

# CIMON PLC

In English

## CPU

- CM1-XP1U/2U/3U
- CM1-XP1F/2F/3F
- CM1-XP1E/2E/3E
- CM1-XP1A/2A/3A
- CM1-CP3E
- CM1-CP3A/B/P/U
- CM1-CP4E/4F
- CM1-CP4A/B/C/D/U
- CM1-UP1F/2F/3F

# PLC Series

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- For your safety and the safe operation of this product, please read this manual before using the product. The manual is subject to change without notice.
- Please review the product specifications in this manual to determine the suitability of this product for its intended use.
- For your safety only qualified persons should perform electrical and wiring attachments to this product.

## Before You Start

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This manual contains important information on the use and operation of this device. Please read all the information carefully for optimal performance and to prevent any damage or misuse of the device.

To keep products safe, all activities including product installation, wiring operation, and maintenance are required to be treated by trained personnel.

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Safety symbols are classified into two categories: "WARNING" and "CAUTION".



Warning: This symbol describes situations that could cause major or fatal injury to the user.



Caution: This symbol describes situations that may cause minor injury or damage to the device.

SAFETY SYMBOLS USED IN THIS PRODUCT MEAN:



This symbol warns the user of potential hazards.



This symbol warns the user of uninsulated voltage within the unit that can cause dangerous electric shock.

Keep this manual nearby the user operating devices so it can be easily checked.

English

#### Design Precautions (⚠ Warning)

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Please install a safety circuit to protect the entire control system in case of an unexpected power shut-down or PLC module malfunction. Such anomalies may severely compromise the integrity of the overall system.

External to the PLC, please install circuits and switches to safeguard the system from mechanical damages (ex. emergency stop, upper/lower limit switches, forward/reverse direction interlocking circuits, etc)

When the PLC detects either of the following failure conditions, it may stop operation and turn off all outputs.

- The overcurrent protection or overvoltage protection of the power supply module is activated.
- The PLC CPU detected a failure, such as the watchdog timer error or module installation failure, with its self-diagnostic function.

In addition, all outputs may be turned on when there is a failure that the PLC CPU cannot detect, such as in the relay or TR terminal. Build an extra monitoring circuit that will monitor any output signal that could cause serious accidents.

A greater than normal current passed through the PLC for an extended period of time, or a short-circuited load flowing through the output module may cause a fire.

Build a circuit that turns on the external power supply after the PLC power supply is turned on. If the external power supply is turned on first, it could result in output failure or malfunction.

In order to ensure that the system operates safely, please configure an interlock circuit in the scan program for the following situations.

- When exchanging data with a computer or other devices.
- When operated by a computer or other devices.

Not doing so could result in output failure or malfunction.

#### Precautions for design (⚠ Caution)

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Do not bundle the input/output signal or communication cables with the main circuit and power cables. They should be installed at least more than 100 mm (3.94inches) apart. Not doing so could result in output failure or malfunction.

#### Precautions for mounting (⚠ Caution)

Use the PLC in an environment that meets the general specifications given in this manual.

Using this PLC in any environment outside the range of the general specifications could result in electric shock, fire, malfunction, or damage to or deterioration of the product.

Please ensure that each module is installed correctly in its place. Loosely or incorrectly installed pieces may result in malfunction, failure, or free-fall.

The PLC power supply should be turned off before mounting the module. Not doing so could cause an electric shock or damage to the device.

Install I/O devices or extension connectors correctly. If they are installed incorrectly, it may result in an input or output failure.

Do not convey direct vibration into the PLC. Doing so could cause electric shock, fire or malfunctions.

After wiring work, please make sure to close the terminal cover before turning on the power for the PLC system.

#### Precautions for wiring (⚠ Warning)

Make sure to check the device's rated voltage and circuit arrangement before wiring. Failure to do so may cause electric shock or damage to the device.

Make sure to close the terminal cover before turning on the power of the PLC system after wiring work. Failure to do so may cause electric shock.

#### Precautions for wiring (⚠ Caution)

Make sure to check the device's regular voltage and sequence of terminals. Failure to do so may cause fire, electric shock, and malfunctions.

Make sure to tighten the screw with standard torque. Loose connections may cause a short circuit, fire, or malfunctions.

When grounding the FG ground terminals, be sure to conduct the product with at least D type (Class 3) grounding. Not doing so could result in electric shock or malfunctions.

When wiring, make sure that wiring debris does not enter the module. Failure to do so may cause fire, equipment damage or malfunctions.

#### Precautions for wiring of CPU (⚠ Caution)

Only a Class2 circuit can be used as the input power of the CPU module.

The CPU must not be removed from its safety enclosure during operation.

**Precautions for test run and repair (⚠ Warning)**

Please do not touch the terminals when the power is on. Doing so could cause an electric shock or malfunctions.

When cleaning or tightening the screws, turn off the power of the PLC and all other systems. Failure to do so could cause an electric shock or malfunctions.

Do not charge, disassemble, heat up, short, or solder the battery. Doing so could cause the battery to heat up, rupture or ignite thereby harming the user.

**Precautions for test run and repair (⚠ Caution)**

Do not dissociate the PCB from the module's casing or make any modifications to the device. Doing so may cause fire, electric shock, or malfunction.

When mounting or separating the module, make sure to turn off power to the PLC and all other devices. Failure to do so could cause an electric shock, or malfunctions.

Use radio, walkie-talkie, or cellphone devices at least 30 cm away from the PLC. Not doing so could result in malfunction.

**Precautions for disposal (⚠ Caution)**

When the product is disposed of, it should be done according to your country's regulations for similar types of industrial waste. Not doing so may cause an occurrence of toxic substances or explosions.



