

# NX-series Safety Controller

EtherCAT System




Integrated safety into machine automation

# The safety solution for any application


The NX Safety Controller enables a safety solution to be integrated into the Sysmac automation platform within our one connection and one software concept.

One connection with NJ/NX Machine Automation Controller and other devices is realized through the use of Safety over EtherCAT -FSoE- protocol. The NX Safety I/O Units can be freely distributed in an I/O rack throughout the network, mixing them in any combination with standard NX I/O Units. The Automation Software Sysmac Studio allows for configuration, programming, simulation and monitoring functionality.

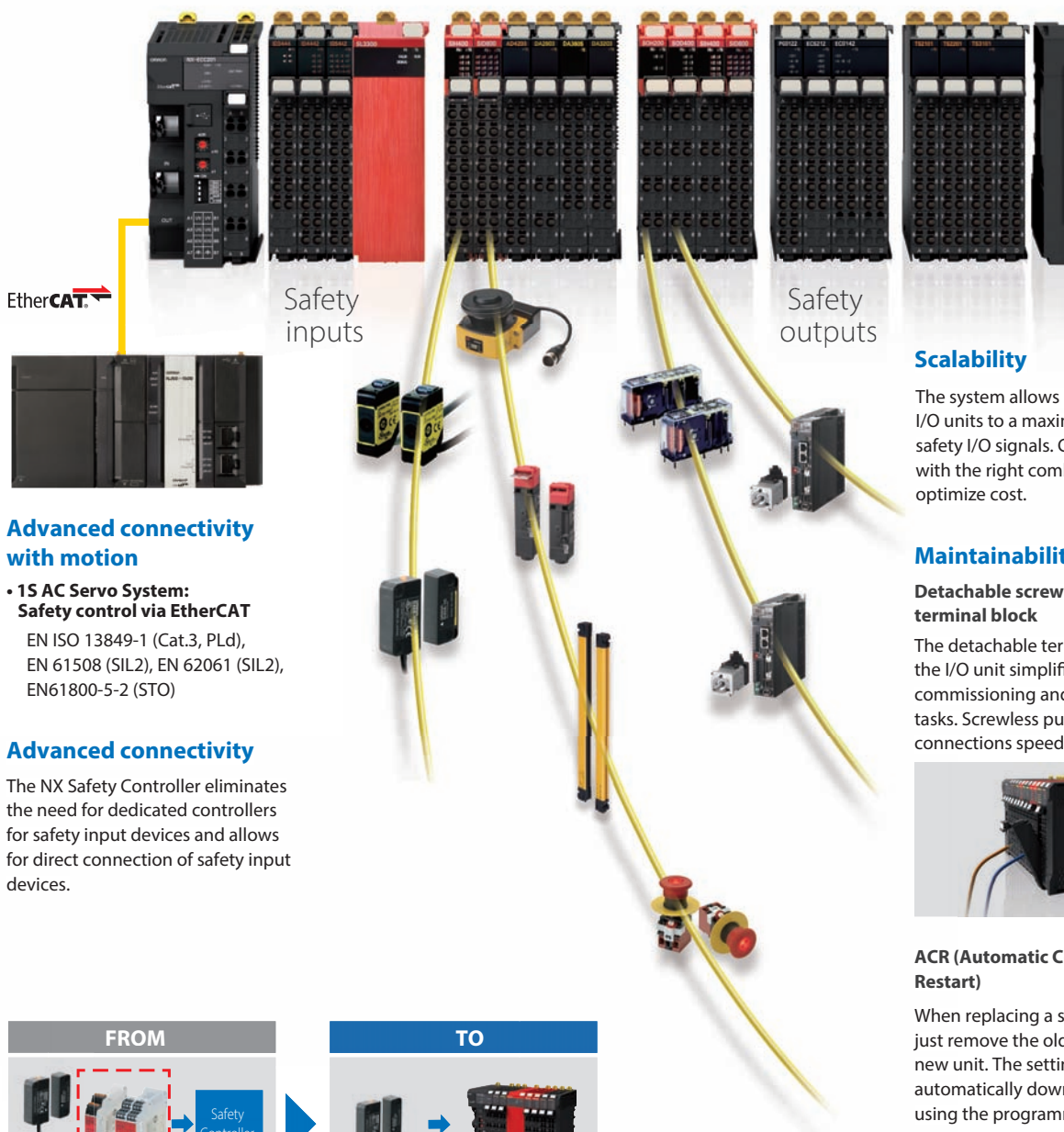
**Safety** 

ISO 13849-1, Cat.4/PLe  
IEC 61508 SIL3

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**PLC** 

IEC 61131-2  
IEC 61131-3  
PLCopen® FBD

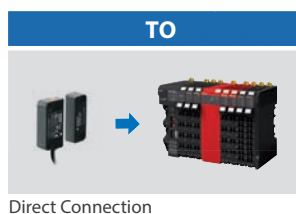
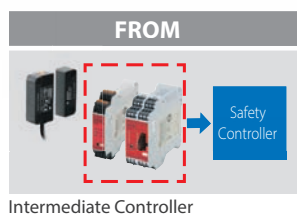


### Advanced connectivity with motion

- 1S AC Servo System:  
Safety control via EtherCAT  
EN ISO 13849-1 (Cat.3, PLd),  
EN 61508 (SIL2), EN 62061 (SIL2),  
EN61800-5-2 (STO)

### Advanced connectivity

The NX Safety Controller eliminates the need for dedicated controllers for safety input devices and allows for direct connection of safety input devices.



### Scalability

The system allows up to 128 safety I/O units to a maximum of 1024 safety I/O signals. Configure systems with the right combination of I/O to optimize cost.

