Micro PLC designed to support data collection and Machine to Machine communication

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

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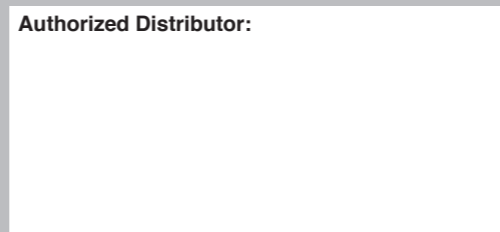Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

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**Cat. No. P144-E1-01**   0919(0919)

Diverse range of functions for your machine

Efficient solution for a flexible production, traceability and monitoring of machine key assets, to respond to operational excellence.

Improved connectivity to networking and serial devices.

Reduced development time with function blocks (FBs) programming.

Battery-free operation increases robustness and reduces maintenance. The extended operating temperature range increase reliability for special applications.

Up to 3 serial ports

CP2E-N

2 Ethernet ports

4-axis positioning function
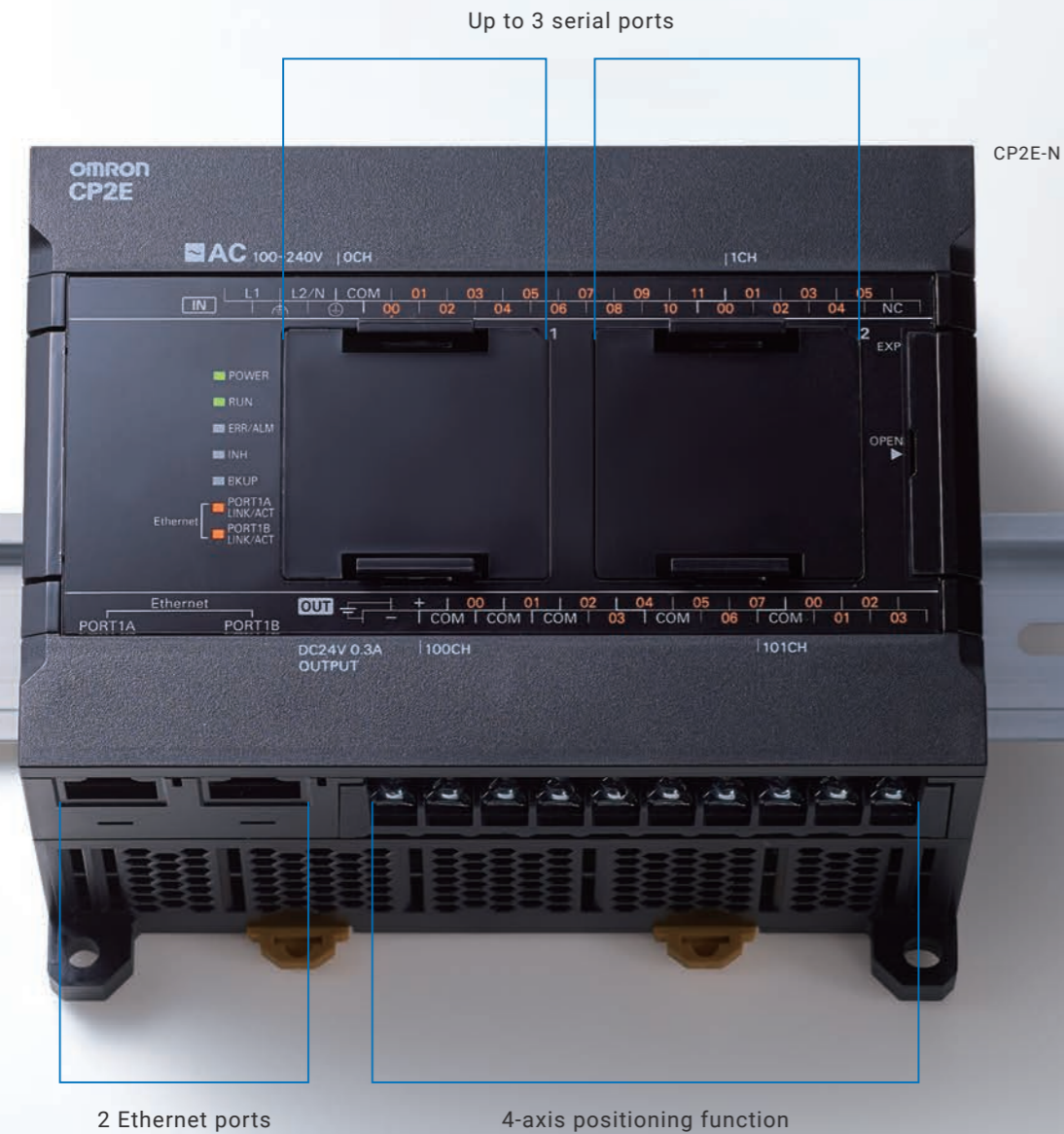
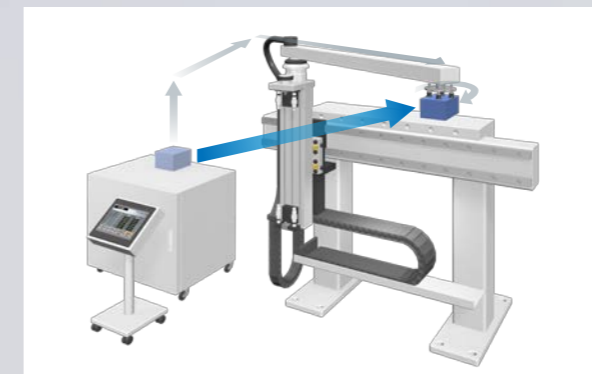## Improved connectivity for ethernet and serial devices ······· P.4-5

