advanced control such as vibration suppression and temperature control
- High-precision control of packaging machines and actuators for servo presses
- Productivity improvement by monitoring device operations and restoring parameters
- Reduction in programming time



Lineup

Sysmac Studio Standard Edition

Compatible with all Sysmac Devices

Part Number	# of Users	License Delivery Method
SYSMAC-SE201L	1	Electronic
SYSMAC-SE203L	3	Electronic
SYSMAC-SE210L	10	Electronic
SYSMAC-SE230L	30	Electronic
SYSMAC-SE250L	50	Electronic
SYSMAC-SE2XXL	Site	Electronic

Sysmac Studio Basic Edition

Control of Standard Edition with Online License Management

Part Number	# of Users	License Delivery Method
SYSMAC-BA201L	1	Electronic

Sysmac Studio Advanced Edition

Control of Basic Edition with Addition of 3D Simulation and Online License Management

Part Number	# of Users	License Delivery Method
SYSMAC-AD201L	1	Electronic

Sysmac Studio Lite Edition

Compatible with all Sysmac Devices except NJ3, NJ5, NX7

Full Capability of Sysmac Studio Limited to NX1, NJ1 controllers.

Part Number	# of Users	License Delivery Method
SYSMAC-LE201L	1	Electronic
SYSMAC-LE203L	3	Electronic
SYSMAC-LE210L	10	Electronic

License required to upgrade from Lite to Standard

Part Number	# of Users	License Delivery Method
SYSMAC-LU501L	1	Electronic
SYSMAC-LU503L	3	Electronic
SYSMAC-LU510L	10	Electronic

Included with Install for Standard, Basic, and Advanced Editions:

- Sysmac Studio
- CX-Integrator
- CX-Designer
- CX-Protocol
- Network Configurator
- CX-ConfiguratorFDT
- Adept Robot IP Address Setting Tool
- CX-Server
- Communications Middleware

Expanded capabilities:

Access to Sysmac Studio License Manager, allowing users to recover licenses in the event of lost license key.

Included with Install for Lite Edition:

- Sysmac Studio
- CX-Integrator
- CX-Designer
- CX-Protocol
- Network Configurator
- CX-ConfiguratorFDT
- Adept Robot IP Address Setting Tool
- CX-Server



Select Your
Sysmac Studio License

Sysmac Family

HMI

NA

Advanced Programmable Terminals and HMIs

Enable faster and more efficient control with clear process visualization.

The NA family of HMI terminals makes it fast and intuitive to implement dynamic and highly custom operator interfaces that provides the factory floor process information in real time. Boosting productivity through clear communication.

- NA HMI's use a single connection to visualize complete machine performance.
- NA HMI's are designed and can be completely stimulated within the integrated development environment Sysmac Studio. Maximizing operator and engineering collaboration.
- Easy to read interfaces with sizes up to 15.4 inches with over 16 million display colors on 24 bit color.





IAG – Intelligent Application Gadgets

The graphics collection accelerates the development process. You can make your own collections and share them between projects.

Lineup

Series	NA Series			
Feature	More than 16 million color (24 bit full color) and wide screen for all models			
Appearance				
Display device	TFT LCD			
Screen size	15.4-inch widescreen	12.1-inch widescreen	9.0-inch widescreen	7.0-inch widescreen
Number of dots (horizontal × vertical)	WXGA 1,280×800 dots		WVGA 800×480 dots	
Colors	16,770,000 colors (24 bit full colors)			
Built-in ports	2 Ethernet ports, 2 USB host ports, 1 USB slave port			
Allowable power supply voltage range	19.2 to 28.8 VDC			
Degree of protection	Front-panel controls: IP65 oil-proof type			
Memory card	SD/SDHC memory card			
Flame colors	Black, silver			



View the OMRON
HMI Portfolio

Sysmac Family

Motion

R88M-1□/R88D-1SN□-ECT

1S AC Servo System

Improved machine design. Increased machine productivity.

