

# THE CP1 FAMILY

Compact machine controllers



» Fast programming with Function Blocks

» Flexible Ethernet connectivity

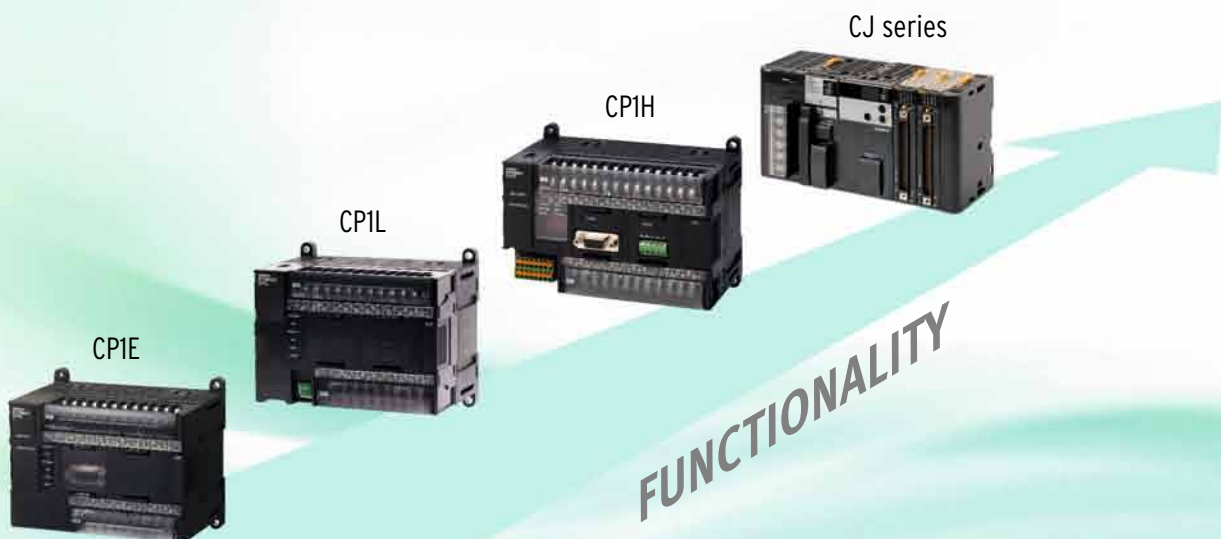
» Easy positioning functionality

# Think big... start small!

*Omron's vast experience in the field of industrial automation has resulted in the creation of the right products for your applications, ranging from simple to more complex automation solutions. The CP1 family of programmable controllers provides you with a complete product line-up to automate compact machines and perform any other simple automation tasks, quickly and easily. Programming and operation are consistent with Omron's other modular Programmable controllers. And you are guaranteed the same high quality and reliability that you expect from any Omron product, ensuring that your equipment keeps on giving continuous dependable performance.*

## Scalable solution

The CP1 family is scalable; this means that you can choose the products with the right level of sophistication to meet your automation needs in terms of functionality, flexibility and pricing. Each of the CP1 family models, the CP1E, CP1L and CP1H, offers the functionality required for complete machine control. Benefits include: easy expansion of I/O, fast and versatile communication, and full positioning capabilities via ready-to-use Function Blocks. The CP1 family uses the same instruction set and professional programming software found in Omron's other modular Programmable controllers.



## Easy positioning, quick results

*The CP1 family is the perfect choice for any application that requires positioning. Whether for conveyor control, point-to-point position control, or non-interpolated pick-and-place systems, the combination of high-speed pulse outputs, variable speed drive control and position feedback will provide all the functionality that you need for your application.*

### **Ideal for position control**

When simplicity and ease of use are essential, there is no better solution for your position applications than combining the CP1 family with servos and inverters from Omron's extensive range. The SmartStep 2 servo drive is a perfect partner and offers high performance while keeping things simple and cost effective. Omron provides standard functions and Function Blocks for SmartStep 2 and other servo drives to create your application with minimal effort.

