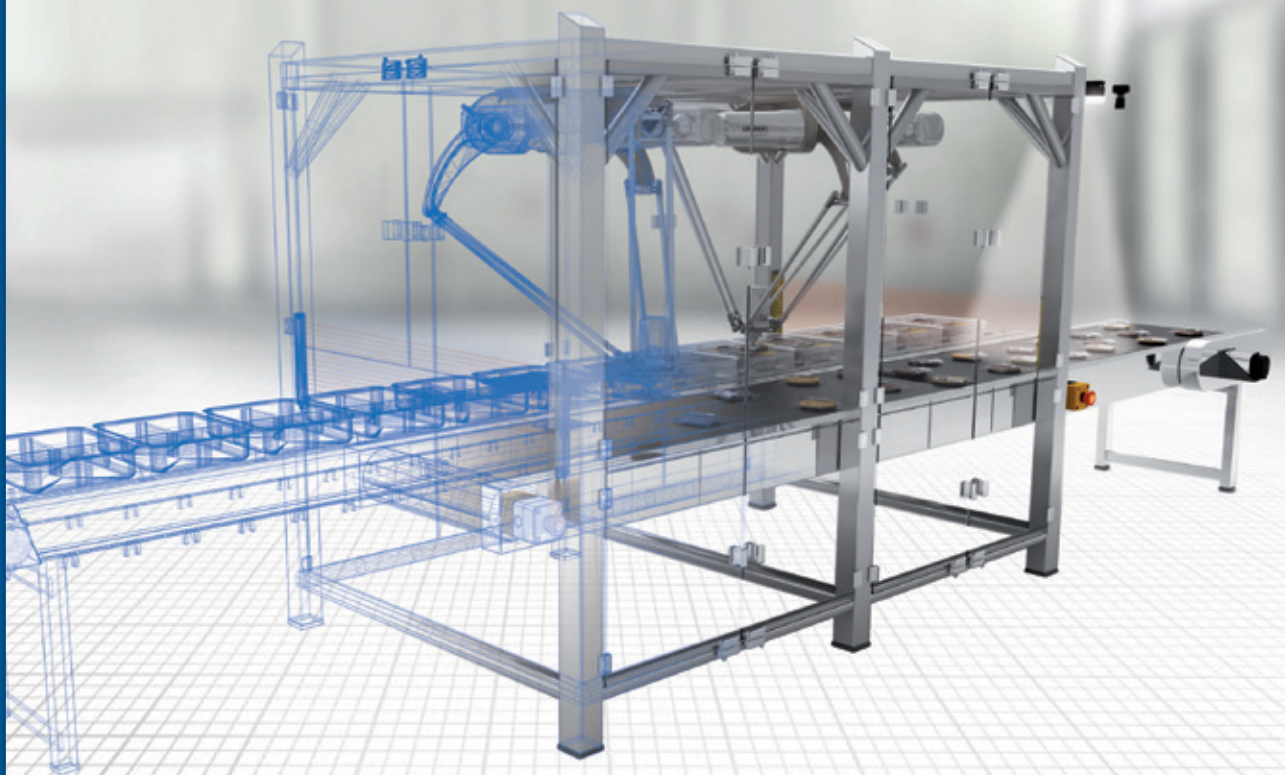# Robotics packaging line solution

Bringing innovation to manufacturing sites

- Flexible robotic solution
- Seamless integration of Virtual and Real
- Global robotic service

sysmac
always in control

Intuitive robotics add flexibility to packaging

The future of intuitive robotics and configurable-modular packing line

Omron offers a complete solution to automating packaging line helping our customers reach high demanding production. Embedded robots and robotic modules are integrated into packaging machines to increase productivity.

Flexible line: Production line using Omron Adept Technologies Inc. robots

Omron's unique combination of control and robotics technologies for advanced production lines

Parallel Robot Hornet

Parallel Robot Quattro

Table/Floor type SCARA Robot eCobra 600/800
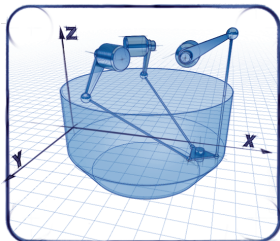

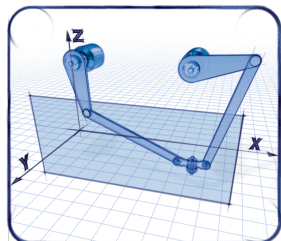Inverted SCARA Robot eCobra 800 Inverted

Articulated Robot Viper

Mobile Robot LD

Flexible machine: Easy to reuse and reconfigure machines using NJ Robotics
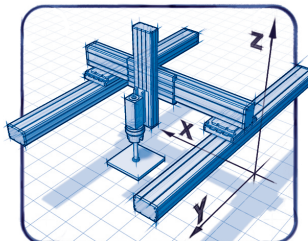
One controller for high-speed synchronous control of devices and robots
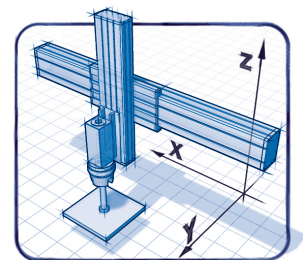

Delta Robot 3 axis

Delta Robot 2 axis

Gantry Robot

Cartesian Robot 2 axis
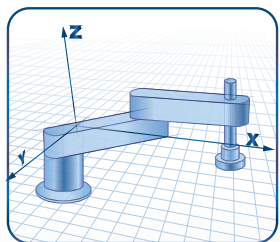
SCARA Robot
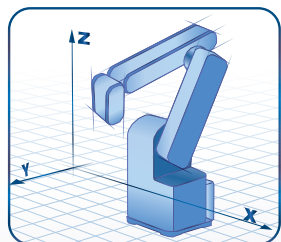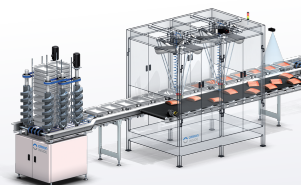

Articulated Robot 3 axis

Machine Automation Controller
NJ Robotics CPU Unit

line

The Omron's unique benefits

The new Omron Robotic Automation enhances the most demanding manufacturing lines providing benefits

Performance

Overall through-put is guaranteed by the synchronization of our machine control with the new vision guided robots