2 ports   1 port

Built-in Ethernet switching function
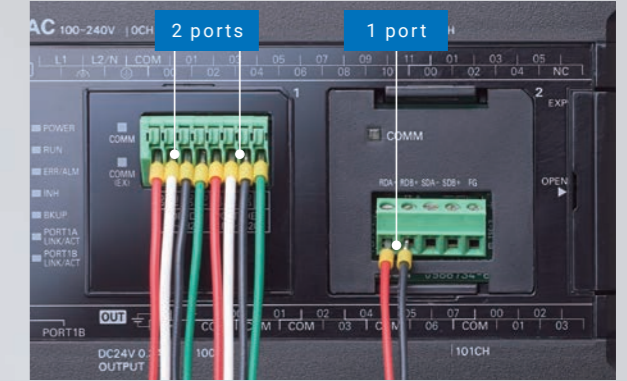
Serial open protocols and Modbus communication

Reduced effort to realize complex machines ······· P.6-7

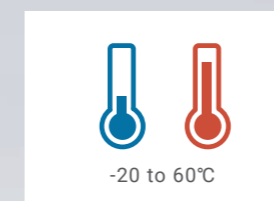FB

Try Omron Function blocks for positioning, Machine to Machine communication and predictive maintenance

Download from www.ia.omron.com/cp_fb

4-axis positioning function with linear interpolation

Install and forget: reliable solution for all environmental conditions ······ P.7

-20 to 60℃

Normal operation continues

Extended operational temperature range

Battery-free operation*

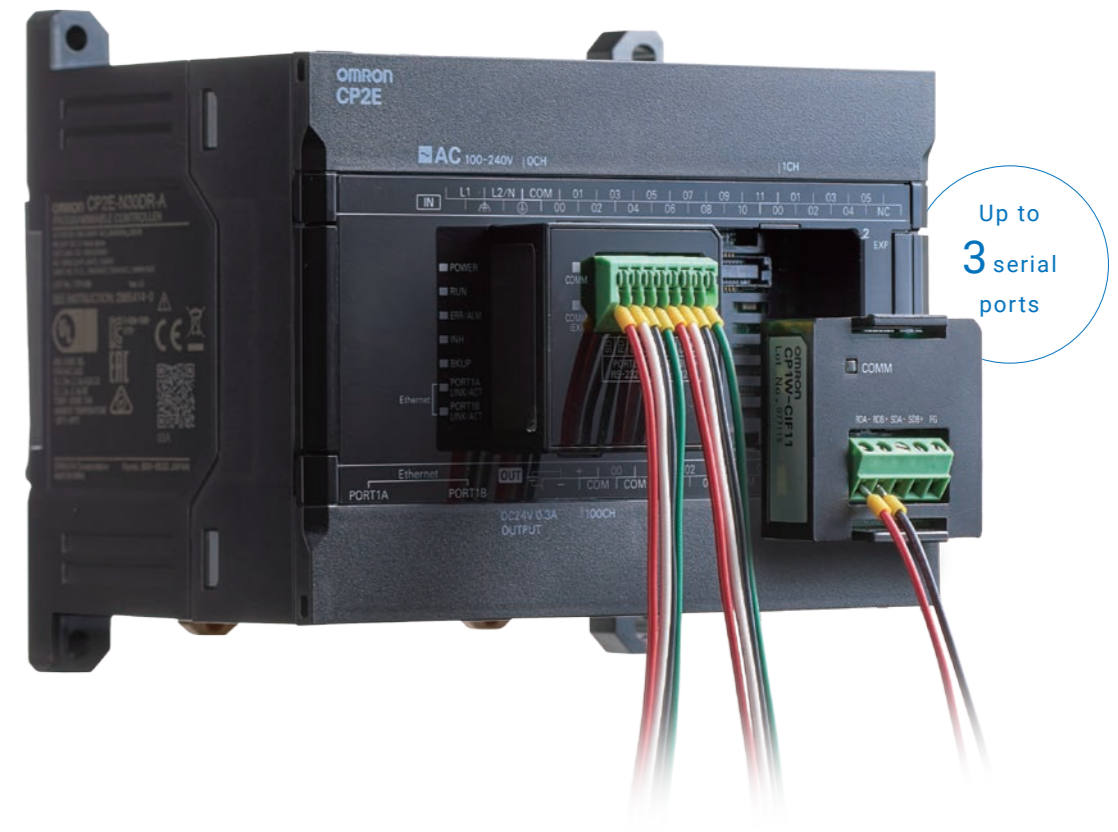Input/output terminal LED indicators for quick troubleshooting