### **Easy variable speed drive control**

Variable speed drive control is made easy within the CP1 family by using the serial port(s) and the Easy Modbus Master feature for high-speed communication. Omron Function Blocks enable you to control and monitor up to 31 inverters in real-time simply by configuration of parameters. With the encoders connected to the high-speed counter inputs, the CP1 is able to calculate the exact position to perform accurate positioning easily and quickly. In addition, in the MX2 inverter series, all simple positioning is handled within the drive itself.



## Flexible Ethernet connectivity

### As simple and quick- as USB!

Thanks to the CP1L-EM's or CP1L-EL's Automatic-Connect function, programming over Ethernet is as simple as using USB on the other models in the CP1 family. This means that you don't need to waste time adjusting the Ethernet settings on the PC, but that you can simply plug and connect, just like USB. The Automatic-Connect function connects instantly over a default IP address to the CP1L, saving you valuable set-up time.

### Versatile communication

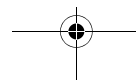
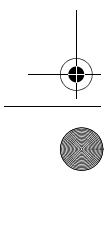
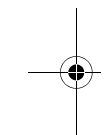
Omron's CP1L Ethernet models are equipped as standard with Socket Services. This facilitates the easy exchange of data with other Ethernet devices supporting a dedicated protocol. The Socket Services reduce effort and simplify programming and allow Ethernet protocols to be used directly from your Programmable controller program. Ethernet can also be used for applications that require remote access functionality, such as a secure VPN connection with a standard router.





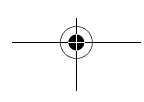
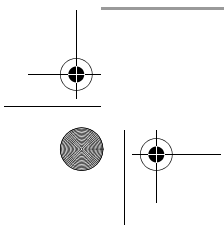
		CP1E									
		E-type					N-type				
		CP1E -E10D_ _	CP1E -E14DR-A	CP1E -E20DR-A	CP1E -E30DR-A	CP1E -E40DR-A	CP1E -N14D_ _	CP1E -N20D_ _	CP1E -NA20D_ _	CP1E -N30D_ _	CP1E -N40D_ _
I/O	Digital Inputs	6	8	12	18	24	8	12	12	18	24
	Digital Outputs	4	6	8	12	16	6	8	8	12	16
	Removable Terminals	No					No				
	Total I/O Capacity	10	14	20	150	160	14	20	140	150	160
	CP1W Expansion Units	No				Yes (3 max.)	No			Yes (3 max.)	
	CJ-Series Special I/O and CPU Bus Units	No					No				
	Interrupt/Quick/Counter Inputs	4	6				6				
	High Speed Counter Inputs	5 (10 kHz max.)	6 (10 kHz max.)				2 (100 kHz max.) and 4 (10 kHz max.)				
	Pulse Outputs (transistor outputs models only)	No					2 axes (100 kHz max.)				
	Analog I/O (embedded)	No					No			2 inputs, 1 output	No
	Analog Adjuster (0-255)	Yes (2)					Yes (2)				
External Analog Settings Input (resolution 1/256)	No					No					
Optional boards	Number of boards supported	0					0			1	
	Serial Communications (CP1W-CIF01/11/12)	No					No			Yes	
	Ethernet (CP1W-CIF41)	No					No			Yes	
	LCD Display (CP1W-DAM01)	No					No				
	Analog I/O boards	No					No				
CPU details	Programming port	USB					USB				
	RS-232C port (embedded)	No					Yes (1)				
	Function Blocks support (Ladder diagrams or ST language)	No					No				
	Processing Speed (minimum)	1.19 μs / Basic instruction, 7.9 μs / Special instruction					1.19 μs / Basic instruction, 7.9 μs / Special instruction				
	Program Capacity	2K steps					8K steps				
	Data Memory Capacity	2K words					8K words				
	Memory Cassette (CP1W-ME05M)	No					No				
	Real-Time Clock	No					Yes (with optional battery)				
	Battery	No					Optional (CP1W-BAT01)				
7-Segment Display	No					No					
Relay Outputs	AC Power Supply	CP1E -E10DR-A	CP1E -E14DR-A	CP1E -E20DR-A	CP1E -E30DR-A	CP1E -E40DR-A	CP1E -N14DR-A	CP1E -N20DR-A	CP1E -NA20DR-A	CP1E -N30DR-A	CP1E -N40DR-A
	DC Power Supply	CP1E -E10DR-D	-	-	-	-	CP1E -N14DR-D	CP1E -N20DR-D	-	CP1E -N30DR-D	CP1E -N40DR-D
Transistor Outputs	Sink Type	AC Power Supply	CP1E -E10DT-A	-	-	-	CP1E -N14DT-A	CP1E -N20DT-A	-	CP1E -N30DT-A	CP1E -N40DT-A
		DC Power Supply	CP1E -E10DT-D	-	-	-	CP1E -N14DT-D	CP1E -N20DT-D	CP1E -NA20DT-D	CP1E -N30DT-D	CP1E -N40DT-D
	Source Type	AC Power Supply	CP1E -E10DT1-A	-	-	-	CP1E -N14DT1-A	CP1E -N20DT1-A	-	CP1E -N30DT1-A	CP1E -N40DT1-A
		DC Power Supply	CP1E -E10DT1-D	-	-	-	CP1E -N14DT1-D	CP1E -N20DT1-D	CP1E -NA20DT1-D	CP1E -N30DT1-D	CP1E -N40DT1-D