**Battery Information**

- 1) CM1-CP4E/F, CM1-UPnF:  
CR2032 (Hitachi Maxell), 3V, 10mA
- 2) Others: CR1/2AA (VARTA Microbattery), 3V, 4mA
- 3) If you change the battery, change the same kind of batteries.

## General Specifications

Items	Specification				Standards
Op. Temp	-10°C-60°C				-
St. Temp	-25°C-80°C				-
Op. Hum	5-95% RH, Not condensed				-
St. Hum	5-95% RH, Not condensed				-
Vibration	In case of Intermittent Vibration				IEC 61131-2
	Frequency	Acceleration	Amplitude	Sweep	
	5 ≤ f < 9 Hz	-	3.5 mm	10 times in X, Y, Z	
	9 ≤ f ≤ 150 Hz	9.8 m/s <sup>2</sup> (1G)	-		
	In case of Continuous Vibration				
	Frequency	Acceleration	Amplitude	Sweep	
	5 ≤ f < 9 Hz	-	1.75 mm	10 times in X, Y, Z	
	9 ≤ f ≤ 150 Hz	4.9 m/s <sup>2</sup> (0.5G)	-		
Shock	Max. shock Acc.: 147 m/s <sup>2</sup> (15G) Time: 11 ms Pulse wave: Half sine wave pulse (3 times in X, Y, Z)				IEC 61131-2
Noise	Square Wave Impulse Noise	±2 kV			CIMON Standard
	Electrostatic Discharge	±4 kV (Contact), ±8 kV (Air)			IEC 61131-2 IEC 61000-4-2
	Radiated Electromagnetic Field	80-1000 MHz,10 V/m			IEC 61131-2 IEC 61000-4-3
	Fast Transient Burst Noise (Voltage)	CPU, Power		2kV	IEC 61131-2 IEC 61000-4-4
		Digital/Analog I/O (AC)			
		Digital/Analog I/O (DC)		1kV	
		Communication			
Ambient Conditions	No corrosive gas and no dust				
Altitude	2,000m or less				
Pollution	Pollution Degree 2 or less				
Cooling	Natural Air Cooling				

English

## Performance Specification (XP Series)

Item		Specification		
		CM1-XP1F/U	CM1-XP2F/U	CM1-XP3F/U
Program Control Method		Repetitive operation, Stored Program (ROM mode), Periodic operation		
I/O Control Method		Scan synchronous batch processing system (I/O refresh), Indirect method, Direct method by instruction		
Program Language		IL (Instruction List), LD (Ladder Diagram), FBD (Function Block Diagram), FBD Extension, SFC (Sequential Function Chart)		
Number of Instructions		Basic Instructions: 60, Application instructions: 480		
Data Processing	LD	0.028 µs/step		
	Floating-point Arithmetic	+, -, x, / : 0.4 µs/Instruction		
Program Memory		7M Byte (Upload, Parameter, System)		
Number of Program Blocks		Max 128, up to 65,530 steps per block (PID)		
Number of I/O		8,192	4,092	2,048
Number of I/O Devices		Input: 131,072 points, Output: 131,072 points		
Supporting Program	LD	Scan, Subroutine, Initialize (COLD), Initialize (HOT), Periodic interrupt		
	Special Configuration	Initializing special card, PID control, Thermistor setting, Loadcell setting, I/O Input module filter setting		
	Communication	User protocol (Serial), User protocol (Ethernet), MODBUS TCP/RTU Master/Slave, Ethernet High-speed link, CIMON-NET Master/Slave, DNP 3, Public network IP setting, Fieldbus, OPC UA Server		
	SFC	SFC Program		
Periodic Interruption		Maximum 15, cycle setting (10–60,000 ms, Unit :10 ms), priority setting (0–14)		
Base Expansion		Maximum 16, Ring topology		
Max. Distance		Electricity (100 m)		
Redundancy				
Operation modes		LOCAL/Remote (RUN, STOP, PAUSE)		
Restarting		Cold, Hot Restart		
Self-Diagnosis		Monitoring delay of processing, problems of memory, I/O, battery, power error		
Data Preservation Against Power Failure		K device and conservation (Latch) in M, L, T, C, S, D device		
Watch Dog Timer (WDT)		Maximum 5000 ms (Unit: 10 ms)		
Timer		On Delay, Off Delay, Addition, Monostable, Retriggerable Cycle: Either 10 or 100 ms TC (Current value)/TS (Setting value)		
Counter		UP, DOWN, UP/DOWN, RING COUNTER, CC (Current value)/CS (Setting value) No limitation on number of points Count range: -32,768-32,767		
PID		32 Channels, Auto-Tuning		



## Performance Specification (XP Series)

Communication Channels	USB	USB 2.0 Mini-B: For Loader Protocol		
	Serial	RS-232C (Maximum 115,200 bps): CICON Loader, CIMON-HMI, MODBUS RTU Slave		
	Ethernet	Expanded/Built-in Ethernet :10/100Base-T/TX, -FX Built-in Ethernet: CICON Loader, CIMON-HMI, Modbus TCP Slave <i>*Available to use Built-in Ethernet when nonuse of expansion.</i>		
Event log		Maximum 100 (Power, Mode, Error)		
Firmware Upgrade		Available		
Power		5 Vdc, 220 mA		
Weight (g)		138 g		
Floating-point Arithmetic		Supporting instructions for floating-point arithmetic		
Capacity of Scan Program		128k steps		
Device Memory	X	8,192	4,096	2,048
	Y	8,192	4,096	2,048
	M	16,000		
	K	16,000		
	L	16,000		
	F	2,048		
	T	4,096 (select between 10 ms and 100 ms)		
	C	4,096		
	S	100Card*100Step		
	D	32,000 Word		
	Z	2,048 Word		
	Q	512 Word		
	R	16 Word		