PRODUCTION LINE

DESIGN AREA
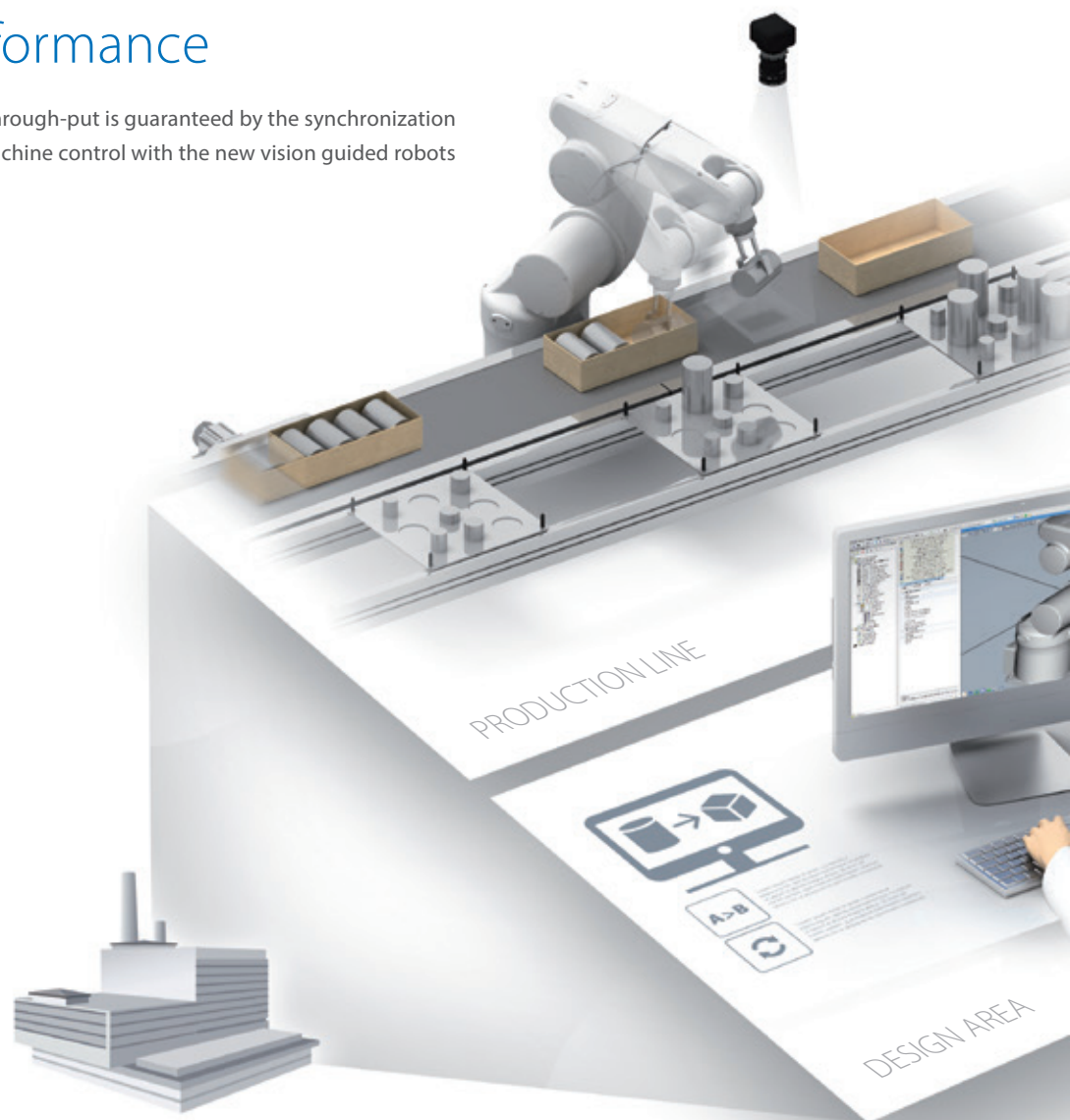
Smart Factory

Quick Delivery

6 huge automated warehouses to provide parts in short time

Simple

Shortening the system verification, startup, and maintenance time by the integrated software environment that bridges real and virtual world

DATA MANAGEMENT

Efficient

All the production data coming from the robots, controllers, sensors, and other devices integrated within the Sysmac concept are collected, shared, and managed to optimize the productivity

Flexible

ACE (software assisted system) generates automatically the new programming code based on the application

Vision-guided robots:
Virtual meets Real

The needs for Pick & Place machines using robots and vision sensors are increasing. Our own Robotics and Vision technology provides the most seamless integration achieved into a single software environment. The machines can be analyzed in the virtual environment that allows studying the application in advance, without having the real machine.