Note: This table is a general overview only. For details, refer to the CP1E datasheet (Cat. No. P061), CP1L datasheet (Cat. No. P081) or CP1H datasheet (Cat. No. P080).





CP1L							CP1H							
L-type			M-type			EL-type	EM-type							
CP1L -L10D_-	CP1L -L14D_-	CP1L -L20D_-	CP1L -M30D_-	CP1L -M40D_-	CP1L -M60D_-	CP1L -EL20D_-	CP1L -EM30D_-	CP1L -EM40D_-	CP1H -Y20DT-D	CP1H -X40D_-	CP1H -XA			
6	8	12	18	24	36	12	18	24	12	24	24			
4	6	8	12	16	24	8	12	16	8	16	16			
No			Yes			No			Yes					
10	54	60	150	160	180	60	150	160	300	320	320			
No			Yes (1 max.)			Yes (3 max.)			Yes (1 max.)			Yes (3 max.)		
No						No			Yes (7 units or 15 input words / 15 output words max.)					
No						No			Yes (2 max.)					
2	4	6				6				6	8			
4 (100 kHz max.)						4 (100 kHz max.)			2 (100 kHz max.) and 2 Line-driver (1 MHz)		4 (100 kHz max.)			
2 axes (100 kHz max.)						2 axes (100 kHz max.)			2 (100 kHz max.) and 2 Line-driver (1 MHz)		4 axes (100 kHz max.)			
No						2 inputs			No					
Yes (1)						No			Yes (1)					
Yes (0-10V)						No			Yes (0-10V)					
0	1	2				1	2			2				
No	Yes					Yes			Yes					
No	Yes					No			Yes					
No	Yes					Yes			Yes					
No						Yes			No					
USB						Ethernet			USB					
No						No			No					
Yes						Yes			Yes					
0.55 µs / Basic instruction, 4.1 µs / Special instruction						0.55 µs / Basic instruction, 4.1 µs / Special instruction			0.10 µs / Basic instruction, 0.15 µs / Special instruction					
5K steps			10K steps			5K (+10K FB) steps	10K (+10K FB) steps		20K steps					
10K words			32K words			10K words	32K words		32K words					
Yes						Yes			Yes					
Yes						Yes			Yes					
Yes (CJ1W-BAT01)						Yes (CJ1W-BAT01)			Yes (CJ1W-BAT01)					
No						No			Yes					
CP1L -L10DR-A	CP1L -L14DR-A	CP1L -L20DR-A	CP1L -M30DR-A	CP1L -M40DR-A	CP1L -M60DR-A	-	-	-	-	CP1H -X40DR-A	CP1H -XA			
CP1L -L10DR-D	CP1L -L14DR-D	CP1L -L20DR-D	CP1L -M30DR-D	CP1L -M40DR-D	CP1L -M60DR-D	CP1L -EL20DR-D	CP1L -EM30DR-D	CP1L -EM40DR-D	-	-	-			
CP1L -L10DT-A	CP1L -L14DT-A	CP1L -L20DT-A	CP1L -M30DT-A	CP1L -M40DT-A	CP1L -M60DT-A	-	-	-	-	-	-			
CP1L -L10DT-D	CP1L -L14DT-D	CP1L -L20DT-D	CP1L -M30DT-D	CP1L -M40DT-D	CP1L -M60DT-D	CP1L -EL20DT-D	CP1L -EM30DT-D	CP1L -EM40DT-D	CP1H -Y20DT-D	CP1H -X40DT-D	CP1H -XA			
-	-	-	-	-	-	-	-	-	-	-	-			
CP1L -L10DT1-D	CP1L -L14DT1-D	CP1L -L20DT1-D	CP1L -M30DT1-D	CP1L -M40DT1-D	CP1L -M60DT1-D	CP1L -EL20DT1-D	CP1L -EM30DT1-D	CP1L -EM40DT1-D	-	CP1H -X40DT1-D	CP1H -XA			





