OMRON

FA Controller Catalog

Controllers ideal for all machines

realizing

Controllers ideal for all machines

Omron has developed automation technology through the development of sensors, switches, PLC, programmable terminals, servo drives, inverters and other products. Now devices connected via standard networks change into new solutions for various machine environments.

- New technology for smart manufacturing
- Collaboration between humans and machines

Innovation

- Environmentally safe products

Innovation

- Integrated systems for optimized manufacturing
- Production data available in real-time
- In-line quality inspection: zero defects

Productivity

- Non-stop processes, 24/7 operation
- Extended product lifecycle

Reliability

- Quick product changeovers
- Openness and third party connectivity
- Scalable systems for optimum solutions

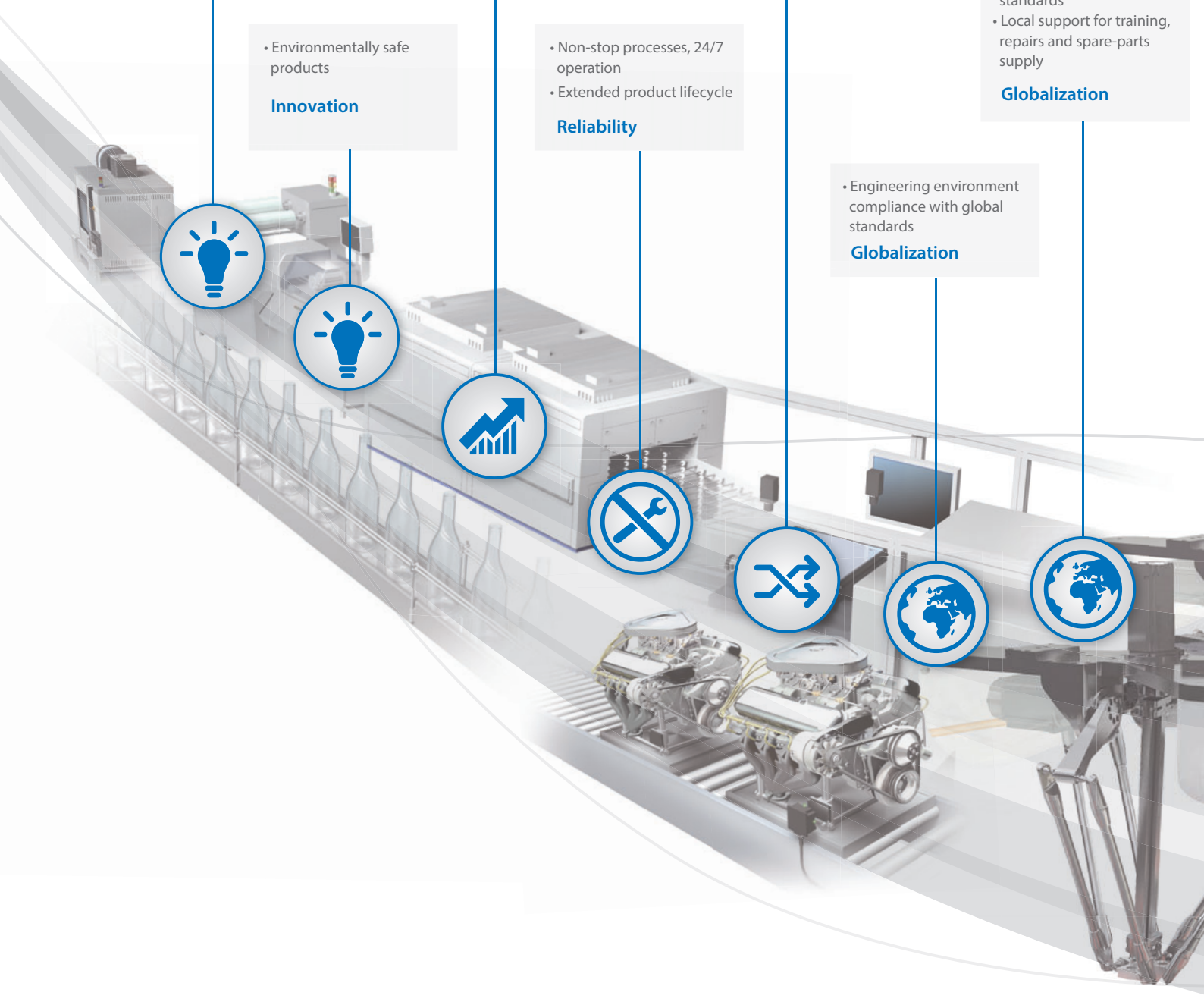
Flexibility

- Engineering environment compliance with global standards

Globalization

- Products meet global standards
- Local support for training, repairs and spare-parts supply

Globalization



The cost-effective CP Series and complete, robust Sysmac NJ/NX Series support from simple machine control through to large production line control and plant management.
The controllers not only help reduce programming, set-up and maintenance times, but also enable fast and accurate fine-tuning control, quality traceability, predictive maintenance, preventive maintenance, and remote maintenance.

NJ/NX series

The Machine Automation Controller integrates logic, motion, safety, vision, information, visualization and networking under one software: Sysmac Studio. This one software provides a true Integrated Development Environment (IDE) that also includes a custom 3D motion simulation tool.
The machine controller comes standard with built-in EtherCAT and EtherNet/IP. The two networks with one connection purpose is the perfect match between fast real time machine control and data plant management.