< VIRTUAL

Sysmac Studio
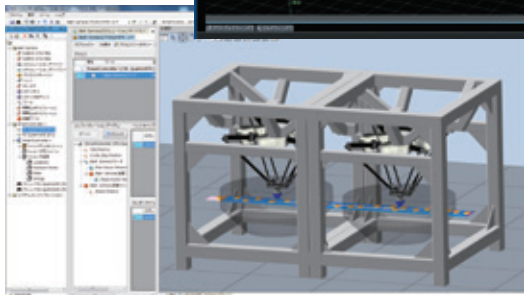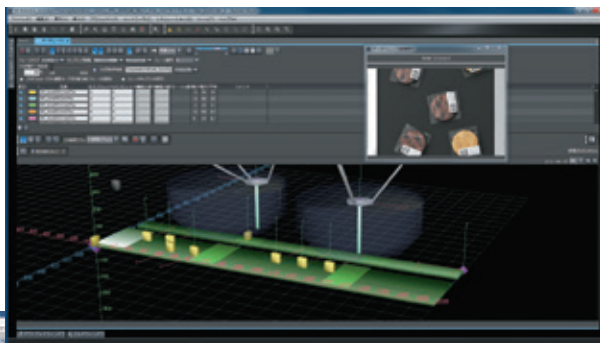
ACE
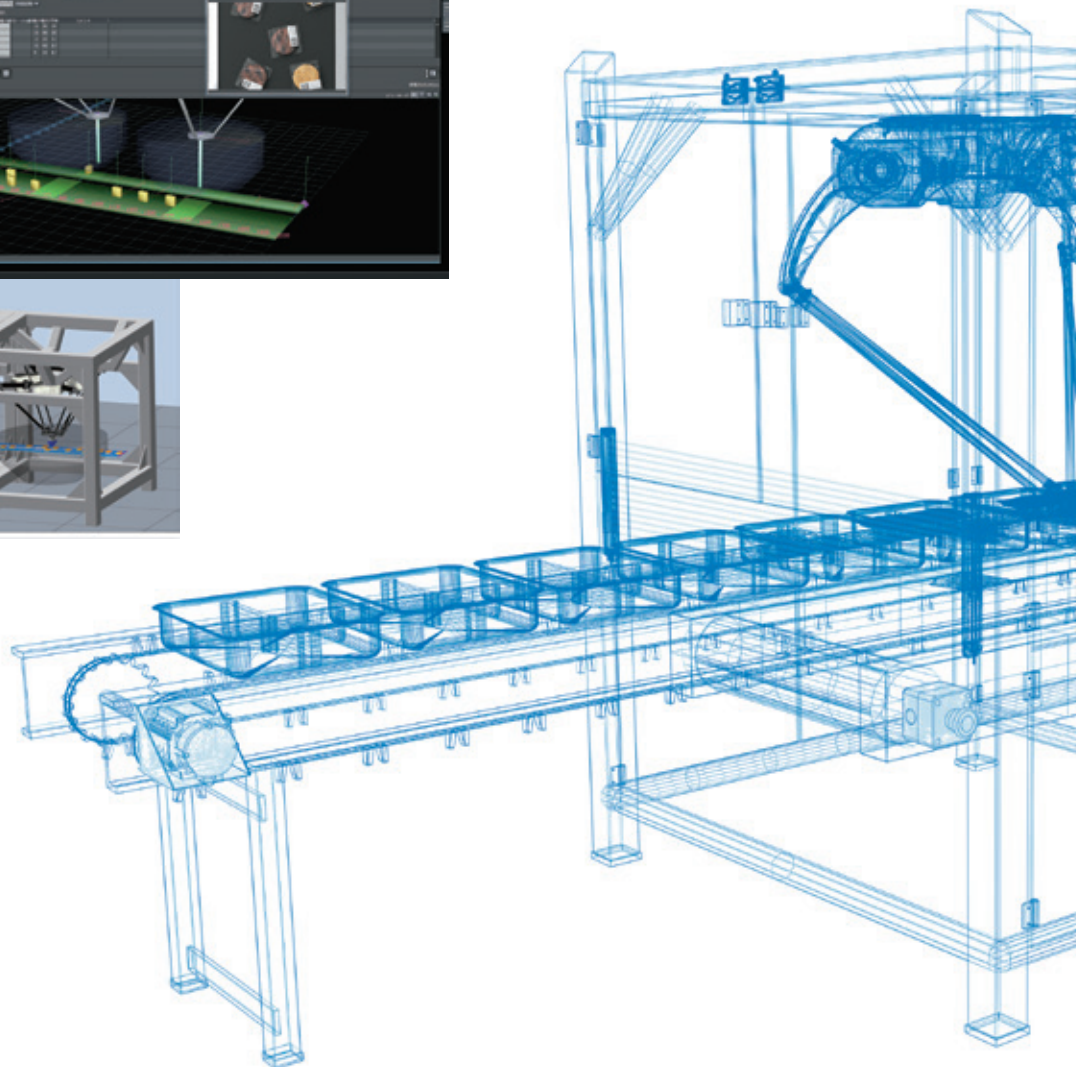
✔ VIRTUAL:

The virtual simulation using the Ace PackXpert or Sysmac Studio is highly reliable since it's based on the same software running in the real robotics and vision system

✔ REAL:

Building high performance Pick & Place machines becomes an easy job thanks to the usability of the fully integrated platform with integrated Vision and Robotics functionality

REAL >

Sysmac Studio
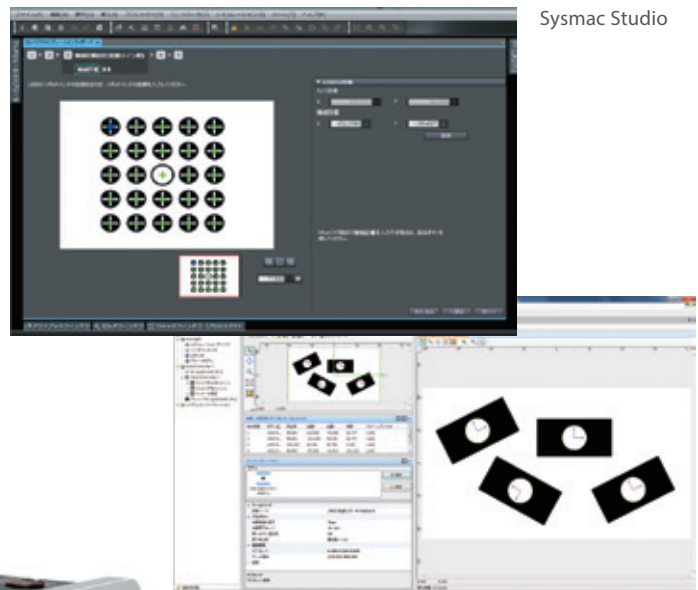
ACE

Benefits include time optimization and reduction for the complete project

Project proposal and Concept

Design, Engineering and Test run

Commissioning and Maintenance

30% SAVE 70%

50% SAVE 50%

60% SAVE 40%

Note. In-house comparison. Based on Omron investigation in November 2015.

Total solution for your packaging line

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.