Automatic Recovery by electric interferences

Note: Please check datasheet (Cat. No. P145) to select your controller. Available functions differ model by model.

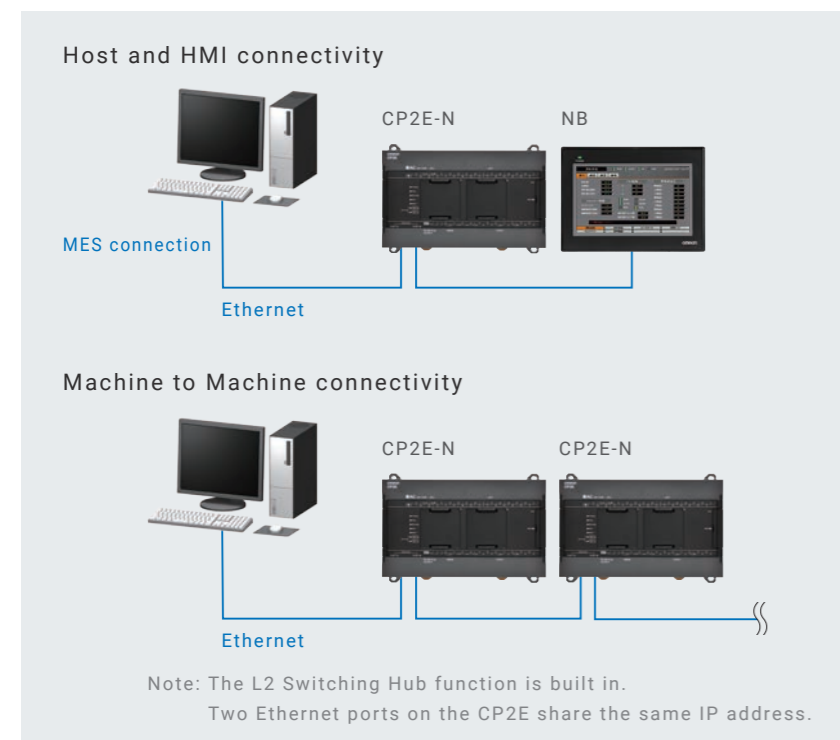* Needed only in case Real Time Clock is used.

Improved connectivity for ethernet and serial devices

## Ready for Machine to Machine communication [CP2E-N]

Connect machines to networks to collect field data.

Two built-in Ethernet ports eliminate the need for switching hubs. One port is connected to the host, and another can be connected to an HMI, PLC, or PC running support software or reserved.

Host and HMI connectivity

MES connection

CP2E-N   NB

Ethernet

Machine to Machine connectivity

CP2E-N   CP2E-N

Ethernet

Note: The L2 Switching Hub function is built in.
        Two Ethernet ports on the CP2E share the same IP address.