**CP1W-8ED**  
DC inputs: 8

**CP1W-8ER**  
Relay outputs: 8

**CP1W-8ET**  
Transistor outputs (sinking): 8

**CP1W-8ET1**  
Transistor outputs (sourcing): 8

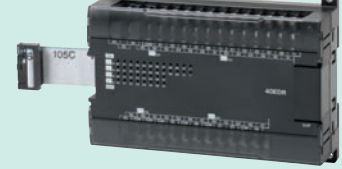


**CP1W-16ER**  
Relay outputs: 16

**CP1W-16ET**  
Transistor outputs (sinking): 16

**CP1W-16ET1**  
Transistor outputs (sourcing): 16

**CP1W-20EDR1**  
DC inputs: 12  
Relay outputs: 8



**CP1W-20EDT**  
DC inputs: 12  
Transistor outputs (sinking): 8

**CP1W-20EDT1**  
DC inputs: 12  
Transistor outputs (sourcing): 8

**CP1W-32ER**  
Relay outputs: 32

**CP1W-32ET**  
Transistor outputs (sinking): 32

**CP1W-32ET1**  
Transistor outputs (sourcing): 32

**CP1W-40EDR**  
DC inputs: 24  
Relay outputs: 16

**CP1W-40EDT**  
DC inputs: 24  
Transistor outputs (sinking): 16

**CP1W-40EDT1**  
DC inputs: 24  
Transistor outputs (sourcing): 16

### Analog I/O Units



#### Analog Input Unit

**CP1W-AD041**  
Analog inputs: 4 (resolution: 6,000)

#### Analog Output Unit

**CP1W-DA021**  
Analog outputs: 2 (resolution: 6,000)

**CP1W-DA041**  
Analog outputs: 4 (resolution: 6,000)



#### Analog I/O Unit

**CP1W-MAD11**  
Analog inputs: 2 (resolution: 6,000)  
Analog outputs: 1 (resolution: 6,000)

### Temperature Sensor Unit



**CP1W-TS001**  
Thermocouple inputs: 2

**CP1W-TS002**  
Thermocouple inputs: 4

**CP1W-TS101**  
Platinum-resistance thermometer input

**CP1W-TS102**  
Platinum-resistance thermometer input

### CompoBus/S I/O Link Unit



**CP1W-SRT21**  
Inputs: 8 bits  
Outputs: 8 bits

### Optional Boards



**CP1W-CIF01**  
RS-232C  
(15 m max.)



**CP1W-CIF11**  
RS-422A/485  
(50 m max.)



**CP1W-CIF12**  
RS-422A/485  
(Isolated-type)  
(500 m max.)



**CP1W-CIF41**  
Ethernet



**CP1W-DAM01**  
Display 4 rows,  
12 characters



**CP1W-ADB21**  
Analog 2 inputs,  
0-10 V, 0-20 mA



**CP1W-DAB21V**  
Analog  
2 outputs, 0-10 V



**CP1W-MAB221**  
Analog 2 inputs  
0-10 V, 0-20 mA  
2 outputs 0-10 V

### Memory Cassette



**CP1W-ME05M**  
512K words  
(upload/download program)

### Battery Set



**CJ1W-BAT01**  
(for CP1L/CP1H)



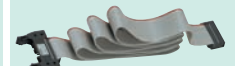
**CP1W-BAT01**  
(for CP1E)