Robot
Omron Adept Technologies Inc. robot

EtherNet/IP

I/O
NX I/O

Sensing
ZW-7000
Displacement Sensor

N-Smart
Fiber/
Laser/
Contact Sensor/
Sensor Communications Unit

Vision
FH Vision System

IO-Link Master/
Photoelectric Sensor/
Proximity Sensor

sysmac
always in control

Information technologies

Smart factory

IT devices

Offices HQ

Sales force
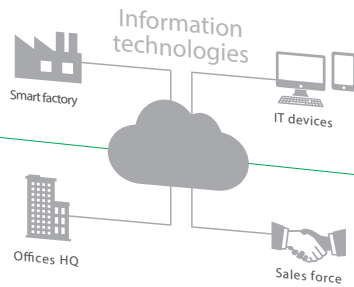
Big Data
Database

Ethernet

Flexible line

Flexible machine

Sysmac Library

NJ/NX/NY
Controller

Machine Automation Controller
NJ Robotics

Safety
NX Safety

MX2 Inverter

EtherCAT

Motion
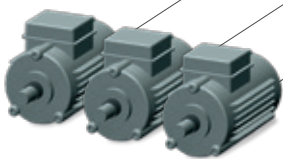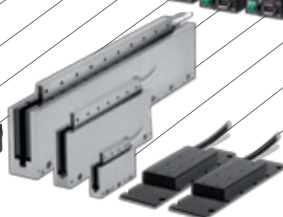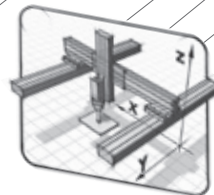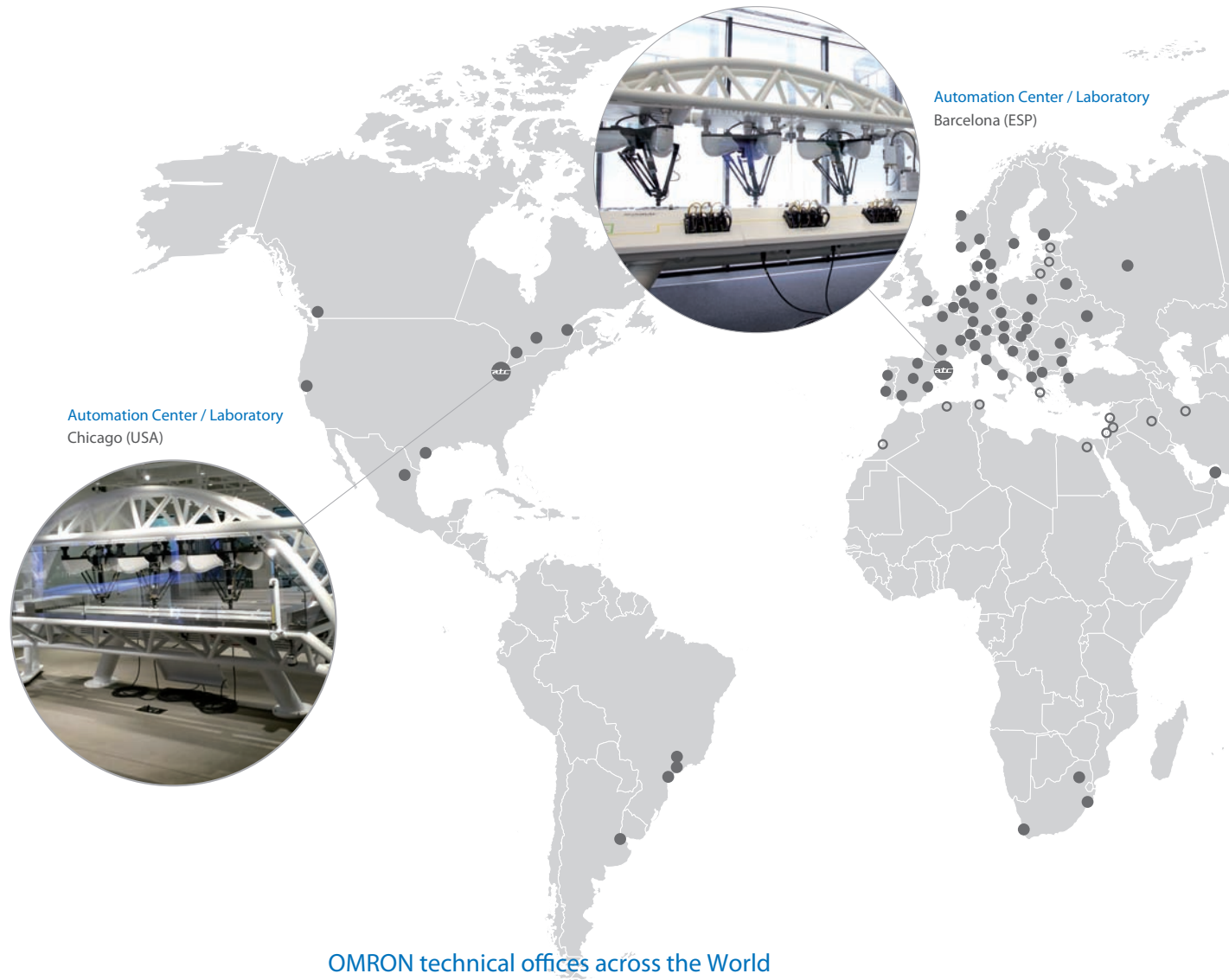G5/1S Servo Drive

Robotics
G5 /1S Servo Drive

Motors

Motors

Linear motors

Kinematics

Global robotic service

Automation Center / Laboratory
Barcelona (ESP)

Automation Center / Laboratory
Chicago (USA)

OMRON technical offices across the World

Automation Center
● Technical office ○ Premium Partner
Kusatsu (JPN), Kariya (JPN), Shanghai (CHN), Barcelona (ESP), Jakarta (IDN), Mumbai (IND), Chicago (USA), Seoul (KOR), Bangkok (THA), Singapore (SGP)

PRESENCE

COMPETENCE

OMRON

Design

Our wide network of machine automation specialists will help you to select the right automation architecture and products to meet your requirements. Our flat structure based on expert-to-expert contact ensures that you will have ONE accountable and responsible expert to deal with on your complete project.

Proof of concept

As your project matures make use of our Automation centers to test and catch-up with technology trends in motion, robotics, networking, safety, quality control etc. Make use of our Tsunagi (connectivity) laboratory to interface, test and validate your complete system with our new machine network (EtherCAT) and factory network (EtherNet/IP).

We will assign a dedicated application engineer to assist with initial programming and proof testing of the critical aspects of your automation system. Our application engineers have in-depth expertise in and knowledge of networks, PLCs, motion, safety and HMIs when applied to machine automation.

Give us a call / Send us your sample / We can simulate the application for you and send you a test report.

Automation Center / Laboratory
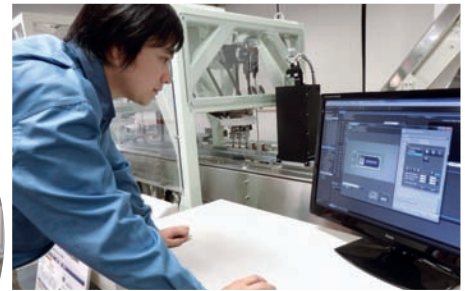Seoul (KOR)

Laboratory
Mishima (JPN)

Automation Center / Laboratory
Shanghai (CHN)

Automation Center / Laboratory
Mumbai (IND)

Test report as a service is based on virtual machine simulation and product samples testing:

Checking of real product samples

3D machine simulation environment

CONFIDENCE > ASSURANCE

Development

During your prototyping phase you will need flexibility in technical support, product supply and exchange. We will assign an inside sales contact to help you source the correct products fast during your prototyping phase.

