

CP1L

The compact machine controller



» Fast processing speed

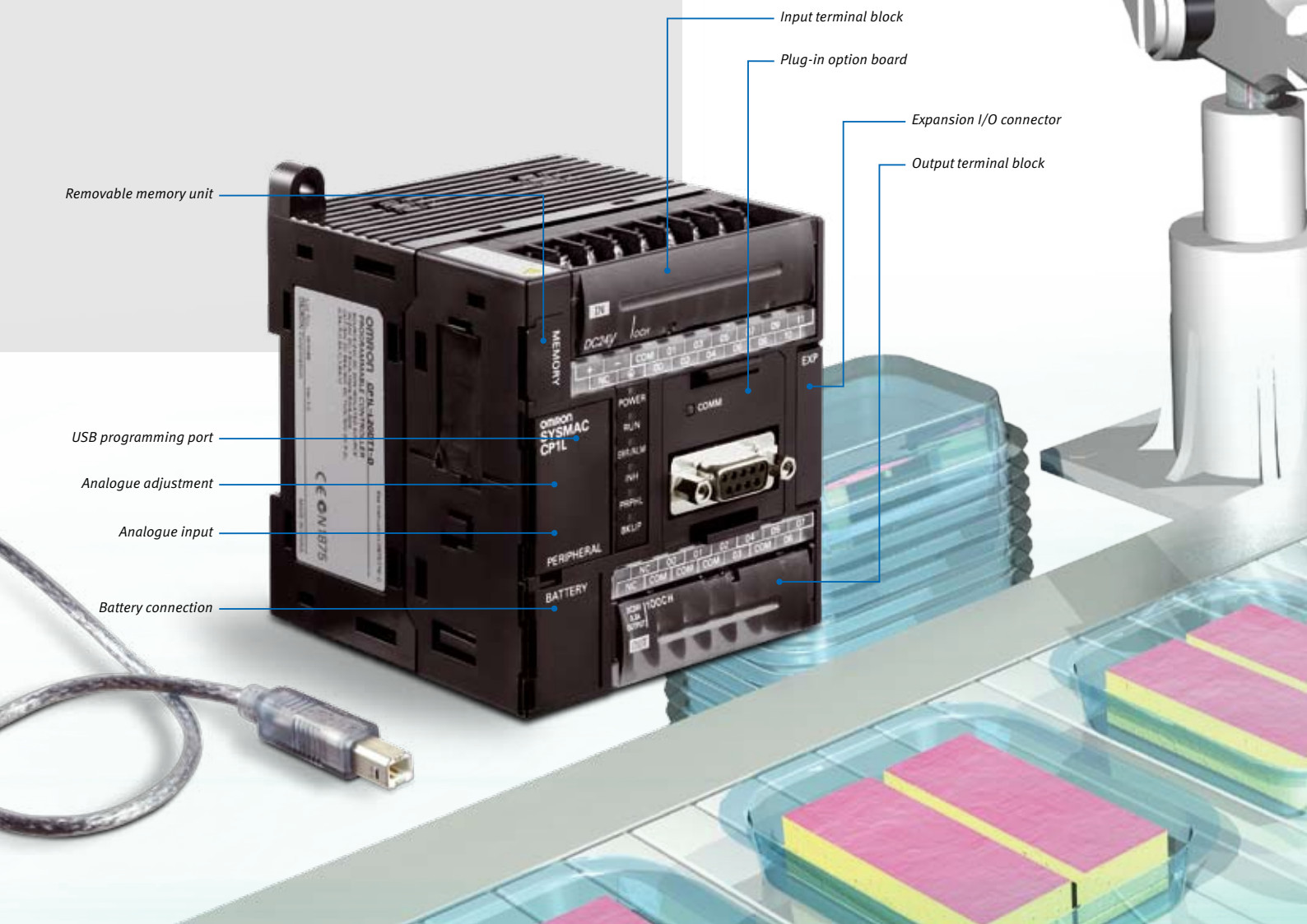
» Advanced motion functionality

» Easy connection and communication

Think big...start small...