Optimized installation and commissioning tasks

- Reduce cabinet size with compact servo drive with same height throughout the whole power range
- Fast and secure screw-less push-in in control I/O connector and brake interlock connector

23 bit high resolution encoder

- No battery, no maintenance and compact size

Multi-axis setup and tuning

- Configure and monitor multiple axes in one view
- Easy & fast parameter transfer among axes in the machine (up to 256 axes)
- Comprehensive gain tuning

Safety control via EtherCAT

- EN ISO 13849-1(Cat.3 PLd)
- EN61508(SIL2), EN62061(SIL2)
- EN61800-5-2(STO)



R88M-1A/R88D-1SAN-ECT

1SA Safety Servo System

Safer environment and higher productivity.

Safety functionality

- Safety-over-EtherCAT (FsoE)
- Safety functions according to SIL3/PLe
- Safety functions: STO, SS1, SS2, SOS, SLS, SLP, SDI, SBC

20 bit high resolution encoder

- No battery, no maintenance and compact size

Optimized installation and commissioning tasks

- Fast and secure screw-less push-in in control I/O connector and brake interlock connector
- Power, encoder and brake in one cable



Lineup

Series	1S Series		G5 Series	
Model	R88M-1□/R88D-1SN□-ECT		R88M-1A□/R88D-1SAN□-ECT	
Appearance				
Type	Built-in EtherCAT Communications		Built-in EtherCAT Communications and Safety	
100 VAC Applicable motor capacity/force	50 W to 400 W		N/A	
200 VAC Applicable motor capacity/force	50 W to 15 kW		200 W to 3 kW	
400 VAC Applicable motor capacity/force	600 W to 15 kW		400 W to 3 kW	
Applicable servomotor	1S Servomotor		1SA Rotary Servomotor	
Control mode	Position, speed and torque control		Position, speed and torque control	
Safety approvals	· ISO 13849-1 (PL-e/PL-d) · EN61508 (SIL3/SIL2) · EN62061 (SIL3/SIL2) · IEC 61800-5-2 (STO)		· EN ISO 13849-1 PLe/Cat.3 · EN 61508 SIL3 · EN 62061 SIL CL3 · EN 61800-5-2 SIL3 (STO/SS1/SS2/SOS/SLS/SLP/SDI/SBC)	
Appearance				
Rated rotation speed	3,000 r/min	2,000 r/min	3,000 r/min	2,000 r/min
Momentary maximum rotation speed	5,000 to 6,000 r/min	3,000 r/min	5,000 to 6,000 r/min	3,000 r/min
Rated torque	0.318 to 9.55 N·m	4.77 to 14.3 N·m	0.637 to 9.55 N·m	9.55 to 19.1 N·m
Capacity	50 W to 3 kW	400 W to 3 kW	200 W to 3 kW	1.5 kW to 3 kW
Applicable servo drive	1S Servo Drive		1SA Servo Drive	
Encoder resolution	23-bit absolute	23-bit absolute	20-bit absolute	20-bit absolute
Protective structure	IP67			



View the OMRON Servo Portfolio

Sysmac Family

I/O

NX Series Modular I/O

Speed and accuracy for machine performance

The NX Modular IO range offers over 120 I/O unique part numbers. Allowing machine design maximum flexibility and modularity. Its ultra-fast internal bus system is synchronized with the distributed clock of the EtherCAT™ network. The resulting system-wide deterministic I/O operation allows machine builders to improve machine production rates and output quality. The NX Modular IO range creates a robust IO foundation for any automation including position, control, temperature, and integrated safety



Communications coupler
· EtherCAT®
· EtherNet/IP™



IO-Link master
· Up to 4 IO-Link devices with one master

Serial communications
· RS-232C or RS-422A/485 interface



RFID
· Direct connection to V680 RFID System



Digital I/O
· 4, 8, 16, or 32 channels per input unit
· 2, 4, 8, 16, or 32 channels per output unit (8 channels per relay output unit)
· 16 channels per mixed I/O unit
· Standard, high-speed, and time-stamp models
· Units with Push-In Plus/MIL/Fujitsu/M3 Screw connector



Analog I/O
· +/-10V voltage and 4-20 mA current signals
· 2, 4 or 8 channels per input unit
· 2 or 4 channels per output unit
· Standard and high-performance models
· Single-ended input and differential input models