English

## Performance Specification (XP Series)

Item		Specification		
		CM1-XP1E	CM1-XP2E	CM1-XP3E
Program Control Method		Repetitive operation, Stored Program (ROM mode), Periodic operation		
I/O Control Method		Scan synchronous batch processing system (I/O refresh), Indirect method, Direct method by instruction		
Program Language		IL (Instruction List), LD (Ladder Diagram), FBD (Function Block Diagram), FBD Extension, SFC (Sequential Function Chart)		
Number of Instructions		Basic Instructions: 60, Application Instructions: 480		
Data Processing	LD	0.028 μs/step		
	Floating-point Arithmetic	+, -, x, / : 0.4 μs/instruction		
Program Memory		7 MByte (Upload, Parameter, System)		
Number of Program Blocks		Max 128, up to 65,530 steps per block (PID)		
Number of I/O		8,192	4,092	2,048
Number of I/O Devices		Input: 131,072 points, Output: 131,072 points		
Supporting Program	LD	Scan, Subroutine, Initialize (COLD), Initialize (HOT), Periodic interrupt		
	Special Configuration	Initializing special card, PID control, Thermistor setting, Loadcell setting, I/O input module filter setting		
	Communication	User protocol (Serial), User protocol (Ethernet), MODBUS TCP/RTU Master/Slave, Ethernet High-speed link, CIMON-NET Master / Slave, DN P3, Public network IP setting, Fieldbus, OPC UA Server		
	SFC	SFC Program		
Periodic Interruption		Maximum 15, cycle setting (10–60,000 ms, Unit :10 ms), priority setting (0–14)		
Base Expansion		Maximum 16 (10/100Base-T/TX)		
Max. Distance		Electricity (100 m)		
Redundancy				
Operation Modes		LOCAL/Remote (RUN, STOP, PAUSE)		
Restarting		Cold, Hot Restart		
Self-Diagnosis		Monitoring delay of processing, problems of memory, I/O, battery, power error		
Data Preservation Against Power Failure		K device and conservation (Latch) in M, L, T, C, S, D device		
Watch Dog Timer (WDT)		Maximum 5000 ms (Unit: 10 ms)		
Timer		On Delay, Off Delay, Addition, Monostable, Retriggerable Cycle: Either 10 or 100 ms TC (Current value)/TS (Setting value)		
Counter		UP, DOWN, UP/DOWN, RING COUNTER, CC (Current value)/CS (Setting value) No limitation on number of points Count range: -32,768-32,767		
PID		32 Channels, Auto-Tuning		

## Performance Specification (XP Series)

Communication Channels	USB	USB 2.0 Mini-B: For Loader Protocol		
	Serial	RS-232C (Maximum 115,200 bps): CICON Loader, CIMON-HMI, MODBUS RTU Slave		
Event log		Power, Mode, Error		
Firmware Upgrade		Available		
Power		5 Vdc, 220 mA		
Weight (g)		138 g		
Floating-point Arithmetic		Supporting instructions for floating-point arithmetic		
Capacity of Scan Program		128k steps		
Device Memory	X	8,192	4,096	2,048
	Y	8,192	4,096	2,048
	M	16,000		
	K	16,000		
	L	16,000		
	F	2,048		
	T	4,096 (select between 10 ms and 100 ms)		
	C	4,096		
	S	100 Card*100 Step		
	D	32,000 Word		
	Z	2,048 Word		
	Q	512 Word		
	R	16 Word		

English

## Performance Specification (XP Series)

Item		Specification		
		CM1-XP1A	CM1-XP2A	CM1-XP3A
Program Control Method		Repetitive operation, Stored Program (ROM mode), Periodic operation		
I/O Control Method		Scan synchronous batch processing system (I/O refresh), Indirect method, Direct method by instruction		
Program Language		IL (Instruction List), LD (Ladder Diagram), FBD (Function Block Diagram), FBD Extension, SFC (Sequential Function Chart)		
Number of Instructions		Basic Instructions: 60, Application Instructions: 480		
Data Processing	LD	0.075 µs/step		
	Floating-point Arithmetic	+, -, x, / : 0.4 µs/instruction		
Program Memory		7 MByte (Upload, Parameter, System)		
Number of Program Blocks		Max 128, up to 65,530 steps per block (PID)		
Number of I/O		8,192	4,092	2,048
Number of I/O Devices		Input: 131,072 points, Output: 131,072 points		
Supporting Program	LD	Scan, Subroutine, Initialize (COLD), Initialize (HOT), Periodic interrupt		
	Special Configuration	Initializing special card, PID control, Thermistor setting, Loadcell setting, I/O Input module filter setting		
	Communication	User protocol (Serial), User protocol (Ethernet), MODBUS TCP/RTU Master, Ethernet High-speed link, CIMON-NET Master/Slave, DNP3, Public network IP setting, Fieldbus		
Periodic Interruption		Maximum 15, cycle setting (10–60,000 ms, Unit :10 ms), priority setting (0–14)		
Base Expansion		Maximum 16 (10Base-T)		
Max. Distance		Electricity (100 m)		
Redundancy		-		
Operation Modes		LOCAL/Remote (RUN, STOP, PAUSE)		
Restarting		Cold, Hot Restart		
Self-Diagnosis		Monitoring delay of processing, problems of memory, I/O, battery, power error		
Data Preservation Against Power Failure		K device and conservation (Latch) in M, L, T, C, S, D device		
Watch Dog Timer (WDT)		Maximum 5000 ms (Unit: 10 ms)		
Timer		On Delay, Off Delay, Addition, Monostable, Retriggerable Cycle: Either 10 or 100 ms TC (Current value)/TS (Setting value)		
Counter		UP, DOWN, UP/DOWN, RING COUNTER, CC (Current value)/CS (Setting value) No limitation on number of points Count range: -32,768-32,767		
PID		32 Channels, Auto-Tuning		