### CJ Unit Adapter



**CP1W-EXT01**  
CJ Unit adapter for use with CP1H.  
Includes CJ endplate.

### I/O Connecting Cable



**CP1W-CN811**  
Length: 80 cm

CP1W Expansion Units include I/O Connection Cable (in lengths of approx. 6 cm) for side-by-side connection.

Note: This table is a general overview only. For details, refer to the CP1E datasheet (Cat. No. P061), CP1L datasheet (Cat. No. P081) or CP1H datasheet (Cat. No. P080).

OMRON PLC and components. CX-One Ver. 4.□ includes CX-1 Programmer Ver. 3.□. 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 Ver. 4.□ includes Micro PLC (the CP1 family) Edition CX-Programmer Ver. 9.□.

Note 1: The CX-One and CX-One Lite cannot be simultaneously installed on the same computer.

Note 2: This section is a general overview only. For details, refer to the CX-One Catalog (No. R134).

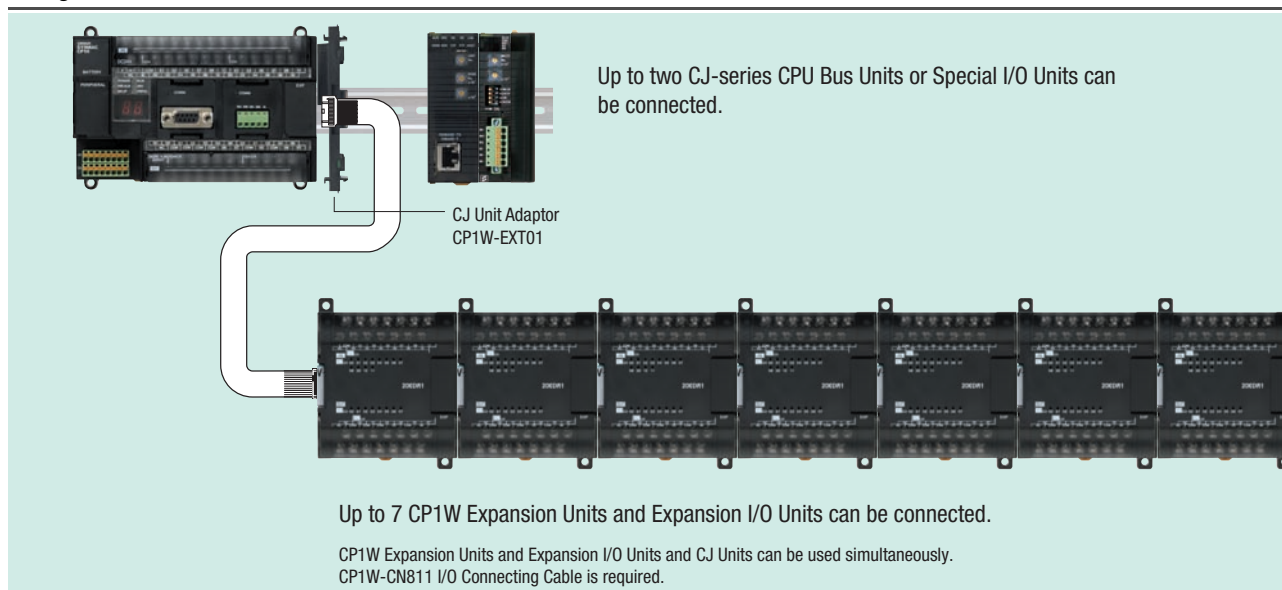
FA Integrated Tool Package CX-One Ver.4.□	Single user licence <sup>1</sup>	DVD <sup>2</sup>	CXONE-AL01
FA Integrated Tool Package CX-One Lite Ver.4.□	Single user licence	CD	CXONE-LT01

<sup>1</sup> Multi licenses are available for the CX-One (3, 10, 30, or 50 licenses).

