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OMRON

SYSMAC CP-series CP1E CPU Units
CP1E-E□D□-A
CP1E-N□D□-□

The CP1E Package PLCs: Economy, Easy, and Efficient

■The E-type Basic CPU Units provide cost performance and easy application with only basic functionality.
■The N-type Application CPU Units support Programmable Terminal connection, position control, and inverter connection

CP1E-E20DR-A *NEW*

CP1E-N40DR-A *NEW*

Features

- Programming, setting, and monitoring with CX-Programmer.
- Easy connection with computers using commercially available USB cables
- Expansion I/O Units can be used to increase the I/O capacity of a CPU Unit (for CPU Units with 30 or 40 I/Opoints).
- Expansion Units can be used to add analog I/O or temperature inputs to a CPU Unit with 30 or 40 I/O points.
- Quick-response inputs
- Input interrupts
- Extensive high-speed counter functionality.
- Versatile pulse control (Models with transistor outputs only).
- Execution of origin searches and origin returns using instructions (Models with transistor outputs only).
- PWM output function (Models with transistor outputs only).
- Changing settings with the analog adjusters.
- Built-in RS-232C port on N-type CPU Units.
- A Serial Option Board can be added to N-type CPU Units with 30 or 40 I/O points.

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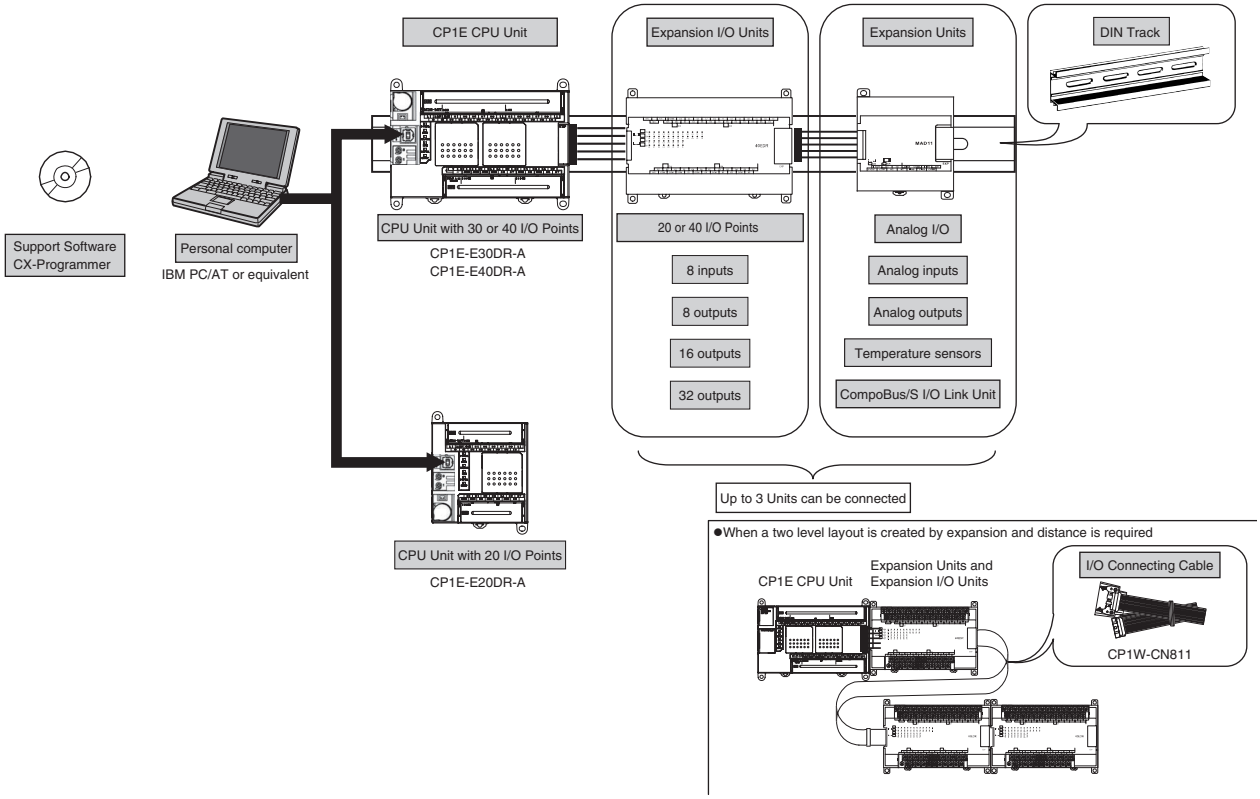
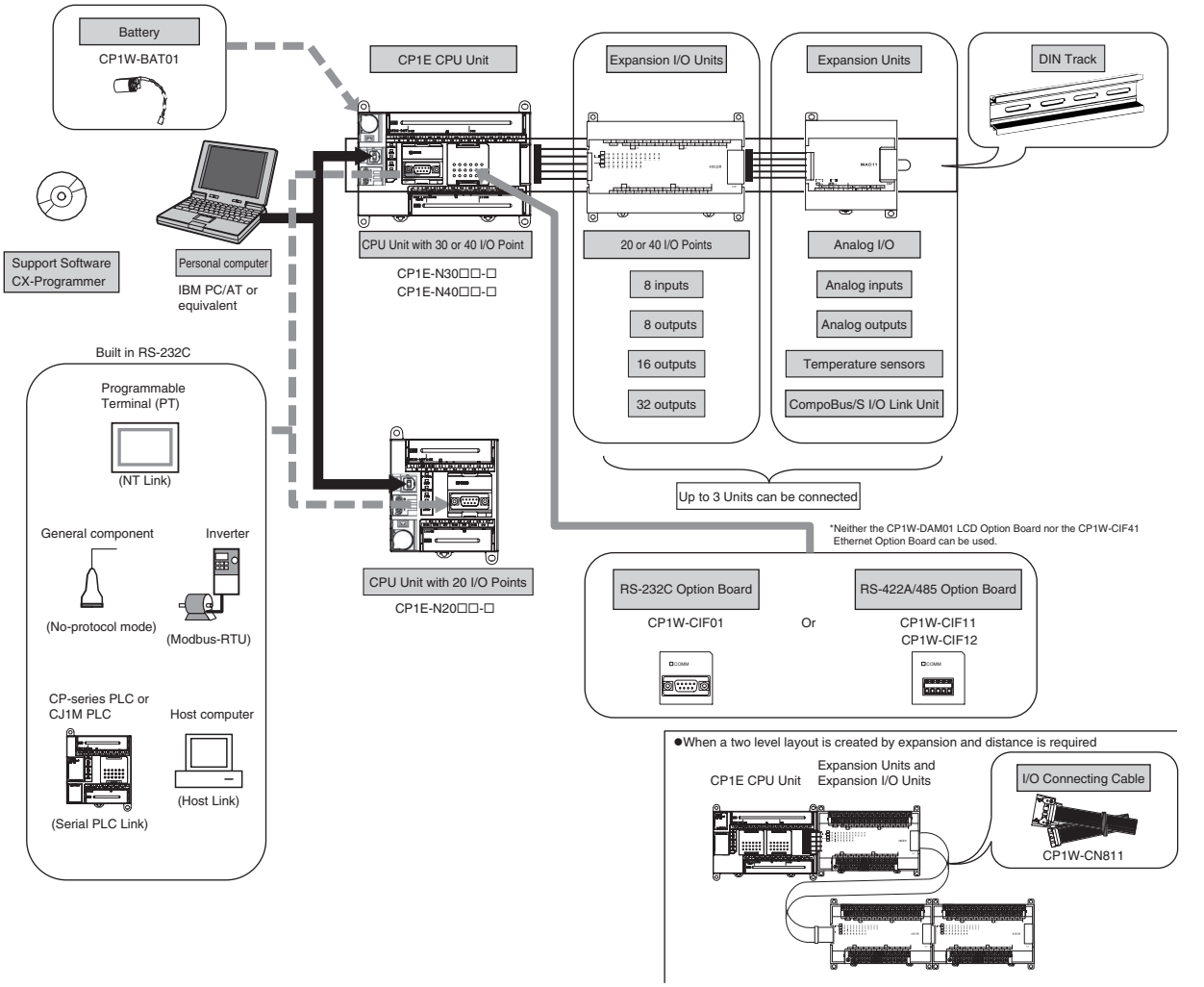
System Configuration

Basic System Configuration Using an E-type CPU Unit



Basic System Configuration Using an N-type CPU Unit



Ordering Information

International Standards

- The standards are abbreviated as follows: U: UL, U1: UL (Class I Division 2 Products for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Products for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, and CE: EC Directives.
- Contact your OMRON representative for further details and applicable conditions for these standards.

E-type CP1E CPU Units (Basic Models)

Product name	Specifications						External power supply (24 VDC) (A)	Current consumption (A)		Model	Standards
	Power Supply	Inputs	Outputs	Output type	Program capacity	Data memory capacity		5 V	24 V		
E-type CPU Units with 20 I/O Points	100 to 240 VAC	12	8	Relay	2K steps	2K words	--	0.17	0.08	**CP1E-E20DR-A** *NEW*	CE
E-type CPU Units with 30 I/O Points		18	12	Relay			0.30	0.17	0.07	**CP1E-E30DR-A** *NEW*	
E-type CPU Units with 40 I/O Points		24	16	Relay			0.30	0.17	0.09	**CP1E-E40DR-A** *NEW*	

Note: There are no accessories included with E-type CP1E CPU Units. A Battery (CP1W-BAT01) cannot be used.

N-type CP1E CPU Units (Application Models)

Product name	Specifications						External power supply (24 VDC) (A)	Current consumption (A)		Model	Standards
	Power Supply	Inputs	Outputs	Output type	Program capacity	Data memory capacity		5 V	24 V		
N-type CPU Units with 20 I/O Points	100 to 240 VAC	12	8	Relay	8K steps	8K words	--	0.18	0.08	**CP1E-N20DR-A** *NEW*	CE
				Transistor (sinking)			--	0.23	0.02	**CP1E-N20DT-A** *NEW*	
				Transistor (sourcing)			--	0.23	0.02	**CP1E-N20DT1-A** *NEW*	
	24 VDC			Relay			--	0.18	0.08	**CP1E-N20DR-D** *NEW*	
				Transistor (sinking)			--	0.23	0.02	**CP1E-N20DT-D** *NEW*	
				Transistor (sourcing)			--	0.23	0.02	**CP1E-N20DT1-D** *NEW*	
N-type CPU Units with 30 I/O Points	100 to 240 VAC	18	12	Relay	8K steps	8K words	0.30	0.21	0.07	**CP1E-N30DR-A** *NEW*	
				Transistor (sinking)			0.30	0.27	0.02	**CP1E-N30DT-A** *NEW*	
				Transistor (sourcing)			0.30	0.27	0.02	**CP1E-N30DT1-A** *NEW*	
	24 VDC			Relay			--	0.21	0.07	**CP1E-N30DR-D** *NEW*	
				Transistor (sinking)			--	0.27	0.02	**CP1E-N30DT-D** *NEW*	
				Transistor (sourcing)			--	0.27	0.02	**CP1E-N30DT1-D** *NEW*	
N-type CPU Units with 40 I/O Points	100 to 240 VAC	24	16	Relay	8K steps	8K words	0.30	0.21	0.09	**CP1E-N40DR-A** *NEW*	
				Transistor (sinking)			0.30	0.31	0.02	**CP1E-N40DT-A** *NEW*	
				Transistor (sourcing)			0.30	0.31	0.02	**CP1E-N40DT1-A** *NEW*	
	24 VDC			Relay			--	0.21	0.09	**CP1E-N40DR-D** *NEW*	
				Transistor (sinking)			--	0.31	0.02	**CP1E-N40DT-D** *NEW*	
				Transistor (sourcing)			--	0.31	0.02	**CP1E-N40DT1-D** *NEW*	
Battery Set	For N-type CP1E CPU Units **Note:** Mount a Battery to an N-type CPU Unit if the data in the following areas must be backed up for power interruptions. • DM Area (D) (except backed up words in the DM Area), Holding Area (H), Counter Completion Flags (C), Counter Present Values (C), Auxiliary Area (A), and Clock Function (Use batteries within two years of manufacture.)									**CP1W-BAT01** *NEW*	CE

Note: There are no accessories included with N-type CP1E CPU Units. RS-232C connectors for the built-in RS-232C port and the Battery (CP1W-BAT01) are not included.

Options (for N-type CP1E CPU Units with 30 I/O Points or 40 I/O Points)

The Options cannot be used for N-type CPU Units with 20 I/O points and all E-type CPU Units.

Product name	Specifications	Model	Standards
RS-232C Option Board	One RS-232C Option Board can be mounted to the Option Board slot. For N-type CP1E CPU Units with 30 I/O Points or 40 I/O Points only. One RS-232C connector is included.	**CP1W-CIF01**	UC1, N, L, CE
RS-422A/485 Option Board	One RS-422A/485 Option Board can be mounted to the Option Board slot. For N-type CP1E CPU Units with 30 I/O Points or 40 I/O Points only.	**CP1W-CIF11**	
RS-422A/485 Isolated-type Option Board		**CP1W-CIF12**	N, L, CE

Note: It is not possible to use a CP-series Ethernet Option Board (CP1W-CIF41), LCD Option Board (CP1W-DAM01), or Memory Card (CP1W-ME05M) with a CP1E CPU Unit.

Programming Devices

Product name		Specifications			Model	Standards
			Number of licenses	Media		
FA Integrated Tool Package CX-One Lite Ver.4.□		CX-One Lite is a subset of the complete CX-One package that provides only the Support Software required for micro PLC applications. CX-One Lite runs on the following OS. Windows 2000 (Service Pack 3 or higher), XP, or Vista CX-One Lite Ver. 4.□ includes Micro PLC Edition CX-Programmer Ver.9.□. The Smart Input function is provided.	1 license	CD	**CXONE-LT01C-V4** ***NEW***	--
		Micro PLC Edition CX-Programmer can still be ordered individually with the following model number.				
	Micro PLC Edition CX-Programmer Ver.9.□	Micro PLC Support Software The Smart Input function is provided. OS: Windows 2000 (Service Pack 3 or higher), XP, or Vista Applicable models: CP1□, CPM□□, SRM1	1 license	CD	**WS02-CXPC2-V9** ***NEW***	--
CX-One FA Integrated Tool Package Ver. 3.□		CX-One is a package that integrates the Support Software for OMRON PLCs and components. CX-One runs on the following OS. OS: Windows 2000 (Service Pack 3 or higher), XP, or Vista CX-One Ver. 3.□ includes CX-Programmer Ver. 8.□.	1 license ✻1	CD	✻4 **CXONE-AL01C-V3**	--
				DVD ✻2	✻4 **CXONE-AL01D-V3**	
		CX-Programmer can still be ordered individually with the following model number.				
	CX-Programmer Ver. 8. □	PLC Support Software OS: Windows 2000 (Service Pack 3 or higher), XP, or Vista	1 license ✻3	CD	**WS02-CXPC1-V8**	--

Note: The Smart Input function is supported only by Micro PLC Edition CX-Programmer version 9.0 or higher and CX-Programmer for CP1E version 1.0.

✻ **1** Site licenses are available for the CX-One (3, 10, 30 or 50 licenses).

✻ **2** When purchasing the DVD format, verify the computer model and DVD drive specifications before purchasing.