## Performance Specification (XP Series)

Communication Channels	USB	USB 2.0 B Type: For Loader Protocol		
	Serial	RS-232C (Maximum 38,400 bps): CICON Loader / Type: RJ11		
Event log		Power, Mode, Error		
Firmware Upgrade		-		
Power		5 Vdc, 220 mA		
Weight (g)		157 g		
Floating-point Arithmetic		Supporting instructions for floating-point arithmetic		
Capacity of Scan Program		128k steps	64k steps	64k steps
Device Memory	X	8,192	4,096	2,048
	Y	8,192	4,096	2,048
	M	16,000		
	K	16,000		
	L	16,000		
	F	2,048		
	T	4,096 (select between 10 ms and 100 ms)		
	C	4,096		
	S	100 Card*100 Step		
	D	32,000 Word		
	Z	2,048 Word		
	R	16 Word		

English

## Performance Specification (CP Series)

Item		Specification		
		CM1-CP3E	CM1-CP4E	CM1-CP4F
Program Control Method		Repetitive operation, Stored Program (ROM mode), Periodic operation		
I/O Control Method		Scan synchronous batch processing system (I/O refresh), Indirect method, Direct method by instruction		
Program Language		IL (Instruction List), LD (Ladder Diagram), FBD (Function Block Diagram), FBD Extension, SFC (Sequential Function Chart)		
Number of Instructions		Basic Instruction: 60, Application instruction: 480		
Data Processing	LD	0.084 μs/step	0.2 μs/step	
Program Memory		512 Kbyte	256 Kbyte	
Number of Program Blocks		Max 128, up to 65,530 steps per block (PID)		
Number of I/O		1,536	384	
Number of I/O Devices		32,768	8,192	
Supporting Program	LD	Scan, Subroutine, Initialize (COLD), Initialize (HOT), Periodic interrupt		
	Special Configuration	Initializing special card, PID control, Thermistor setting, Loadcell setting, I/O Input module filter setting		
	Communication	User protocol (Serial), User protocol (Ethernet), MODBUS TCP/RTU Master, Ethernet High-speed link, CIMON-NET Master / Slave, DNP3, Public network IP setting, Fieldbus, OPC UA Server		
	SFC	SFC Program		
Periodic Interruption		Maximum 15, cycle setting (10–60,000 ms, Unit :10 ms), priority setting (0–14)		
Base Expansion		Maximum 16 (10Base-T)	-	
Max. Distance		Electricity (100 m)	-	
Redundancy		-		
Operation Modes		LOCAL/Remote (RUN, STOP, PAUSE)		
Restarting		Cold, Hot Restart		
Self-Diagnosis		Monitoring delay of processing, problems of memory, I/O, battery, power error		
Data Preservation Against Power Failure		K device and conservation (Latch) in M, L, T, C, S, D device		
Watch Dog Timer (WDT)		Maximum 5000 ms (Unit: 10 ms)		
Timer		On Delay, Off Delay, Addition, Monostable, Retriggerable Cycle: Either 10 or 100 ms TC (Current value)/TS (Setting value)		
Counter		UP, DOWN, UP/DOWN, RING COUNTER, CC (Current value)/CS (Setting value) No limitation on number of points Count range: -32,768-32,767		
PID		32 Channels, Auto-Tuning		

## Performance Specification (CP Series)

Communication Channels	USB	USB 2.0 B Mini-B: For Loader Protocol		
	Serial	RS-232C (Maximum 38,400 bps): CICON Loader, CIMON-HMI, MODBUS RTU Slave / Type: Terminal Block		RS-485 (Maximum 115,200 bps): CICON Loader, CIMON-HMI, MODBUS RTU Slave / Type: RJ45
	Ethernet	Expanded: 10Base-T	-	
Event log		Power, Mode, Error		
Firmware Upgrade		Available		
Power		5 Vdc, 195 mA	5 Vdc, 70 mA	5 Vdc, 100 mA
Weight (g)		140 g	127 g	137 g
Floating-point Arithmetic		-		
Capacity of Scan Program		64k steps	16k steps	
Device Memory	X	1,536	384	
	Y	1,536	384	
	M	8,192		
	K	2,048		
	L	2,048		
	F	2,048		
	T	1,024 (select between 10 ms and 100 ms)		
	C	1,024		
	S	100 Card*100 Step		
	D	10,000 Word	5,000 Word	
	Z	1,024 Word		
	Q	512 Word		
	R	16 Word		