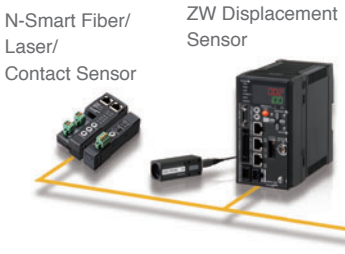
CS/CJ series

This series supports a wide variety of communication interface including EtherNet/IP™.
The FA Integrated Tool Package CX-One makes programming and debugging faster and easier. The PLC is suitable for small to medium machines - from simple stand-alone applications up to networked, high-speed machines. It is built to give you innovation without growing pains.

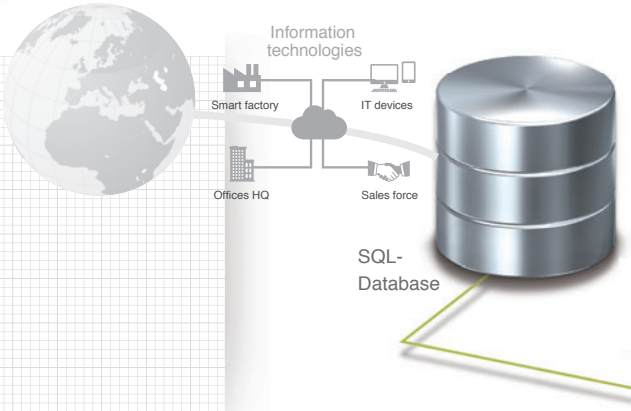
CP series

The CP Series provides a complete product line-up to automate compact machines and perform any other simple automation tasks, quickly and easily. Connect the HMI, servo drives, inverters, temperature controllers and other devices to create a more cost-effective system.

A fully integrated platform



The Machine Automation Controller integrates logic, motion, safety, vision, information, visualization and networking under one software: Sysmac Studio.

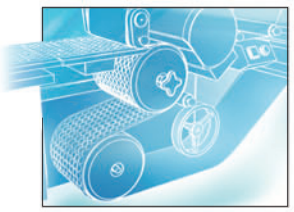


Features

- Complete integration of motion and logic
- A large selection of CPU Units for up to 256 axes
- Fully conforms with IEC 61131-3 standards
- PLCopen Function Blocks for Motion Control
- Linear and circular interpolation
- Electronic gear and cam synchronization
- Integrated Development Environment provided by Sysmac Studio

Standard networks

- Built-in EtherCAT and EtherNet/IP ports
- EtherCAT: High-speed network to connect a wide range of machine automation devices such as I/O, sensors and drives. Fast, highly accurate control in synchronization with the EtherCAT cycle. Up to 512 slaves
- EtherNet/IP: Based on standard protocols (TCP/IP and UDP/IP). Allows for mixing Ethernet devices and Ethernet applications



Blistar packaging machines

Safety integration

- Flexible system lets you integrate safety into machine automation through the use of Safety over EtherCAT (FSoE). Sysmac Studio reduces programming time

NJ CPU Unit with advanced functionality

- Database Connection: Logs real-time data from production lines directly into SQL Databases. This enables predictive/preventive maintenance and quality traceability
- Robotics: Controls parallel link robots
- SECS/GEM: Built-in SECS/GEM communications functions

Sysmac Studio

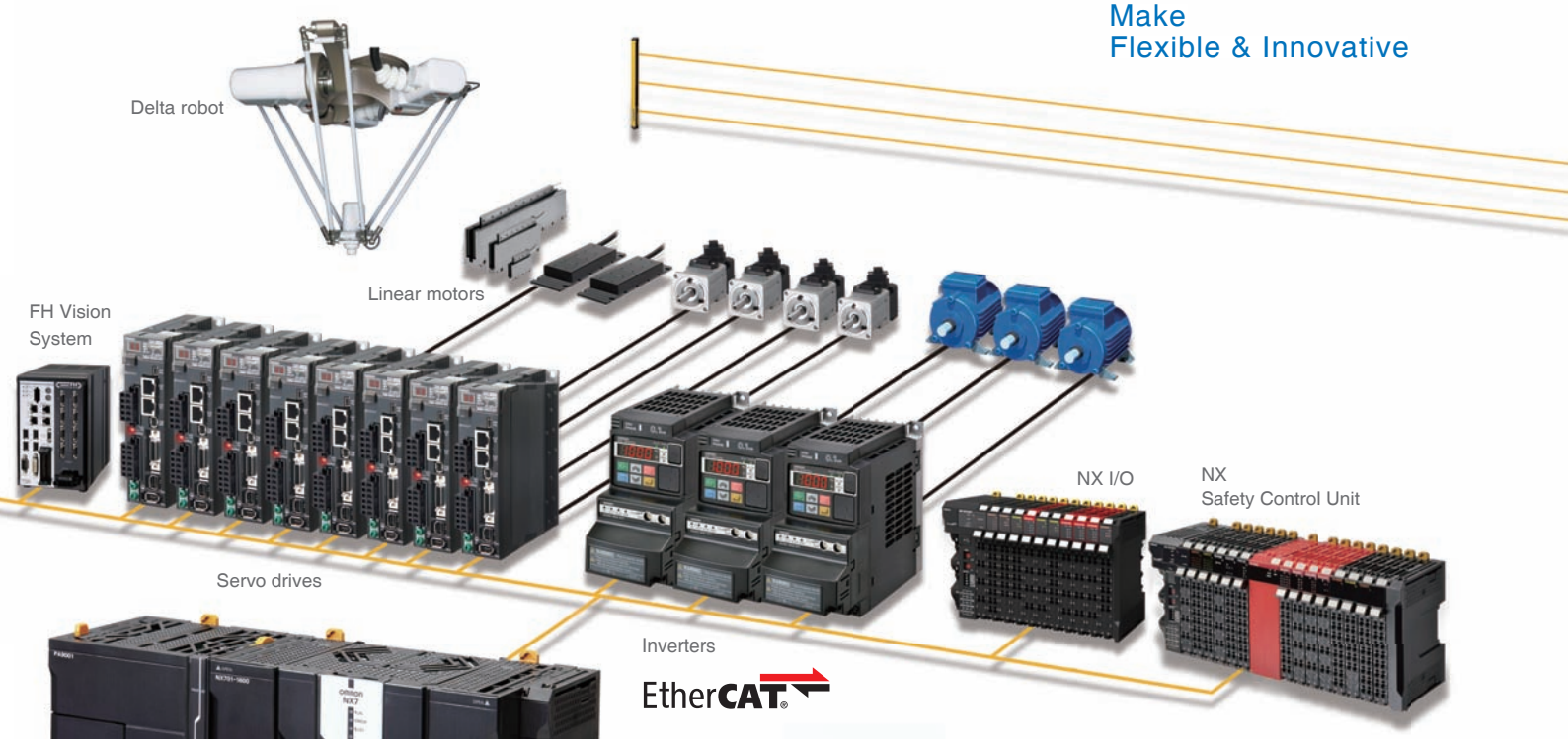
- Integrates configuration of the NJ/NX Machine Automation Controller and EtherCAT slaves, programming, debugging, and monitoring