✻ **3** Site licenses are available for the CX-Programmer (3 or 10 licenses).

✻ **4** CX-Programmer version 8.2 or higher is required for CP1E PLCs. CX-Programmer version 8.2 is available via a CX-One V3 auto update.

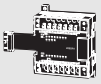
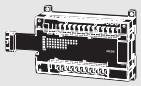
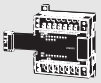
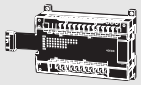
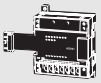
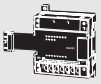
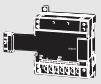
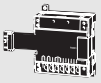
The following tables lists the Support Software that can be installed from CX-One

Support Software in CX-One		CX-One Lite Ver.4.0	CX-One Ver.3.2	Support Software in CX-One		CX-One Lite Ver.4.0	CX-One Ver.3.2
Micro PLC Edition CX-Programmer	Ver.9.□	Yes	No	CX-Drive	Ver.1.□	Yes	Yes
CX-Programmer	Ver.8.□	No	Yes	CX-Process Tool	Ver.5.□	No	Yes
CX-Integrator	Ver.2.□	Yes	Yes	Faceplate Auto-Builder for NS	Ver.3.□	No	Yes
Switch Box Utility	Ver.1.□	Yes	Yes	CX-Designer	Ver.3.□	Yes	Yes
CX-Protocol	Ver.1.□	No	Yes	NV-Designer	Ver.1.□	Yes	Yes
CX-Simulator	Ver.1.□	Yes	Yes	CX-Thermo	Ver.4.□	Yes	Yes
CX-Position	Ver.2.□	No	Yes	CX-ConfiguratorFDT	Ver.1.□	Yes	Yes
CX-Motion-NCF	Ver.1.□	No	Yes	CX-FLnet	Ver.1.□	No	Yes
CX-Motion-MCH	Ver.2.□	No	Yes	Network Configurator	Ver.3.□	Yes	Yes
CX-Motion	Ver.2.□	No	Yes	CX-Server	Ver.4.□	Yes	Yes

Note: For details, refer to the CX-One Catalog (Cat. No. R134).

Expansion I/O Units and Expansion Units (for E-type CP1E CPU Units with 30 I/O Points or 40 I/O Points and N-type CP1E CPU Units with 30 I/O Points or 40 I/O Points)

E-type CP1E CPU Units with 20 I/O points and N-type CP1E CPU Units with 20 I/O points do not support Expansion I/O Units and Expansion Units.

Unit type	Product name	Specifications			Current consumption (A)		Model	Standards
		Inputs	Outputs	Output type	5 V	24 V		
CP1W Expansion I/O Units	**Input Unit**	8	--	--	0.018	--	**CP1W-8ED**	U, C, N, L, CE
	Output Units	--	8	Relay	0.026	0.044	**CP1W-8ER**	
				Transistor (sinking)	0.075	--	**CP1W-8ET**	
				Transistor (sourcing)	0.075	--	**CP1W-8ET1**	
		--	16	Relay	0.042	0.090	**CP1W-16ER**	N, L, CE
				Transistor (sinking)	0.076	--	**CP1W-16ET**	
				Transistor (sourcing)	0.076	--	**CP1W-16ET1**	
		--	32	Relay	0.049	0.131	**CP1W-32ER**	N, L, CE
				Transistor (sinking)	0.113	--	**CP1W-32ET**	
				Transistor (sourcing)	0.113	--	**CP1W-32ET1**	
	I/O Units 	12	8	Relay	0.103	0.044	**CP1W-20EDR1**	U, C, N, L, CE
				Transistor (sinking)	0.130	--	**CP1W-20EDT**	
				Transistor (sourcing)	0.130	--	**CP1W-20EDT1**	
		24	16	Relay	0.080	0.090	**CP1W-40EDR**	N, L, CE
				Transistor (sinking)	0.160	--	**CP1W-40EDT**	
				Transistor (sourcing)	0.160	--	**CP1W-40EDT1**	
CP1W Expansion Units	**Analog Input Unit** 	4 analog inputs Input range: 0 to 5 V, 1 to 5 V, 0 to 10 V, ±10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/6000			0.100	0.090	**CP1W-AD041**	UC1, N, L, CE
	Analog Output Unit 	4 analog outputs Output range: 0 to 5 V, 1 to 5 V, 0 to 10 V, ±10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/6000			0.080	0.124	**CP1W-DA041**	
	Analog I/O Unit 	2 analog inputs and 1 analog output I/O range: 0 to 5 V, 1 to 5 V, 0 to 10 V, ±10 V, 0 to 20 mA, or 4 to 20 mA. Resolution: 1/6000			0.083	0.110	**CP1W-MAD11**	U, C, N, L, CE
	Temperature Sensor Unit 	2 temperature sensor inputs Sensor type: Thermocouple (J or K)			0.040	0.059	**CP1W-TS001**	
		4 temperature sensor inputs Sensor type: Thermocouple (J or K)			0.040	0.059	**CP1W-TS002**	
		2 temperature sensor inputs Sensor type: Platinum resistance thermometer (Pt100 or JPt100)			0.054	0.073	**CP1W-TS101**	
		4 temperature sensor inputs Sensor type: Platinum resistance thermometer (Pt100 or JPt100)			0.054	0.073	**CP1W-TS102**	
	CompoBus/S I/O Link Unit	CompoBus/S slave 8 inputs and 8 outputs			0.029	--	**CP1W-SRT21**	

I/O Connecting Cable

Product name	Specifications	Model	Standards
I/O Connecting Cable	80 cm (for CP1W Expansion I/O Units and Expansion Units) Only one I/O Connecting Cable can be used in each PLC.	**CP1W-CN811**	UC1, N, L, CE

Note: An I/O Connecting Cable (approx. 6 cm) for horizontal connection is provided with CP1W Expansion I/O Units and Expansion Units.

General Specifications

Type		AC power supply models	DC power supply models
Model		CP1E-□□□□-A	CP1E-N□□□-D
Enclosure		Mounted in a panel	
Dimensions (H × D × W)		CPU Unit with 20 I/O points (CP1E-□20D□-□): 90mm ✻1 × 85mm ✻2 × 86 mm CPU Unit with 30 I/O points (CP1E-□30D□-□): 90mm ✻1 × 85mm ✻2 × 130 mm CPU Unit with 40 I/O points (CP1E-□40D□-□): 90mm ✻1 × 85mm ✻2 × 150 mm	
Weight		CPU Unit with 20 I/O points (CP1E-□20D□-□): 370g max. CPU Unit with 30 I/O points (CP1E-□30D□-□): 600g max. CPU Unit with 40 I/O points (CP1E-□40D□-□): 660g max.	
Electrical specifications	Supply voltage	100 to 240 VAC 50/60 Hz	24 VDC
	Operating voltage range	85 to 264 VAC	20.4 to 26.4 VDC
	Power consumption	15 VA/100 VAC max. (CP1E-□20D□-A) 25 VA/240 VAC max. (CP1E-□20D□-A) 50 VA/100 VAC max. (CP1E-□30D□-A/□40D□-A) 70 VA/240 VAC max. (CP1E-□30D□-A/□40D□-A)	13 W max. (CP1E-N20D□-D) 20 W max. (CP1E-N30D□-D/N40D□-D) ✻4
	Inrush current	120 VAC, 20 A for 8 ms max. for cold start at room temperature 240 VAC, 40 A for 8 ms max. for cold start at room temperature	30 A max. (for cold start) 20ms max.
	External power supply ✻3	None (CP1E-□20D□-A) 300 mA 24 VDC (CP1E-□30D□-A/□40D□-A)	None
	Insulation resistance	20 MΩ min. (at 500 VDC) between the external AC terminals and GR terminals	No issulation between primary and secondary DC power supplies.
	Dielectric strength	2,300 VAC 50/60Hz for 1 min between AC external and GR terminals Leakage current: 5 mA max.	No issulation between primary and secondary DC power supplies.
	Power OFF detection time	10 ms min.	2 ms min.
Application environment	Ambient operating temperature	0 to 55 °C	
	Ambient humidity	10% to 90%	
	Atmosphere	No corrosive gas.	
	Ambient storage temperature	-20 to 75 °C (excluding battery)	
	Altitude	2,000 m max.	
	Pollution degree	2 or less: Conforms to JIS B3502 and IEC 61131-2.	
	Noise resistance	2 kV on power supply line (Conforms to IEC61000-4-4.)	
	Overvoltage category	Category II: Conforms to JIS B3502 and IEC 61131-2.	
	EMC Immunity Level	Zone B	
	Vibration resistance	Conforms to JIS 60068-2-6. 5 to 8.4 Hz with 3.5-mm amplitude, 8.4 to 150 Hz Acceleration of 9.8 m/s^2 for 100 min in X, Y, and Z directions (10 sweeps of 10 min each = 100 min total)	
	Shock resistance	Conforms to JIS 60068-2-27. 147 m/s^2, 3 times in X, Y, and Z directions	
Terminal block		Fixed (not removable)	
Terminal screw size		M3	
Applicable standards		EC Directive	
Grounding method		Ground to 100 Ω or less.	

✻1 Total of 110 mm with mounting brackets.
✻2 Excluding cables.
✻3 Use the external power supply to power input devices. Do not use it to drive output devices.
✻4 This is the rated value for the maximum system configuration. Use the following formula to calculate power consumption for CPU Units with DC power.
Formula: DC power consumption = (5V current consumption × 5 V/70% (internal power efficiency) + 24V current consumption) × 1.1(current fluctuation factor)
The above calculation results show that a DC power supply with a greater capacity is required.

Performance Specifications

Item			CP1E-					
			E20DR-A	E30DR-A	E40DR-A	N20D□-□	N30D□-□	N40D□-□
Program capacity			2 K steps (8 Kbytes) including the symbol table, comments, and program indices of the CX-Programmer			8 K steps (32 Kbytes) including the symbol table, comments, and program indices of the CX-Programmer		
Control method			Stored program method					
I/O control method			Cyclic scan with immediate refreshing					
Program language			Ladder diagram					
Instructions			Approximately 200					
Processing speed	Overhead processing time		0.4 ms					
	Instruction execution times		Basic instructions (LD): 1.19 μs min. Special instructions (MOV): 7.9 μs min.					
Number of CP1W-series Expansion Units connected			None	3 Units		None	3 Units	
Maximum number of I/O points			20	150 (30 built in, 40 x 3 expansion)	160 (40 built in, 40 x 3 expansion)	20	150 (30 built in, 40 x 3 expansion)	160 (40 built in, 40 x 3 expansion)
Built-in I/O			20 12 inputs 8 outputs	30 18 inputs 12 outputs	40 24 inputs 16 outputs	20 12 inputs 8 outputs	30 18 inputs 12 outputs	40 24 inputs 16 outputs
Built-in input functions	High-speed counters	High-speed counter mode/ maximum frequency	Incremental Pulse Inputs 10 kHz: 6 counters Up/Down Inputs 10 kHz: 2 counters Pulse + Direction Inputs 10 kHz: 2 counters Differential Phase Inputs (4x) 5 kHz: 2 counters			Incremental Pulse Inputs 100 kHz: 2 counters,10 kHz: 4 counters Up/Down Inputs 100 kHz: 1 counters,10 kHz: 1 counters Pulse + Direction Inputs 100 kHz: 2 counters Differential Phase Inputs (4x) 50 kHz: 1 counter, 5 kHz: 1 counter		
		Counting mode	Linear mode Ring mode					
		Count value	32 bits					
		Counter reset modes	Phase Z and software reset (excluding increment pulse input) Software reset					
		Control method	Target Matching Range Comparison					
	Input interrupts		6 inputs (interrupt input pulse width: 50 μs min.)					
	Quick-response Inputs		6 inputs (input pulse width: 50 μs min.)					
	Normal input	Input constants	Delays can be set in the PLC Setup (0 to 32 ms, default: 8 ms). Set values: 0, 1, 2, 4, 8, 16, or 32 ms					
Built-in output functions	Pulse outputs (Models with transistor outputs only)	Pulse output method and output frequency	No pulse output function			Pulse + Direction Mode 1 Hz to 100 kHz: 2 outputs		
		Output mode				Continuous mode (for speed control) Independent mode (for position control)		
		Number of output pulses				Relative coordinates: 0000 0000 to 7FFF FFFF hex (0 to 2147483647) Absolute coordinates: 8000 0000 to 7FFF FFFF hex (-2147483647 to 2147483647)		
		Acceleration/ deceleration curves				Trapezoidal acceleration and deceleration (Cannot perform S-curve acceleration and deceleration.)		
		Changing SVs during instruction execution				Only target position can be changed.		
		Origin searches				Included		
	Pulse outputs (Models with transistor outputs only)	Frequency	PWM output function not included			2.0 to 6,553.5 Hz (in increments of 0.1 Hz) with 1 output or 2 Hz to 32,000 Hz (in increments of 1 Hz) with 1 output		
		Duty factor				0.0% to 100.0% (in increments of 0.1%) Accuracy: +1%/-0% at 2 Hz to 10,000 Hz and +5%/-0% at 10,000 Hz to 32,000 kHz		
		Output mode				Continuous Mode		
Analog adjusters			2 adjusters (Setting range: 0 to 255)					

Item			CP1E-					
			E20DR-A	E30DR-A	E40DR-A	N20D□-□	N30D□-□	N40D□-□
Communications	Peripheral USB Port		Conforming to USB 2.0 B type					
		Transmission distance	5 m max.					
	Built-in RS-232C port		No built-in RS-232C port			Interface: Conforms to EIA RS-232C.		
		Communications method				Half duplex		
		synchronization				Start-stop		
		Baud rate				1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, or 115.2 kbps		
		Transmission distance				15 m max.		
		Supported protocol				• Host Link • 1:N NT Link • No-protocol mode • Serial PLC Link Slave, Serial PLC Link Master • Modbus-RTU Easy Master		
	Serial Option port		Option Board cannot be mounted.				1 port	
		Mountable Option Boards					• CP1W-CIF01 One RS-232C port • CP1W-CIF11 One RS-422A/485 port • CP1W-CIF12 One RS-422A/485 port (isolated)	
		Communications method					Depends on Option Board.	
		synchronization					Depends on Option Board.	
		Baud rate					1.2, 2.4, 4.8, 9.6, 19.2, 38.4, 57.6, or 115.2 kbps	
		Compatible protocols					• Host Link • 1:N NT Link • No-protocol mode • Serial PLC Link Slave, Serial PLC Link Master • Modbus-RTU Easy Master	
Number of tasks			17 • One cyclic execution task • One scheduled interrupt task (always interrupt task 1) • Six input interrupt tasks (interrupt tasks 2 to 7) • Sixteen high-speed counter interrupt tasks (interrupt tasks 1 to 16)					
Maximum subroutine number			128					
Maximum jump number			128					
Scheduled interrupt tasks			1 interrupt task					
Clock			Clock function not included.			Included. Accuracy (monthly deviation): -4.5 min to -0.5 min at ambient temperature of 55°C, -2.0 min to +2.0 min at ambient temperature of 25°C, -2.5 min to +1.5 min at ambient temperature of 0°C		
Memory backup	Built-in EEPROM		Ladder programs and parameters are automatically saved to built-in EEPROM A section of the Data Memory Area can be saved to the built-in EEPROM.					
	Battery backup With CP1W-BAT01 Battery (Sold separately)		Battery cannot be mounted.			CP1W-BAT01 can be used. Maximum battery service life: 5 years Backup Time Guaranteed value (ambient temperature: 55°C): 13,000 hours (approx. 1.5 years) Effective value (ambient temperature: 25°C): 43,000 hours (approx. 5 years)		
CIO Area	Input Bits		1,600 bits (100 words): CIO 0.00 to CIO 99.15 (CIO 00 to CIO 99)					
	Output Bits		1,600 bits (100 words): CIO 100.00 to CIO 199.15 (CIO 100 to CIO 199)					
	Serial PLC Link Words		1,440 bits (90 words): CIO 200.00 to CIO 289.15 (words CIO 200 to CIO 289)					
Work Area (W)			1,600 bits (100 words): W0.00 to W99.15 (W0 to W99)					
Holding Area (H)			800 bits (50 words): H0.00 to H49.15 (H0 to H49) The bits and words in this area are used only in programming. Bit ON/OFF status will be retained when the operating mode is changed.					
Auxiliary Area (A)			Read-only: 7,168 bits (448 words) A0 to A447 Read/write: 4,896 bits (306 words) in words A448 to A753					
Temporary Relay Area (TR) (TR Area)			16 bits: TR0 to TR15					
Timer Area (T)			256 timer numbers (T0000 to T255 (separate from counters))					
Counter Area (C)			256 counter numbers (C0000 to C255 (separate from timers))					
Data Memory Area (D)			2 Kwords: D0 to D2047 Of these, 1,500 words can be saved to the backup memory (built-in EEPROM) using settings in the Auxiliary Area.			8 Kwords: D0 to D8191 Of these, 7,000 words can be saved to the backup memory (built-in EEP-ROM) using settings in the Auxiliary Area		
Operating modes			PROGRAM mode: Program execution is stopped. Preparations can be executed prior to program execution in this mode. MONITOR mode: Programs are executed. Some operations, such as online editing, and changes to present values in I/O memory, are enabled in this mode. RUN mode: Programs are executed. This is the normal operating mode.					