English

## Performance Specification (CP Series)

Item		Specification			
		CM1-CP3A	CM1-CP3B	CM1-CP3U	CM1-CP3P
Program Control Method		Repetitive operation, Stored Program (ROM mode), Periodic operation			
I/O Control Method		Scan synchronous batch processing system (I/O refresh), Indirect method, Direct method by instruction			
Program Language		IL (Instruction List), LD (Ladder Diagram), FBD (Function Block Diagram), FBD Extension			
Number of Instructions		Basic Instructions: 60, Application Instructions: 480			
Data Processing	LD	0.2 $\mu$ s / Step			
Program Memory		512 Kbyte			
Number of Program Blocks		Max 128, up to 65,530 steps per block (PID)			
Number of I/O		1,024			
Number of I/O Devices		Input: 32,768 points, Output: 32,768 points			
Supporting Program	LD	Scan, Subroutine, Initialize (COLD), Initialize (HOT), Periodic interrupt			
	Special Configuration	Initializing special card, PID control, Thermistor setting, Loadcell setting , I/O Input module filter setting			
	Communication	User protocol (Serial), User protocol (Ethernet), MODBUS TCP/RTU M aster, Ethernet High-speed link, CIMON-NET Master/Slave, DNP3, Pub lic network IP setting, Fieldbus			
Periodic Interruption		Maximum 15, cycle setting (10–60,000 ms, Unit :10 ms), priority setting (0–14)			
Base Expansion		Maximum 16 (10Base-T)			
Max. Distance		Electricity (100 m)			
Redundancy		-			
Operation Modes		LOCAL/Remote (RUN, STOP, PAUSE)			
Restarting		Cold, Hot Restart			
Self-Diagnosis		Monitoring delay of processing, problems of memory, I/O, battery, power error			
Data Preservation Against Power Failure		K device and conservation (Latch) in M, L, T, C, S, D device			
Watch Dog Timer (WDT)		Maximum 5000 ms (Unit: 10 ms)			
Timer		On Delay, Off Delay, Addition, Monostable, Retriggerable Cycle: Either 10 or 100 ms TC (Current value)/TS (Setting value)			
Counter		UP, DOWN, UP/DOWN, RING COUNTER, CC (Current value)/CS (Setting value) No limitation on number of points Count range: -32,768-32,767			
PID		32 Channels, Auto-Tuning			



## Performance Specification (CP Series)

Communication Channels	USB			USB 2.0 B Type: For Loader Protocol	
	Serial	RS-232C (Maximum 38,400 bps): CICON Loader / Type: RJ11			
	Ethernet	Expanded: 10Base-T			
Event log		Power, Mode, Error			
Firmware Upgrade		-			
Power		5 Vdc, 240 mA			
Weight (g)		135 g	135 g	153 g	139 g
Floating-point Arithmetic		-			
Capacity of Scan Program		32k steps			
Device Memory	X	1,024			
	Y	1,024			
	M	8,192			
	K	2,048			
	L	2,048			
	F	2,048			
	T	1,024 (select between 10 ms and 100 ms)			
	C	1,024			
	S	100 Card*100 Step			
	D	10,000 Word			
	Z	1,024 Word			
	R	16 Word			

English

## Performance Specification (UP Series)






Items		Performance Specification		
		CM1-UP1F	CM1-UP2F	CM1-UP3F
Program Control Method		Repetitive Operation, Periodic Operation, Stored Program		
I/O Control Method		Scan synchronous batch processing system (I/O Refresh), Direct method by instruction		
Program Language		LD (Ladder Diagram), IL (Instruction List), FBD (Function Block Diagram), FBD Extension, SFC (Sequential Function Chart), ST (Structured Text)		
No. of Instructions		Basic Instructions: approx. 60 Application Instructions: approx. 480		
Data Processing	LD	0.075 $\mu$ s/step		
	MOV	0.049 $\mu$ s/step		
	Floating-point Arithmetic	+, -, $\times$ , / : 0.050 $\mu$ s/Instruction		
Program Memory		7 MByte (Upload, Parameter, System)		
No. of Program Blocks		Scan, Special, Comm., SFC Program: Max. 128 blocks. Max 65,530 steps per block (PID) ST Program: Max. 128 blocks		
No. of I/O		16,384 points	8,192 points	4,096 points
Max. No. of valid I/O		16,384 points	8,192 points	4,096 points
Supported Programs	LD	Scan, Subroutine, Initialize (COLD/HOT), Periodic Interrupt		
	Special Config.	Initializing Special Card, PID Control, Thermistor Setting, Loadcell Setting, I/O Input Module Filter Setting		
	Communication	User Protocol (Serial/Ethernet), MODBUS TCP/RTU Master, Ethernet High-speed Link, CIMON-NET Master/Slave, DNP3, Public Network IP Setting, Fieldbus, OPC UA Server		
	SFC	SFC Program		
	ST	ST Program (ST-only local variables/global variables)		
Periodic Interruption		Max. 15, cycle setting (1-60,000 ms, unit: 1 ms), Priority (0-14)		
Base Expansion		Local Base + Max. 31 Expansions (Line-Expansion)		
Max. Distance		Electricity (100 m)		
Redundancy		-		
Operation Modes		LOCAL/Remote (RUN, STOP, PAUSE), Switch (RUN, STOP, Pause/RM)		
Restarting		Cold, Hot Restart		
Self-Diagnosis		Monitoring Process Delay, Memory Errors, I/O Errors, Power Errors, Battery Errors		
Data Preservation Against Power Failure		K Device and Conservation area (Latch) in M, L, T, C, S, D Device		
Watch Dog Timer (WDT)		10-5000 ms (Unit: 10 ms)		