### Maintainability

#### Detachable screwless terminal block

The detachable terminal block of the I/O unit simplifies the commissioning and maintenance tasks. Screwless push-in connections speed up installation.



#### ACR (Automatic Configuration Restart)

When replacing a safety I/O Unit, just remove the old unit and insert a new unit. The setting data is automatically downloaded without using the programming software.



# Flexibility and reusability of programming code

## Standard programming with Sysmac Studio

Sysmac Studio is compliant to the IEC 61131-3 standard and utilizes PLCopen® function blocks. The safety controller provides a large program capacity of 2048 KB (equivalent to more than 2,000 function blocks), visual setting of IO and automatic generating wiring diagram, variable style programming, reusable user-defined function blocks, offline simulation and simple automatic test.



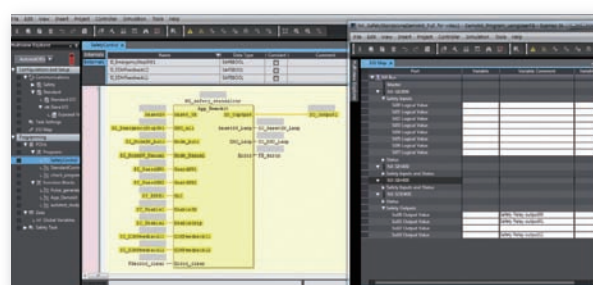
## Visual setting of IO and automatic generating wiring diagram

Safety I/O settings are completed by dragging and dropping the visual icons, and wiring diagrams are automatically generated based on the terminal settings. The same window can be used for I/O monitoring and troubleshooting.



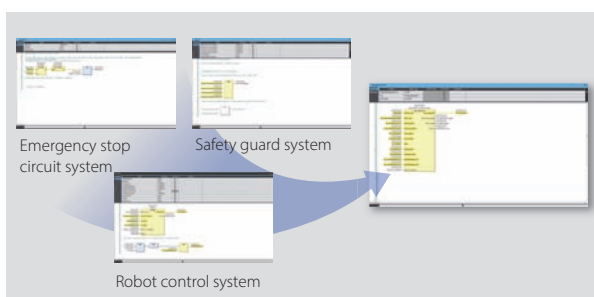
## Programming with variables

Unlike previous programming with physical addresses, programming with variables does not depend on the hardware configuration. You can use the same code for the machine with a different hardware configuration by flexibly changing connections between variable names and hardware memory addresses.