Function Specifications

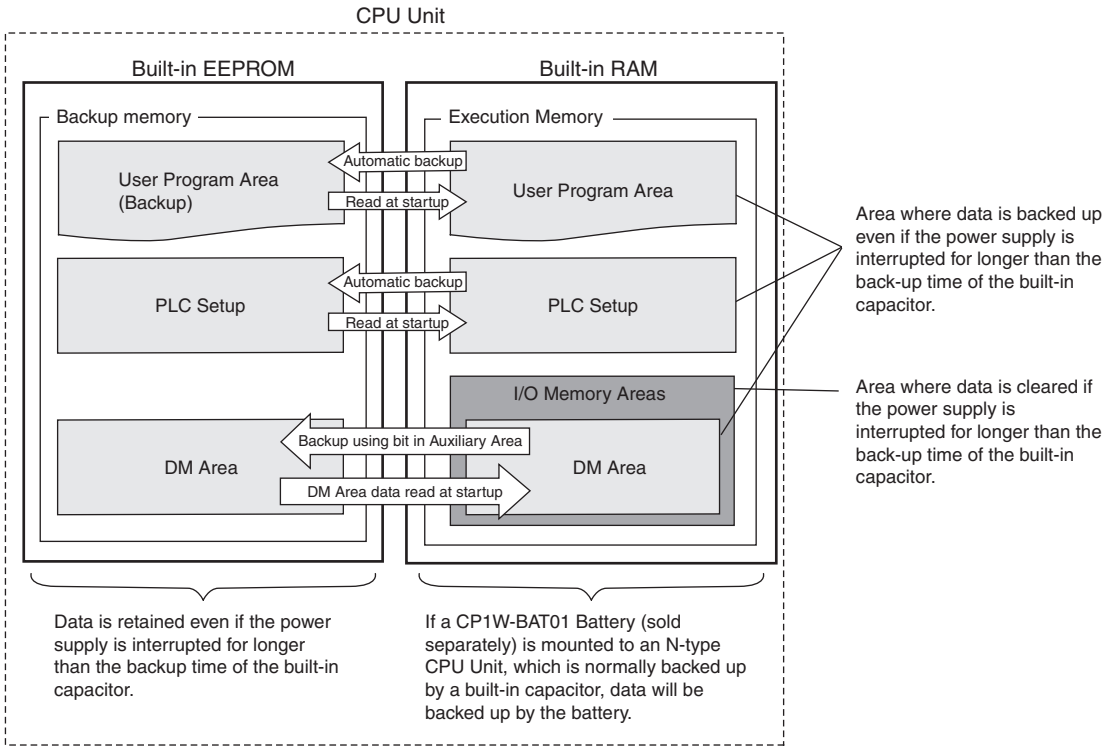
Function					Function description
Cycle time management	Minimum cycle time				Makes the cycle time consistent.
	Monitoring the cycle time				Monitors the cycle time.
CPU Unit built-in functions	Inputs	High-speed counter inputs	High-speed pulse inputs		High-speed pulses from devices such as a rotary encoder are counted. The counted values are stored in the Auxiliary Area. Interrupt tasks can be executed when target is reached or by range comparison.
			Input pulse frequency measurement		The frequency of pulses input by the PRV instruction is measured.
		Interrupt inputs			Relevant interrupt tasks are executed during the cycle when the CPU Unit built-in inputs turn ON or turn OFF.
		Quick-response inputs			Inputs can be read without being affected by cycle time. Use the quick-response inputs to read signals shorter than the cycle time.
		Normal inputs	I/O refreshing	Cyclic refreshing	The CPU Unit's built-in I/O are cyclically refreshed.
				Immediate refreshing	I/O refreshing by immediate refreshing instructions
			Input response times		Input constants can be set for Basic I/O Units. The response time can be increased to reduce the effects of chattering and noise at input contacts. The response time can be decreased to enable detecting shorter input pulses.
	Outputs	Pulse outputs (Models with transistor outputs only)	Pulse control		A pulse signal is output and positioning or speed control is performed with a servo driver that accepts a pulse input. Continuous mode for speed control or independent mode for position control can be used. There are functions for changing to positioning during speed control and for changing the target value during positioning.
			Origin positioning		Origin searches and origin returns
		PWM outputs (Models with transistor outputs only)			Pulses for which the duty ratio (ratio between ON time and OFF time during one pulse cycle) can be set are output.
		Normal outputs	Load OFF function		All of the outputs on the CPU Unit's I/O can be turned OFF when an error occurs in RUN or MONITOR mode.
Expansion I/O Units and Expansion Units	Functions supported by both Expansion I/O Unit and Expansion Unit	I/O refreshing	Cyclic refreshing		The Expansion I/O Units and Expansion Units are cyclically refreshed.
			Refreshing by IORF		I/O refreshing by IORF instruction
		Load OFF function			All of the outputs on Expansion I/O Units and Expansion Units are turned OFF (0000 hex) when an error occurs in RUN or MONITOR mode.
	Expansion I/O Units	Input response times			The response time can be increased to reduce the effects of chattering and noise at input contacts. The response time can be decreased to enable detecting shorter input pulses.
	Expansion Units	Unit error detection			Errors in Expansion Units are detected. The CPU Unit is notified that the Expansion Unit stopped due to an error.
Memory management functions	Holding I/O memory when changing operating modes				The status of I/O memory can be held when the operating mode is changed. The forced-set/reset status can be held when the operating mode is changed.
	Automatic backup to the backup memory (built-in EEPROM)				Automatic backup of ladder programs and parameter area to the backup memory (built-in EEPROM)
Communications					--
	Peripheral USB port	Peripheral bus (toolbus)			Port for communications with computer (CX-Programmer)
	Serial port (CP1E-N□D□-□ only)				--
		Host Link (SYSWAY) communications			Host Link command can be sent to Host Computer or PT to read/write I/O memory, read/control the operating mode, and perform other operations for PLC.
		No-protocol communications			I/O instructions for communications ports (TXD/RXD instructions) can be used for data transfer with peripheral devices such as bar code readers.
		NT Link communications			I/O memory in the PLC can be allocated and directly linked to various PT functions, including status control areas, status notification areas, touch switches, lamps, memory tables, and other objects.
		Serial PLC Links			Up to ten words per Unit can be shared by up to nine CPU Units, including one Polling Unit and eight Polled Units. **Note:** Programmable Terminal (PT) cannot be connected.
		Modbus-RTU Easy Master function			Modbus-RTU commands are sent by the Modbus-RTU Master function. Modbus slaves, such as inverters, can be easily controlled with serial communications.
Interrupt	Scheduled interrupts				Tasks can be executed at a specified interval (1.0 ms min., Unit: 0.1 ms).
	Interrupt inputs				Interrupt tasks are processed when the built-in input turns ON or OFF.
	High-speed counter interrupts				This function counts input pulses with the CPU Unit's built-in high-speed counter and executes an interrupt task when the count reaches the preset value or falls within a preset range (target value or zone comparison).

Function				Function description
Power supply management	Memory protection			Holding Area data, DM Area data, EM Area data, Counter Completion Flags, and counter present values are held even when power is turned OFF. This function can be used only with an N-type CPU Unit and only when the Battery Set (sold separately) is mounted.
	Number of power interruptions counter			The number of times power has been interrupted is counted.
Debugging	Online editing			The program can be changed during operation in MONITOR mode or PROGRAM mode.
	Force-set/reset			Specified bits can be set or reset.
	Differentiate monitoring			ON/OFF changes in specified bits can be monitored.
	Storing the stop position at errors			The location and task number where execution stopped for a program error is recorded.
	Program check			The programs can be checked for items such as no END instruction and FALS/FAL errors at startup.
Self-diagn osis and restoration	Error Log			Details and the time of occurrence of error codes predefined by the CPU Unit are stored.
	CPU error detection			CPU Unit WDT errors are detected.
	User-defined failure diagnosis			Errors can be generated for user-specified conditions: Non-fatal errors (FAL) and fatal errors (FALS).
	Load OFF function			The built-in outputs, Expansion I/O Unit outputs, and Expansion Unit outputs are turned OFF.
	Non-fatal error detection	System FAL error detection (User-defined non-fatal error)		This function generates a non-fatal (FAL) error when the user-defined conditions are met in program.
		Backup memory error detection		This function detects when data in the backup memory (built-in EEPROM) that stores the ladder program is corrupted.
		PLC Setup error detection		This function detects setting errors in the PLC Setup.
		Option Board errors		This function detects when the Option Board is malfunctioning or disconnected.
		Battery error detection (N-type CPU Units only)		This function detects when the battery voltage is low or the battery is disconnected. **Note:** This function is valid only when a battery is mounted and the ***Do not detect battery error*** Check Box is cleared in the PLC Setup.
	Fatal Error Detection	Memory error detection		This function detects errors that occur in memory of the CPU Unit.
		I/O bus error detection		This function detects errors that occur during data transfer between the CPU Unit and another Unit.
		Too Many I/O Points Error Detection		This function detects when more than the maximum number of CP1W Expansion I/O Units and Expansion Units are connected to the PLC.
		Program error detection		This function detects when there is an error in the program. See the following for details.
			Instruction processing error detection	This function detects an error when the given data value is invalid when executing an instruction, or execution of instruction between tasks was attempted.
			Indirect DM addressing BCD error	This function detects an error when an indirect DM/EM address in BCD mode is not BCD.
			Illegal area access error detection	This function detects an error when an attempt is made to access an illegal area with an instruction operand.
			No END error detection	This function detects an error when there is no END instruction at the end of the program.
			Task error detection	The execution condition for an interrupt task was met but there is no interrupt task with the specified number.
			overflow error detection	This function detects an error when too many differentiated instructions are entered or deleted during online editing (131,072 times or more).
			Invalid instruction error detection	This function detects an error when an attempt is made to execute an instruction that is not defined in the system.
			User program area overflow error detection	This function detects an error when instruction data is stored after the last address in user program area.
		Cycle time exceeded error detection		This function monitors the cycle time (10 to 1,000 ms) and stops the operation when the set value is exceeded.
		System FALS error detection (user-defined fatal error)		This function generates a fatal (FALS) error when the user-defined conditions are met in program.
Maintenance	Automatic online connection via network			This function enables automatically connecting to the PLC online when the CX-Programmer is directly connected by a serial connection (peripheral USB port or serial port).
Security functions	Read protection using password			This function protects user memory. Read protection: Set a password using the CX-Programmer. Overwrite protection is not provided.
	Write protection from FINS commands			This function prohibits writing by using FINS commands sent over the network.

Internal Memory in the CPU Units

CPU Unit Memory Backup

As shown in the following diagram, the internal memory in the CPU Unit consists of built-in RAM and built-in EEPROM. The built-in RAM is used as execution memory and the built-in EEPROM is used as backup memory.

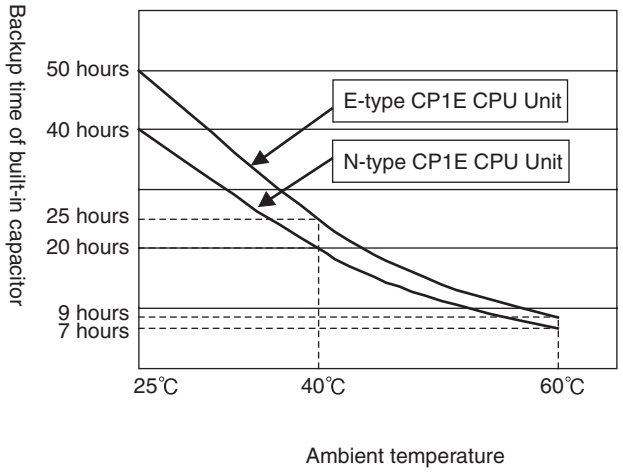


●Precautions for Correct Use

Create a system and write the ladder programs so that problems will not occure in the system if the data in these area may be unstable.

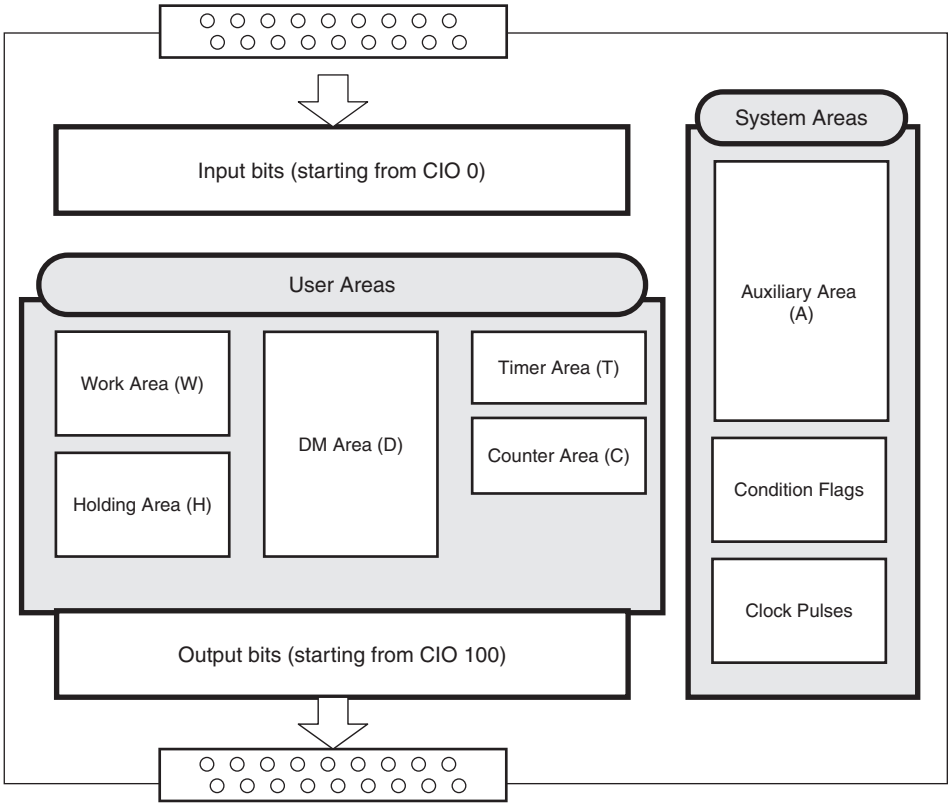
- Data in areas such as the DM area (D), Holding Area (H), the Counter Present Values (C) and the status of Counter Completion Flags (C), which is retained by the battery, may be unstable when the power supply is turned off (Except for the DM area that are retained by the built-in EEPROM using the Aucilliary Area bit.)
- The error log, and clock data (N-type CPU Unit only) in the Auxiliary Area will become unstable. Other words and bits in the Auxiliary Area will be cleared to their default values.