## Performance Specification (UP Series)

<b>Timer</b>		Cycle: 0.01 second-6553.5 seconds (10 or 100 ms) On Delay, Off Delay, Integration, Monostable, Retriggerable		
<b>Counter</b>		Counter Range: -32,768-32,767 UP, DOWN, UP/DOWN, RING COUNTER		
<b>PID</b>		32 Channels, Auto-Tuning		
<b>Communication Channels</b>	<b>USB</b>	Serial: Loader Protocol only		
	<b>Serial</b>	RS-232C (Max. 115,200 bps) Supported Protocols: CICON Loader, CIMON-HMI, MODBUS RTU Slave		
	<b>Ethernet (2 Ports)</b>	Speed: 10/100/1000 Mbps Expansion or Ethernet Comm. (Port A: Ethernet Comm., Port B: Expansion) Supported Comm. (Ethernet): CICON Loader, CIMON-HMI, MODBUS TCP Slave		
<b>Event Log</b>		Max. 100 event logs (Power, Mode, Error)		
<b>Firmware Upgrade</b>		Supported		
<b>Power</b>		5 Vdc, less than 250 mA		
<b>Weight (g)</b>		130 g (±5 g)		
<b>Floating-point Arithmetic</b>		Supports floating-point arithmetic instructions		
<b>Additional Features</b>		I/O Reservation, PLC-LINK, RTC, Online Edit, Program download via SD Card, Whole system backup/recovery, Device backup/recovery, System log backup		
<b>Scan Program Capacity</b>		256k steps	128k steps	64k steps
<b>Device Memory</b>	<b>X</b>	16,384 Points	8,192 Points	4,096 Points
	<b>Y</b>	16,384 Points	8,192 Points	4,096 Points
	<b>M</b>	65,536 Points		
	<b>K</b>	65,536 Points		
	<b>L</b>	65,536 Points		
	<b>F</b>	4,096 Points		
	<b>T</b>	4,096 (select between 10 ms, 100 ms)		
	<b>C</b>	4,096		
	<b>S</b>	100 Cards * 100 Steps		
	<b>D</b>	32,767 Words		
	<b>Z</b>	1,024 Words		
	<b>Q</b>	8,192 Points		
	<b>R</b>	16 Words		

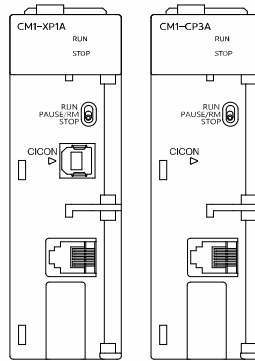
English

## CPU Comm. Port / Supported Protocol (CP Series)







Interface		RS-232 (Loader only)	USB (Loader only)	RS-232	RS-232	RS-422/485	Ethernet (Expansion)
Connector							
Location		Front	Front	Front	Bottom		Bottom
CP3	A/B/P	Yes	No	No	No	No	Yes
	U	Yes	Yes(B)	No	No	No	
	E	No	Yes(mini-B)	Yes (Loader, HMI, Modbus/RTU)	No	No	
CP4	A/B	Yes	No	No	No	No	No
	C	Yes	No	No	Yes (Loader, HMI)	No	
	D	Yes	No	No	No	Yes	
	U	Yes	Yes(B)	No	No	(Loader, HMI)	
	E	No	Yes(mini-B)	Yes (Loader, HMI, Modbus/RTU)	No	No	
	F	No	Yes(mini-B)			Yes (Loader, HMI, Modbus/RTU)	

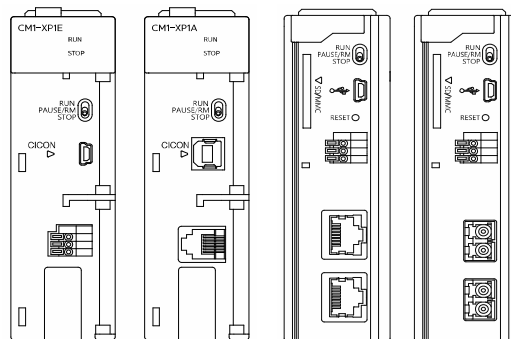
► Same features in XnPnA, CP3U, CP4U

► Same features in CP3A/B/P, CP4A/B/C/D








## CPU Comm. Port / Supported Protocol (XP Series)

Interface		RS-232 (Loader only)	USB (Loader only)	RS-232	RS-232	RS-422/485	Ethernet	
Connector		<div>RJ11</div> 	<div>B or mini-B</div> 	<div>Terminal Block</div> 	<div>RJ45</div> 			<div>RJ45</div>  <div>or Optic</div> 
Location		Front	Front	Front	Bottom		Bottom	
XP	1A/2A/3A	No	Yes (B)	No	No	No	Yes (RJ45) (Expansion)	
	1B/2B/3B /1E/2E/3E	No	Yes (mini-B)	Yes (Loader, HMI, Modbus/RTU)	No	No	Yes (RJ45) (Expansion)	
	1F/2F/3F /1U/2U/3U	No	Yes (mini-B)	Yes (Loader, HMI, Modbus/RTU)	No	No	Yes (RJ45/Optic (Expansion or Ethernet Comm. – Loader, HMI, Modbus/TCP)	

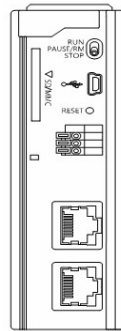


English

## CPU Comm. Port / Supported Protocol (UP Series)

Interface		RS-232C (Loader only)	USB (Loader Only)	RS-232C	RS-232C	RS-422/485	Ethernet
Connector							
Location		Front	Front	Front	Bottom		Bottom
UP	1F/2F/3F	No	Yes(mini-B)	Yes (Loader, HMI, Modbus/RTU)	No	No	Yes (RJ45) * Port A: Ethernet Comm.- Loader, HMI, Modbus/TCP * Port B: Expansion

\* XPnF/U, UPnF have identical appearance



### ► Recommendations on using USB Cable

1. Recommended to use CIMON's shielded cable within 3 m length.
2. In case of using PC that is vulnerable to noises, it is recommended to use USB Hub or Isolator.