FB Ethernet Send/Receive Data

Reduce programming time by Ethernet Send/Receive Data FB to easily exchange data between controllers.
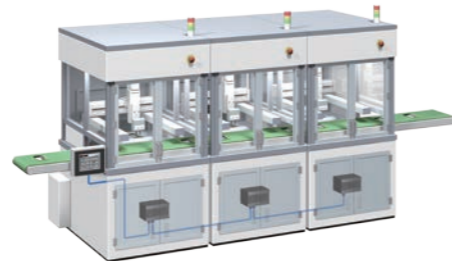
Assembling lines

Improve design efficiency and productivity reducing development time with a modular conception of the machine

Open connectivity to serial devices [CP2E-N]

CP2E-N can use up to 3 serial ports by mounting option boards.

Data collection, Control and Monitoring of serial devices is easy and flexible.

CP2E-N   NB

Ethernet

RS-232C   RS-232C   RS-485

Bar code reader   Measurement device   Inverter
                    (air leak tester,
                    weigher, etc.)
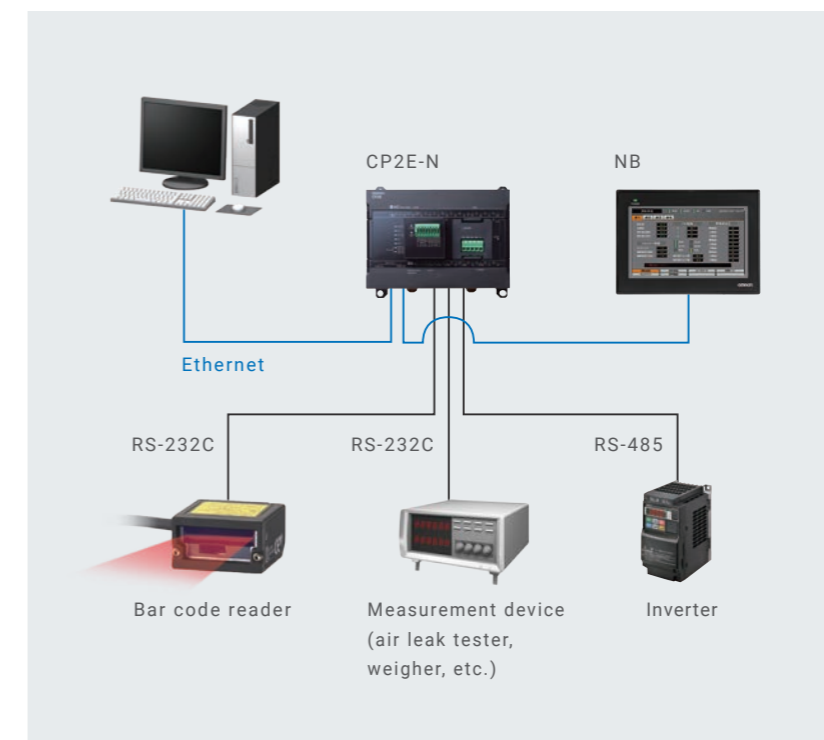
FB Modbus RTU master

Reduce programming time by Modbus FB to easily communicate with serial devices.