The built-in capacitor's backup time varies with the ambient temperature as shown in the following graph.



I/O Memory Areas

Data can be read and written to I/O memory from the ladder programs. I/O memory consists of an area for I/O with external devices, user areas, and system areas.

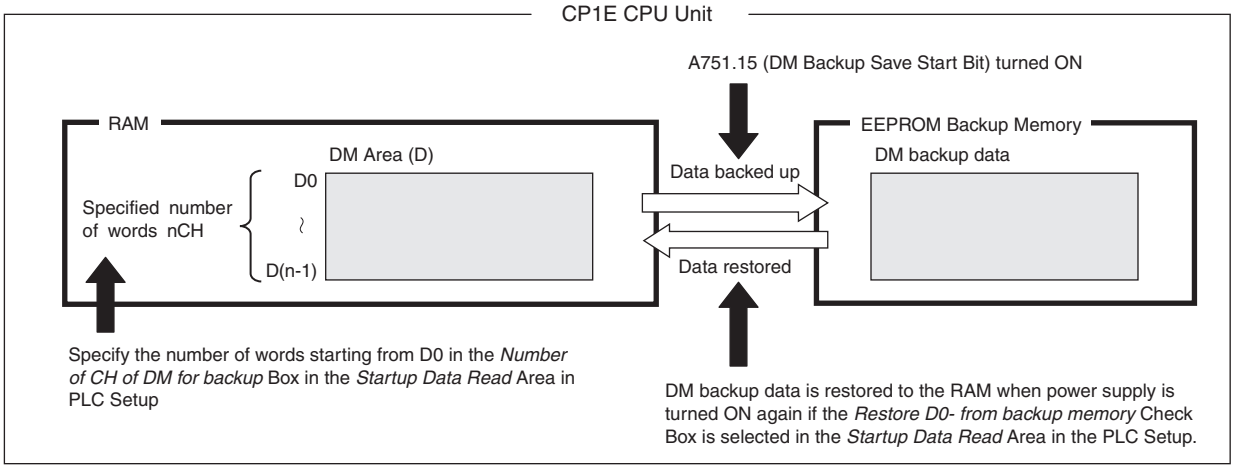


I/O Memory Areas

Name		No. of bits	Word addresses	Remarks
CIO Area	Input Bits	1,600 bits (100 words)	CIO 0 to CIO 99	--
	Output Bits	1,600 bits (100 words)	CIO 100 to CIO 199	--
	Serial PLC Link Words	1,440 bits (90 words)	CIO 200 to CIO 289	--
Work Area (W)		1,600 bits (100 words)	W0 to W99	--
Holding Area (H)		800 bits (50 words)	H0 to H49	Data in this area is retained during power interruptions if a Battery Set (sold separately) is mounted to an N-type CPU Unit.
Data Memory Area (D)	E-type CPU Unit	2 Kwords	D0 to D2047	Data in specified words of the DM Area can be retained in the built-in EEPROM in the backup memory by using a bit in the Auxiliary Area. Applicable words: D0 to D1499
	N-type CPU Unit	8 Kwords	D0 to D8191	Data in specified words of the DM Area can be retained in the built-in EEPROM in the backup memory by using a bit in the Auxiliary Area. Applicable words: D0 to D6999
Timer Area (T)	Present values	256	T0 to T255	--
	Timer Completion Flags	256		--
Counter Area (C)	Present values	256	C0 to C255	Data in this area is retained during power interruptions if a Battery Set (sold separately) is mounted to an N-type CPU Unit.
	Counter Completion Flags	256		--
Auxiliary Area (A)	Read only	7168 bits (448 words)	A0 to A447	Data in this area is retained during power interruptions if a Battery Set (sold separately) is mounted to an N-type CPU Unit.
	Read-write	4,896 bits (306 words)	A448 to A753	
Temporary Area (TR)		16 bits	TR0 to TR15.	--

Backing Up and Restoring DM Area Data

The contents of the DM Area (D) will become unstable if the power supply is interrupted for longer than the backup time of the built-in capacitor for an N-type CPU Unit without a Battery or for an E-type CPU Unit.
The contents of the specified words in the DM Area data can be backed up from RAM to the built-in EEPROM backup memory during operation by turning ON a bit in the Auxiliary Area. The number of DM Area words to back up is specified in the Number of CH of DM for backup Box in the PLC Setup. If the Restore D0- from backup memory Check Box is selected in the PLC Setup, the backup data will automatically be restored to RAM when the power is turned back ON so that data is not lost even if power is interrupted.



Conditions for Executing Backup

Specified words starting from D0 in the RAM can be saved to the built-in EEPROM backup memory by turning ON A751.15.
(These words are called the DM backup words and the data is called the DM backup data.)
A751.15 (DM Backup Save Start Bit) can be used in any operating mode (RUN, MONITOR, or PROGRAM mode).

Words That Can Be Backed Up

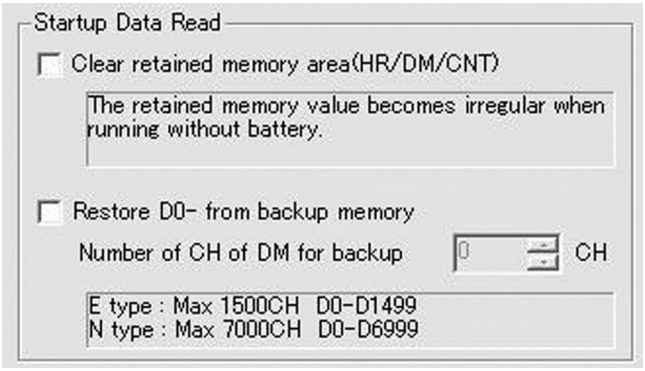
- E-type CP1E CPU Units: D0 to D1499
- N-type CP1E CPU Units: D0 to D6999

Number of Words To Back Up

The number of words to back up starting from D0 is set in the *Number of CH of DM for backup* Box in the *Startup Data Read* Area in the PLC Setup.

Restoring DM Backup Data to RAM When Power Is Turned ON

The DM backup data can be restored to RAM when power is turned ON by selecting the *Restore D0- from backup memory* Check Box in the *Startup Data Read* Area in the PLC Setup.

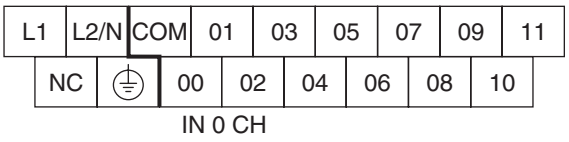


Built-in Inputs

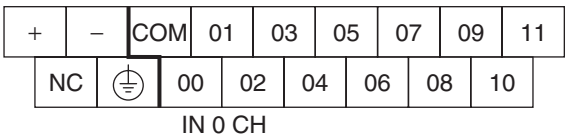
Terminal Arrangements

●Input Terminal Arrangement for CPU Unit with 20 I/O Points

AC power supply models

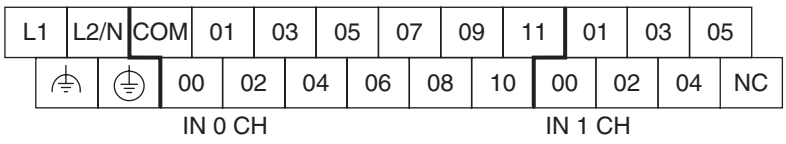


DC power supply models

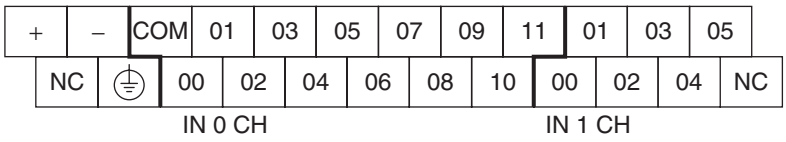


●Input Terminal Arrangement for CPU Unit with 30 I/O Points

AC power supply models

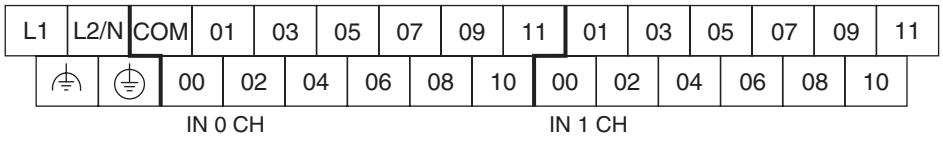


DC power supply models

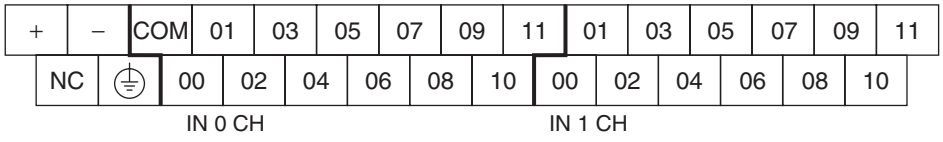


●Input Terminal Arrangement for CPU Unit with 40 I/O Points

AC power supply models



DC power supply models



Allocating Built-in Inputs to Functions

Input terminals are allocated functions by setting parameters in the PLC Setup. Set the PLC Setup so that each terminal is used for only one function.

CPU Unit			Input terminal block		Settings in PLC Setup						
					Interrupt input setting on Built-in Input Tab Page			High-speed counter 0 to 3 setting on Built-in Input Tab Page			Origin search settings on Pulse Output 0/1 Tab Page
CPU Unit with 20 I/O points	CPU Unit with 30 I/O points	CPU Unit with 40 I/O points	Terminal block label	Terminal number	Normal	Interrupt	Quick	Use			Use
					Normal input	Input interrupt	Quick-response input	Single-phase (increment pulse input)	Two-phase (differential phase x4 or up/down)	Two-phase (pulse/direction)	
Applicable	Applicable	Applicable	0CH	00	Normal input 0	--	--	Counter 0, increment input	Counter 0, phase A or up input	Counter 0, pulse input	--
				01	Normal input 1	--	--	Counter 1, increment input	Counter 0, phase B or down input	Counter 1, pulse input	--
				02	Normal input 2	Interrupt input 2	Quick-response input 2	Counter 2, increment input	Counter 1, phase A or up input	Counter 0, direction	--
				03	Normal input 3	Interrupt input 3	Quick-response input 3	--	Counter 1, phase B or down input	Counter 1, direction	--
				04	Normal input 4	Interrupt input 4	Quick-response input 4	Counter 3, increment input	Counter 0, phase Z or reset input	Counter 0, reset input	--
				05	Normal input 5	Interrupt input 5	Quick-response input 5	Counter 4, increment input	Counter 1, phase Z or reset input	Counter 1, reset input	--
				06	Normal input 6	Interrupt input 6	Quick-response input 6	Counter 5, increment input	--	--	Pulse 0: Origin input signal
				07	Normal input 7	Interrupt input 7	Quick-response input 7	--	--	--	Pulse 1: Origin input signal
				08	Normal input 8	--	--	--	--	--	--
				09	Normal input 9	--	--	--	--	--	--
				10	Normal input 10	--	--	--	--	--	Pulse 0: Origin proximity input signal
				11	Normal input 11	--	--	--	--	--	Pulse 1: Origin proximity input signal
Not applicable			1CH	00	Normal input 12	--	--	--	--	--	--
				01	Normal input 13	--	--	--	--	--	--
				02	Normal input 14	--	--	--	--	--	--
				03	Normal input 15	--	--	--	--	--	--
				04	Normal input 16	--	--	--	--	--	--
				05	Normal input 17	--	--	--	--	--	--
	Not applicable			06	Normal input 18	--	--	--	--	--	--
				07	Normal input 19	--	--	--	--	--	--
				08	Normal input 20	--	--	--	--	--	--
				09	Normal input 21	--	--	--	--	--	--
				10	Normal input 22	--	--	--	--	--	--
				11	Normal input 23	--	--	--	--	--	--

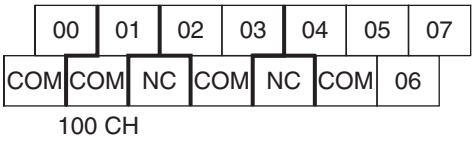
Built-in Outputs

Terminal Arrangements

●Output Terminal Arrangement for CPU Unit with 20 I/O Points

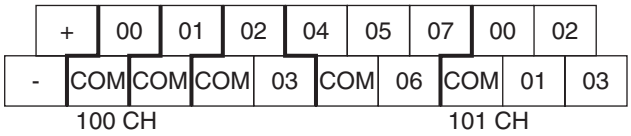
AC power supply model

DC power supply model

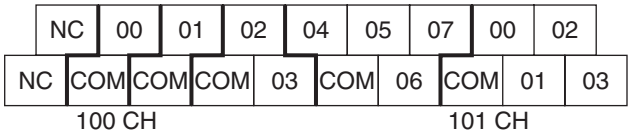


●Output Terminal Arrangement for CPU Unit with 30 I/O Points

AC power supply model

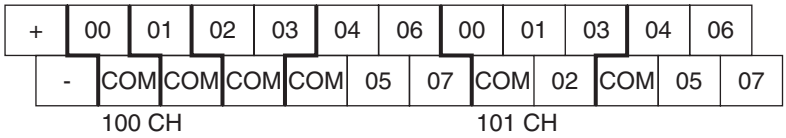


DC power supply model

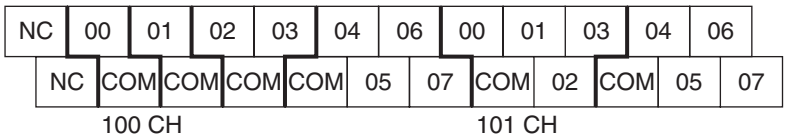


●Output Terminal Arrangement for CPU Unit with 40 I/O Points

AC power supply model



DC power supply model



Allocating Built-in Output Terminals to Functions

Output terminals are allocated functions by setting parameters in the PLC Setup. Set the PLC Setup so that each terminal is used for only one function.