When it comes to controllers for compact machines, Omron's new CP1L series offers the compactness of a micro-PLC with the capability of a modular PLC. But this new and exciting range is not only compact, it is scalable, has a faster processing speed than other controllers and is in a class of its own when it comes to price/performance. Naturally, it is compatible with all other devices in the Omron PLC line up.

The CP1L series not only has all the functionality you need to control your machine, including outstanding positioning capability, it even has a USB interface as standard for programming and monitoring, so you can plug and play easily and cheaply without having to buy expensive cables. As the CP1L series shares the same architecture as the CS and CJ series, programs are fully compatible for memory allocations and instructions.



Removable memory unit

USB programming port

Analogue adjustment

Analogue input

Battery connection

Input terminal block

Plug-in option board

Expansion I/O connector

Output terminal block

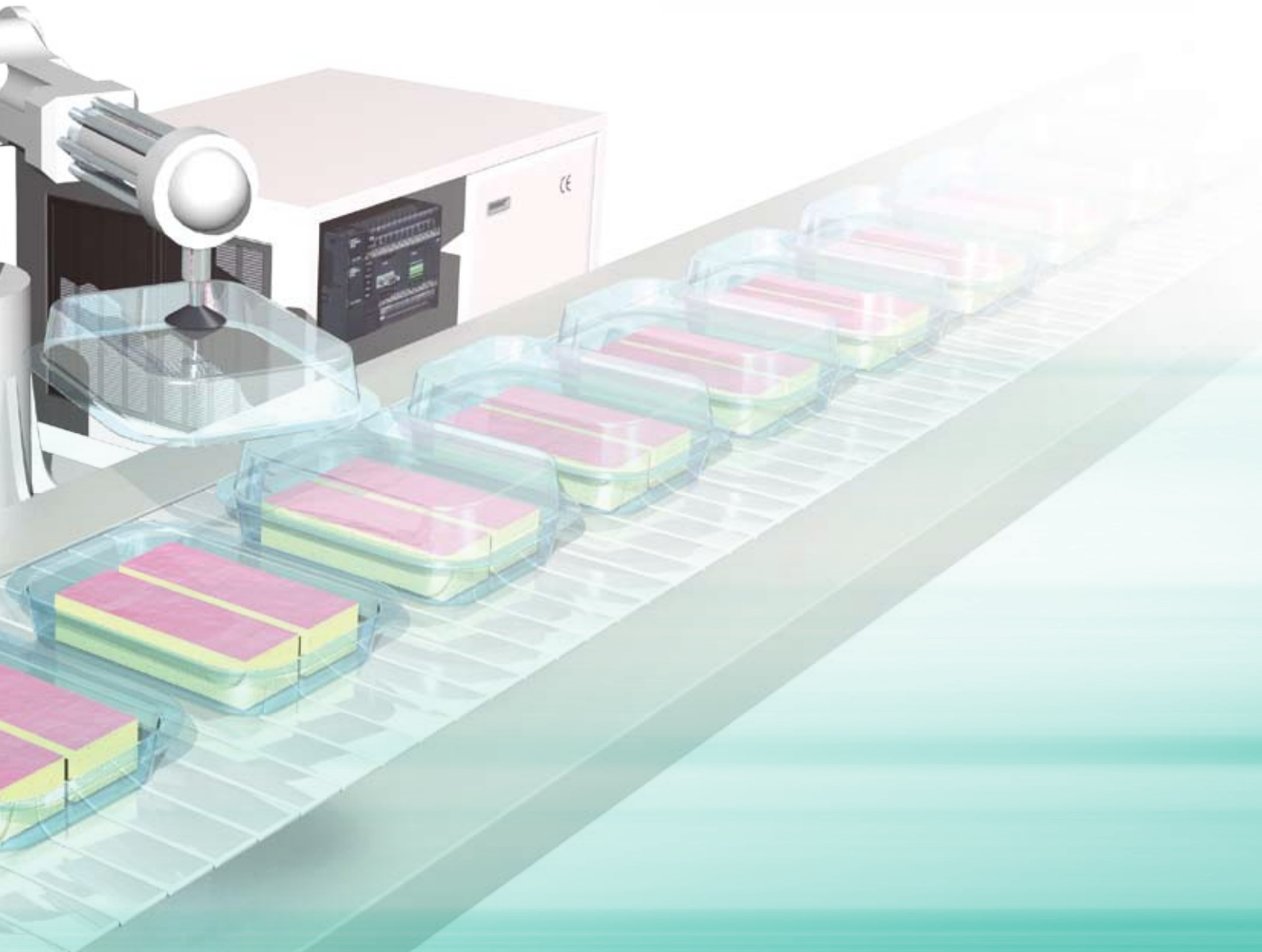
...take the lead today!