Sysmac Studio

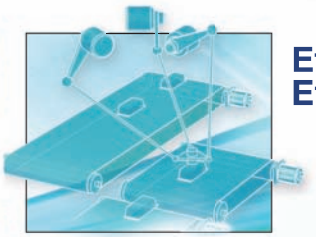
What's new

Fastest Cycle Time	
Real axes	
EtherCAT slaves	
Motion Core	

Make
Flexible & Innovative

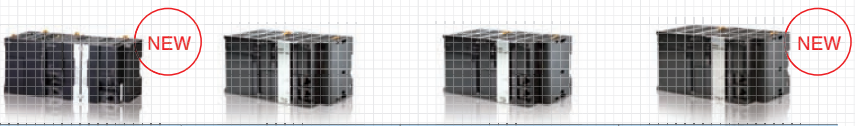


Filling and capping



Delta robot picking system

Scalability, performance, robustness…
Choose the most suitable CPU for your application!



NX7	NJ5	NJ3	NJ1
125 µs	500 µs	500 µs	1 ms
256, 128 axes	64, 32, 16 axes	8, 4 axes	2, 0 axes
512	192	192	64
Two synchronized Motion Cores	Synchronized Motion Core	Synchronized Motion Core	Synchronized Motion Core

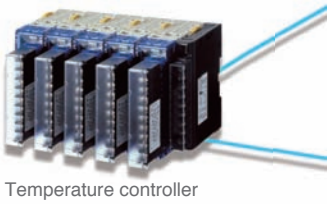
Sysmac Concept Book
·P079

Sysmac Integrated Catalog
·P072

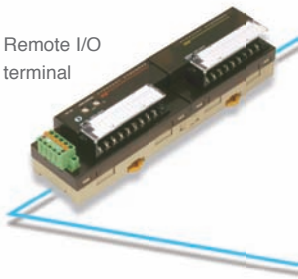
A wide range of PLC and I/O brings innovation to your machines and reduces costs

Faster and larger networks, a wide variety of communication interfaces

CS/CJ series



Temperature controller



Remote I/O terminal

The PLC is suitable for small to medium machines - from simple stand-alone applications up to networked, high-speed machines. It is built to give you innovation without growing pains.

Features

- Supports open networks including EtherNet/IP, EtherCAT, FL-net, DeviceNet and CompoNet
- Efficient programming with variables and EtherNet/IP setting with variable names make the configuration more flexible
- A wide range of CPU units and I/O units to suit your needs

DeviceNet

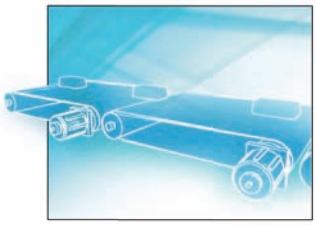
CompoNet

Open to the world

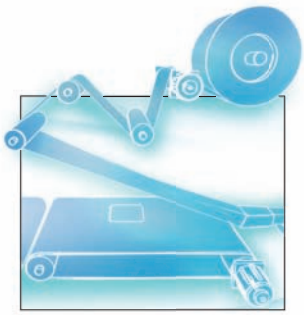
- Data communication via standard Ethernet port with EtherNet/IP Data Link function
- Increased EtherNet/IP performance to 12,000 pps*1
- High-speed I/O link based on EtherCAT enables distributed control using multiple CPU units

Advanced motion control

- Multi-axes synchronous control
- Can replace expensive motion controllers



Main conveyor



Film Feeder

High-speed

- Faster program execution and immediate I/O refreshing for flexible machine control

Highly flexible

- Adapt the PLC unit to your needs with the wide variety of compatible CJ1 I/O Units

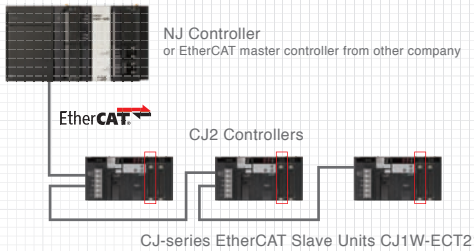
*1. CJ2H (built-in EtherNet/IP) and CJ/CS-series EtherNet/IP Unit