Commissioning

With our world-wide network for service and support the export of your product is made simple, we will support you on-site with your customer, anywhere in the world. We can arrange a liaison sales engineer to facilitate training, spare parts supply or even machine commissioning. All this in a localised language with localised documentation – giving you complete peace of mind.

Serial production

As your production increases we will engage in supplying you within 24hrs and repairing within 3 days. All our products are global products meeting global standards - CE, cULus, NK, LR -

Omron continues to develop robot systems to meet your needs.

Omron offers a wide range of solutions ideal for applications in the food and beverage, automotive, and electronic components industries.

· Post-press process (Automotive industry)

Inspections

Aligment
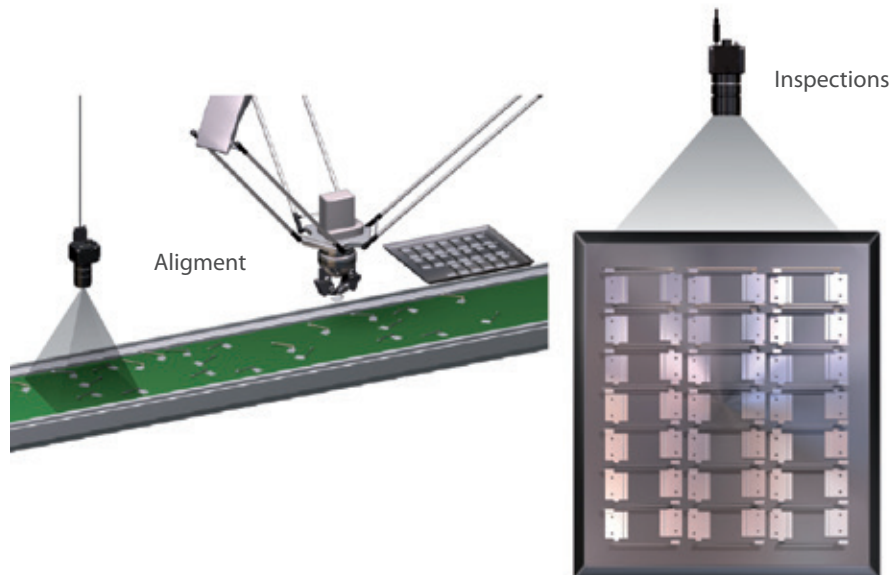
FROM	TO
When both alignment and inspection were performed, individual vision system controllers were required for each process, which consumed space and increased cost. The previous controller that could be connected with two cameras could not process simultaneously due to waiting time.	Up to eight cameras can be connected with one vision system controller, saving space and cost. Parallel processing by a CPU eliminates waiting time and reduces cycle time.

Environment surrounding Food & Beverage industry

Manufacturer
- Food safety and reliability
- Rising labor costs
- New products and lifecycle

F&B machine builder
- Differentiation between machine builders
- Short lead time
- Enhancing proposal capabilities
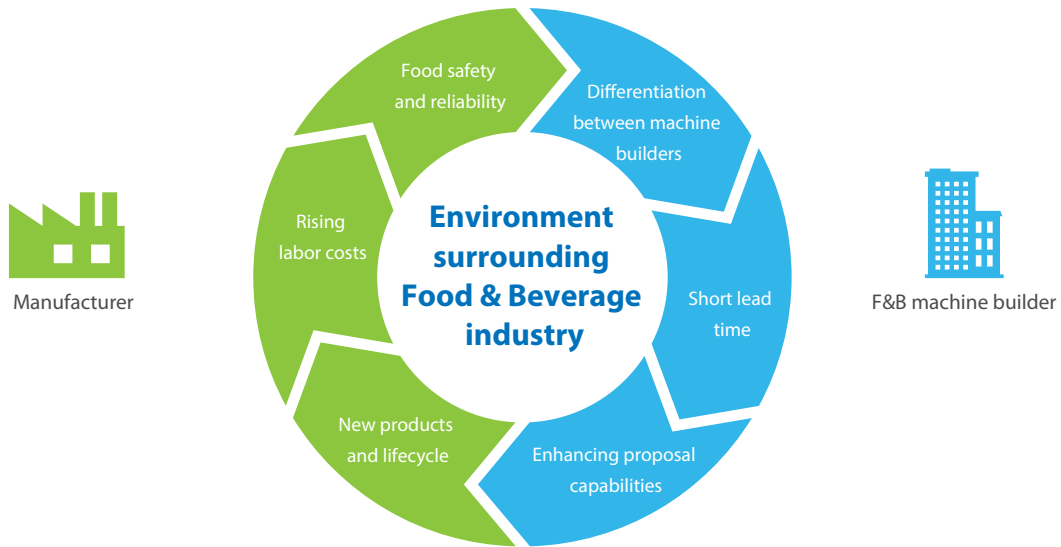
· Packing process
  (Food & beverage
  industry)

FROM

Pattern search provided by general vision sensors sometimes could not detect folded laminate pouches or detected the incorrect position, generating picking errors.

TO

Search algorithm Shape Search III can reliably detect objects even under adverse conditions. Accurate picking position measurement minimizes picking errors.
The sensor can distinguish the top and bottom of the pouch by detecting characteristic points. This makes more efficient use of the space inside boxes when pouches are packed in boxes.

200,000 products
— Flexible line

	CONTROLLERS			
Product name	**NX701**	**NJ501**	**NJ301**	**NJ101**
Description	Ideal for large-scale, fast, and highly-accurate control with up to 256 axes.	NJ5 series Machine Controller with Sequence and Motion functionality	NJ3 series Machine Controller with Sequence and Motion functionality	Ideal for simple machines
Software	Sysmac Studio	Sysmac Studio	Sysmac Studio	Sysmac Studio
Programming	• Ladder (within In-line ST) • Structured Text • In-line ST	• Ladder (within In-line ST) • Structured Text • In-line ST	• Ladder (within In-line ST) • Structured Text • In-line ST	• Ladder (within In-line ST) • Structured Text • In-line ST
Standard programming	• IEC 61131-3 • PLCopen Function Blocks for Motion Control	• IEC 61131-3 • PLCopen Function Blocks for Motion Control	• IEC 61131-3 • PLCopen Function Blocks for Motion Control	• IEC 61131-3 • PLCopen Function Blocks for Motion Control
Program capacity	80MB	20 MB	5 MB	3MB
Variables capacity — No Retain attribute	256MB	4MB	2MB	2MB
Variables capacity — Retain attribute	4MB	2MB	0.5MB	0.5MB
Memory card	SD/SDHC memory card	SD/SDHC memory card	SD/SDHC memory card	SD/SDHC memory card
Built-in ports	• EtherNet/IP • EtherCAT • USB 2.0	• EtherNet/IP • EtherCAT • USB 2.0	• EtherNet/IP • EtherCAT • USB 2.0	• EtherNet/IP • EtherCAT • USB 2.0
Number of EtherCAT slaves	512	192	192	64
Number of motion control axes	256, 128	64, 32, 16	8, 4	2, 0
Motion control	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and groups	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and groups	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and groups	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and groups
Ordering information	P089 NJ/NX Catalog			