All you need in one series

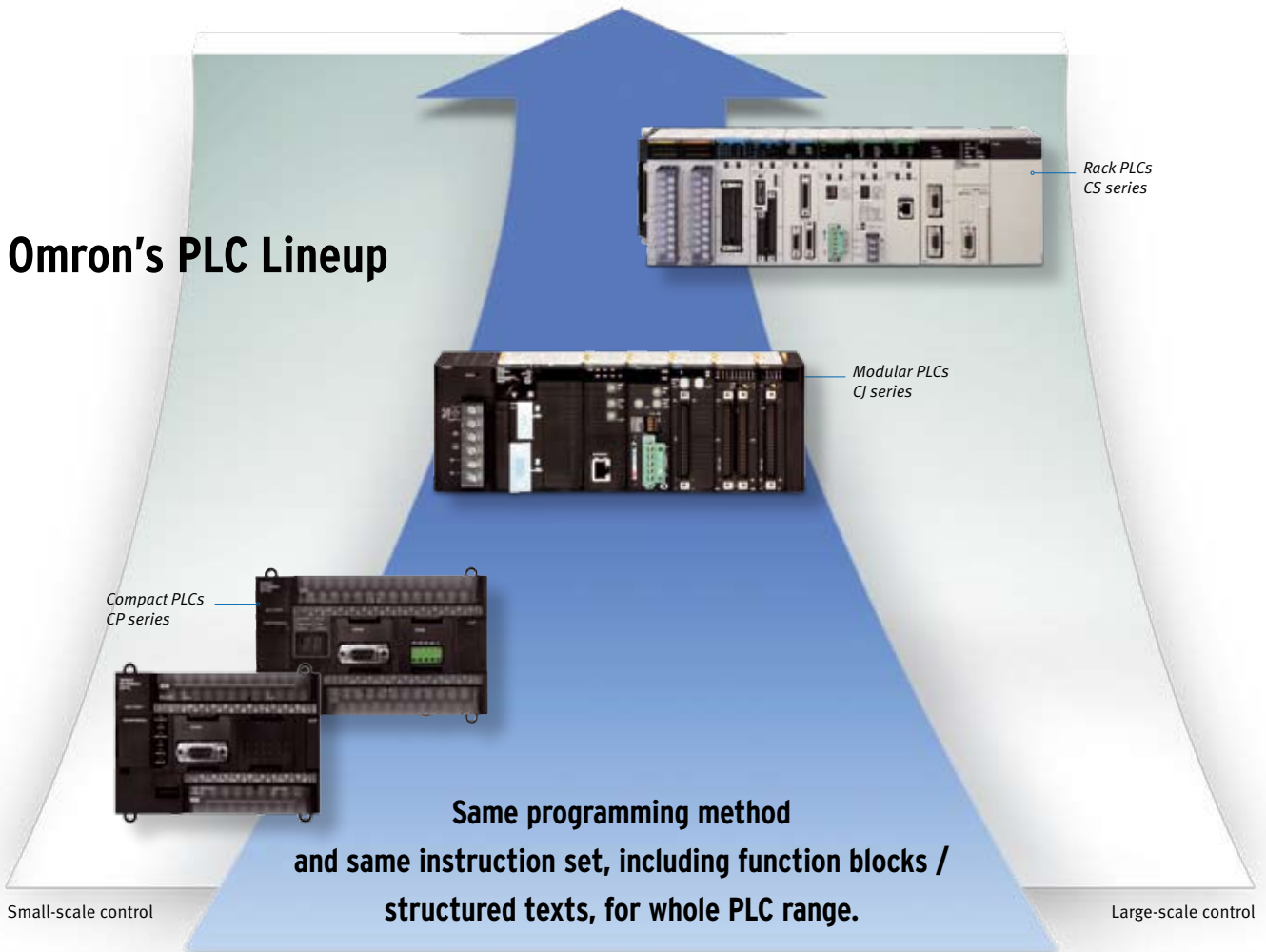
With the CP1L series you get all the functionality and flexibility you need in a controller plus the added advantage of one single platform, which means no worries about field-buses or integration of software. And the same 'Smart Platform' communication routing is provided over multiple network layers. The CP1L series... the compact range that simply meets your needs.