What's new

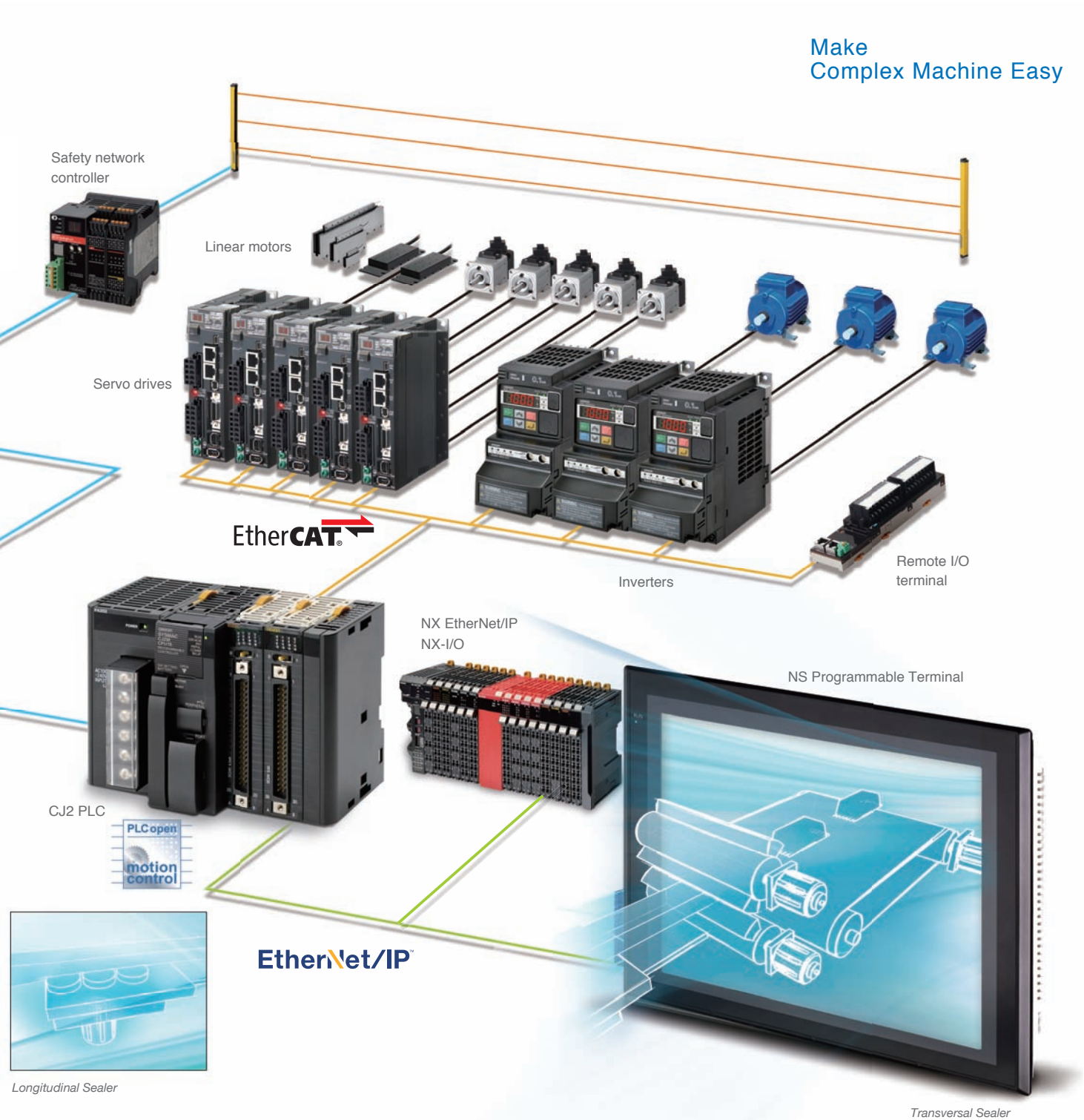
CJ-series EtherCAT Slave Unit

High-speed I/O link

EtherCAT enables distributed control using multiple controllers.
The modularized system facilitates design and installation.



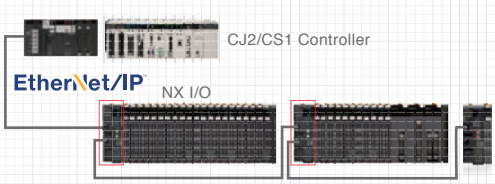
Make
Complex Machine Easy



CJ2/CS1 with NX EtherNet/IP Coupler Unit

Flexible system with a variety of NX I/O

Flexible distributed I/O system can be built using NX I/O in the CJ2/CS1 system. This allows you to save space and to flexibly respond to changes in machine specifications.

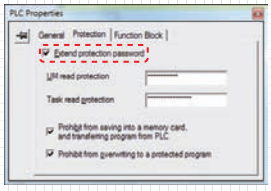


EtherNet/IP Coupler Units NX-EIC202

CS/CJ/CP-series CPU Unit

16-character password to keep your assets secure

The number of characters in each password for UM read protection and task read protection is increased from 8 to 16. This improves the security of your design assets.



CJ2 Catalog
·P059
CS1 Catalog
·P047

More cost-effective automation for compact machines

Simple, Compact, Economical

The CP Series provides a complete product line-up to automate compact machines and perform any other simple automation tasks, quickly and easily.

Features

- 10 to 60 I/O base models, expandable to 320 I/O points
- Digital, analog and temperature sensor I/O expansion units
- Up to 4 high-speed pulse outputs and up to 6 high-speed counter inputs
- Excellent communication capabilities for both serial and Ethernet networking
- Powerful instructions common within the CJ Series

Easy positioning, quick results

- Easy control: Speed control, positioning, origin search and interrupt feeding
- Modbus Master feature for easy inverter control

Saving programming time

- Ladder diagram, Function Blocks*1 or Structured Text*1 programming

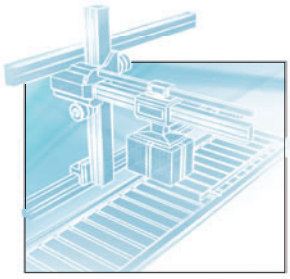
Versatile communication

- USB or Ethernet port*2 – no special cables needed
- Communication with Temperature Controller E5□C without special programs
- Optional boards for RS-232C, RS-485 or Ethernet

More options – greater possibilities!