CPU Unit			Output terminal block		Other than those shown right	When a pulse output instruction (SPED, ACC, PLS2, or ORG) is executed	Setting in PLC Setup: Origin search setting on Pulse Output 0/1 Tab Page	When the PWM instruction is executed
CPU Unit with 20 I/O points	CPU Unit with 30 I/O points	CPU Unit with 40 I/O points	Terminal block label	Terminal number	Normal output	Fixed duty ratio pulse output		Variable duty ratio pulse output
						Pulse + direction	Use	PWM output
Applicable	Applicable	Applicable	100CH	00	Normal output 0	Pulse output 0 (pulse)	--	--
				01	Normal output 1	Pulse output 1 (pulse)	--	PWM output 0
				02	Normal output 2	Pulse output 0 (direction)	--	--
				03	Normal output 3	Pulse output 1 (direction)	--	--
				04	Normal output 4	--	Pulse 0: Error counter reset output	--
				05	Normal output 5	--	Pulse 1: Error counter reset output	--
				06	Normal output 6	--	--	--
				07	Normal output 7	--	--	--
Not applicable			101CH	00	Normal output 8	--	--	--
				01	Normal output 9	--	--	--
				02	Normal output 10	--	--	--
				03	Normal output 11	--	--	--
	Not applicable			04	Normal output 12	--	--	--
				05	Normal output 13	--	--	--
				06	Normal output 14	--	--	--
				07	Normal output 15	--	--	--

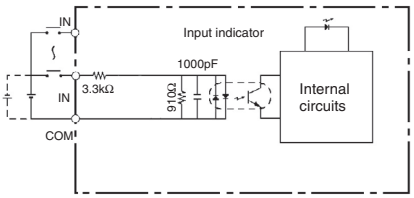
These functions are supported only by N-type CPU Units with transistor outputs.

I/O Specifications for CPU Units

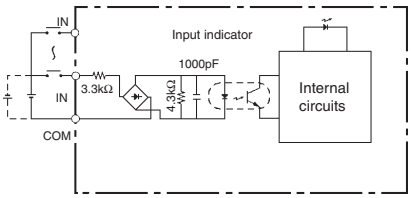
Input Specifications

Item	Specification		
Input type	High-speed counter inputs or Normal Inputs	High-speed counter inputs, interrupt input, quick-response inputs, or Normal Inputs	Normal inputs
Input bits	CIO 0.00 to CIO 0.01	CIO 0.02 to CIO 0.07 ✻1	CIO 0.08 to CIO 0.11 and CIO 1.00 to CIO 1.11 ✻1
Input voltage	24 VDC, +10%, -15%		
Applicable sensors	2-wire and 3-wire sensors		
Input Impedance	3.3 kΩ	3.3 kΩ	4.8 kΩ
Input current	7.5 mA typical	7.5 mA typical	5 mA typical
ON voltage/current	17.0 VDC/3 mA min.	17.0 VDC/3 mA min.	14.4 VDC/3 mA min.
OFF voltage/current	1 mA max. at 5.0 VDC max.	1 mA max. at 5.0 VDC max.	1 mA max. at 5.0 VDC max.
ON response time ✻2	E-type CPU Unit: 50 μs min. N-type CPU Unit: 2.5 μs min.	50 μs max.	1 ms max.
OFF response time ✻2	E-type CPU Unit: 50 μs min. N-type CPU Unit: 2.5 μs min.	50 μs max.	1 ms max.
Circuit configuration	E-type CPU Unit		N-type CPU Unit

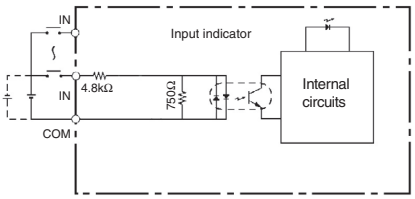
Input 0.00 to 0.07



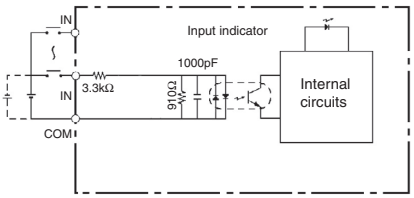
Input 0.00 to 0.01



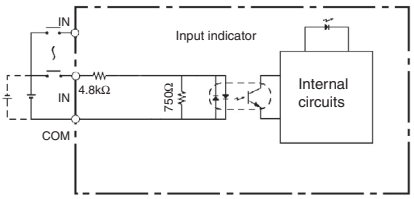
Input 0.08 to 0.11, 1.00 to 1.11



Input 0.02 to 0.07



Input 0.08 to 0.11, 1.00 to 1.11

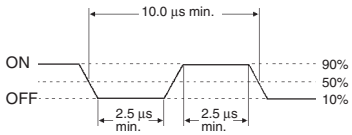


✻ **1** The bits that can be used depend on the model of CPU Unit.

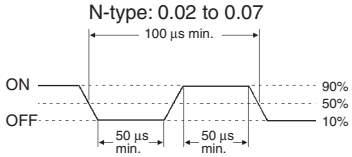
✻ **2** The response time is the delay caused by hardware. The delay set in the PLC Setup (0 to 32 ms, default: 8 ms) for a normal input must be added to this value.

Pulse plus direction input mode,
Increment mode
Up/down input mode

N-type: 0.00/0.01

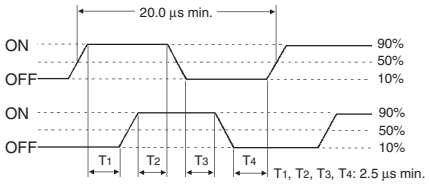


E-type: 0.00 to 0.07
N-type: 0.02 to 0.07

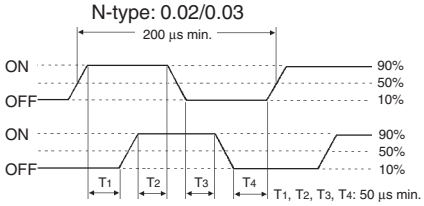


Differential phase mode

N-type: 0.00/0.01

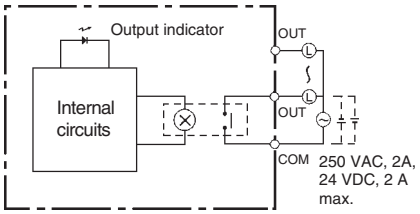


E-type: 0.00 to 0.03
N-type: 0.02/0.03



Output Specifications

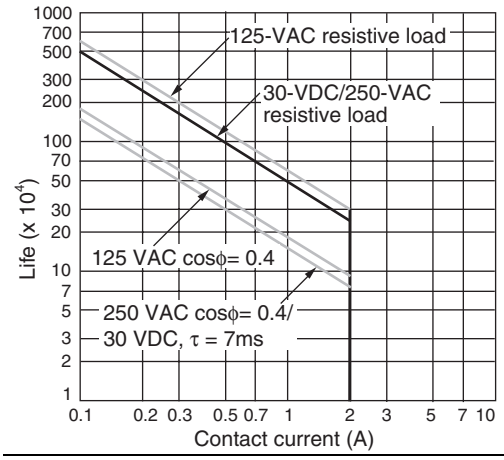
●Output Specifications for Relay Outputs

Item			Specification
Maximum switching capacity			250 VAC/2 A (cosϕ = 1) 2 A, 24 VDC (4 A/common)
Minimum switching capacity			5 VDC, 10 mA
Service life of relay	Electrical	Resistive load	200,000 operations (24 VDC)
		Inductive load	70,000 operations (250 VAC, cosϕ = 0.4)
	Mechanical		20,000,000 operations
ON delay			15 ms max.
OFF response time			15 ms max.
Circuit configuration			

Estimating the Service Life of Relays

Under normal conditions, the service life of output contacts is as shown above. The service life of relays is as shown in the following diagram as a guideline

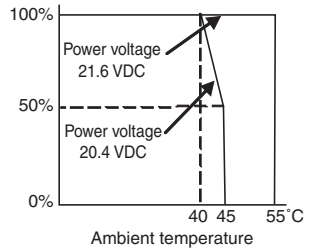
CP1E-□□DR-□



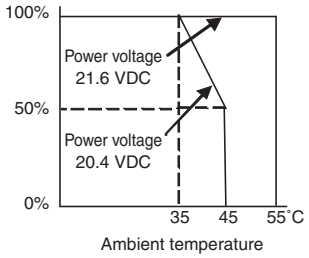
Relationship between Continuous Simultaneous ON Rate and Ambient Temperature

There are restrictions on the power supply voltage and output load current imposed by the ambient temperature. Make sure that the power supply voltage and output load current are within the following ranges.

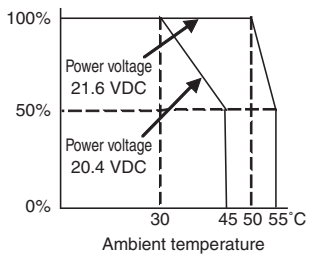
CP1E-N20DR-D



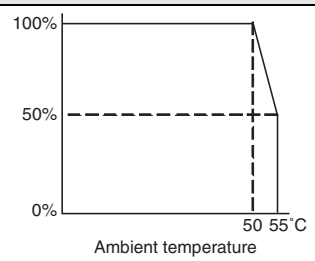
CP1E-N30DR-D



CP1E-N40DR-D



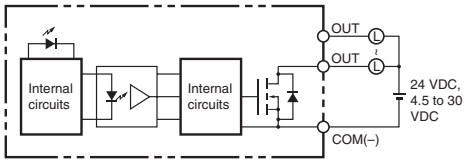
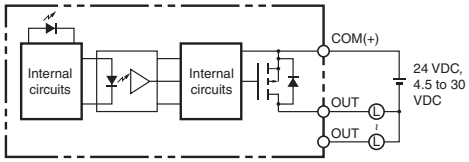
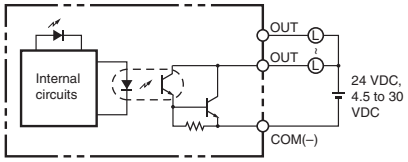
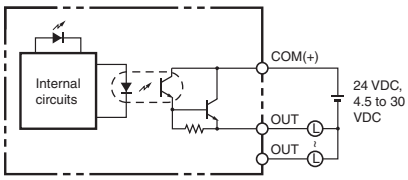
CP1E-□20DR-A/N20DT□-□



Note: The above restrictions apply to the relay output load current from the CPU Unit even if Expansion I/O Units are not connected.

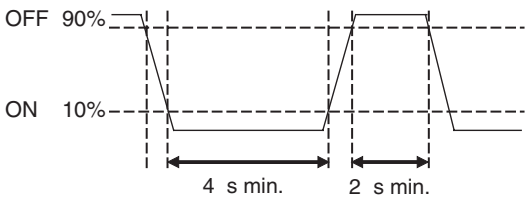
●Output Specifications for Transistor Outputs (Sinking or Sourcing)

Normal Outputs

Item	Specification	
	CIO 100.00 and CIO 100.01	CIO 100.02 to CIO 100.07 and CIO 101.00 to CIO 101.07 ✻2
Maximum switching capacity	4.5 to 30 VDC, 0.3 A/output, 0.9 A/common ✻1 CP1E-N40D□-□: 3.6 A per Unit CP1E-N30D□-□: 2.7 A per Unit CP1E-N20D□-□: 1.8 A per Unit	
Minimum switching capacity	4.5 to 30 VDC, 1 mA	
Leakage current	0.1mA max.	
Residual voltage	0.6 V max.	1.5V max.
ON response time	0.1 ms max.	0.1 ms max.
OFF response time	0.1 ms max.	1 ms max.
Fuse	Not provided.	
Circuit configuration	**Normal outputs: CIO 100.00 to CIO 100.01** **(sinking outputs)**  **Normal outputs: CIO 100.00 to CIO 100.01** **(sourcing outputs)** 	**Normal outputs: CIO 100.02 to CIO 100.07** **CIO 101.00 to CIO 101.07** **(sinking)**  **Normal outputs: CIO 100.02 to CIO 100.07,** **CIO 101.00 to CIO 101.07 (sourcing).** 

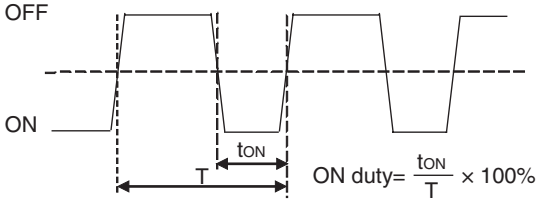
Note: Do not connect a load to an output terminal or apply a voltage in excess of the maximum switching capacity.
✻ **1** Also do not exceed 0.9 A for the total for CIO 100.00 to CIO 100.03.
✻ **2** The bits that can be used depend on the model of CPU Unit.

Pulse Outputs (CIO 100.00 and CIO 100.01)

Item	Specification
Maximum switching capacity	100 mA/4.5 to 26.4 VDC
Minimum switching capacity	7 mA/4.5 to 26.4 VDC
Maximum output frequency	100 kHz
Output waveform	

Note: 1. The load for the above values is assumed to be the resistance load, and does not take into account the impedance for the connecting cable to the load.
2. Due to distortions in pulse waveforms resulting from connecting cable impedance, the pulse widths in actual operation may be smaller than the values shown above.

PWM Output (CIO 100.01)

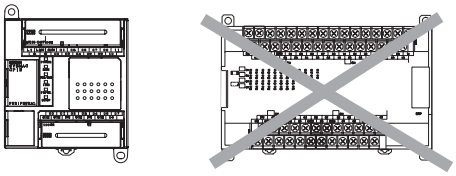
Item	Specification
Maximum switching capacity	30 mA/4.5 to 26.4 VDC
Maximum output frequency	32 kHz
PWM output accuracy	For ON duty +1%, .0%:10 kHz output For ON duty +5%, .0%: 0 to 32 kHz output
Output waveform	

Specifications of Expansion I/O Units and Expansion Units

Expandable CPU Units

- Expansion I/O Units and Expansion Units cannot be connected to an E-type or N-type CPU Units with 20 I/O points.
- A total of up to three Expansion I/O Units and Expansion Units can be connected to an E-type or N-type CPU Unit with 30 or 40 I/O points.

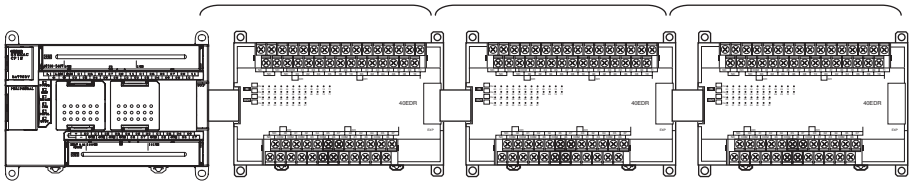
●CP1E CPU Unit with 20 I/O Points



CP-series Expansion Units and Expansion I/O Units cannot be connected.

●CP1E CPU Unit with 30 or 40 I/O Points

A total of up to three CP-series Expansion I/O Units and Expansion Units can be connected.



Connection Methods

Connection cables for the Expansion I/O Units and Expansion Units are used to connect the Units. The length can be extended by using a CP1W-CN811 I/O Connection Cable (length: 800 m).