Semiautomatic assembling machines

Connect bar code readers for traceability and monitor state of machine

Reduced effort to realize complex machines

Up to 4-axis linear interpolation   CP2E-N

CP2E-N   NB

Ethernet

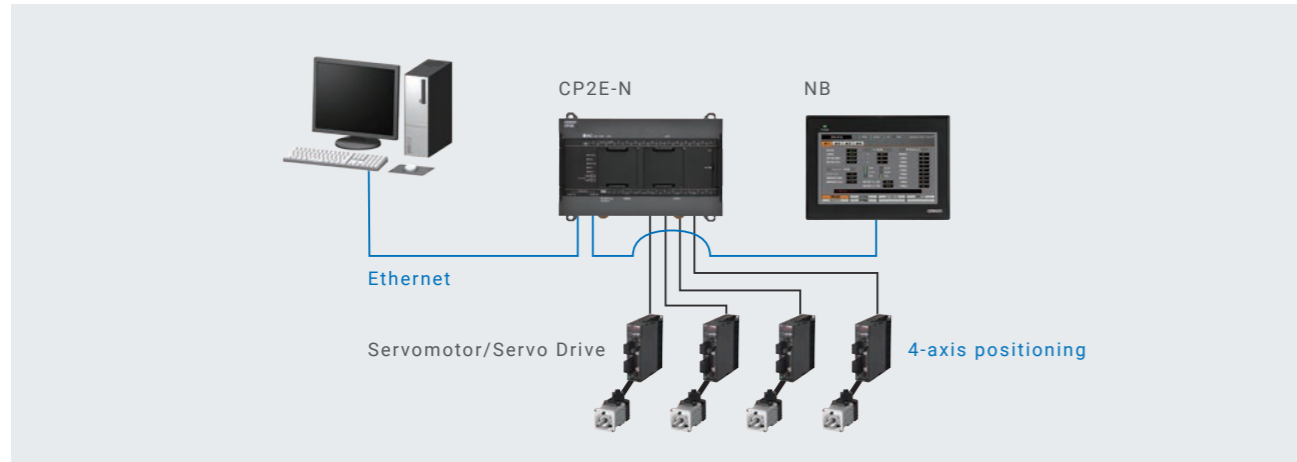Servomotor/Servo Drive   4-axis positioning
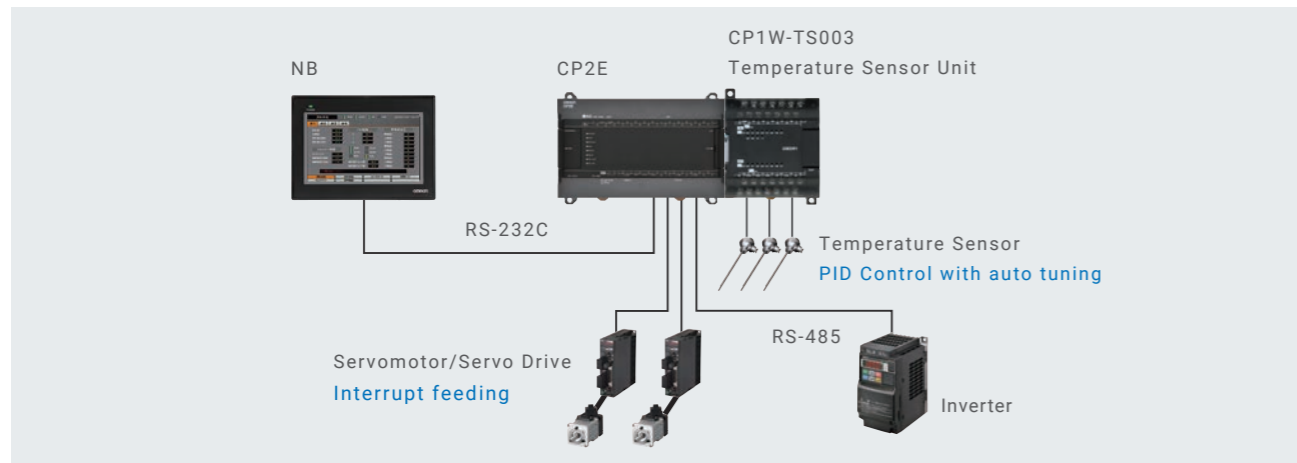
FB   Linear interpolation

Simplified positioning:
4-axis can operate simultaneously for
a faster positioning.

Pick and Place
Operate with 4-axis
simultaneously to reduce
machine cycle time

Positioning on mark for Packaging Machines   CP2E-N/CP2E-S

NB   CP2E   CP1W-TS003
Temperature Sensor Unit

RS-232C

Temperature Sensor
PID Control with auto tuning

Servomotor/Servo Drive
Interrupt feeding   RS-485
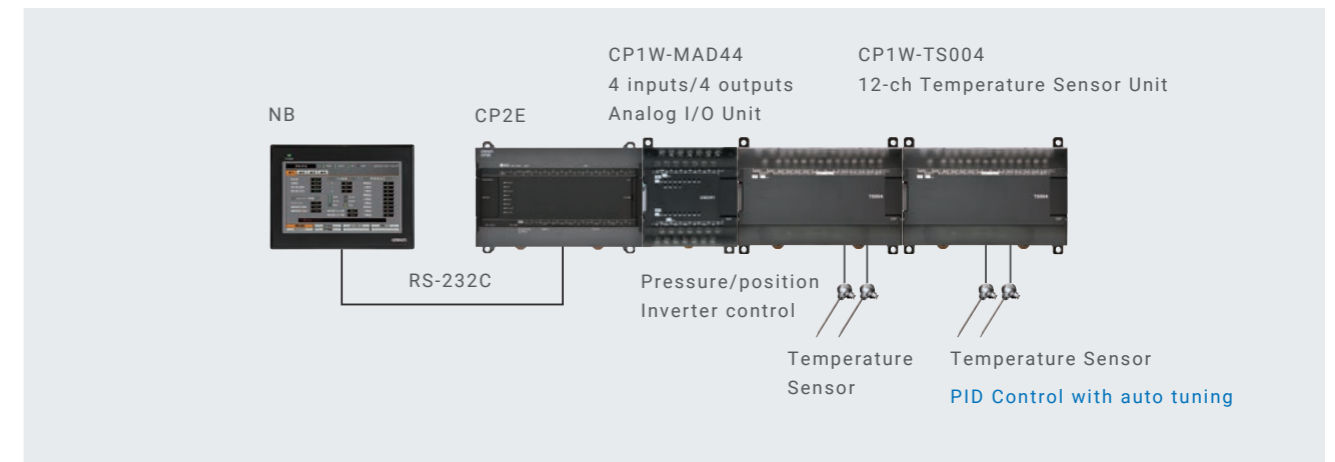
Inverter