- Analog I/O unit with a resolution of 1/12,000 for high-accuracy inspections
- One multi-input unit for both temperature and analog control of a packaging machine or molding machine
- Analog option boards helps save space

*1. CP1H and CP1L only
*2. CP1L-EM/EL only.



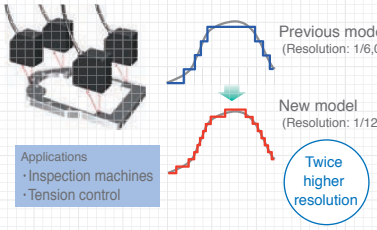
Palletizer

What's new

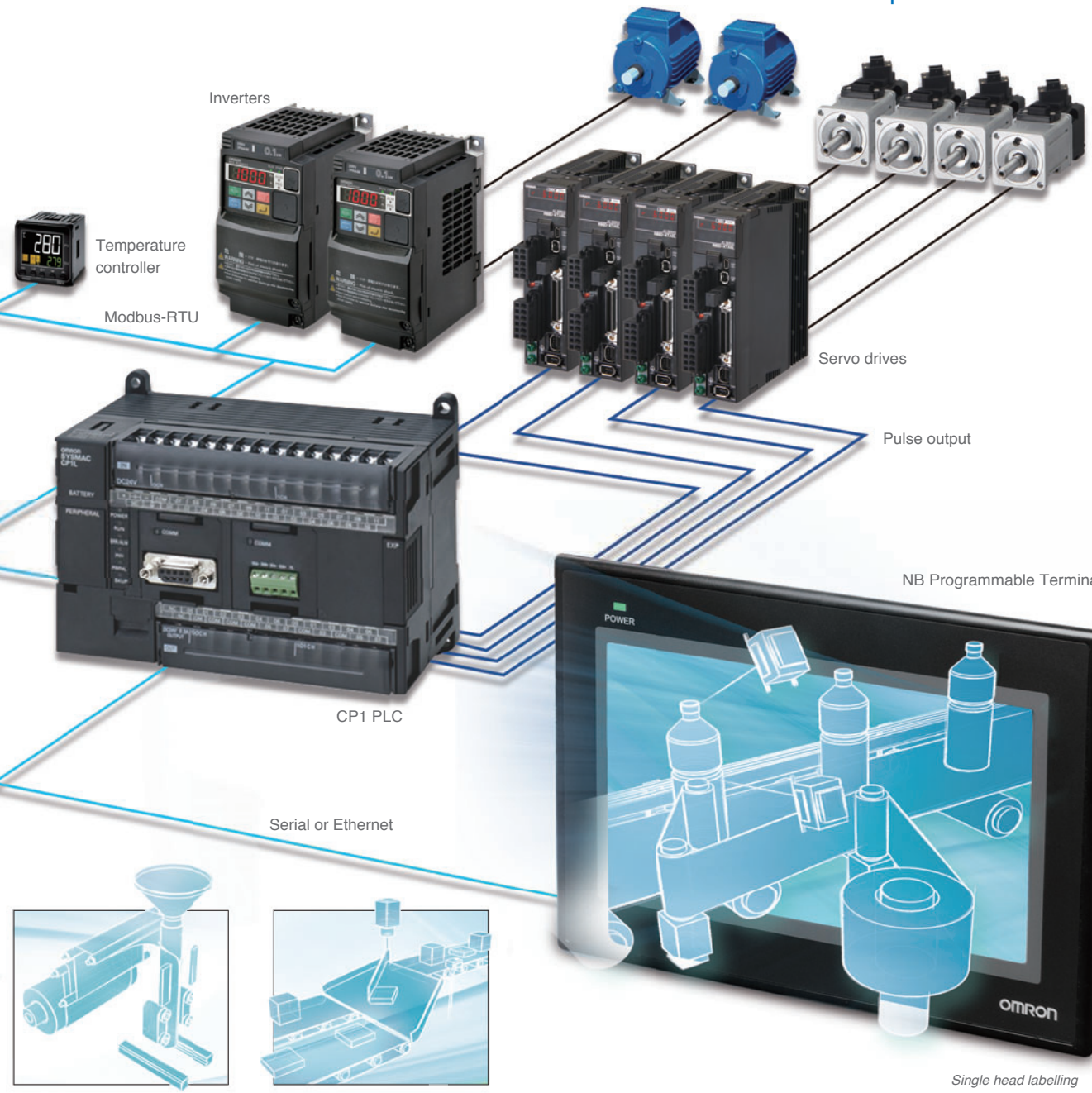
Analog I/O Unit

Improve control/inspection accuracy

High-accuracy analog I/O control with a resolution of 1/12,000.
CP1W-AD042/DA042/MAD42/MAD44



Make
Simple Machine Reasonable



Non continuous Form, Fill and Seal

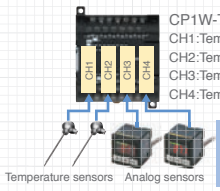
Conveyor diverter

Single head labelling

Temperature Sensor Unit

Multi-inputs: thermocouple/analog inputs

The CP1W-TS003 has two inputs that can be used for temperature sensor or analog inputs. Both temperature sensor and analog inputs can be achieved with only one unit.