Maximum Number of I/O Points for an Expanded System

CPU Unit	Built-in I/O on CPU Unit			Total number of Expansion I/O Units and Expansion Units that can be connected	Number of inputs: 24 Number of outputs: 16 Total number of I/O points when three CP1W-40ED□ Expansion I/O Units are connected		
	Total	Number of inputs	Number of outputs		Total	Number of inputs	Number of outputs
CP1E-□20D□-□	20	12	8	Not possible.	20	12	8
CP1E-□30D□-□	30	18	12	3 Units maximum	150	90	60
CP1E-□40D□-□	40	24	16		160	96	64

Restrictions on External Power Supply Capacity

The following restrictions apply when using the CPU Unit's external power supply.

●CPU Unit with 30 or 40 I/O Points

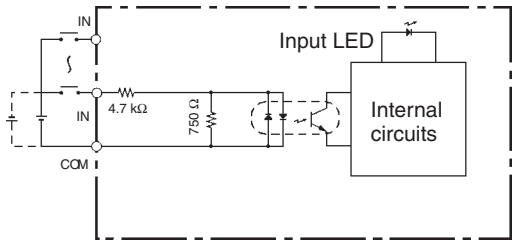
It may not be possible to use the full 300 mA of the external power supply when connecting a CP-series Expansion I/O Unit or CP-series Expansion Unit because the power supply capacity is restricted for CPU Units with 30 or 40 I/O points.
The entire 300 mA from the external power supply can be used if Expansion Units and Expansion I/O Units are not connected.
Refer to the CP1E CPU Unit Hardware Manual (Cat. No. W479) for details.

●CPU Unit with 20 I/O Points

There is no external power supply on CPU Units with 20 I/O points.

Specifications of Expansion I/O Units

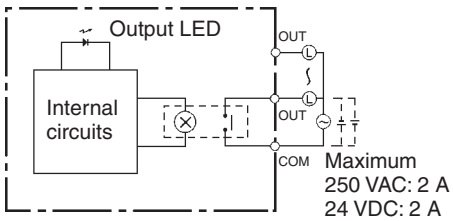
●Input Specifications (CP1W-40EDR/40EDT/40EDT1/20EDR1/20EDT/20EDT1/8ED)

Item	Specification
Input voltage	24 VDC +10%/-15%
Input impedance	4.7 kΩ
Input current	5 mA typical
ON voltage	14.4 VDC min.
OFF voltage	5.0 VDC max.
ON delay	1 ms max. ✻
OFF delay	1 ms max. ✻
Circuit configuration	

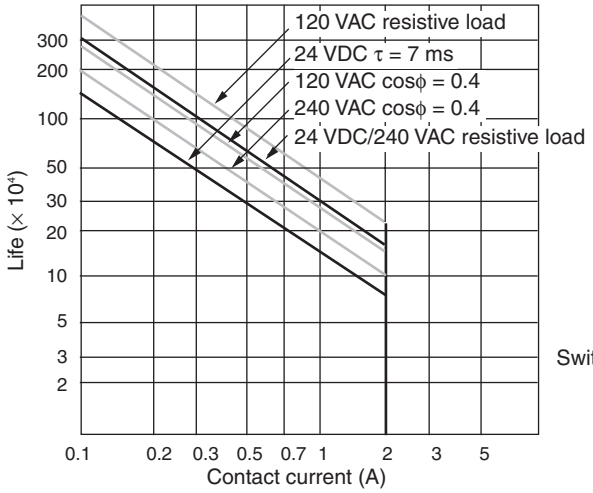
Note: Do not apply voltage in excess of the rated voltage to the input terminal.

✻ The response time is the hardware delay value. The delay set in the PLC Setup (0 to 32 ms, default: 8 ms) must be added to this value. For the CP1W-40EDR/EDT/EDT1, a fixed value of 16 ms must be added.

●Output Specifications
Relay Outputs (CP1W-40EDR/32ER/20EDR1/16ER/8ER)

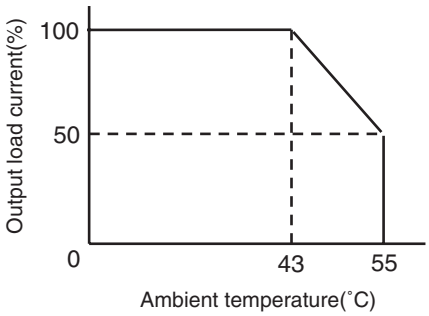
Item			Specification
Max. switching capacity			2 A, 250 VAC (cosϕ = 1), 2 A, 24 VDC (4 A/common)
Min. switching capacity			5 VDC, 10 mA
Service life of relay (See note.)	**Electrical**	**Resistive load**	150,000 operations (24 VDC)
		Inductive load	100,000 operations (240 VAC, cosϕ = 0.4)
	Mechanical		20,000,000 operations
ON delay			15 ms max.
OFF delay			15 ms max.
Circuit configuration			

Note: 1. Under the worst conditions, the service life of output contacts is as shown above. The service life of relays is as shown in the following diagram as a guideline.

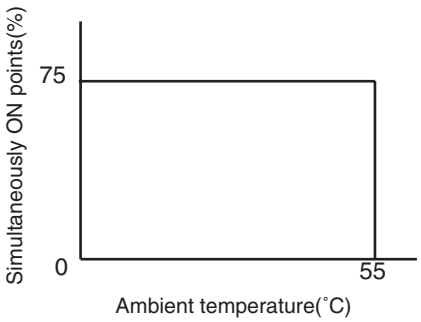


Switching rate: 1,800 operations/hour

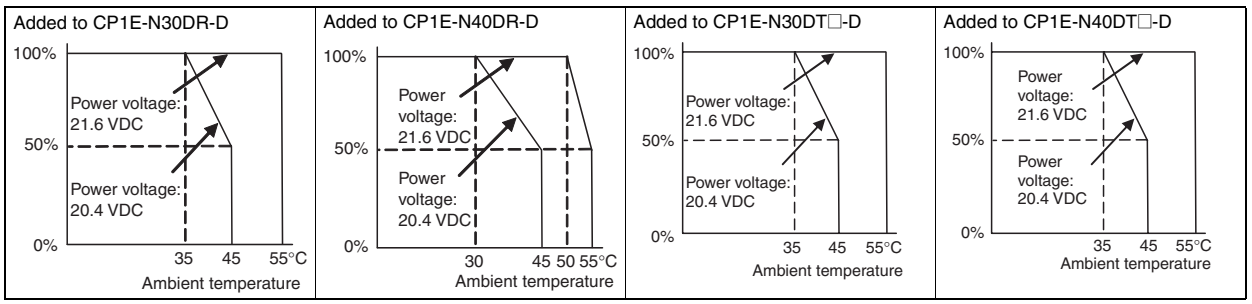
2. With the CP1W-32ER/CP1W-16ER, the load current is restricted depending on the ambient temperature. Design the system considering the load current based on the following graph.



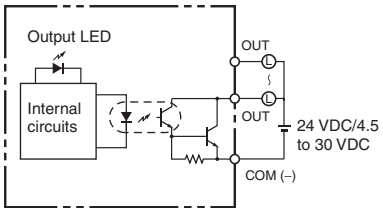
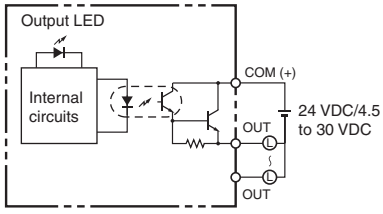
3. CP1W-32ER's maximum number of simultaneously ON output points is 24 (75%). Design the system considering the simultaneously ON points and load current based on the following curve.



4. CPU Units with DC power supply (CP1E-N□□□-D) are restrictions imposed by the ambient temperature.
Relay Output Load Current Derating Curves for Expansion I/O Units (CP1W-8ER/16ER/20EDR1/32ER/40EDR)

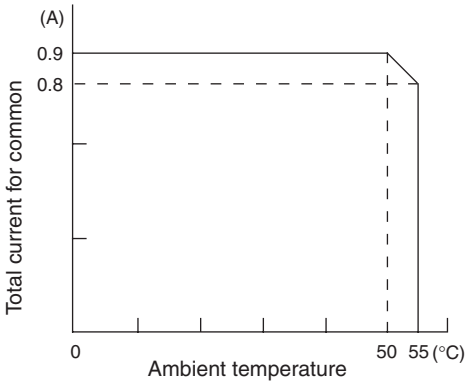


●Transistor Outputs (Sinking or Sourcing)

Item	Specification				
	CP1W-40EDT CP1W-40EDT1	CP1W-32ET CP1W-32ET1	CP1W-20EDT CP1W-20EDT1	CP1W-16ET CP1W-16ET1	CP1W-8ET CP1W-8ET1
Max. switching capacity (See note 2.)	4.5 to 30 VDC 0.3 A/output	4.5 to 30 VDC 0.3 A/output	24 VDC +10%/-5% 0.3 A/output	4.5 to 30 VDC 0.3 A/output	• OUT00/01 4.5 to 30 VDC, 0.2 A/output • OUT02 to 07 4.5 to 30 VDC, 0.3 A/output
	0.9 A/common 3.6 A/Unit	0.9 A/common 7.2 A/Unit	0.9 A/common 1.8 A/Unit	0.9 A/common 3.6 A/Unit	0.9 A/common 1.8 A/Unit
Leakage current	0.1 mA max.	0.1 mA max.	0.1 mA max.	0.1 mA max.	0.1 mA max.
Residual voltage	1.5 V max.	1.5 V max.	1.5 V max.	1.5 V max.	1.5 V max.
ON delay	0.1 ms max.	0.1 ms max.	0.1 ms.	0.1 ms max.	0.1 ms max.
OFF delay	1 ms max. 24 VDC +10%/-5% 5 to 300 mA	1 ms max. 24 VDC +10%/-5% 5 to 300 mA	1 ms max. 24 VDC +10%/-5% 5 to 300 mA	1 ms max. 24 VDC +10%/-5% 5 to 300 mA	1 ms max. 24 VDC +10%/-5% 5 to 300 mA
Max. number of Simultaneously ON Points of Output	16 pts (100%)	24 pts (75%)	8 pts (100%)	16 pts (100%)	8 pts (100%)
Fuse (See note 1.)	1 fuse/common				
Circuit configuration	Sinking Outputs  Sourcing Outputs 				

Note: 1. The fuse cannot be replaced by the user.

2. If the ambient temperature is maintained below 50°C, up to 0.9 A/common can be used.



3. Do not connect a load to an output terminal or apply a voltage in excess of the maximum switching capacity.

Specifications of Expansion Units

●Analog Input Units

Model		CP1W-AD041	
Item		Voltage Input	Current Input
Number of inputs		4 inputs (4 words allocated)	
Input signal range		0 to 5 VDC, 1 to 5 VDC, 0 to 10 VDC, or –10 to 10 VDC	0 to 20 mA or 4 to 20 mA
Max. rated input		±15 V	±30 mA
External input impedance		1 MΩ min.	Approx. 250 Ω
Resolution		1/6000 (full scale)	
Overall accuracy	25°C	0.3% full scale	0.4% full scale
	0 to 55°C	0.6% full scale	0.8% full scale
A/D conversion data		16-bit binary (4-digit hexadecimal) Full scale for –10 to 10 V: F448 to 0BB8 Hex Full scale for other ranges: 0000 to 1770 Hex	
Averaging function		Supported (Set in output words n+1 and n+2.)	
Open-circuit detection function		Supported	
Conversion time		2 ms/point (8 ms/all points)	
Isolation method		Photocoupler isolation between analog I/O terminals and internal circuits. No isolation between analog I/O signals.	
Current consumption		5 VDC: 100 mA max.; 24 VDC: 90 mA max.	

●Analog Output Units

Model			CP1W-DA041	
Item			Voltage Output	Current Output
Analog output section	Number of outputs		4 outputs (4 words allocated)	
	Output signal range		1 to 5 VDC, 0 to 10 VDC, or –10 to 10 VDC	0 to 20 mA or 4 to 20 mA
	External output allowable load resistance		2 kΩ min.	350 Ω max.
	External output impedance		0.5 Ω max.	---
	Resolution		1/6000 (full scale)	
	Overall accuracy	25°C	0.4% full scale	
		0 to 55°C	0.8% full scale	
	D/A conversion data		16-bit binary (4-digit hexadecimal) Full scale for –10 to 10 V: F448 to 0BB8 Hex Full scale for other ranges: 0000 to 1770 Hex	
Conversion time			2 ms/point (8 ms/all points)	
Isolation method			Photocoupler isolation between analog I/O terminals and internal circuits. No isolation between analog I/O signals.	
Current consumption			5 VDC: 80 mA max.; 24 VDC: 124 mA max.	

●Analog I/O Units

Model			CP1W-MAD11	
Item			Voltage I/O	Current I/O
Analog Input Section	Number of inputs		2 inputs (2 words allocated)	
	Input signal range		0 to 5 VDC, 1 to 5 VDC, 0 to 10 VDC, or −10 to 10 VDC	0 to 20 mA or 4 to 20 mA
	Max. rated input		±15 V	±30 mA
	External input impedance		1 MΩ min.	Approx. 250 Ω
	Resolution		1/6000 (full scale)	
	Overall accuracy	25°C	0.3% full scale	0.4% full scale
		0 to 55°C	0.6% full scale	0.8% full scale
	A/D conversion data		16-bit binary (4-digit hexadecimal) Full scale for −10 to 10 V: F448 to 0BB8 hex Full scale for other ranges: 0000 to 1770 hex	
	Averaging function		Supported (Settable for individual inputs via DIP switch)	
	Open-circuit detection function		Supported	
Analog Output Section	Number of outputs		1 output (1 word allocated)	
	Output signal range		1 to 5 VDC, 0 to 10 VDC, or −10 to 10 VDC,	0 to 20 mA or 4 to 20 mA
	Allowable external output load resistance		1 kΩ min.	600 Ω max.
	External output impedance		0.5 Ω max.	
	Resolution		1/6000 (full scale)	
	Overall accuracy	25°C	0.4% full scale	
		0 to 55°C	0.8% full scale	
	Set data (D/A conversion)		16-bit binary (4-digit hexadecimal) Full scale for −10 to 10 V: F448 to 0BB8 hex Full scale for other ranges: 0000 to 1770 hex	
Conversion time			2 ms/point (6 ms/all points)	
Isolation method			Photocoupler isolation between analog I/O terminals and internal circuits. No isolation between analog I/O signals.	
Current consumption			5 VDC: 83 mA max., 24 VDC: 110 mA max.	

●Temperature Sensors Units

Item	CP1W-TS001	CP1W-TS002	CP1W-TS101	CP1W-TS102
Temperature sensors	Thermocouples		Platinum resistance thermometer	
	Switchable between K and J, but same type must be used for all inputs.		Switchable between Pt100 and JPt100, but same type must be used for all inputs.	
Number of inputs	2	4	2	4
Allocated input words	2	4	2	4
Accuracy	(The larger of ±0.5% of converted value or ±2°C) ±1 digit max. ✻		(The larger of ±0.5% of converted value or ±1°C) ±1 digit max.	
Conversion time	250 ms for 2 or 4 input points			
Converted temperature data	16-bit binary data (4-digit hexadecimal)			
Isolation	Photocouplers between all temperature input signals			
Current consumption	5 VDC: 40 mA max., 24 VDC: 59 mA max.		5 VDC: 54 mA max., 24 VDC: 73 mA max.	

✻ Accuracy for a K-type sensor at -100°C or less is ±4°C ±1 digit max.

The rotary switch is used to set the temperature range.