<sup>2</sup> The CX-One is also available on CD (CXONE-AL□□C-V4).

CX-One supported OS: Windows 7, Windows Vista® or Windows XP (SP3 or SP2)  
Except for Windows XP 64-bit version.

## Using CJ-series units and CP1W units with the CP1H



## CJ-Series Units for use with CP1H

Description	Unit Name	Model	Description	Unit Name	Model
Analog I/O and Control Units	Universal Analog Input Unit	CJ1W-AD04U	Motion/Position Control Units	Position Control Units	CJ1W-NC
	Analog Input Unit	CJ1W-AD041-V1		CJ1W-NC	
		CJ1W-AD042		CJ1W-NC	
		CJ1W-AD081-V1		CJ1W-NC	
		CJ1W-AD081-V1		CJ1W-NC	
	Analog Output Unit	CJ1W-DA021		CJ1W-NC	
		CJ1W-DA041		CJ1W-NC	
		CJ1W-DA042V		CJ1W-NC	
		CJ1W-DA08V		CJ1W-NC	
		CJ1W-DA08C		CJ1W-NC	
		CJ1W-DA08C		CJ1W-NC	
	Analog Input/Output Unit	CJ1W-MAD42		MECHATROLINK-II Position Control Unit	CJ1W-NC
	Universal Analog Input Unit	CJ1W-PH41U			CJ1W-NC
	Process Input Unit	CJ1W-PDC15			CJ1W-NC
	Thermocouple Input Unit	CJ1W-PTS15			CJ1W-NC
		CJ1W-PTS51	CJ1W-NC		
	Resistance Thermometer Input Unit	CJ1W-PTS16	MECHATROLINK-II Motion Control Unit		CJ1W-MC
		CJ1W-PTS52			CJ1W-MC
	Temperature Control Loops, Thermocouple Unit	CJ1W-TC001			CJ1W-SC
		CJ1W-TC002			CJ1W-SC
CJ1W-TC003		CJ1W-SC			
CJ1W-TC004		CJ1W-SC			
Temperature Control Loops, RTD	CJ1W-TC101	CJ1W-SC			
	CJ1W-TC102	CJ1W-SC			
	CJ1W-TC103	CJ1W-SC			
	CJ1W-TC104	CJ1W-SC			
Motion/Position Control Units	High Speed Counter Unit	CJ1W-CT021	Communication Units	Serial Communication Units	CJ1W-SC
		CJ1W-CT021		CJ1W-SC	
Control Units	RFID Sensor Controller Unit	RFID Sensor Controller Unit		Ethernet Unit	CJ1W-ET
				EtherNet/IP Unit	CJ1W-EIP
				FL-net Ethernet Unit	CJ1W-FL
				High-speed Data Storage Unit	CJ1W-SP
				DeviceNet Master Unit	CJ1W-DR
				CompoNet Master Unit	CJ1W-CR
				CompoBus/S Master Unit	CJ1W-SR
				Controller Link Unit	CJ1W-CL
				CJ1W-V6	CJ1W-V6
				CJ1W-V6	CJ1W-V6
				CJ1W-V6	CJ1W-V6
				CJ1W-V6	CJ1W-V6
				CJ1W-V6	CJ1W-V6
			CJ1W-V6	CJ1W-V6	
			CJ1W-V6	CJ1W-V6	

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OMRON



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IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

- The application examples provided in this catalog are for reference only. Check functions and safety of the equipment before use.
- Never use the products for any application requiring special safety requirements, such as nuclear energy control systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, or other application involving serious risk to life or property, without ensuring that the system as a whole has been designed to address the risks, and that the OMRON products are properly rated and installed for the intended use within the overall equipment or system.

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

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Largest Supplier of Electrical and Electronic Components

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[XF2J-0824-11A-R100](#) [G3NA-425B-2 DC5-24](#) [MY2N-DC24](#) [XF2J-0824-12A](#) [G8JN-1C7T-R-DC12](#) [G8VA-1A4T-R01-DC12](#) [G8HE-1A7T-](#)  
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