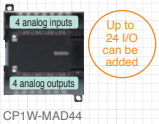
CP1W-TS003
CH1:Temperature sensor input
CH2:Temperature sensor input
CH3:Temperature sensor/analog input
CH4:Temperature sensor/analog input

Applications
・Vacuum packaging machines
・Sterilization equipment

Analog I/O Unit/Temperature Sensor Unit

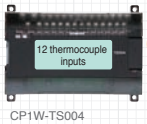
For a wide variety of applications

The unit with multiple analog I/O or with multiple temperature sensor inputs provides more scalability and flexibility.



Up to 24 I/O can be added

CP1W-MAD44



Up to 36 inputs can be added

CP1W-TS004

Applications
・Molding machines・Ovens

CP1 Catalog
・P082

CP1E Catalog
・P060

Controllers Selection

Omron offers a wide range of FA Controllers to suit your automation applications - from simple control to complex, highly accurate control.

NJ/NX series

Series		NJ/NX Series		
Product name		NX701 CPU Units	NJ501 CPU Units	NJ301 CPU Units
Model		NX701-□□□□	NJ501-1□□□	NJ301-1□□□
Appearance				
CPU Unit features		Ideal for large-scale, fast, and highly-accurate control with up to 256 axes	Ideal for large-scale, fast, and highly-accurate control with up to 64 axes	Ideal for small-scale control with up to eight axes
Support software		Sysmac Studio	Sysmac Studio	Sysmac Studio
Instruction execution times	LOAD instructions	0.37 ns or more	1.2 ns (1.9 ns or less)	2.0 ns (3.0 ns or less)
	Math instructions (for Long Real Data)	3.2 ns or more	26 ns or more	42 ns or more
Program capacity		80MB	20MB	5MB
Variables capacity		4 MB: Retain attribute 256 MB: No Retain attribute	2 MB: Retain attribute 4 MB: No Retain attribute	0.5 MB: Retain attribute 2 MB: No Retain attribute
I/O capacity/Max. no. of configuration Units (Expansion Racks)		—	2,560 points/40 Units (3 Expansion Racks)	2,560 points/40 Units (3 Expansion Racks)
Number of motion axes		128 or 256	16, 32 or 64	4 or 8
Number of EtherCAT slaves		512	192	192
Database connection		—	—	—
Number of controlled robots		—	—	—
SECS/GEM communications		—	—	—
External memory		Memory Cards	Memory Cards	Memory Cards
CJ Special I/O Units and CPU Bus Units		—	Mountable *2	Mountable *2

CS/CJ series

Series		CJ Series		CS Series	
Model		CJ2H	CJ2M	CS1H/G	CS1D
Appearance					
CPU Unit features *3		A large data memory capacity, multi-function Ethernet port, tag access functionality, and a USB port. Ideal for high-speed, high-precision machines	Based on the long track record of the CJ1M and adds greater cost performance and flexibility. Ideal for general-purpose machine control	From machine control to information management multiple-application Controllers with a wide range of functions	Redundant CPU Units, Power Supply Units, Communications Units, and Expansion I/O Cables
		High-speed I/O Units, synchronized control, USB port, built-in EtherNet/IP port, data structures and arrays, Function Blocks (Ladder diagrams/Structured Text)	High-speed I/O Units, USB port, built-in EtherNet/IP port, data structures and arrays, FB Program Area, Function Blocks (Ladder diagrams/Structured Text), Serial Communications Option Boards	Up to 5,120 points of I/O, Inner Board capability, Function Blocks (Ladder diagrams/Structured Text)	Up to 5,120 points of I/O, redundant CPU Units and Power Supply Units, Inner Board capability
Support software		CX-One	CX-One	CX-One	CX-One
Instruction execution times (basic instructions)		0.016 µs	0.04 µs	CS1G: 0.04 µs CS1H: 0.02 µs	0.02 µs
Max. no. of I/O points		2,560	2,560	960 to 5,120	960 to 5,120
Program capacity		50K to 400K steps	5K to 60K steps	10K to 250K steps	10K to 250K steps
Data memory capacity		160K to 832K words	64K to 160K words	64K to 448K words (EM Area: 1 to 13 banks)	64K to 448K words (EM Area: 1 to 13 banks)
Built-in features	Built-in I/O	—	32 points *4	—	—
	Interrupt inputs	—	8 inputs *4	—	—
	High-speed counter	—	4 inputs *4	—	—
	Pulse outputs *3	—	4 outputs *4	—	—
External memory		Memory Cards	Memory Cards	Memory Cards	Memory Cards
CJ Special I/O Units and CPU Bus Units		Mountable	Mountable	Mountable (units for CS series)	Mountable (units for CS series)

*3. These features are not supported by all of the CPU Unit models in the relevant series. Refer to specific product catalogs for details.
*4. Applicable when a Pulse I/O Block is mounted.