Features at a glance

- 4 high-speed encoder inputs and 2 high-speed pulse outputs
- CPUs with AC or DC supply and 14, 20, 30 or 40 I/O built-in
- Instruction set compatible with CP1H-, CJ1-, and CS1 series PLC
- Optional RS232C and RS-422A/485 serial ports
- USB programming port
- Scalable with a wide range of I/O units (maximum up to 160 I/O points)
- Motion functionality
- One and the same software as other Omron controllers



Omron's PLC Lineup



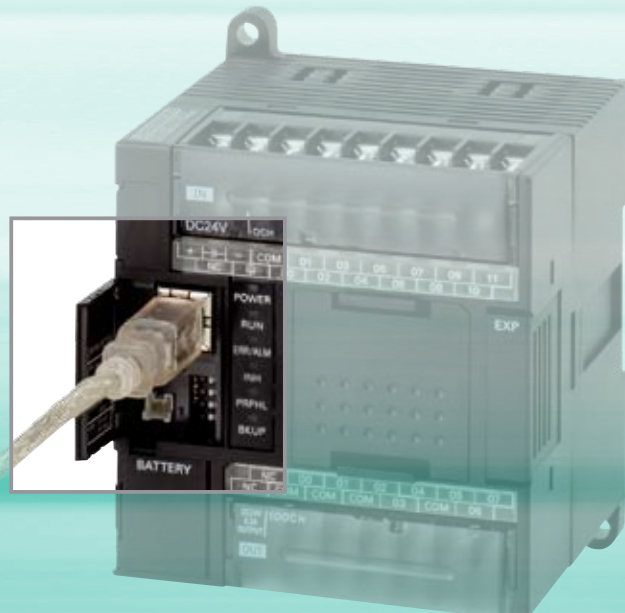
Easy and familiar programming

Omron's CX-One software offers the same easy and familiar programming that saves you time and effort. Enabling you to build, configure and program your networks, PLCs, HMIs, motion-control systems, drives, temperature controllers and sensors.



USB interface, no expensive cabling required

No need for expensive additional cables with the CP1L series either because the USB interface enables you to simply plug and play.



Prepared for future growth



Expansion of needs



Expansion of needs



CP1L-L

- CPU with 14 or 20 digital I/O built-in
- Expandable up to 60 I/O points (1 unit)
- USB port + 1 optional serial port
- 5 Ksteps user memory
- 0.6 μ s instruction speed
- 4 encoder inputs (100 kHz)
- 2 pulse outputs (100 kHz)



CP1L-M

- CPU with 30 or 40 digital I/O built-in
- Expandable up to 160 I/O points (3 units)
- USB port + 2 optional serial ports
- 10 Ksteps user memory
- 0.6 μ s instruction speed
- 4 encoder inputs (100 kHz)
- 2 pulse outputs (100 kHz)



CP1H

- CPU with 40 digital I/O and (optional) analogue I/O (4in/20out) built-in
- Expandable up to 320 I/O points (7 units)
- USB port + 2 optional serial ports
- 20 Ksteps user memory
- 0.1 μ s instruction speed
- 4 encoder inputs (2 x 1 MHz + 2 x 100 kHz)
- 4 pulse outputs (2 x 1 MHz + 2 x 100 kHz)

CP1L

CPU Units and Expansion Units

When it comes to controllers for compact machines, Omron's new CP1L series offers the compactness of a micro-PLC with the capability of a modular PLC.

But this new and exciting range is not only compact, it is scaleable, has a faster processing speed than other controllers and is in a class of its own when it comes to price/performance. Naturally, it is compatible with all other devices in the Omron PLC line up.