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 or Industrial PC Platform NY IPC Machine Controller.
Please download it from following URL and install to Sysmac Studio Automation Software.
http://www.ia.omron.com/sysmac_library/
  • The Adept Robot Control Library allows you to control parallel, SCARA, and articulated robots manufactured by Omron Adept Technologies Inc. from the NJ/NX Machine Automation Controller or Industrial PC Platform NY IPC Machine Controller by using the same instructions and programming methods.

CONTROLLERS

	NX1	NX1P	NY51□-1	NY53□-1
Product name	NX1	NX1P	NY51□-1	NY53□-1
Description	Compact controller ideal for small-scale control with up to eight axes	Compact controller with up to 4-axis motion control, up to 4-axis single-axis control, and built-in I/O	Two operating systems: Windows and Real-Time OS	
Software	Sysmac Studio	Sysmac Studio	Sysmac Studio	Sysmac Studio
Programming	• Ladder (within in-line ST) • Structured Text • In-line ST	• Ladder (within in-line ST) • Structured Text • In-line ST	• Ladder (within in-line ST) • Structured Text • In-line ST	• Ladder (within in-line ST) • Structured Text • In-line ST
Standard programming	• IEC61131-3 • PLCopen Function Blocks for Motion Control	• IEC61131-3 • PLCopen Function Blocks for Motion Control	• IEC61131-3 • PLCopen Function Blocks for Motion Control	• IEC61131-3 • PLCopen Function Blocks for Motion Control
Program capacity	5MB	1.5MB	40MB	
Variables capacity — **No Retain attribute**	32MB	2MB	64MB	
Variables capacity — **Retain attribute**	1.5MB	32KB	4MB	
Memory card	SD/SDHC memory card	SD/SDHC memory card	SSD, HDD	
Built-in ports	• EtherNet/IP • EtherCAT	• EtherNet/IP • EtherCAT	• EtherNet/IP • EtherCAT • USB2.0/3.0	
Number of EtherCAT slaves	64	16	192	
Number of motion control axes	8, 4, 2, 0 *	4, 2, 0 *	64, 32, 16	
Motion control	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and groups	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and groups	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and groups	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and groups
Ordering information	P129 NX1 Catalog	P115 NX1P Catalog	P118 Industrial PC Platform Catalog	

* Motion control axes and 4 single-axis position control axes.

INDUSTRIAL ROBOTS

Product name	Hornet 565	Quattro 650/800	Viper 650/850
Robot type	Parallel robot		Articulated robot
Number of axes	3, 4	4	6
Maunting	Inverted	Inverted	Table / Floor / Inverted
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	---	---	653 to 855 mm
Position repeatability	±0.10 mm	±0.10 mm	±0.02 to 0.03 mm

Protection/ Cleanroom Classes — Specifications	IP67: arms and platform
	IP65: underside of robot
	IP20: topside of robot
	Class 1000
		• H type
		  IP67: arms and platform
		  Class 1000
		• HS type
		  IP67: arms and platform
		  IP66: robot base
		  Class 1000
			IP40

Protection/ Cleanroom Classes — Option	IP65: topside of robot	• H type IP65: robot base	IP54: robot main body IP65: robot joints (J4, J5, J6) Class10 Cleanroom model
Ordering information	I822 Industrial Robots Datasheets		

Product name	Cobra 450/500/650	eCobra 600/800	eCobra 800 Inverted
Robot type	SCARA robot		
Number of axes	4	4	4
Maunting	Table / Floor	Table / Floor	Inverted
Payload capacity	5 kg	5.5 kg	5.5 kg
Working volume (Radius)	---	---	---
Reach	450 to 650 mm	600 to 800 mm	800 mm
Position repeatability	±0.02 mm	±0.017 mm	±0.017 mm
Protection/ Cleanroom Classes — Specifications	IP20	IP20	IP20

Protection/ Cleanroom Classes — Option	---	• eCobra 600
		  Class10 Cleanroom model
		• eCobra 800
		  IP65, Class10 Cleanroom model
			IP65,
			Class10 Cleanroom model

Ordering information	I822 Industrial Robots Datasheets		

MOBILE ROBOTS

Product name	LD	
Robot type	Mobile robot	
Product type	OEM	Cart Transporter
Maximum load	60, 90 kg	105, 130 kg
Maximum speed	1.8 m/s, 1.35 m/s	1.35 m/s, 0.9 m/s
Maximum rotation speed	300°/s, 225°/s	180°/s
Stop position accuracy	± 100 mm: Position, ± 2°: Rotation (±10 mm: Position, ±0.5°: Rotation with option (High Accuracy Positioning System))	
Protection/Cleanroom Classes	IP20 Class 100	IP20
Ordering information	I828 Mobile Robots Datasheet	

— Flexible Machine

MACHINE CONTROLLERS	
Product name	**NJ- series Robotics**
	NJ501
Description	Machine Controller with Sequence, Motion and Robotics functionality
Software	Sysmac Studio
Programming	• Ladder (within In-line ST) • Structured Text • In-line ST
Standard programming	• IEC 61131-3 • PLCopen Function Blocks for Motion Control
Program capacity	20 MB
Variables capacity — **No Retain attribute**	4MB
Retain attribute	2MB
Memory card	SD/SDHC memory card
Built-in ports	• EtherNet/IP • EtherCAT • USB 2.0
Number of EtherCAT slaves	192
Number of axes	64, 32, 16
Motion control	• Axes groups interpolation and single axis moves • Electronic cams and gearboxes • Direct position control for axis and groups • Up to 8 parallel, Cartesian, and serial robot control
Ordering information	P089 NJ/NX Catalog