## Device & Address

### ► Device

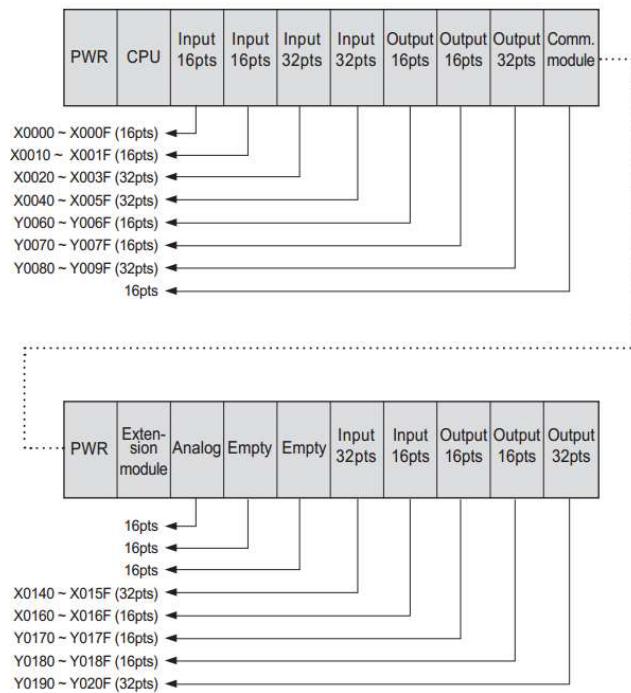
- Input: X
- Sub Relay: M
- Timer: T
- Data Device: D
- Link Relay: L
- Special Relay: F
- Output: Y
- Keep Relay: K
- Counter: C
- Sub Data Device: @D
- Step control Relay: S
- Index register: R

### ► Device Address

- Bit Data: [Device]+[Card No.]+[Bit No.]
  - Device: X, Y, M, K, L, F, Card No.: 10Dec (Decimal). 3 Characters
  - Bit No.: 16Hex. 1 Character
  - Ex) X0100-> 10Dec. (word) + 16Hex (Last Bit): [10th Address and 0th bit]
- Word Data: [Device]+[Card No.]
  - Device: D, Z, T, C, Card No.: 10Dec. 4 Characters
  - Ex) D0100-> 10Dec.(word): [100th word Address]
- Timer, Counter Output: [Device]+[Bit No.]
  - Device: T, C, Bit No.: 10Dec 4 Characters
  - Ex) T0100-> 10Dec.(word): [T 100th Bit Address]
- Step Controller I/O: [Device]+[Card No.]+[.]+[Step No.]
  - Device: S
  - Card No.: 10Dec. 2 Characters, Step No.: 10Dec. 2Characters
  - Ex) Sxx.xx -> xx is 10Dec.(0~99)
- Assign Bit Device to Word: [Device]+[Card No.]+[0]
  - Device: X, Y, M, K, L, F, Card No.: 10Dec. 3 Characters
  - Ex) X010-> 10Dec. (word): [X 10th Address]

English

## I/O points for Slot



- ▶ Slot number is assigned in order from left except Power and CPU module.
- ▶ The analog, communication, special module and empty slot has 16 points (1 Word) each.



### ► Built-In Functions

- PID Control
  - It operates 32 Loops PID without PID module.
- RTC (Except CP\*A type)
  - It reads time from RTC and saves it in F memory device.
- Input and Output Reservation
  - It scans and detects module at designated slot.
  - It refers to a reservation function which writes a program without I/O change in case of extension, damage or module replacement.
- Online Edit
  - Scan program can be edited when CPU is in RUN mode (Online).
- Serial Communication
  - Available for communication using Loader, HMI, Modbus/RTU Slave.
  - RS-232 Port (UPnF/XPnE/F/U, CP3C, CP3E, CP4E/F)
  - RS-422/485 Port (CP4D/U, CP4F)
- Ethernet Communication (XPnF/U, UPnF)
  - In case of XPnF/U, the Ethernet communication is available when expansion function is not used.
  - Available for communication using Loader, HMI, Modbus/TCP Slave.
  - In case of UPnF, the Ethernet communication and expansion function can be used at the same time. (Port A: Ethernet communication, Port B: Expansion)

### ► Self-Diagnostic Functions

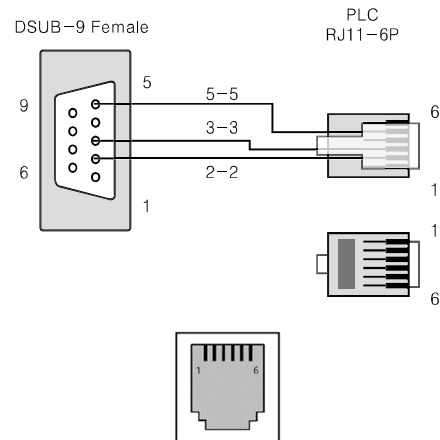
- Watch-Dog Timer
  - It detects delayed operation error in the program.
- Module Installation in Slot
  - It detects whether the module is installed in slot.
- Memory Error
  - In case of error in flash memory of CPU module or dual port RAM of special module, error will save in F memory device.
- Battery Error
  - If the battery goes down under standard voltage, F34 will be turned ON.
- Power Error
  - If the input voltage to Power module is lower than standard range, RUN and STOP lamp will blink.

## RS-232 (RJ11, Loader) Interface

► RJ11 (6Pin) port is built-in for RS-232 (Loader Only)

Pin No.	Signal Name	Description
1	-	-
2	TXD	Transmit Data
3	RXD	Receive Data
4	-	-
5	SGND	Signal Ground
6	-	-

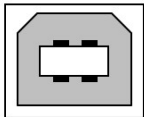
Normal wiring for USB to Serial (RS-232) Converter (CM0-CBL15/30)



## USB (Loader) Interface

- USB B type or mini-B type for Loader

USB B Type



USB Mini-B Type

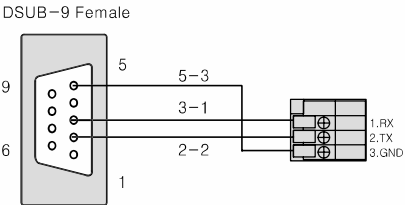


## RS-232 (Terminal Block) Interface

- 3 Pin spring type Terminal Block for RS-232
- 2.54 mm Pitch 3pin / PCB Spring type / AWG 26-20

Pin No.	Signal Name	Description
1	RX	Receive Data
2	TX	Transmit Data
3	SGND	Signal Ground

Normal wiring for USB to Serial (RS-232) Converter.