Instruc-tion   Fixed positioning on interrupt
(IFEED instruction)

With one instruction you can
execute a fixed positioning
on Interrupt input (mark)
independently by PLC cycle time.

Stop after a defined
amount of pulses

Speed control   Position control

(Time)

Interrupt input
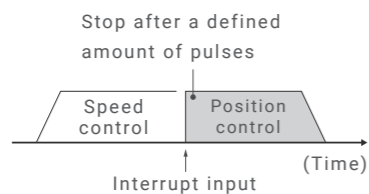
Packaging machine
Constant movement from
mark detection to seal
position

Stable temperature control with autotuning function   CP2E-N/CP2E-S/CP2E-E

NB   CP2E
CP1W-MAD44
4 inputs/4 outputs
Analog I/O Unit

CP1W-TS004
12-ch Temperature Sensor Unit

RS-232C   Pressure/position
Inverter control

Temperature
Sensor   Temperature Sensor
PID Control with auto tuning

FB   PID Control with auto tuning

PID with Autotuning function
enable stable temperature
control reducing start-up time.
Connection with stand alone
temperature control is also
available.

(Temperature)   Hunting   Overshooting

Temperature
control (PID)

(Time)
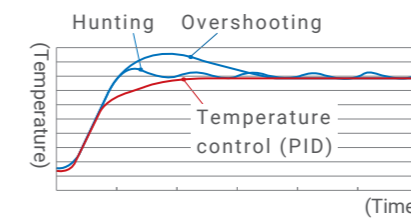
Small extrusion machine
Stable multipoint temperature control,
setting via NB series HMI

Install and forget: reliable solution for all environmental conditions   CP2E-N/CP2E-S/CP2E-E

Extended operational temperature range

Increase reliability in special
applications

-20 to 60℃

Multi-level
parking

Waste disposal
equipment

Grain storage
facility

Battery-free operation*

Cost reduction in maintenance,
logistic/stock

* Needed only in case Real Time Clock is used.

I/O LED indicators

Reduce installation time
and easily check wiring
errors by LED indicators

Automatic Recovery by electric interferences.

CP2E detects and recovers
in real-time operation a bit
corruption.
Increase machine efficiency
avoiding CPU stops.

Normal operation continues

Product lineup

CP2E-N Network Model: Ethernet connectivity, 4-axis positioning, FB programming

CPU unit with 30, 40, or 60 I/O points

2 Ethernet ports	Up to 3 serial ports	4-axis positioning	2 option boards	3 expansion units
Memory 10K steps	Clock	Battery-free	-20 to 60℃	USB port

CPU unit with 14 or 20 I/O points

1 Ethernet port	Up to 2 serial ports	2-axis positioning	1 option board	Expansion unit
Memory 10K steps	Clock	Battery-free	-20 to 60℃	USB port

CP2E-S Standard Model: 2 serial ports, 2-axis positioning, FB programming

CPU unit with 30, 40, or 60 I/O points

Ethernet	1 x RS-232C port 1 x RS-485 port*1	2-axis positioning	option board	3 expansion units
Memory 8K steps	Clock	Battery-free	-20 to 60℃	USB port

CP2E-E Essential Model: 1 serial port, FB programming

CPU unit with 30, 40, or 60 I/O points

Ethernet	1 x RS-232C port *1	positioning	option board	3 expansion units
Memory 4K steps	Clock	Battery-free	-20 to 60℃	USB port

CPU unit with 14 or 20 I/O points

Ethernet	1 x RS-232C port *1	positioning	option board	Expansion unit
Memory 4K steps	Clock	Battery-free	-20 to 60℃	USB port