— Lineup for Omron Robotic Automation

SOFTWARE		
Model / Automation Control Environment (ACE)	Sysmac Studio Standard Edition Ver.1.□□	Sysmac Library
The ACE is a PC-based software package that helps you quickly and easily set up your robot system. The software makes it easy to configure single and multi-robot systems. ACE PackXpert is the intelligent software choice designed to manage packaging systems from integration to deployment • ACE PackXpert provides the underlying robot programming based on the system configuration • Built-in customization allows for any line configuration and advanced load balancing • Wizard-based user-friendly interface to calibrate and teach the robots • Tightly-integrated vision option (ACE Sight) enables visionguided conveyor-tracking	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, NY Industrial PC, EtherCAT Slave, and the HMI. • One software for motion, logic sequencing, safety, drives, vision and HMI • Fully compliant with open standard IEC 61131-3 • 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 • IEC standard and PLCopen Function Blocks for Motion Control and Safety **Robot Additional Option*** Sysmac Studio Robot Additional Option is a license to enable the Vision & Robot integrated simulation.	The Sysmac Library is a collection of software functional components that can be used in programs for the NJ/NX Machine Automation Controllers or Industrial PC Platform NY IPC Machine Controller. Packed with Omron's rich technical know-how on control programs, the Sysmac Library makes advanced control easy. Install the Sysmac Library to use it in the Sysmac Studio. • For a wide range of applications • Available to download from OMRON's website • High quality product with reliable global support **SYSMAC-XR009** **Adept Robot Control Library** The Adept Robot Control Library allows parallel, SCARA, and articulated robots manufactured by Omron Adept Technologies Inc. to be controlled directly from the NJ/NX Machine Automation Controller or Industrial PC Platform NY IPC Machine Controller by using the same instructions and programming method as the controller.
Ordering information	I822 Industrial Robots Datasheets	Refer to your OMRON website for details.

* This product is a license only. You need the Sysmac Studio Standard Edition DVD media to install it.
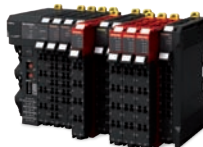
VISION SENSORS

Series	FH
Product name	Vision System
Hardware features	Flexible configuration of cameras and controller to suit your applications
Software FEATURE	Flexible setting with flowchart
Processing items	Processing items covering general applications
Processing resolution — 300,000 pixels	640 (H) x 480 (V)
2 million pixels	2040 (H) x 1088 (V)
4 million pixels	2040 (H) x 2048 (V)
12 million pixels	4084(H)x 3072(V)
Communications interfaces	EtherCAT, Ethernet, parallel I/O, encoder input
Ordering information	Q197 FH Catalog

PROGRAMMABLE TERMINALS

Model	NA5-15W	NA5-12W	NA5-9W	NA5-7W
Display device	TFT LCD	TFT LCD	TFT LCD	TFT LCD
Screen size	15.4-inch widescreen	12.1-inch widescreen	9.0-inch widescreen	7.0-inch widescreen
Resolution	1280 x 800 dots (horizontal x vertical)	1280 x 800 dots (horizontal x vertical)	800 x 480 dots (horizontal x vertical)	800 x 480 dots (horizontal x vertical)
Colors	16,770,000 colors (24 bit full colors)	16,770,000 colors (24 bit full colors)	16,770,000 colors (24 bit full colors)	16,770,000 colors (24 bit full colors)
Operation	• Touch panel: Analog resistive membrane type • Function keys: 3 inputs (capacitance inputs)	• Touch panel: Analog resistive membrane type • Function keys: 3 inputs (capacitance inputs)	• Touch panel: Analog resistive membrane type • Function keys: 3 inputs (capacitance inputs)	• Touch panel: Analog resistive membrane type • Function keys: 3 inputs (capacitance inputs)
Built-in ports	• 2 Ethernet ports • 2 USB host ports • 1 USB slave port	• 2 Ethernet ports • 2 USB host ports • 1 USB slave port	• 2 Ethernet ports • 2 USB host ports • 1 USB slave port	• 2 Ethernet ports • 2 USB host ports • 1 USB slave port
Allowable power supply voltage range	19.2 to 28.8 VDC	19.2 to 28.8 VDC	19.2 to 28.8 VDC	19.2 to 28.8 VDC
Programming software	Sysmac Studio	Sysmac Studio	Sysmac Studio	Sysmac Studio
Degree of protection	Front-panel controls: IP65 oil-proof type	Front-panel controls: IP65 oil-proof type	Front-panel controls: IP65 oil-proof type	Front-panel controls: IP65 oil-proof type
Memory card	SD/SDHC memory card	SD/SDHC memory card	SD/SDHC memory card	SD/SDHC memory card
Features	• Sharing NJ controller variables in the NA project • Increased security with password protection • Visual Basic programming • Testing NA with the NJ control program via Simulator in Sysmac Studio	• Sharing NJ controller variables in the NA project • Increased security with password protection • Visual Basic programming • Testing NA with the NJ control program via Simulator in Sysmac Studio	• Sharing NJ controller variables in the NA project • Increased security with password protection • Visual Basic programming • Testing NA with the NJ control program via Simulator in Sysmac Studio	• Sharing NJ controller variables in the NA project • Increased security with password protection • Visual Basic programming • Testing NA with the NJ control program via Simulator in Sysmac Studio
Frame colors	Black, silver	Black, silver	Black, silver	Black, silver
Ordering information	V413 NA Catalog			

I/O

Series	NX	GX
Type	Modular I/O	Block I/O
Communications interface	EtherCAT	EtherCAT
Number of connectable units	• 63 units max. • Input: 1,024 bytes max., output: 1,024 bytes max.	One expansion unit can be connected with one digital I/O terminal (16 inputs + 16 outputs)
I/O types	• Digital I/O • Analog I/O • Encoder input • Pulse output • Temperature input • Safety	• Digital I/O • Analog I/O • Encoder input • Expansion unit
Features	• Over 100 models of I/O units including position interface, temperature inputs and integrated safety • High-speed I/O units synchronized with the EtherCAT cycle • NsynX technology provides deterministic I/O response with nanosecond resolution • Detachable front connector with push-in type screw-less terminals in all NX I/O units • Up to 32 digital inputs or outputs	• Wide variety of lineup: digital I/O, analog I/O, and encoder input units • Easy maintenance: removable I/O terminal • Easy set-up: automatic and manual address setting
Mounting	DIN track	DIN track
Ordering information	R183 NX Catalog	Refer to your OMRON website for details.

