

# AC Servo System

1S Series



Optimized installation and setup  
Increased machine productivity  
Global availability and global conformance

# State of the art technology applied to general-purpose servo

## Improved machine design, greater machine productivity

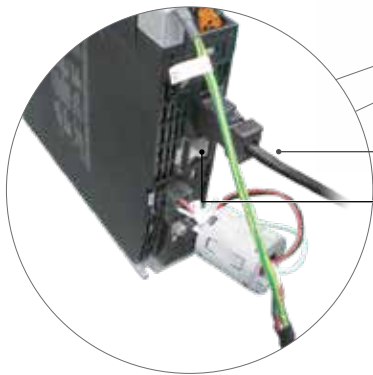
Designed to meet a variety of machine requirements, the 1S servo technology optimizes the full cycle, through the machine design, installation and commissioning tasks and finally to the maintenance once in production. In addition to the traditional motion solution, the 1S servo offers high-resolution multi-turn encoder with battery backup, safety network built-in and improved loop control, allowing accurate and higher machine productivity.

The 1S concept is maintained while the capacity range has been expanded.

## Optimized installation and commissioning tasks

Cabinet size reduction:

- Compact servo drive with same height throughout the power range from 0.1 to 7.5 kW



Pre-assembled motor cables

Embedded relay for direct motor brake control



Direct wiring of I/O signals. No need for terminal block units

**NO WIRING**

- Fast and secure screw-less push-in in all connectors
- Pluggable connectors for easy pre-wiring and system maintenance \*1

## Servo features

- Power range from 50 W to 15 kW \*2
- 23 bit high resolution encoder
- Battery-free absolute multi-turn encoder
- Improved loop control for low overshoot and quick settling time
- Safety function built-in:
  - Hardwired Safe Torque Off :  
EN ISO 13849-1(Cat.3 PLe), EN61508(SIL3), EN62061(SIL3), EN61800-5-2(STO)
  - Safety over EtherCAT(FSoE) :  
EN ISO 13849-1(Cat.3 PLd), EN61508(SIL2), EN62061(SIL2), EN61800-5-2(STO)

**NEW**

Expanded with High Capacity  
Range: 4 - 15 kW \*2



\*1. Except 15 kW (200 V)

\*2. The 3000-r/min servomotor of 5 kW (200 VAC) and 1500-r/min servomotors of 4 kW and 5.5 kW (200 VAC) will be available soon.



## Simplified machine design and maintenance

- No battery, no maintenance
- No need for homing sequence improving machine uptime
- 23 bit high resolution encoder as standard
- Absolute multi-turn encoder design without mechanics: 16 bits, 65536 turns
- Compact and smaller motor size

## 50% setup time reduction\*



### Servo sizing

- Servo sizing tool for the entire machine
- Graphical environment of the kinematic chain
- Electronic CAM import from Sysmac Studio

Save 40% \*



### System configuration

- NJ project auto-builder from servo sizing file
- Quick setup wizard for key parameters
- Parameters transfer in less than 400 ms

Save 60% \*



### Gain tuning & test run

- "Best effort" feature for quick stabilization time
- Easy tuning with intelligent gain search in less than 2 minutes
- Wizard for tuning, test run & monitoring
- Advanced tuning simulation to reduce testing effort and prevent machine damage