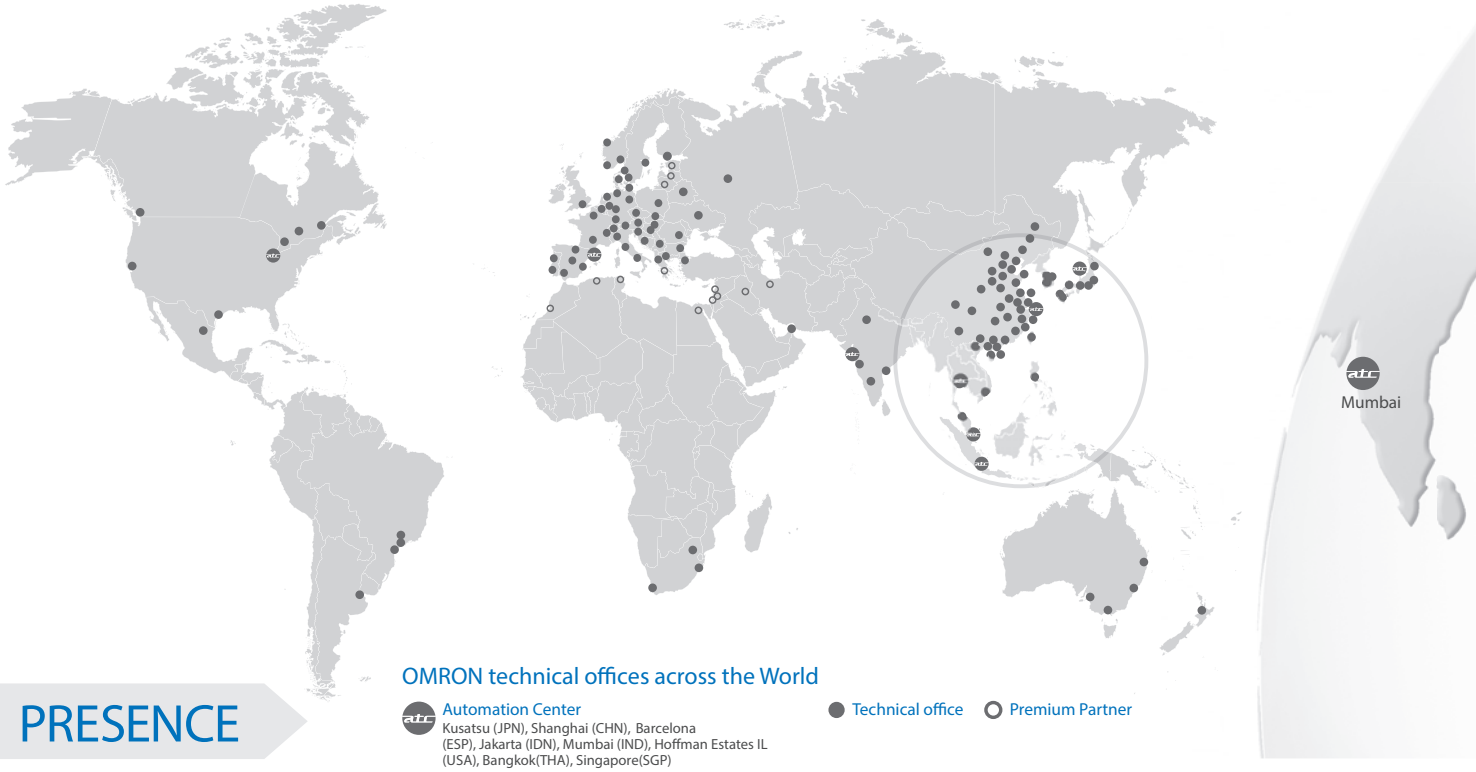
NJ/NX Series				
NJ101 CPU Units	NJ-series Database Connection CPU Units		NJ-series Robotics CPU Units	NJ-series SECS/GEM CPU Units
NJ101 - □□□□	NJ501-1□20	NJ101-□□20	NJ501-4□□□	NJ501-□□4□
				
Ideal for simple machines	Controller directly connectable to database		Parallel link robot control function in addition to machine control	Built-in SECS/GEM communications functions
Sysmac Studio	Sysmac Studio		Sysmac Studio	Sysmac Studio SECS/GEM Configurator
3.3 ns (5.0 ns or less)	1.2 ns (1.9 ns or less)	3.3 ns (5.0 ns or less)	1.2 ns (1.9 ns or less)	1.2 ns (1.9 ns or less)
70 ns or more	26 ns or more	70 ns or more	26 ns or more	26 ns or more
3MB	20MB	3MB	20MB	20MB
0.5 MB: Retain attribute 2 MB: No Retain attribute	2 MB: Retain attribute 4 MB: No Retain attribute	0.5 MB: Retain attribute 2 MB: No Retain attribute	2 MB: Retain attribute 4 MB: No Retain attribute	2 MB: Retain attribute 4 MB: No Retain attribute
2,560 points/40 Units (3 Expansion Racks)	2,560 points/40 Units (3 Expansion Racks)		2,560 points/40 Units (3 Expansion Racks)	2,560 points/40 Units (3 Expansion Racks)
0 or 2	16, 32 or 64	2 or 0	16, 32 or 64	16, 32 or 64
64	192	64	192	192
—	Provided		— Provided (NJ501-4320 only)	—
—	—		8 max. *1	—
—	—		—	Provided
Memory Cards	Memory Cards		Memory Cards	Memory Cards
Mountable *2	Mountable *2		Mountable *2	Mountable *2

*1. The number of controlled robots varies according to the number of axes used for the system.
*2. For the details of mountable Units, refer to the user's manuals.

CP series

Series		CP Series			
Model		CP1H	CP1L	CP1E-N/NA Type	CP1E-E Type
Appearance					
CPU Unit features *3		Four axis position control and comprehensive model	High performing model with embedded Ethernet for two axis position control	Standard model for HMI connection, two axes position control, and inverter connection	Cost effective performance and easy application with only basic functionality
		Pulse outputs for up to 4 axes, CP1W Expansion Units can be mounted, easy Modbus-RTU, Serial Communications Option Boards, Ethernet Option Board, CJ-series Special I/O Units and CPU Bus Units can be mounted, Function Blocks (Ladder diagrams/Structured Text), LCD Option Board, analog adjuster, seven-segment LED display (2 digits)	Pulse outputs for up to 2 axes, models with USB port, models with Ethernet communications port, CP1W Expansion Units can be mounted, easy Modbus-RTU, Serial Communications Option Boards, Ethernet Option Board, Function Blocks (Ladder diagrams/Structured Text), LCD Option Board, analog adjuster, Analog I/O Option Boards	Pulse outputs for up to 2 axes, USB port, RS-232C port, CP1W Expansion Units can be mounted, easy Modbus-RTU, Serial Communications Option Boards, Ethernet Option Board, 2 analog adjusters	USB port, CP1W Expansion Units can be mounted, 2 analog adjusters
Support software		CX-One	CX-One	CX-One	CX-One
Instruction execution times (basic instructions)		0.10 µs	0.55 µs	1.19 µs	1.19 µs
Max. no. of I/O points		320 points (40 built in + 280 expansion)	180 points (60 built in + 120 expansion)	180 points (60 built in + 120 expansion)	180 points (60 built in + 120 expansion)
Program capacity		20K steps	5K or 10K steps	8K steps	2K steps
Data memory capacity		32K words	10K or 32K words	8K words	2K words
Built-in features	Built-in I/O	20 or 40 points	10 or 60 points	14 or 60 points	10 or 60 points
	Interrupt inputs	6 or 8 inputs	2, 4 or 6 inputs	6 inputs	4 or 6 inputs
	High-speed counter	4 inputs	4 inputs	4 inputs	5 or 6 inputs
	Pulse outputs *3	4 outputs	2 outputs	2 outputs	—
External memory		Memory Cassettes	Memory Cassettes	—	—
CJ Special I/O Units and CPU Bus Units		Mountable	—	—	—