High-speed analog input
· 4 channels per input unit
· Differential input
· Sampling as fast as every 5 μs



Load cell inputs
· One load cell with one unit
· Fastest conversion cycle of 125 μs



Safety I/O
· 4 or 8 safety input points per unit
· 2 or 4 safety output points per unit
· Free allocation of the safety I/O units on the internal high speed bus

Safety CPU
· EN ISO13849-1 (PLe/Safety Category 4), IEC 61508 (SIL3) certified



Temperature inputs
· Thermocouple or RTD inputs, 2 or 4 per unit
· Conversion time of 10 ms, 60 ms or 250 ms

Heater burnout detection
· 4 CT sensor inputs and 4 trigger outputs to drive SSRs



Temperature control
· 2 or 4 multi-input (thermocouple and resistance thermometer) channels per unit
· Conversion time of 50 ms
· Voltage output (for driving SSR) or linear current output
· 1 CT input per channel



Position interface
· Incremental and absolute encoder support
· Pulse output unit (line driver output model)

Lineup

Series	NX Series
Features	· Over 100 models including digital I/O, analog I/O, position interface, temperature inputs, temperature control, RFID, safety CPU, and safety I/O · NsynX technology provides I/O response with less than 1 μs jitter · Screwless terminal block, connector, and M3 screw types · Up to 32 channels per digital input unit or output unit
Appearance	
Type	Modular I/O
Communications interface	EtherCAT
Number of connectable units	· 63 units max. · Input: 1,024 bytes max., output: 1,024 bytes max.
Unit types	Communications coupler, IO-Link master, serial communication, RFID, digital I/O, analog I/O, high-speed analog input, load cell input, safety I/O, safety CPU, temperature input, heater burnout detection, temperature control, position interface
Mounting	DIN track

* See page 27 for more information on safety I/O.

Series	NXR Series
Features	· IP67 Ingress Protection Rating for Longevity · M12 Connector for Quick Connection · Pre-Programmed Port Setting for Fast Set-up
Appearance	
Type	Block
Communications interface	EtherNet/IP and EtherCAT™ with IO Link
Number of connectable units	8 configurable ports: IO-Link, 2 inputs, 2 outputs, or 1 input and 1 output
I/O types	Digital I/O