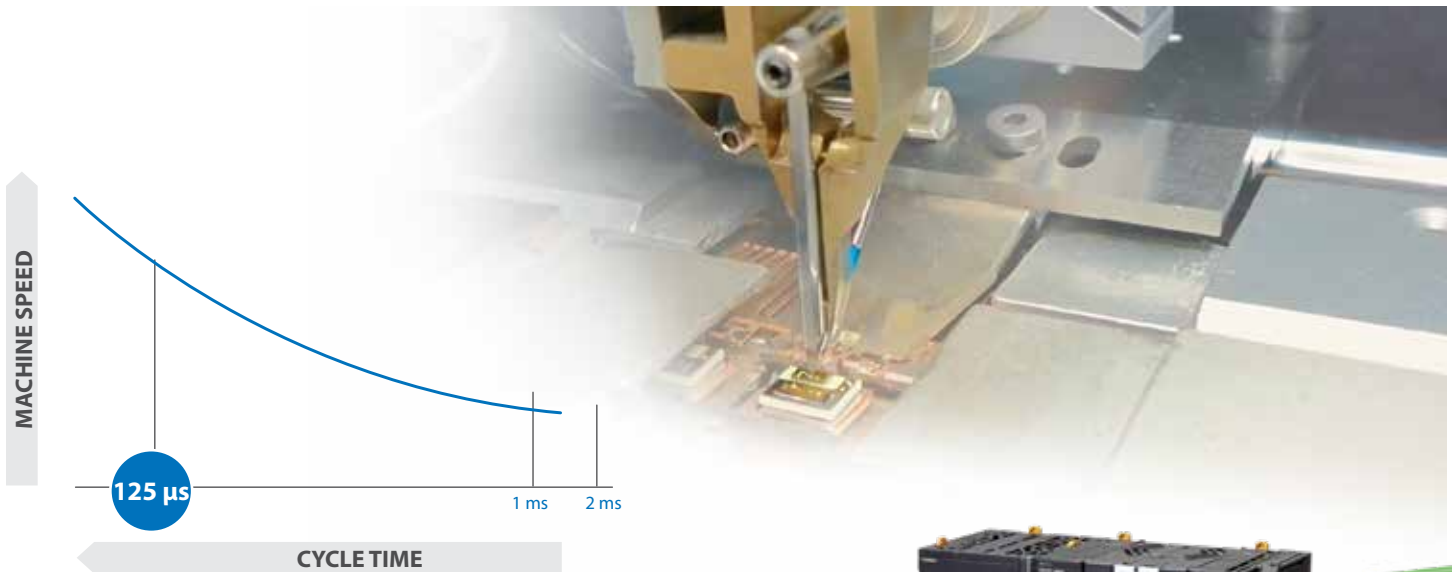
Save 50% \*

PATENT PENDING

\* Performance comparison with previous Omron products based on Omron investigation in July 2019.



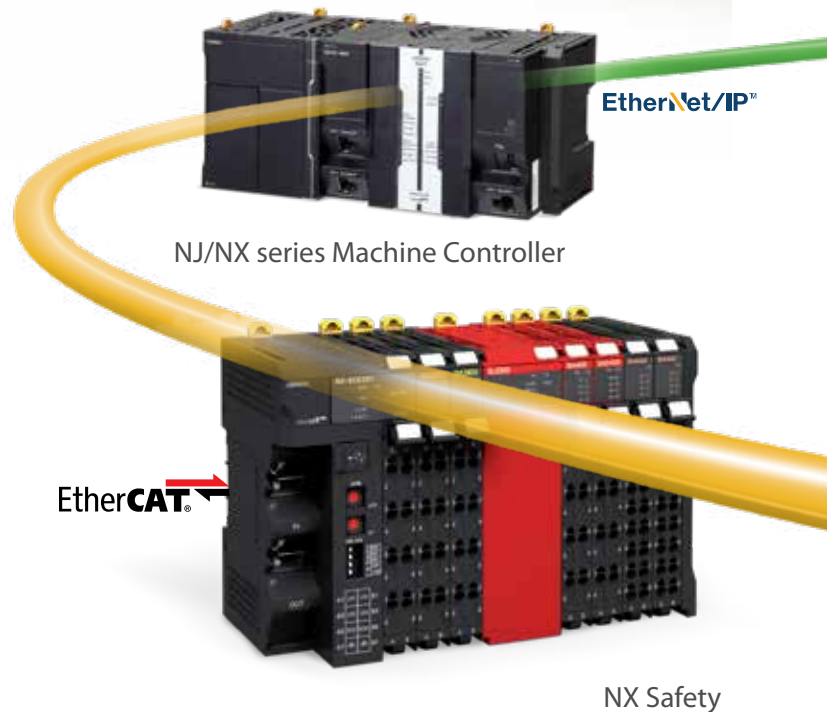
# Thoroughly integrated, completely in control



## Higher productivity

### 125 $\mu$ s system cycle

- Faster machine speed with zero reduction in accuracy
- Accurate profile generation in the controller
- The 23 bit high resolution encoder in combination with the improved loop control provides an accurate following profile



## Integrated Safety

### Safety control via EtherCAT

- Simplified safety installation
- Reduction of safety devices
- Safety function built-in: Fail Safe over EtherCAT (FSoE) Safe Torque Off
- Safety approval: EN ISO 13849-1(Cat.3 PLd), EN61508(SIL2), EN62061(SIL2), EN61800-5-2(STO)
- Troubleshooter integrated with Sysmac Studio



Servo sizing



Setup



Logic, Motion & Safety  
programming



Simulation



Commissioning



## Completely in Control

### Sysmac Studio

- Simplified servo setup: Direct use of servo sizing calculation
- Open standard IEC 61131-3 programming
- Standard PLCopen Function Blocks for Motion and Safety
- Sysmac Library for fast engineering and optimized machine availability
  - Application libraries
  - Optimized productivity
  - Predictive maintenance
  - Reduced downtime