- 4 high-speed encoder inputs and 2 high-speed pulse outputs
- CPUs with AC or DC supply and 14, 20, 30 or 40 I/O built-in
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- Scaleable with a wide range of I/O units (maximum up to 160 I/O points)
- Motion functionality
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CPU Unit Specification

CPU Units

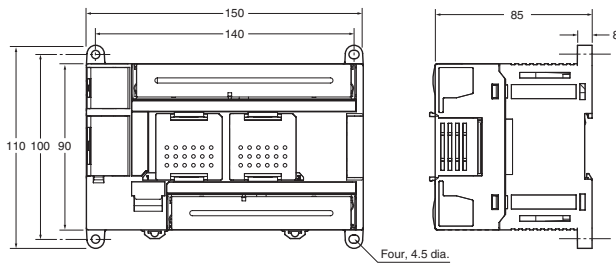
Type	CP1L-M40 (40 points)	CP1L-M30 (30 points)	CP1L-L20 (20 points)	CP1L-L14 (14 points)	
Item	Models	CP1L-M40□□-□	CP1L-M30□□-□	CP1L-L20□□-□	CP1L-L14□□-□
Control method	Stored program method				
I/O control method	Cyclic scan with immediate refreshing				
Program language	Ladder diagram				
Function blocks	Maximum number of function block definitions: 128 Maximum number of instances: 256 Languages usable in function block definitions: Ladder diagrams, structured text (ST)				
Instruction length	1 to 7 steps per instruction				
Instructions	Approx. 500 (function codes: 3 digits)				
Instruction execution time	Basic instructions: 0.55 μs min. Special instructions: 4.1 μs min.				
Common processing time	0.4 ms				
Program capacity	10K steps		5K steps		
Number of tasks	288 (32 cyclic tasks and 256 interrupt tasks)				
Interrupt tasks	Scheduled interrupt tasks	1 (interrupt task No. 2, fixed)			
	Input interrupt tasks	6 (interrupt task No. 140 to 145, fixed)		4 (interrupt task No. 140 to 143, fixed)	
(Interrupt tasks can also be specified and executed for high-speed counter interrupts and executed.)					
Maximum subroutine number	256				
Maximum jump number	256				
I/O areas	Input bits	24: CIO 0.00 to CIO 0.11 and CIO 1.00 to CIO 1.11	18: CIO 0.00 to CIO 0.11 and CIO 1.00 to CIO 1.05	12: CIO 0.00 to CIO 0.11	8: CIO 0.00 to CIO 0.07
	Output bits	16: CIO 100.00 to CIO 100.07 and CIO 101.00 to CIO 101.07	12: CIO 100.00 to CIO 100.07 and CIO 101.00 to CIO 101.03	8: CIO 100.00 to CIO 100.07	6: CIO 100.00 to CIO 100.05
	1:1 Link Area	1,024 bits (64 words): CIO 3000.00 to CIO 3063.15 (CIO 3000 to CIO 3063)			
	Serial PLC Link Area	1,440 bits (90 words): CIO 3100.00 to CIO 3189.15 (CIO 3100 to CIO 3189)			
Work bits	8,192 bits (512 words): W000.00 to W511.15 (W0 to W511) CIO Area: 37,504 bits (2,344 words): CIO 3800.00 to CIO 6143.15 (CIO 3800 to CIO 6143)				
TR Area	16 bits: TR0 to TR15				
Holding Area	8,192 bits (512 words): H0.00 to H511.15 (H0 to H511)				
AR Area	Read-only (Write-prohibited): 7168 bits (448 words): A0.00 to A447.15 (A0 to A447) Read/Write: 8192 bits (512 words): A448.00 to A959.15 (A448 to A959)				
Timers	4,096 bits: T0 to T4095				
Counters	4,096 bits: C0 to C4095				
DM Area	32 Kwords: D0 to D32767		10 Kwords: D0 to D9999, D32000 to D32767		
Data Register Area	16 registers (16 bits): DR0 to DR15				
Index Register Area	16 registers (32 bits): IR0 to IR15				
Task Flag Area	32 flags (32 bits): TK0000 to TK0031				