## User-defined function blocks

You can define your own function blocks. Repeat use of user-defined function blocks cuts programming time and maintains consistency of quality. Secure the code with password protection and add user-defined help files to make re-using functions safe and easy.



## Offline simulation and simple automatic test

You can check operation on the Simulator without physical devices. Furthermore, basing on the relationship between inputs and outputs, program can be tested automatically. This significantly reduces program modification and debugging time.



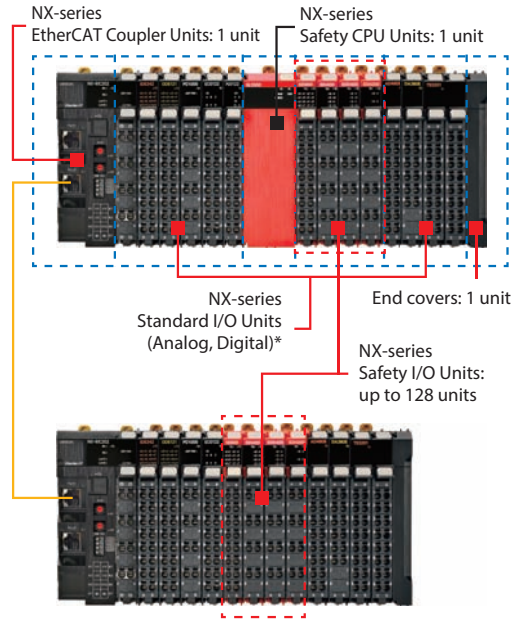
## Safety System Monitor Library

Safety programs that run at production sites can be managed.

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## System configuration



\* Refer to your OMRON website for details.

### NX-series EtherCAT Coupler Unit

Accessory: End cover

NX Unit power consumption	Maximum I/O power supply current	Model
1.45 W or lower	4A	NX-ECC201
1.45 W or lower	10A	NX-ECC202
1.25 W or lower	10A	NX-ECC203

### Safety CPU Unit

Maximum number of safety I/O points	Program capacity	Number of safety master connections	Model
256	512 KB	32	NX-SL3300
1024	2048 KB	128	NX-SL3500

### Safety Input Unit

Number of safety input points	Number of test output points	Rated input voltage	OMRON special safety input devices	Model
4 points	2 points	24 VDC	Can be connected	NX-SIH400
8 points	2 points	24 VDC	Cannot be connected	NX-SID800

### Safety Input Unit

Number of safety output points	Internal I/O common	Rated input voltage	Maximum load current	Model
2 points	Sourcing outputs(PNP)	24 VDC	2.0 A/point	NX-SOH200
4 points	Sourcing outputs(PNP)	24 VDC	0.5 A/point and 2.0 A/Unit	NX-SOD400

## 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	Specifications	Number of licenses		Media	Model
Sysmac Studio Standard Edition *1 Ver.1.□□	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-series CPU Units, NY-series Industrial PC, EtherCAT Slave, and the HMI.	1 license *3	—	—	SYSMAC-SE201L
	Sysmac Studio runs on the following OS. *2 Windows 7(32-bit/64-bit version)/Windows 8.1(32-bit/64-bit version)/ Windows 10(32-bit/64-bit version)/Windows 11(64-bit version)	— (Media only)	—	Sysmac Studio (32bit) DVD	SYSMAC-SE200D
		— (Media only)	—	Sysmac Studio (64bit) DVD	SYSMAC-SE200D-64

Note: For details of the Automation Software Sysmac Studio, refer to your local OMRON website.

\*1. The Sysmac Studio Standard Edition with license(s) (SYSMAC-SE□□□□) provides functions of the NX-I/O Edition (SYSMAC-NE001L) and functions of the Safety Edition (SYSMAC-FE001L).

With the Sysmac Studio Standard Edition with license(s) (SYSMAC-SE□□□□) version 1.10 or higher, you can use the setup functions for the EtherNet/IP Coupler.

\*2. Model "SYSMAC-SE200D-64" runs on Windows 10 (64bit) or higher.

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

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

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