*1. RS-232C: Screwless terminal block (6 terminals), RS-485: Screwless terminal block (3 terminals)

Option Board (for CP2E-N-type CPU Units)

1-port Serial Option Board

RS-232C   RS-422A/485   RS-422A/485 (isolated)

2-port Serial Option Board *2

RS-232C RS-232C   RS-232C RS-485 (isolated)   RS-485 (isolated) RS-485 (isolated)

Analog Option Board *2

2 analog inputs 0 to 10 V, 0 to 20 mA

2 analog outputs 0 to 10 V

2 analog inputs 0 to 10 V, 0 to 20 mA 2 analog outputs 0 to 10 V

*2. Two 2-port serial option boards cannot be mounted in a CPU unit. Two analog option boards also cannot be mounted in a CPU unit.

Expansion I/O Unit and Expansion Unit

40-point I/O Unit 32-point Output Unit

20-point I/O Unit 16-point Output Unit

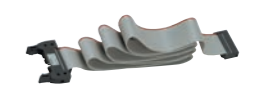8-point Input Unit 8-point Output Unit

Analog Input Unit Analog Output Unit Analog I/O Unit

4-ch Temperature Sensor Unit 2-ch Temperature Sensor Unit

12-ch Temperature Sensor Unit

I/O Connecting Cable

Battery

Battery: only for Real time Clock function- CP2E-N/CP2E-S CPU Unit

Ordering Information

CPU Units

CP2E-N/Network Models

I/O points	Specifications						
	Power supply	Inputs	Outputs	Output type	Program capacity	DM Area capacity	Model
14	100 to 240 VAC	8	6	Relay	10K steps	16K words	CP2E-N14DR-A
				Transistor (sinking)			CP2E-N14DT-A
	24 VDC			Relay			CP2E-N14DR-D
				Transistor (sinking)			CP2E-N14DT-D
				Transistor (sourcing)			CP2E-N14DT1-D
20	100 to 240 VAC	12	8	Relay			CP2E-N20DR-A
				Transistor (sinking)			CP2E-N20DT-A
	24 VDC			Relay			CP2E-N20DR-D
				Transistor (sinking)			CP2E-N20DT-D
				Transistor (sourcing)			CP2E-N20DT1-D
30	100 to 240 VAC	18	12	Relay			CP2E-N30DR-A
				Transistor (sinking)			CP2E-N30DT-A
	24 VDC			Relay			CP2E-N30DR-D
				Transistor (sinking)			CP2E-N30DT-D
				Transistor (sourcing)			CP2E-N30DT1-D
40	100 to 240 VAC	24	16	Relay			CP2E-N40DR-A
				Transistor (sinking)			CP2E-N40DT-A
	24 VDC			Relay			CP2E-N40DR-D
				Transistor (sinking)			CP2E-N40DT-D
				Transistor (sourcing)			CP2E-N40DT1-D
60	100 to 240 VAC	36	24	Relay			CP2E-N60DR-A
				Transistor (sinking)			CP2E-N60DT-A
	24 VDC			Relay			CP2E-N60DR-D
				Transistor (sinking)			CP2E-N60DT-D
				Transistor (sourcing)			CP2E-N60DT1-D

CP2E-S/Standard Models

I/O points	Specifications						
	Power supply	Inputs	Outputs	Output type	Program capacity	DM Area capacity	Model
30	100 to 240 VAC	18	12	Relay	8K steps	8K words	CP2E-S30DR-A
	24 VDC			Transistor (sinking)			CP2E-S30DT-D
				Transistor (sourcing)			CP2E-S30DT1-D
40	100 to 240 VAC	24	16	Relay			CP2E-S40DR-A
	24 VDC			Transistor (sinking)			CP2E-S40DT-D
				Transistor (sourcing)			CP2E-S40DT1-D
60	100 to 240 VAC	36	24	Relay			CP2E-S60DR-A
	24 VDC			Transistor (sinking)			CP2E-S60DT-D
				Transistor (sourcing)			CP2E-S60DT1-D

CP2E-E/Essential Models

I/O points	Specifications						
	Power supply	Inputs	Outputs	Output type	Program capacity	DM Area capacity	Model
14	100 to 240 VAC	8	6	Relay	4K steps	4K words	CP2E-E14DR-A
20		12	8	Relay			CP2E-E20DR-A
30		18	12	Relay			CP2E-E30DR-A
40		24	16	Relay			CP2E-E40DR-A
60		36	24	Relay			CP2E-E60DR-A

For details, refer to datasheet of CP2E (Cat.No. P145).