Setting		CP1W-TS001/TS002			CP1W-TS101/TS102		
		Input type	Range (°C)	Range (°F)	Input type	Range (°C)	Range (°F)
	0	K	−200 to 1,300	−300 to 2,300	Pt100	−200.0 to 650.0	−300.0 to 1,200.0
	1		0.0 to 500.0	0.0 to 900.0	JPt100	−200.0 to 650.0	−300.0 to 1,200.0
	2	J	−100 to 850	−100 to 1,500	---	Cannot be set.	
	3		0.0 to 400.0	0.0 to 750.0	---		
	4 to F	---	Cannot be set.		---		

●CompoBus/S I/O Link Unit

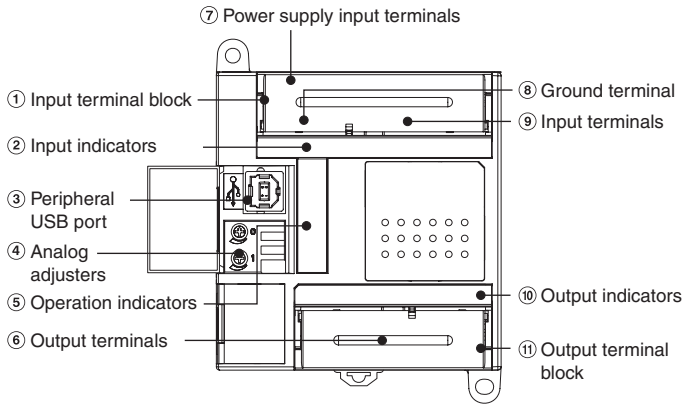
Model number	CP1W-SRT21
Master/slave	CompoBus/S Slave
Number of I/O points	8 input points, 8 output points
Number of words allocated in CPU Unit I/O memory	1 input word, 1 output word
Node number setting	Set using the DIP switch (Set before turning on the CPU Unit's power supply.)

External Interfaces

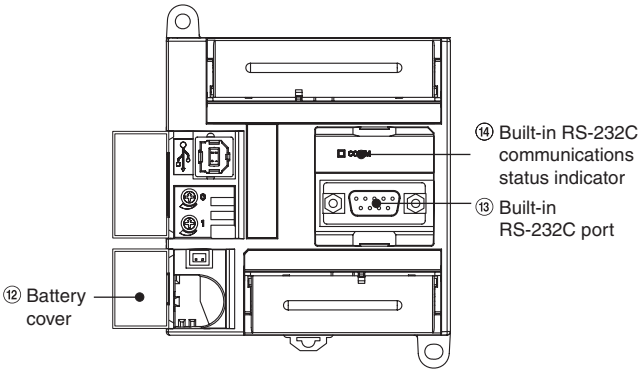
The CP1E CPU Units provide the following external interfaces.

CP1E CPU Unit with 20 I/O Points

E-type

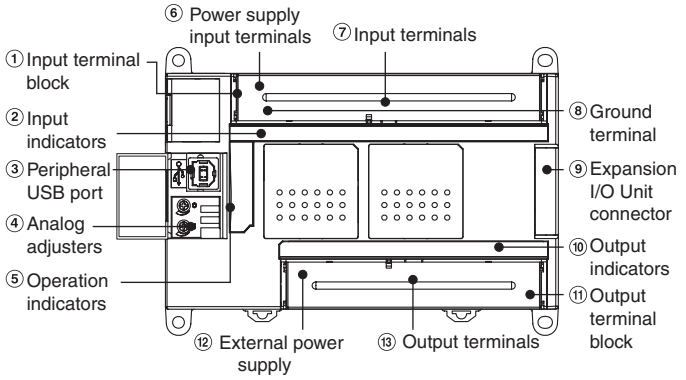


N-type

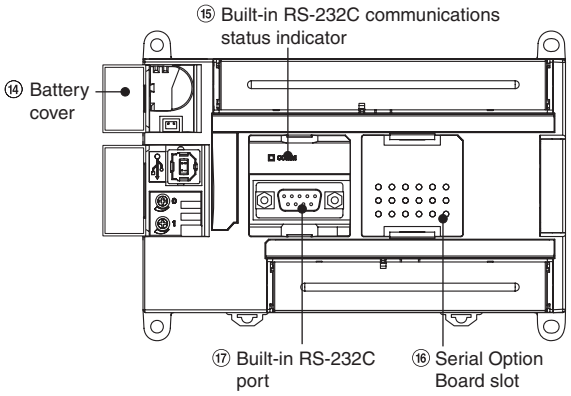


CP1E CPU Unit with 30/40 I/O Points

E-type

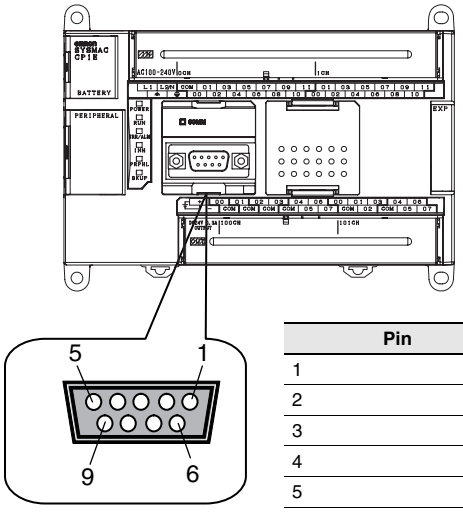


N-type



Built-in RS-232C Port for N-type CPU Units

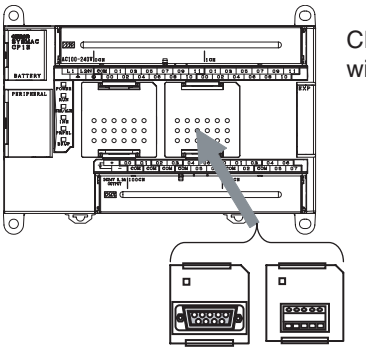
●RS-232C Connector



Pin	Abbr.	Signal name	Signal direction
1	FG	Frame ground	--
2	SD (TXD)	Send data	Output
3	RD (RXD)	Receive data	Input
4	RS (RTS)	Request to send	Output
5	CS (CTS)	Clear to send	Input
6	5 V	Power supply	--
7	DR (DSR)	Data set ready	Input
8	ER (DTR)	Data terminal ready	Output
9	SG (0 V)	Signal ground	--
Connector hood	FG	Frame Ground	--

Optional Serial Communications Board for N-type CPU Units with 30 or 40 I/O Points

The Option Board can be mounted in the option board slot of a CP1E N-type CPU Unit with 30 or 40 I/O Points.



CP1E N-type CPU Unit
with 30 or 40 I/O Points

RS-232C Option Board (CP1W-CIF01)

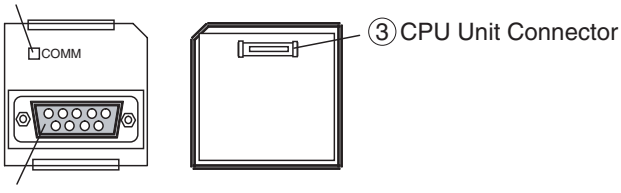
RS-422A/485 Option Board (CP1W-CIF11/12)

Model number	Port	Maximum transmission distance	Connection method
CP1W-CIF01	One RS-232C port	15 m	Connector (D-sub, 9 pin female)
CP1W-CIF11	One RS-422A/485 port	50 m	Terminal block (using ferrules)
CP1W-CIF12	One Isolated RS-422A/485 port	500 m	Terminal block (using ferrules)

CP1W-CIF01 RS-232C Option Board

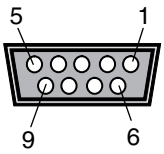
Front Back

①Communications Status Indicator



②RS-232 Connector

●RS-232C Connector

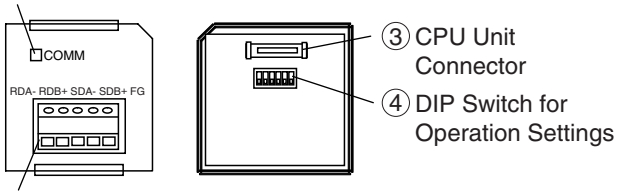


Pin	Abbr.	Signal name	Signal direction
1	FG	Frame ground	--
2	SD (TXD)	Send data	Output
3	RD (RXD)	Receive data	Input
4	RS (RTS)	Request to send	Output
5	CS (CTS)	Clear to send	Input
6	5 V	Power supply	--
7	DR (DSR)	Data set ready	Input
8	ER (DTR)	Data terminal ready	Output
9	SG (0 V)	Signal ground	--
Connector hood	FG	Frame Ground	--

CP1W-CIF11/CIF12 RS-422A/485 Option Board

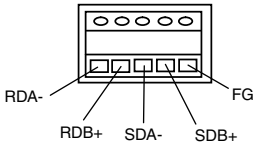
Front Back

① Communications Status Indicator



② RS-422A/485 Connector

●RS-422A/485 Terminal Block



Tighten the terminal block screws to a torque of 0.28 N·m.

Connecting to Support Software

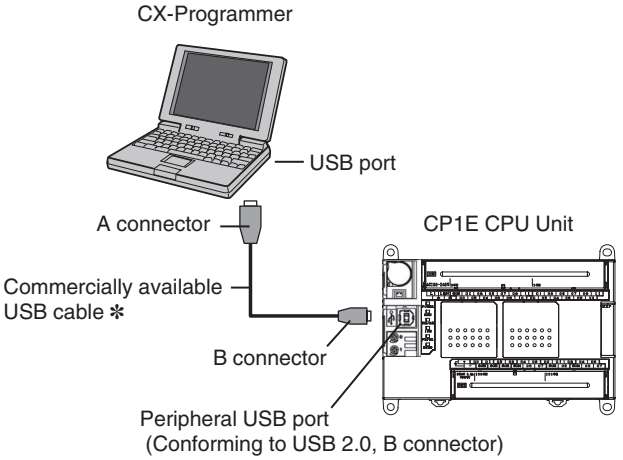
Operating Environment and System Configuration

The following system is required to operate the CX-Programmer. Make sure your system provides the following conditions and has the necessary components.

Item	Description
Supported computer	IBM PC/AT or equivalent
CD-ROM or DVD-ROM drive	One or more
Supported Operating Systems	Windows Vista, Windows XP, Windows 2000 (Service Pack 2 or later)
CPU	Pentium II 333 MHz or faster
RAM	256 MB min. 512 MB or more recommended
Available hard disk space	600 MB min.
Display	800 x 600 SVGA min.
PLC and connection port	USB port

Connecting Methods

Using commercially available USB cable, connect the CX-Programmer to the peripheral USB port on the CPU Unit.



Note: The CX-Programmer cannot be used if it is connected to the built-in RS-232C port or serial option port of a CP1E CPU Unit.
✻ Commercially available USB cable: 5 m max., for USB 2.0.

Connecting Cable

Use the following cable to connect the CP1E CPU Unit to the computer running the Support Software.

Port at Unit	Port at computer	Network type (communications mode)	Model numbers	Length	Remarks
Peripheral USB port	USB port	USB 2.0 (or 1.1)	Commercially available USB cable (A connector - B connector)	Less than 5 m	--

Unit Versions

Units	Model numbers	Unit version
CP1E CPU Units	CP1E-E□D□-A CP1E-N□D□-□	Unit version 1.□

Unit Versions and Programming Devices

The following tables show the relationship between unit versions and CX-Programmer versions.

Unit Versions and Programming Devices

CPU Unit	Functions	Required Programming Device ✻			
		CX-Programmer	Micro PLC Edition CX-Programmer		CX-Programmer for CP1E
		Ver. 8.2 or higher	Ver. 8.2	Ver. 9.0 or higher	Ver. 1.0
CP1E-E□D□-A CP1E-N□D□-□	Functions for unit version 1.□	Applicable The SmartInput function is not supported.	Applicable The SmartInput function is not supported.	Applicable The SmartInput function is supported.	Applicable The SmartInput function is supported.

✻A Programming Console cannot be used.

Programming Instructions

Sequence Input Instructions

Instruction	Mnemonic
LOAD	LD
LOAD NOT	LD NOT
AND	AND
AND NOT	AND NOT
OR	OR
OR NOT	OR NOT
AND LOAD	AND LD
OR LOAD	OR LD
NOT	NOT
CONDITION ON	UP
CONDITION OFF	DOWN

Sequence Output Instructions

Instruction	Mnemonic
OUTPUT	OUT
OUTPUT NOT	OUT NOT
KEEP	KEEP
DIFFERENTIATE UP	DIFU
DIFFERENTIATE DOWN	DIFD
SET	SET
RESET	RSET
MULTIPLE BIT SET	SETA
MULTIPLE BIT RESET	RSTA
SINGLE BIT SET	SETB
SINGLE BIT RESET	RSTB

Sequence Output Instructions

Instruction	Mnemonic
END	END
NO OPERATION	NOP
INTERLOCK	IL
INTERLOCK CLEAR	ILC
MULTI-INTERLOCK DIFFERENTIATION HOLD	MILH
MULTI-INTERLOCK DIFFERENTIATION RELEASE	MILR
MULTI-INTERLOCK CLEAR	MILC
JUMP	JMP
JUMP END	JME
CONDITIONAL JUMP	CJP
FOR LOOP	FOR
BREAK LOOP	BREAK
NEXT LOOP	NEXT

Timer and Counter Instructions

Instruction	Mnemonic
TIMER	TIM
	TIMX
COUNTER	CNT
	CNTX
HIGH-SPEED TIMER	TIMH
	TIMHX
ONE-MS TIMER	TMHH
	TMHHX
ACCUMULATIVE TIMER	TTIM
	TTIMX
LONG TIMER	TIML
	TIMLX
REVERSIBLE COUNTER	CNTR
	CNTRX
RESET TIMER/COUNTER	CNR
	CNRX

Comparison Instructions

Instruction	Mnemonic
Input Comparison Instructions (unsigned)	LD,AND,OR+=
	LD,AND,OR+<>
	LD,AND,OR+<
	LD,AND,OR+<=
	LD,AND,OR+>
	LD,AND,OR+>=
Input Comparison Instructions (double, unsigned)	LD,AND,OR+=+L
	LD,AND,OR+<>+L
	LD,AND,OR+<+L
	LD,AND,OR+<=+L
	LD,AND,OR+>+L
	LD,AND,OR+>=+L
Input Comparison Instructions (signed)	LD,AND,OR+=+S
	LD,AND,OR+<>+S
	LD,AND,OR+<+S
	LD,AND,OR+<=+S
	LD,AND,OR+>+S
	LD,AND,OR+>=+S
Input Comparison Instructions (double, signed)	LD,AND,OR+=+SL
	LD,AND,OR+<>+SL
	LD,AND,OR+<+SL
	LD,AND,OR+<=+SL
	LD,AND,OR+>+SL
	LD,AND,OR+>=+SL
Time Comparison Instructions	=DT
	<>DT
	<DT
	<=DT
	>DT
	>=DT
COMPARE	CMP
DOUBLE COMPARE	CMPL
SIGNED BINARY COMPARE	CPS
DOUBLE SIGNED BINARY COMPARE	CPSL
TABLE COMPARE	TCMP
UNSIGNED BLOCK COMPARE	BCMP
AREA RANGE COMPARE	ZCP
DOUBLE AREA RANGE COMPARE	ZCPL