Type	CP1L-M40 (40 points)	CP1L-M30 (30 points)	CP1L-L20 (20 points)	CP1L-L14 (14 points)	
Item	Models	CP1L-M40□□□□	CP1L-M30□□□□	CP1L-L20□□□□	CP1L-L14□□□□
Trace Memory	4,000 words (500 samples for the trace data maximum of 31 bits and 6 words.)				
Memory Cassette	A special Memory Cassette (CP1W-ME05M) can be mounted. Note: Can be used for program backups and auto-booting.				
Clock function	Supported. Accuracy (monthly deviation): -4.5 min to -0.5 min (ambient temperature: 55°C), -2.0 min to +2.0 min (ambient temperature: 25°C), -2.5 min to +1.5 min (ambient temperature: 0°C)				
Communications functions	One built-in peripheral port (USB 1.1): For connecting Support Software only.		A maximum of one Serial Communications Option Board can be mounted.		
Memory backup	Flash memory: User programs, parameters (such as the PLC Setup), comment data, and the entire DM Area can be saved to flash memory as initial values. Battery backup: The Holding Area, DM Area, and counter values (flags, PV) are backed up by a battery.				
Battery service life	5 years at 25°C. (Use the replacement battery within two years of manufacture.)				
Built-in input terminals	40 (24 inputs, 16 outputs)	30 (18 inputs, 12 outputs)	20 (12 inputs, 8 outputs)	14 (8 inputs, 6 outputs)	
Number of connectable Expansion Units and Expansion I/O Units	CP-series Expansion Unit and Expansion I/O Units: 3 max.		CP-series Expansion Units and Expansion I/O Units: 1 max.		
Max. number of I/O points	160 (40 built in + 40 per Expansion (I/O) Unit × 3 Units)	150 (30 built in + 40 per Expansion (I/O) Unit × 3 Units)	60 (20 built in + 40 per Expansion (I/O) Unit × 1 Unit)	54 (14 built in + 40 per Expansion (I/O) Unit × 1 Unit)	
Interrupt inputs	6 inputs (Response time: 0.3 ms)		4 inputs (Response time: 0.3 ms)		
Interrupt inputs counter mode	6 inputs (Response frequency: 5 kHz max. for all interrupt inputs), 16 bits Up or down counters		4 inputs (Response frequency: 5 kHz max. for all interrupt inputs), 16 bits Up or down counters		
Quick-response inputs	6 points (Min. input pulse width: 50 μs max.)		4 points (Min. input pulse width: 50 μs max.)		
Scheduled interrupts	1				
High-speed counters	4 counters, 2 axes (24-VDC input) 4 inputs: Differential phases (4x), 50 kHz or Single-phase (pulse plus direction, up/down, increment), 100 kHz Value range: 32 bits, Linear mode or ring mode Interrupts: Target value comparison or range comparison				
Pulse outputs (models with transistor outputs only)	Pulse outputs	Trapezoidal or S-curve acceleration and deceleration (Duty ratio: 50% fixed) 2 outputs, 1 Hz to 100 kHz (CCW/CW or pulse plus direction)			
	PWM outputs	Duty ratio: 0.0% to 100.0% (specified in increments of 0.1% or 1%) 2 outputs, 0.1 to 6553.5 Hz or 1 to 32,800 Hz (Accuracy: ±5% at 1 kHz)			
Analog control	1 (Setting range: 0 to 255)				
External analog input	1 input (Resolution: 1/256, Input range: 0 to 10 V). Not isolated.				

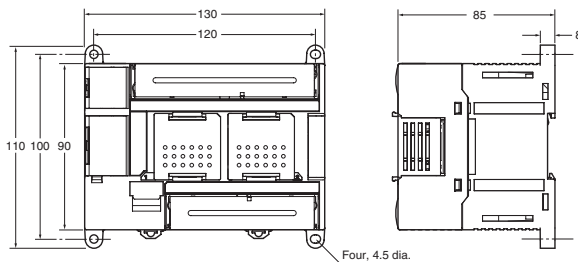
Dimensions

(Unit: mm)