View the OMRON
local NX IO Portfolio

Sysmac Family

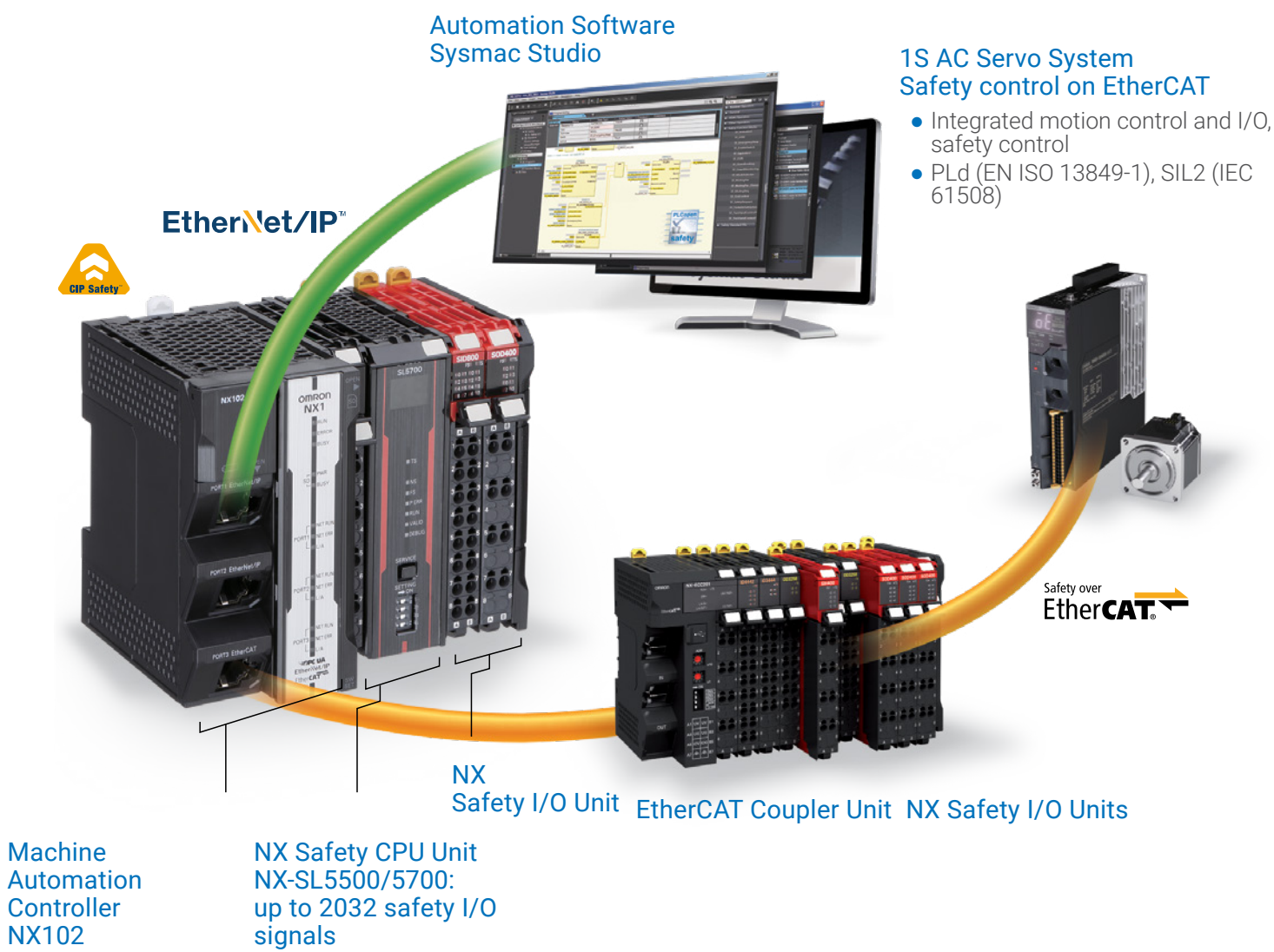
Safety

NX-SL/SI/SO

NX Safety Controller

Integrated safety into machine automation

- The safety controller meets PLe according to the ISO 13849-1 and SIL3 according to IEC 61508
- Flexible system lets you freely mix safety controller and safety I/O units with standard NX I/O
- Integration in One software, Sysmac Studio
- Certified programs can be reused, which reduces the amount of verification work



Lineup

Safety Controller

Product name	Safety CPU Unit	
Model	NX-SL5500/5700	NX-SL3300/3500
Features	• Two different networks, Safety over EtherCAT (FSoE) and EtherNet/IP (CIP Safety), in a single system • Line safety control and fast machine control at the same time • Sysmac Studio version 1.24 or higher for hardware configuration and programming • Flexible Safety system building • Optimal I/O building	• Integrated safety into machine automation through the use of Safety over EtherCAT -FSoE- protocol. • Freely mixing with standard NX I/O • Sysmac Studio version 1.07 or higher for hardware configuration and programming • Flexible Safety system building • Optimal I/O building
Appearance		
Network	Safety over EtherCAT (FSoE), EtherNet/IP (CIP Safety)	Safety over EtherCAT (FSoE)
Applicable standards	EN ISO 13849-1 (PLe/Safety Category 4), IEC 61508(SIL3), IEC/EN 62061(SIL CL3), IEC/EN 61131-2, IEC 6132-3-1, IEC 61131-6	EN ISO 13849-1 (PLe/Safety Category 4), IEC 61508 (SIL3), EN 62061 (SIL CL3), IEC/EN 61131-2, IEC 6132-3-1
Programming	• IEC 61131-3 standard • PLCopen Function Blocks for Safety	
Program capacity	2048 KB, 4096 KB	512 KB, 2048 KB
Safety I/O connection	128/254	32/128
Maximum number of safety I/O points	1024, 2032	256, 1024
Units that can connect	NX102 CPU Unit, Communication Control Unit	NX102 CPU Unit, EtherCAT Coupler Unit, EtherNet/IP Coupler Unit