FB Function Blocks are available to download free of charge from Omron website. (www.ia.omron.com/cp_fb)

Optional Products

Battery: only for Real time Clock function- CP2E-N/CP2E-S CPU Unit

Product name	Specifications	Model
Battery	CP2E-N, CP2E-S dedicated battery. Install when using the clock function	CP2W-BAT02

Option Boards for CP2E-N

Product name	Specifications	Model
1-port Serial Option Board	RS-232C	CP1W-CIF01
	RS-422A/485	CP1W-CIF11
	RS-422A/485 (isolated)	CP1W-CIF12-V1
2-port Serial Option Board *1	RS-232C 2port	CP2W-CIFD1
	RS-232C, RS-485 (isolated)	CP2W-CIFD2
	RS-485 (isolated) 2port	CP2W-CIFD3
Analog Option Board *1	2 analog inputs. 0 to 10 V (resolution: 1/4000), 0 to 20 mA (resolution: 1/2000)	CP1W-ADB21
	2 analog outputs. 0 to 10 V (resolution: 1/4000)	CP1W-DAB21V
	2 analog inputs. 0 to 10 V (resolution: 1/4000), 0 to 20 mA (resolution: 1/2000) 2 analog outputs. 0 to 10 V (resolution: 1/4000)	CP1W-MAB221

*1.Two 2-port serial option boards cannot be mounted in a CPU unit. Two analog option boards also cannot be mounted in a CPU unit.

Expansion I/O Units and Expansion Units

Unit type	Product name	Inputs	Outputs	Specifications	Model
CP1W Expansion I/O Unit	Input Unit	8	—	24 VDC input	CP1W-8ED
	Output Unit	—	8	Relay	CP1W-8ER
			8	Transistor (sinking)	CP1W-8ET
			8	Transistor (sourcing)	CP1W-8ET1
			16	Relay	CP1W-16ER
			16	Transistor (sinking)	CP1W-16ET
			16	Transistor (sourcing)	CP1W-16ET1
			32	Relay	CP1W-32ER
			32	Transistor (sinking)	CP1W-32ET
			32	Transistor (sourcing)	CP1W-32ET1
	I/O Unit	12	8	Relay	CP1W-20EDR1
		12	8	Transistor (sinking)	CP1W-20EDT
		12	8	Transistor (sourcing)	CP1W-20EDT1
		24	16	Relay	CP1W-40EDR
		24	16	Transistor (sinking)	CP1W-40EDT
		24	16	Transistor (sourcing)	CP1W-40EDT1
CP1W Expansion Unit	Analog Input Unit	4 ch	—	Input range: 0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/6000	CP1W-AD041
		4 ch		Input range: 0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/12000	CP1W-AD042
	Analog Output Unit	—	2 ch	Output range: 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/6000	CP1W-DA021
			4 ch		CP1W-DA041
			4 ch	Output range: 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/12000	CP1W-DA042
	Analog I/O Unit	2 ch	1 ch	Input range: 0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA. Output range: 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/6000	CP1W-MAD11
		4 ch	2 ch	Input range: 0 to 5 V, 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA. Output range: 1 to 5 V, 0 to 10 V, -10 to 10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/12000	CP1W-MAD42
		4 ch	4 ch		CP1W-MAD44
	Temperature Sensor Unit	2 ch	—	Sensor type: Thermocouple (K or J)	CP1W-TS001
		4 ch			CP1W-TS002
		2 ch		Sensor type: Platinum resistance thermometer (Pt100 or JPt100)	CP1W-TS101
		4 ch			CP1W-TS102
		4 ch		Sensor type: Thermocouple (K or J). 4 ch or 2 analog inputs. Input range: 0 to 10 V, 1 to 5 V, or 4 to 20 mA. Resolution: 1/12000	CP1W-TS003
		12 ch		Sensor type: Thermocouple (K or J)	CP1W-TS004
I/O Connecting Cable				800 mm extension cable for CP1W Expansion I/O Units and CP1W Expansion Units. Only one I/O Connecting Cable can be used in each PLC	CP1W-CN811

Software

Product name	Specifications	License	Media	Model
CX-One Lite Ver4.□	A subset of the complete CX-One package that provides only the support software required for compact PLC applications	1	DVD	CXONE-LT01D-V4
Cx-One Ver4.□	A comprehensive software package that integrates support software for Omron PLCs and components	1	DVD	CXONE-AL01D-V4