Service and support



PRESENCE

OMRON technical offices across the World

Automation Center
Kusatsu (JPN), Shanghai (CHN), Barcelona (ESP), Jakarta (IDN), Mumbai (IND), Hoffman Estates IL (USA), Bangkok(THA), Singapore(SGP)

Technical office

Premium Partner

COMPETENCE

OMRON

Design

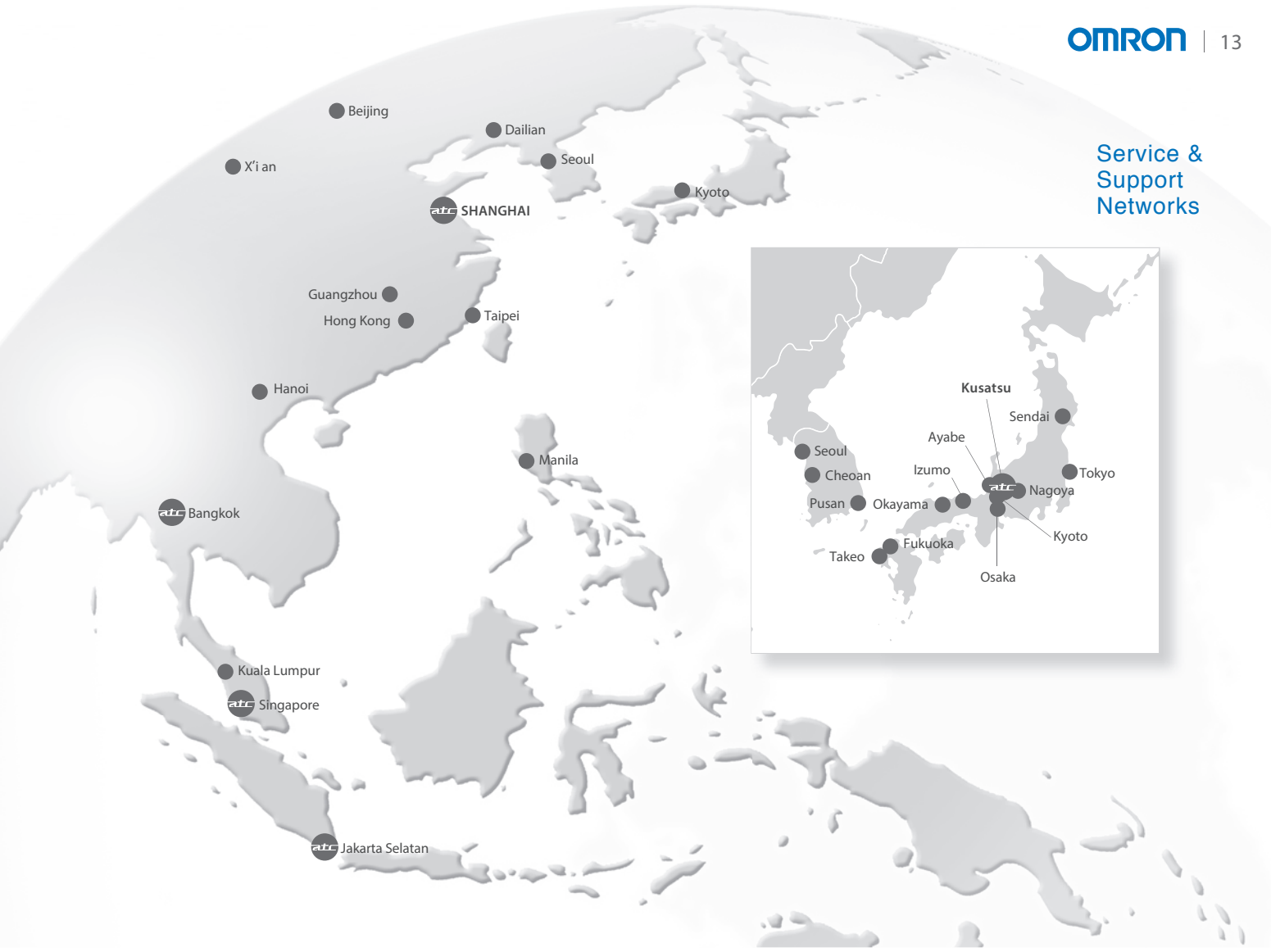
Our wi de net work of machine automation specialists will help you to select the right automation architecture and products to meet your requirements. Our flat structure based on expert-to-expert contact ensures that you will have ONE accountable and responsible expert to deal with on your complete project.

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. and 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.

Service & Support Networks



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 -

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