Product name	Safety Input Unit	Safety Output Unit
Model	NX-SIH400/SID800	NX-SOH200/SOD400
Appearance		
Applicable standards	EN ISO 13849-1 (PLe/Safety Category 4), IEC 61508(SIL3), IEC/EN 62061(SIL CL3), IEC/EN 61131-2, IEC 6132-3-1	
Number of safety input/output points	4, 8	2, 4

Sysmac Family

Vision

FH Vision System

Flexible solution for machine vision

The FH Vision System is optimized to detect the position and orientation of any object at high speed and with high accuracy. The built-in EtherCAT communications enable reliable and easy networking with motion control, increasing the overall machine performance. A flexible machine vision tailored for quality inspection.



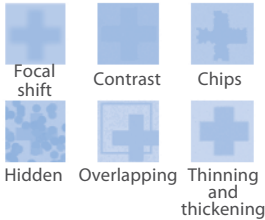
Wide camera range

- Up to 20.4 M pixel
- High speed CMOS camera
- Use different fields of vision and at any angle



Advanced shape search technology

- Differences of the work piece
- Dust and dirt conditions
- Detection of overlapping objects
- Changing ambient environment



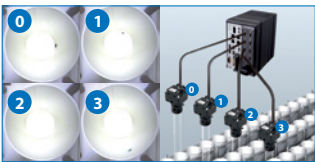
Unique light

- The MDMC light flexibly changes illumination colors and angles according to items to measure.



Multiple inspection

- Powerful 4-core i7 parallel processor
- Up to 8 camera by one controller



FQ-M Vision Sensor

Designed for object tracking

The FQ-M Series is a vision sensor designed specifically for pick and place applications. Up to 5,000 pieces per minute with 360 degree rotation can be detected. The FQ-M series include an incremental encoder input for easy tracking and calibration.



Compact design

Camera and image processing in one

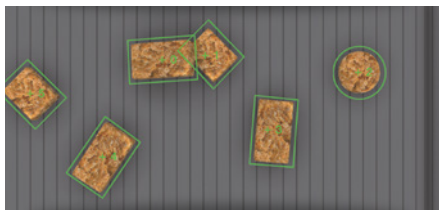
Standard C-mount lenses; choose the field of view and focus distance you need

- Flexible cables
- Vision sensor with encoder input for tracking function



Advanced shape search technology

Product detection: 10 pcs with rotation < 200 ms



Lineup

Product name	Smart Camera	Vision System
Series	FQ-M Series	FH Series
Appearance		
Hardware features	· Camera and image processing in one · Easy to installation	Flexible configuration of cameras and controller to suit your applications
Software feature	Communication wizard for easy setting	Flexible setting with flowchart
Processing items	Processing items for Pick & Place applications	Processing items covering general applications
Processing resolution	0.4 Mpix	752 (H)×480 (V)
	5 Mpix	—
	20.4 Mpix	—
Communications interfaces	EtherCAT, Ethernet, Parallel I/O, encoder input	

Sysmac Family

Sensing

ZW-8000/7000

Confocal Fiber Displacement Sensor

Measure anything from anywhere for the most reliable in-line measurements.

The ZW-8000 Series provides high-precision in-line measurements of rattling, inclined, shiny, thin or minute parts. The ZW-7000 Series provides ultra-high-speed, stable measurements of diffuse reflective objects during movement. These sensors help increase quality inspection accuracy and to reduce inspection time.



Reliable measurements for any material and surface types
The white light confocal design principals allow a continuous measurement of object in any mixed conditions including mirror, coarse, transparent, curved, or narrow areas without stopping the sensor head.