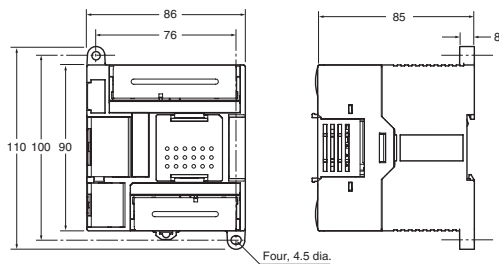
CP1L CPU Units with 40 I/O Points



CP1L CPU Units with 30 I/O Points

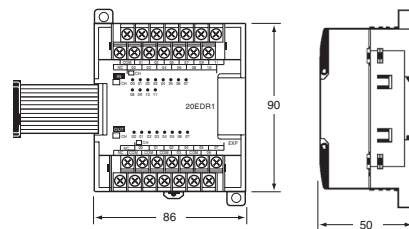


CP1L CPU Units with 14 or 20 I/O Points

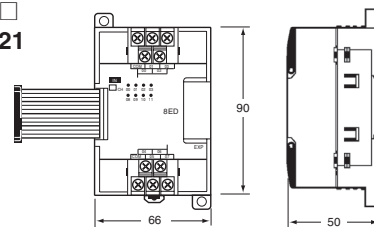


Expansion Units and Expansion I/O Units

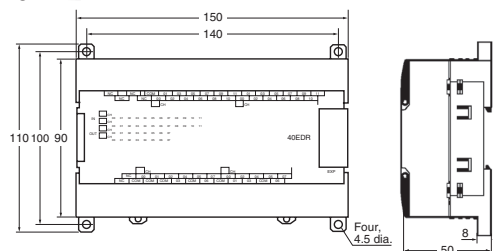
- CP1W-20ED□
- CP1W-16ER
- CP1W-AD041/CP1W-DA041
- CP1W-MAD11/CP1W-TS□□□



- CP1W-8E□□
- CP1W-SRT21

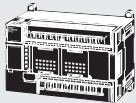
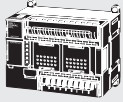

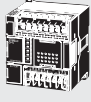


CP1W-40ED□



Ordering Information

CP1L CPU Units

CPU Unit	Specifications				Model	Standards
	Power supply	Output method	Inputs	Outputs		
CP1L-M CPU Units with 40 Points 	AC power supply	Relay output	24	16	CP1L-M40DR-A	UC1, N, L, CE
	DC power supply	Transistor output (sinking)			CP1L-M40DR-D	
		Transistor output (sourcing)			CP1L-M40DT-D	
					CP1L-M40DT1-D	
CP1L-M CPU Units with 30 Points 	AC power supply	Relay output	18	12	CP1L-M30DR-A	
	DC power supply	Transistor output (sinking)			CP1L-M30DR-D	
		Transistor output (sourcing)			CP1L-M30DT-D	
					CP1L-M30DT1-D	
CP1L-L CPU Units with 20 Points 	AC power supply	Relay output	12	8	CP1L-L20DR-A	
	DC power supply	Transistor output (sinking)			CP1L-L20DR-D	
		Transistor output (sourcing)			CP1L-L20DT-D	
					CP1L-L20DT1-D	
CP1L-L CPU Units with 14 Points 	AC power supply	Relay output	8	6	CP1L-L14DR-A	
	DC power supply	Transistor output (sinking)			CP1L-L14DR-D	
		Transistor output (sourcing)			CP1L-L14DT-D	
					CP1L-L14DT1-D	

Options for CPU Units

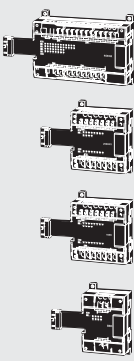





Name	Specifications	Model	Standards
RS-232C Option Board	For CPU Unit option port.	CP1W-CIF01	UC1, N, L, CE
RS-422A/485 Option Board	For CPU Unit option port.	CP1W-CIF11	
Memory Cassette	Can be used for backing up programs or auto-booting.	CP1W-ME05M	