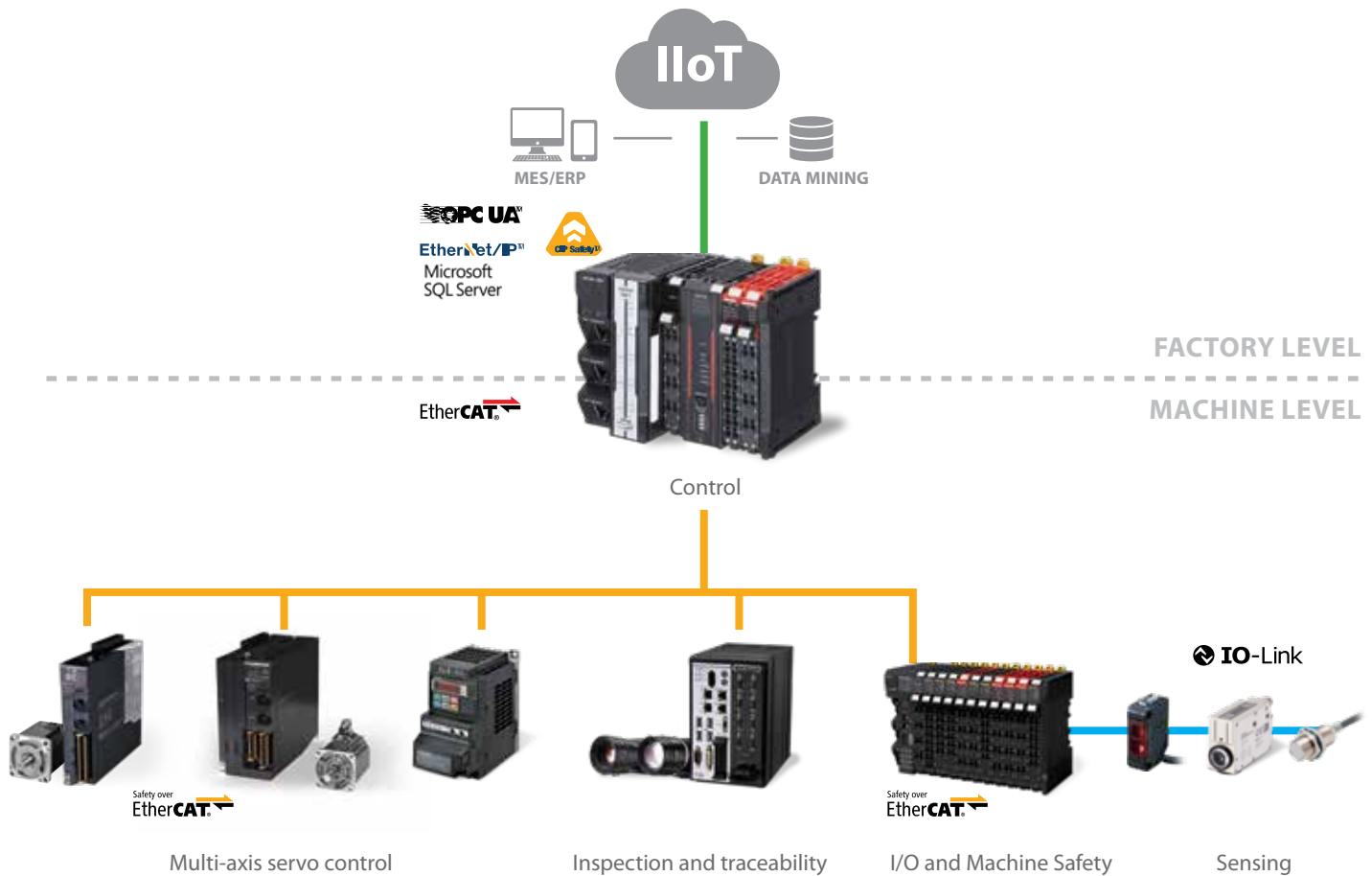
Safety over  
**EtherCAT**

1S Servo



Contact us for specifications

# Sysmac Automation Platform



## Software



### Sysmac Studio, our fully integrated software

- One single tool for logic sequence, motion, safety, robotics, vision and HMI
- Fully compliant with open standard IEC 61131-3
- PLCopen Function Blocks for Motion and Safety
- Supports Ladder, Structured Text and In-Line ST programming with a rich instruction set
- CAM editor for easy programming of complex motion profiles
- Database Connectivity Function Block library

### 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/](http://www.ia.omron.com/sysmac_library/)

# Sysmac Servo Family

## Machine Controller

OPC UA

Microsoft  
SQL Server

EtherNet/IP™

EtherCAT®



The NX-series Safety Network Controller connected with the NX1 Machine Controller enables the use of both EtherNet/IP + CIP Safety and EtherCAT + FSoE at the same time.

### NJ/NX series

- Logic sequence, Motion, Safety, Robotics and Database connection functionality
- Scalable motion control: CPUs from 2 up to 256 axes
- IEC 61131-3 controller
- PLCopen Function Blocks for Motion Control and Safety
- Advanced motion with Robotics functionality
- Built-in EtherCAT and EtherNet/IP ports

## Motion

EtherCAT®



### 1S Motion Safety servo

Available soon

- Servo drive for rotary motors
- Up to 3kW
- Battery-free absolute multi-turn encoder
- Advanced safety functions: STO/SS1/SS2/SOS/SLS/SLP/SDI/SBC
- Servo drive for rotary motors with one cable connection

EtherCAT®



### 1S Servo System - General purpose servo

- Servo drive for rotary motors
- Up to 15kW
- Battery-free absolute multi-turn encoder
- Safety function: STO



EtherCAT®



### G5 Servo System

- Servo drive for rotary or linear motors
- Rotary motor: Up to 15 kW
- Iron- core and Ironless linear motor models: Up to 2100 N peak force
- Safety function: STO (Hardwired Safe Torque Off only)
- Full closed loop control

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