SAFETY

Product name	NX Safety CPU Unit	NX Safety Input Unit	NX Safety Output Unit
Network	FSoE – Safety over EtherCAT	FSoE – Safety over EtherCAT	FSoE – Safety over EtherCAT
Applicable Standards	EN ISO 13849-1, 2 (PLe/Safety Category 4), IEC 61508 (SIL3), EN 62061 (SIL CL3), EN 61131-2	EN ISO 13849-1, 2 (PLe/Safety Category 4), IEC 61508 (SIL3), EN 62061 (SIL CL3), EN 61131-2	EN ISO 13849-1, 2 (PLe/Safety Category 4), IEC 61508 (SIL3), EN 62061 (SIL CL3), EN 61131-2
Programming	• IEC 61131-3 standard • PLCopen Function Blocks for Safety	----	----
Number of safety master connections	32/128	----	----
Number of safety input/output points	----	• 4 points • 8 points	• 2 points • 4 points
Number of test output points	----	2 points	----
Terminal block	----	Screwless clamping terminal block	Screwless clamping terminal block
Features	• Freely mixing with standard NX I/O • Reusable certified programs • NX variables sharing in the NJ controller project	• Freely mixing with standard NX I/O • The 4-point unit can be directly connected with OMRON non-contact switches and singlebeam sensors • I/O data monitoring in the NJ controller project	• Freely mixing with standard NX I/O • The 2-point unit is characterized by large output breaking current of 2.0 A • I/O data monitoring in the NJ controller project
Mounting	DIN track	DIN track	DIN track
Ordering information	Refer to your OMRON website for details.		

SERVOMOTORS/LINEAR MOTORS/DRIVES

Product name	G5 Servo Drives	1S Servo Drives
Type	Built-in EtherCAT Communications	Built-in EtherCAT Communications
Linear Type	Yes (Refer to the G5 Series Catalog (Cat.No.I815) for details.)	No
100 VAC Applicable motor capacity/force	50 to 400 W	100 to 400W
200 VAC Applicable motor capacity/force	50 W to 15 kW	100 to 3kW
400 VAC Applicable motor capacity/force	400 W to 15 kW	600 to 3kW
Applicable servomotor	G5 rotary servomotor	1S servomotor
Control mode	Position, speed and torque control	Position, speed and torque control
Safety approvals	• ISO13849-1 (PL-c,d) • EN61508 (SIL2) • EN62061 (SIL2) • IEC61800-5-2 (STO)	• ISO13849-1 (PL-e/PL-d) • EN61508 (SIL3/SIL2) • EN62061 (SIL3/SIL2) • IEC61800-5-2 (STO)
Full closed loop	Built-in	No
Ordering information	I815 G5 Catalog	I821 1S Catalog

Product name	G5 Servomotors		1S Servomotors	
Rated rotation speed	3,000 r/min	2,000 r/min	3,000 r/min	2,000 r/min
Momentary maximum rotation speed	4,500 to 6,000 r/min	3,000 r/min	5000 to 6000 r/min	3000 r/min
Rated torque	0.16 to 15.9 Nm	1.91 to 23.9 Nm	0.318 to 9.55N·m	4.77 to 14.3 N·m
Capacity	50 W to 5 kW	400 W to 5 kW	100W to 3 kW	400W to 3kW
Applicable servo drive	G5 Servo Drive (for rotary servomotor)		1S Servo Drive	
Encoder resolution	20-bit incremental/ 17-bit absolute	20-bit incremental/ 17-bit absolute	23-bit absolute	23-bit absolute
Protective structure	IP67	IP67	IP67	IP67
Ordering information	I815 G5 Catalog		I821 1S Catalog	

Product name	G5 Servomotors		1S Servomotors
Rated rotation speed	1,500 r/min	1,000 r/min	1,000 r/min
Momentary maximum rotation speed	2,000 to 3,000 r/min	2,000 r/min	2000 r/min
Rated torque	47.8 to 95.5 Nm	8.59 to 57.3 Nm	8.59 to 28.7 N·m
Capacity	7.5 to 15 kW	900 W to 6 kW	900 W to 3kW
Applicable servo drive	G5 Servo Drive (for rotary servomotor)		1S Servo Drive
Encoder resolution	17-bit absolute	20-bit incremental/ 17-bit absolute	23-bit absolute
Protective structure	IP67	IP67	IP67
Ordering information	I815 G5 Catalog		I821 1S Catalog

INVERTERS

Series	RX-V1	MX2-V1
Three-phase 400 V	0.4 to 132 kW	0.4 to 15 kW
Three-phase 200 V	0.4 to 55 kW	0.1 to 15 kW
Single-phase 200 V	---	0.1 to 2.2 kW
Control methods	• V/F control • Sensorless vector control • Vector control with a PG	• V/F control • Sensorless vector control
Starting torque	• 200% at 0.3 Hz in open loop • Full torque at 0 Hz in closed loop	200% at 0.5 Hz
Communications	Optional EtherCAT communication unit	Optional EtherCAT communication unit
PLC functionality (Drive Programming)	Provided as standard	Provided as standard
Ordering information	I919 3G3RX-V1 Catalog	I920 MX2-V1 Catalog

DISPLACEMENT/FIBER/LASER/CONTACT/PROXIMITY SENSORS

	Displacement Sensor	Fiber/Laser/Contact Sensors	Fiber/Proximity Sensors
Series	ZW-7000	N-Smart	E3X/E2C
Measurement method	White light confocal principle	---	---
Applications	Height, thickness	---	---
Measuring range	Min: 10±0.5 mm, Max: 30±2 mm	---	---
Static resolution	0.004 to 0.016 µm	---	---
Linearity	±0.45 to 2.0 µm	---	---
Features	• Measuring shiny objects with an inclination of ±25° • ±0.5 µm or less linearity for various materials • Ultra-compact, Lightweight sensor • Synchronous control and setting of multiple sensors via Ethernet • Wide variety of interfaces (EtherCAT/Ethernet/RS-232C/Analog voltage and current)	Connect fiber, laser and contact sensors to EtherCAT at low initial cost	Easily connect fiber and proximity sensors to EtherCAT
Network specification	---	EtherCAT communication unit	EtherCAT communication unit
Maximum connectable sensors	---	30	30
Connectable sensor amplifier units	---	• E3NX-FA0 • E3NX-CA0 • E3NC-LA0 • E3NC-SA0 • E9NC-TA0	• E3X-HD0 • E2C-EDA0
Mounting	DIN track (controller)	DIN track	DIN track
Ordering information	Q250 ZW-7000/5000 Catalog	Refer to your OMRON website for details.	