ZW-8000/700 Resolution

- Angle characteristic: ±25° for shiny surfaces
- Linearity for different materials: ±0.3 μm
- Minimum sampling period: 20 μs
- Minimum spot diameter: 4 μm



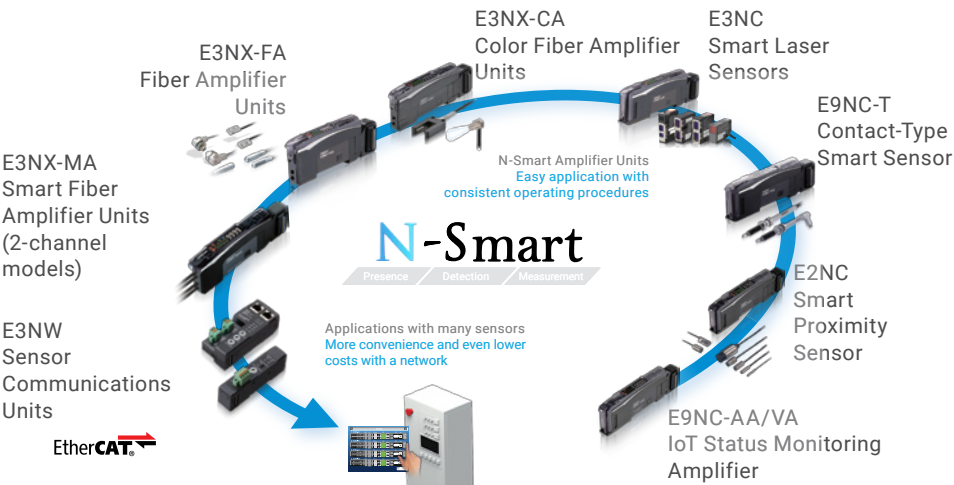
Note: Specifications differ among models. Please ask OMRON sales representative for details.

E3NX/E3NC/E9NC/E2NC Series

N-Smart Series

Various sensors connected over EtherCAT™

The N-Smart lineup of next-generation fiber sensors, laser sensors, contact sensors, and proximity sensors are designed to solve common industry problems maximizing uptime to achieve optimum cost performance.



N-Smart Series Problem Solving Features

- Ultra-easy Advanced Smart Tuning with the push of a button
 - Stable detection of high-speed workpieces
 - Predictive maintenance to reduce downtime
 - Highly visible white LED display
 - E3NX-FA has 1.5x the sensing distance of conventional amplifiers¹
1. Compared with E3X-ZV/MZV

Lineup

Product name	Confocal Fiber Displacement Sensor		
Series	ZW-8000 Series	ZW-7000 Series	ZW-5000 Series
Feature	For measurements of rattling or in-clined "transparent objects or mirror surfaces" such as thin film sheets or glass	For accurate shape measurements of "coarse surfaces" while the sensor head is moving	Bring the benefits of the white light confocal principle to production lines
Appearance			
Measurement method	White light confocal principle		
Measuring range	Min : 7±0.3 mm, Max : 30±2 mm		
Static resolution	0.002 to 0.016 μm		
Linearity	±0.3 to ±3.0 μm		
Spot diameter	4 to 11 μm	50 to 190 μm	9 to 20 μm
Measurement cycle	60 to 7500 μs	20 to 400 μs	80 to 1600 μs

Product name	Detection Sensors	
Series	N-Smart Series	
Feature	Connect fiber, laser and contact sensors to EtherCAT™	
Appearance		
Network specification	EtherCAT™ communication unit	
Sensor Communications Units	E3NW-ECT/DS	
Connectable sensor amplifier units	Fiber Sensor E3NX-FA0 E3NX-CA0 E3NX-MA0 Laser Sensor E3NC-LA0 E3NC-SA0	Contact Sensor E9NC-TA0 E9NC-AA0/VA0 Proximity Sensor E2NC-EA0
Maximum number of connectable sensors	30	

Product name	Detection Sensors	
Series	IO Link Comptable	
Feature	Utilize IO-link at the basic sensor level to start predict machine maintenance programs, reconfigure replacement sensors and quickly troubleshoot sensor failures to minimize downtime.	
Appearance		
Network specification	IO Link on NXR Series Remote IO	
Connectable sensor	Photoelectric Sensor E3Z-IL E3AS-HL E3AS-F E3AS-L Color Sensor E3S-DC-IL	Proximity Sensor E2E NEXT E2EQ NEXT E2EW