Programming Devices

Name	Specifications	Model	Standards	
CX-One FA Integrated Tool Package Ver. 2.0	CX-One is a package that integrates the Support Software for OMRON PLCs and components. CX-One runs on the following OS. OS: Windows 98SE, Me, NT 4.0 (Service Pack 6a), 2000 (Service Pack 3 or higher), or XP *CX-Thermo runs only on Windows 2000 (Service Pack 3 or higher) or XP. CX-One Ver. 2.0 includes CX-Programmer Ver. 7.□. For details, refer to the CX-One catalog (Cat. No. R134). *The software is provided on CDs for the CXONE-AL□□C-□EV2 and on DVD for the CXONE-AL□□D-□EV2. *Site licenses are available for users who must run the CX-One on many computers. Ask your OMRON representative for details.	1 license	CXONE-AL01C-EV2	---
		3 licenses	CXONE-AL03C-EV2 CXONE-AL03D-EV2	
		10 licenses	CXONE-AL10C-EV2 CXONE-AL10D-EV2	
		50 licenses	CXONE-AL50C-EV2 CXONE-AL50D-EV2	
USB Programming cable	A-type male to B-type male (Length: 1.8 m)	CP1W-CN221	---	
Programming Device Connecting Cable for CP1W-CIF01 RS-232C Option Board	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)	For anti-static connectors	XW2Z-200S-CV	---
	Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)		XW2Z-500S-CV	
	Connects DOS computers, D-Sub 9-pin (Length: 2.0 m)		XW2Z-200S-V	
	Connects DOS computers, D-Sub 9-pin (Length: 5.0 m)		XW2Z-500S-V	
USB-Serial Conversion Cable (See note)	USB-RS-232C Conversion Cable (Length: 0.5 m) and PC driver (on a CD-ROM disc) are included. Complies with USB Specification 1.1 On personal computer side: USB (A plug connector, male) On PLC side: RS-232C (D-sub 9-pin, male) Driver: Supported by Windows 98, Me, 2000, and XP	CS1W-CIF31		

- Note:**
- Cannot be used with a peripheral USB port.
 - CP1L PLCs are supported by CX-Programmer version 7.1 or higher.

Expansion Units

Name	Output method	Inputs	Outputs	Model	Standards
Expansion I/O Units 	Relay	24	16	CP1W-40EDR	N, L, CE
	Transistor (sinking)			CP1W-40EDT	
	Transistor output (sourcing)			CP1W-40EDT1	
	Relay	12	8	CP1W-20EDR1	U, C, L, CE
	Transistor (sinking)			CP1W-20EDT	U, C, N, L, CE
	Transistor output (sourcing)			CP1W-20EDT1	
	Relay	---	16	CP1W-16ER	CE
	---	8	---	CP1W-8ED	U, C, N, L, CE
	Relay	---	8	CP1W-8ER	
	Transistor (sinking)	---	8	CP1W-8ET	
Transistor output (sourcing)	---	---	CP1W-8ET1		
Analog Input Unit 	Analog (resolution: 1/6000)	4	---	CP1W-AD041	UC1, CE
Analog Output Unit 	Analog (resolution: 1/6000)	---	4	CP1W-DA041	UC1, CE
Analog I/O Unit 	Analog (resolution: 1/6000)	2	1	CP1W-MAD11	U, C, N, CE
CompoBus/S I/O Link Unit 	---	8 (I/O link input bits)	8 (I/O link input bits)	CP1W-SRT21	U, C, N, L, CE
Temperature Sensor Unit 	2 thermocouple inputs			CP1W-TS001	U, C, N, L, CE
	4 thermocouple inputs			CP1W-TS002	
	2 platinum resistance thermometer inputs			CP1W-TS101	
	4 platinum resistance thermometer inputs			CP1W-TS102	

Optional Products, Maintenance Products and DIN Track Accessories

Name	Specifications	Model	Standards
Battery Set	For CP1L CPU Units (Use batteries within two years of manufacture.)	CJ1W-BAT01	CE
DIN Track	Length: 0.5 m; Height: 7.3 mm	PFP-50N	---
	Length: 1 m; Height: 7.3 mm	PFP-100N	
	Length: 1 m; Height: 16 mm	PFP-100N2	
End Plate	There are 2 stoppers provided with CPU Units and I/O Interface Units as standard accessories to secure the Units on the DIN Track.	PFP-M	

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