Data Movement Instructions

Instruction	Mnemonic
MOVE	MOV
DOUBLE MOVE	MOVL
MOVE NOT	MVN
MOVE BIT	MOVB
MOVE DIGIT	MOVD
MULTIPLE BIT TRANSFER	XFRB
BLOCK TRANSFER	XFER
BLOCK SET	BSET
DATA EXCHANGE	XCHG
SINGLE WORD DISTRIBUTE	DIST
DATA COLLECT	COLL

Data Shift Instructions

Instruction	Mnemonic
SHIFT REGISTER	SFT
REVERSIBLE SHIFT REGISTER	SFTR
WORD SHIFT	WSFT
ARITHMETIC SHIFT LEFT	ASL
ARITHMETIC SHIFT RIGHT	ASR
ROTATE LEFT	ROL
ROTATE RIGHT	ROR
ONE DIGIT SHIFT LEFT	SLD
ONE DIGIT SHIFT RIGHT	SRD
SHIFT N-BITS LEFT	NASL
DOUBLE SHIFT N-BITS LEFT	NSLL
SHIFT N-BITS RIGHT	NASR
DOUBLE SHIFT N-BITS RIGHT	NSRL

Increment/Decrement Instructions

Instruction	Mnemonic
INCREMENT BINARY	++
DOUBLE INCREMENT BINARY	++L
DECREMENT BINARY	--
DOUBLE DECREMENT BINARY	--L
INCREMENT BCD	++B
DOUBLE INCREMENT BCD	++BL
DECREMENT BCD	--B
DOUBLE DECREMENT BCD	--BL

Symbol Math Instructions

Instruction	Mnemonic
SIGNED BINARY ADD WITHOUT CARRY	+
DOUBLE SIGNED BINARY ADD WITHOUT CARRY	+L
SIGNED BINARY ADD WITH CARRY	+C
DOUBLE SIGNED BINARY ADD WITH CARRY	+CL
BCD ADD WITHOUT CARRY	+B
DOUBLE BCD ADD WITHOUT CARRY	+BL
BCD ADD WITH CARRY	+BC
DOUBLE BCD ADD WITH CARRY	+BCL
SIGNED BINARY SUBTRACT WITHOUT CARRY	-
DOUBLE SIGNED BINARY SUBTRACT WITHOUT CARRY	-L
SIGNED BINARY SUBTRACT WITH CARRY	-C
DOUBLE SIGNED BINARY SUBTRACT WITH CARRY	-CL
BCD SUBTRACT WITHOUT CARRY	-B
DOUBLE BCD SUBTRACT WITHOUT CARRY	-BL
BCD SUBTRACT WITH CARRY	-BC
DOUBLE BCD SUBTRACT WITH CARRY	-BCL
SIGNED BINARY MULTIPLY	*
DOUBLE SIGNED BINARY MULTIPLY	*L
BCD MULTIPLY	*B
DOUBLE BCD MULTIPLY	*BL
SIGNED BINARY DIVIDE	/
DOUBLE SIGNED BINARY DIVIDE	/L
BCD DIVIDE	/B
DOUBLE BCD DIVIDE	/BL

Conversion Instructions

Instruction	Mnemonic
BCD-TO-BINARY	BIN
DOUBLE BCD-TO-DOUBLE BINARY	BINL
BINARY-TO-BCD	BCD
DOUBLE BINARY-TO-DOUBLE BCD	BCDL
2'S COMPLEMENT	NEG
DATA DECODER	MLPX
DATA ENCODER	DMPX
ASCII CONVERT	ASC
ASCII TO HEX	HEX

Logic Instructions

Instruction	Mnemonic
LOGICAL AND	ANDW
DOUBLE LOGICAL AND	ANDL
LOGICAL OR	ORW
DOUBLE LOGICAL OR	ORWL
EXCLUSIVE OR	XORW
DOUBLE EXCLUSIVE OR	XORL
COMPLEMENT	COM
DOUBLE COMPLEMENT	COML

Special Math Instructions

Instruction	Mnemonic
ARITHMETIC PROCESS	APR
BIT COUNTER	BCNT

Floating-point Math Instructions

Instruction	Mnemonic
FLOATING TO 16-BIT	FIX
FLOATING TO 32-BIT	FIXL
16-BIT TO FLOATING	FLT
32-BIT TO FLOATING	FLTL
FLOATING-POINT ADD	+F
FLOATING-POINT SUBTRACT	-F
FLOATING-POINT DIVIDE	/F
FLOATING-POINT MULTIPLY	*F
Floating Symbol Comparison	LD, AND, OR+=F
	LD, AND, OR+<>F
	LD, AND, OR+<F
	LD, AND, OR+<=F
	LD, AND, OR+>F
	LD, AND, OR+>=F
FLOATING- POINT TO ASCII	FSTR
ASCII TO FLOATING-POINT	FVAL

Table Data Processing Instructions

Instruction	Mnemonic
SWAP BYTES	SWAP
FRAME CHECKSUM	FCS

Data Control Instructions

Instruction	Mnemonic
PID CONTROL WITH AUTOTUNING	PIDAT
TIME-PROPORTIONAL OUTPUT	TPO
SCALING	SCL
SCALING 2	SCL2
SCALING 3	SCL3
AVERAGE	AVG

Subroutine Instructions

Instruction	Mnemonic
SUBROUTINE CALL	SBS
SUBROUTINE ENTRY	SBN
SUBROUTINE RETURN	RET

Interrupt Control Instructions

Instruction	Mnemonic
SET INTERRUPT MASK	MSKS
CLEAR INTERRUPT	CLI
DISABLE INTERRUPTS	DI
ENABLE INTERRUPTS	EI

High-speed Counter and Pulse Output Instructions

Instruction	Mnemonic
MODE CONTROL	INI
HIGH-SPEED COUNTER PV READ	PRV
COMPARISON TABLE LOAD	CTBL
SPEED OUTPUT	SPED
SET PULSES	PULS
PULSE OUTPUT	PLS2
ACCELERATION CONTROL	ACC
ORIGIN SEARCH	ORG
PULSE WITH VARIABLE DUTY FACTOR	PWM

Step Instructions

Instruction	Mnemonic
STEP DEFINE	STEP
STEP START	SNXT

I/O Unit Instructions

Instruction	Mnemonic
I/O REFRESH	IORF
7-SEGMENT DECODER	SDEC
DIGITAL SWITCH INPUT	DSW
MATRIX INPUT	MTR
7-SEGMENT DISPLAY OUTPUT	7SEG

Serial Communications Instructions

Instruction	Mnemonic
TRANSMIT	TXD
RECEIVE	RXD

Clock Instructions

Instruction	Mnemonic
CALENDAR ADD	CADD
CALENDAR SUBTRACT	CSUB
CLOCK ADJUSTMENT	DATE

Failure Diagnosis Instructions

Instruction	Mnemonic
FAILURE ALARM	FAL
SEVERE FAILURE ALARM	FALS

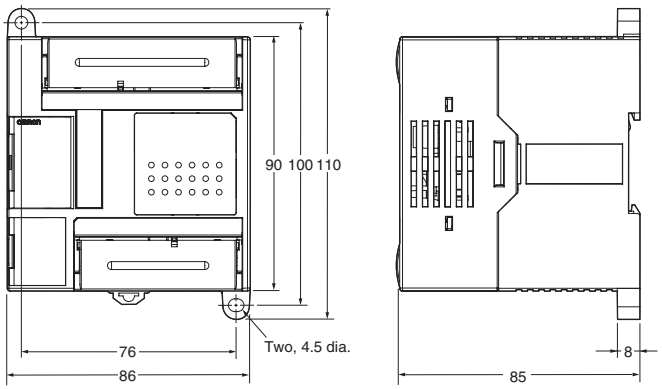
Other Instructions

Instruction	Mnemonic
SET CARRY	STC
CLEAR CARRY	CLC
EXTEND MAXIMUM CYCLE TIME	WDT

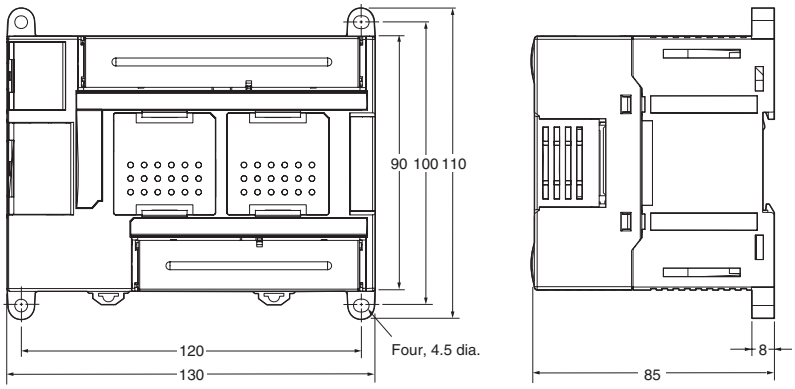
Dimensions

CP1E CPU Unit

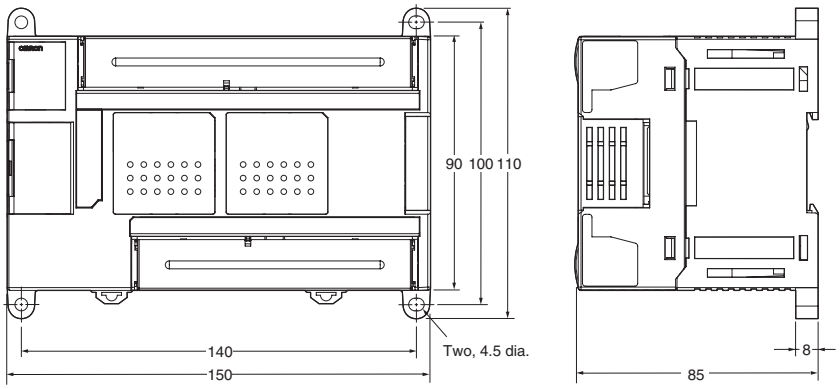
●CPU Units with 20 I/O Point



●CPU Units with 30 I/O Point

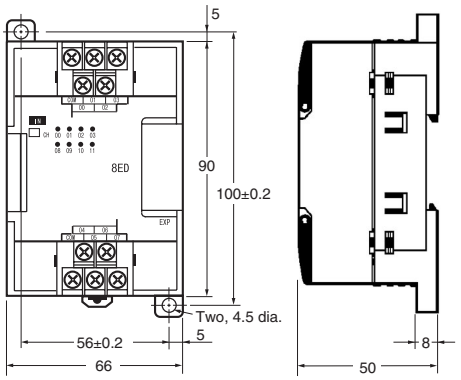


●CPU Units with 40 I/O Point

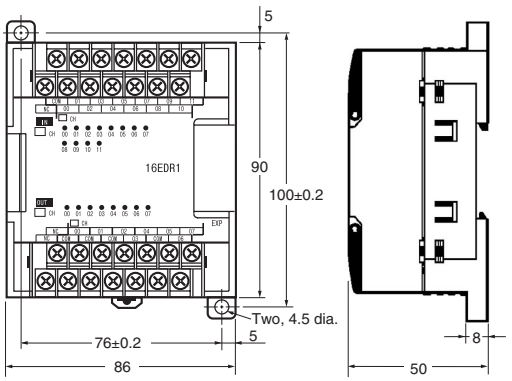


Expansion I/O Units and Expansion Units

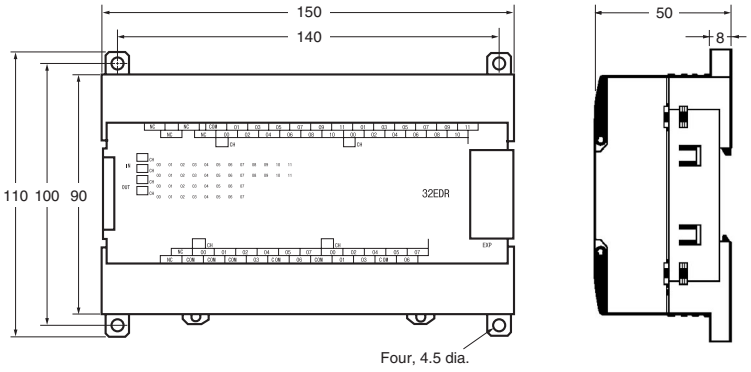
●CP1W-8E□□/CP1W-SRT21



●CP1W-20ED□/CP1W-16E□□/CP1W-AD041/CP1W-DA041/CP1W-MAD11/CP1W-TS□□□



●CP1W-40ED□/CP1W-32E□□



Related Manuals

Manual name	Cat. No.	Model numbers	Application	Contents
SYSMAC CP Series CP1E CPU Unit Hardware Manual	W479	CP1E-E□D□-A CP1E-N□D□-□	To learn the hardware specifications of the CP1E PLCs	Describes the following information for CP1E PLCs. • Overview and features • Basic system configuration • Part names and functions • Installation and settings • Troubleshooting
			Use this manual together with the CP1E CPU Unit Software Manual (Cat. No. W480) and CP1E CPU Unit Instructions Reference Manual (Cat. No. W483).	
SYSMAC CP Series CP1E CPU Unit Software Manual	W480	CP1E-E□D□-A CP1E-N□D□-□	To learn the software specifications of the CP1E	Describes the following information for CP1E PLCs. • CPU Unit operation • Internal memory • Programming • Settings • CPU Unit built-in functions • Interrupts • High-speed counter inputs • Pulse outputs • Serial communications • Other functions
			Use this manual together with the CP1E CPU Unit Hardware Manual (Cat. No. W479) and CP1E CPU Unit Instructions Reference Manual (Cat. No. W483).	
SYSMAC CP Series CP1E CPU Unit Instructions Reference Manual	W483	CP1E-E□D□-A CP1E-N□D□-□	To learn programming instructions in detail	Describes each programming instruction in detail. When programming, use this manual together with the CP1E CPU Unit Hardware Manual (Cat. No. W479) and CP1E CPU Unit Software Manual (Cat. No. W480).
CS/CJ/CP/NSJ Series Communications Commands Reference Manual	W342	CS1G/H-CPU□□H CS1G/H-CPU□□-V1 CS1D-CPU□□H CS1D-CPU□□S CS1W-SCU□□-V1 CS1W-SCB□□-V1 CJ1G/H-CPU□□H CJ1G-CPU□□P CJ1M-CPU□□ CJ1G-CPU□□ CJ1W-SCU□□-V1	To learn communications commands for CS/CJ/CP/NSJ-series Controllers in detail	Describes 1) C-mode commands and 2) FINS commands in detail. Read this manual for details on C-mode and FINS commands addressed to CPU Units.
			Note: This manual describes commands addressed to CPU Units. It does not cover commands addressed to other Units or ports (e.g., serial communications ports on CPU Units, communications ports on Serial Communications Units/Boards, and other Communications Units).	
SYSMAC CP Series CP1L/CP1E CPU Unit Introduction Manual	W461	CP1L-L10D□-□ CP1L-L14D□-□ CP1L-L20D□-□ CP1L-M30D□-□ CP1L-M40D□-□ CP1L-M60D□-□ CP1E-E□D□-A CP1E-N□D□-□	To learn the basic setup methods of the CP1L/CP1E PLCs	Describes the following information for CP1L/CP1E PLCs. • Basic configuration and component names • Mounting and wiring • Programming, data transfer, and debugging using the CX-Programmer • Application program examples

MEMO

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