View the OMRON Sensor Portfolio

Sysmac Family

Robot

Parallel Robot, SCARA Robot, Articulated Robots

Advanced solutions for flexible production lines

OMRON offers three robot families with over 100+ models to ensure you have the right robot for the right job. Our robots are available with food-grade grease, cleanroom, or ESD protections to ensure your productions aren't compromised and to avoid costly recalls. Our parallel, SCARA and articulated robots are designed to be programmed using familiar languages (IEC 61131-3) with NJ/NX/NY controllers connected via EtherNet/IP™.



Combine OMRON's robotics portfolio with a Sysmac controller to simplify integration with unified control of robots and machines. Seamlessly integrate the entire process flow throughout design, commissioning, operation, and its maintenance.

OMRON Robots

Our line of integrated controller-compatible robots come with real-time EtherCAT connectivity to an Omron NJ501-R.

OMRON NJ501-R

Integrated machine and robotics controller that offers top performance and scalability, by seamlessly combining motion, robotics, logic, IO, and safety.

Sysmac Studio

Unified software platform to simulate, deploy, control, and monitor robotics alongside the Omron automation ecosystem.

Application Manager

Application-level runtime environment for vision, recipe management and robot application modules like PackManager.



Machine Automation Controller and robot EtherCAT™ master



Sysmac Studio software to simulate and program applications

Lineup

Series		Hornet 565	Quattro 650/800	Cobra 450/500/650
Feature		Parallel robot ideal for use in the food and beverage, pharmaceutical, and healthcare industries	Four-axis parallel robot achieves high speed and high precision	Mid-size SCARA robot for material handling, assembly, precision machining and adhesive application
Appearance				
Robot type		Parallel robot	Parallel robot	SCARA robot
Number of axes		3, 4	4	4
Mounting		Inverted	Inverted	Table/Floor
Payload capacity		3 kg (8 kg: without rotation axis)	· Quattro 650 6 kg (No rotation: 15 kg) · Quattro 800 4 kg (No rotation: 10 kg)	5 kg
Working volume (radius)		565 mm	650 to 800 mm	—
Reach		—	—	450 to 650 mm
Position repeatability		±0.10 mm	±0.10 mm	±0.02 mm
Protection/Cleanroom classes	Specifications	IP67: arms and platform IP65: underside of robot IP20: topside of robot	· H type IP67: arms and platform IP65: underside of robot IP20: topside of robot · HS type IP67: arms and platform IP66: robot base	IP20
	Option	IP65: topside of robot (with optional cover)	H type IP65: topside of robot (with optional cover)	—

Series		eCobra 600/800	eCobra 800 Inverted	Viper 650/850
Feature		Mid-size/large SCARA robot for precision machining, assembly, and material handling	Overhead-mount large SCARA robot for precision machining, assembly, and material handling	Articulated robot for machining, assembly, and material handling
Appearance				
Robot type		SCARA robot	SCARA robot	Articulated robot
Number of axes		4	4	6
Mounting		Table/Floor	Inverted	Table/Floor/Inverted
Payload capacity		5.5 kg	5.5 kg	5 kg
Working volume (radius)		—	—	—
Reach		600 to 800 mm	800 mm	635 to 855 mm
Position repeatability		±0.017 mm	±0.017 mm	±0.02 to 0.03 mm
Protection/Cleanroom classes	Specifications	IP20	IP20	IP40
	Option	· eCobra 600 Class10 Cleanroom model · eCobra 800 IP65, Class10 Cleanroom model	IP65, Class10 Cleanroom model	IP54: robot main body IP65: robot joints (J4, J5, J6) Class10 Cleanroom model

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As a global leader in automation technology, we use our extensive portfolio to build integrated solutions that optimize manufacturing and improve safety. With Proof of Concept Centers located throughout the world, we give customers the freedom to create world-class products using solutions they can trust.

Engineering values to customers and partners:

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- Feasibility studies for advanced sensing technologies
- Proof-of-concept testing for fixed, collaborative and mobile robotics
- Technical training



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