## RS-232 (RJ45) Interface

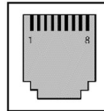
### ► RJ45 connector for RS-232

#### Modem (Flow Control)

Pin No.	Signal Name	Description
1	DSR/RI	Data set Ready / Ring Indicator
2	DCD	Data Carrier Detect
3	DTR	Data Terminal Ready
4	SGND	Signal Ground
5	RXD	Receive Data
6	TXD	Transmit Data
7	CTS	Clear to Send
8	RTS	Request To Send

#### Null Modem (Non Flow Control)

Pin No.	Signal Name	Description
1		
2		
3		
4	SGND	Signal Ground
5	RXD	Receive Data
6	TXD	Transmit Data
7		
8		



## RS-422/485 (RJ45) Interface

### ► RJ45 connector for RS-422/485

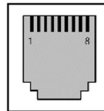
#### RS-422

Pin No.	Signal Name	Description
1	TXD+	Send Data (+)
2	TXD-	Send Data (-)
3	RXD+	Receive Data (+)
4	-	-
5	RXD-	Receive Data (-)
6	-	-
7	-	-
8	SGND	Signal Ground

#### RS-485

Pin No.	Signal Name	Description
1	TRXD+	Transmit/Receive Data (+)
2	TRXD-	Transmit/Receive Data (-)
3	TRXD+	Transmit/Receive Data (+)
4	-	-
5	TRXD-	Transmit/Receive Data (-)
6	-	-
7	-	-
8	SGND	Signal Ground

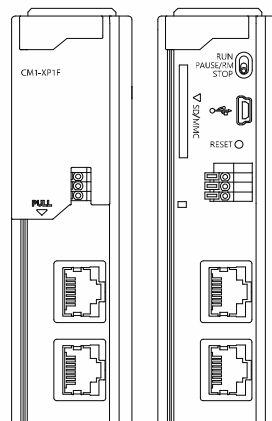
※ Connect Pin 1-3, Pin 2-4



English

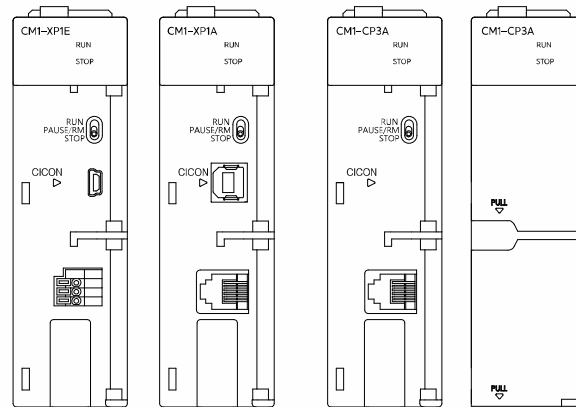
## Appearance

- Same features in XPnF/U, UPnF.



## Appearance

- ▶ Same features in XpNE, CPnE/F.
- ▶ Same features in XpNA, CP3U, CP4U.
- ▶ Same features in CP3A/B/P, CP4A/B/C/D.

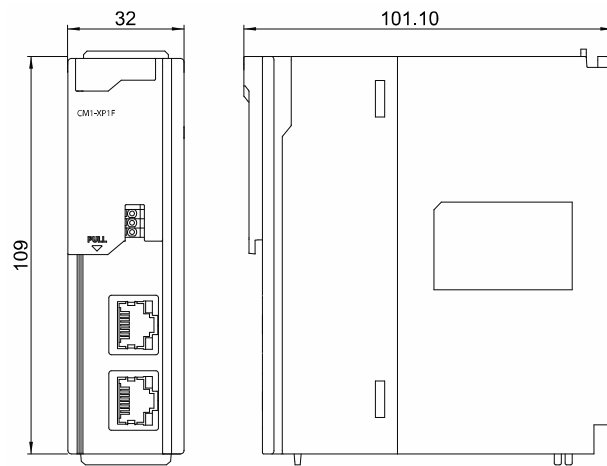


English

## Dimensions

► Same features in XPnF/U, UPnF.

(Unit: mm)

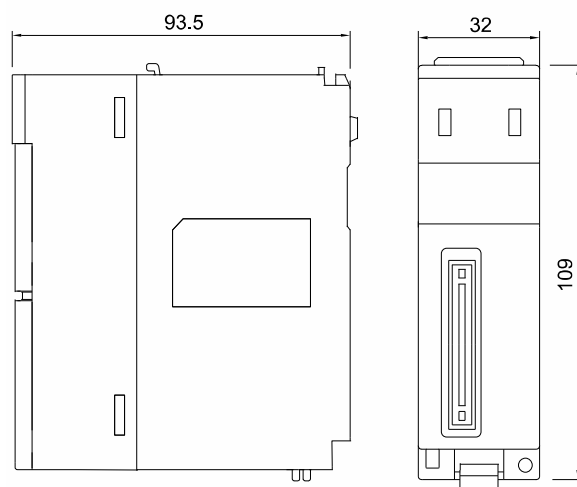




## Dimensions

► Same features in XPnE, XPnA, CPnE/F, CP3A/B/P/U, CP4A/B/C/D/U

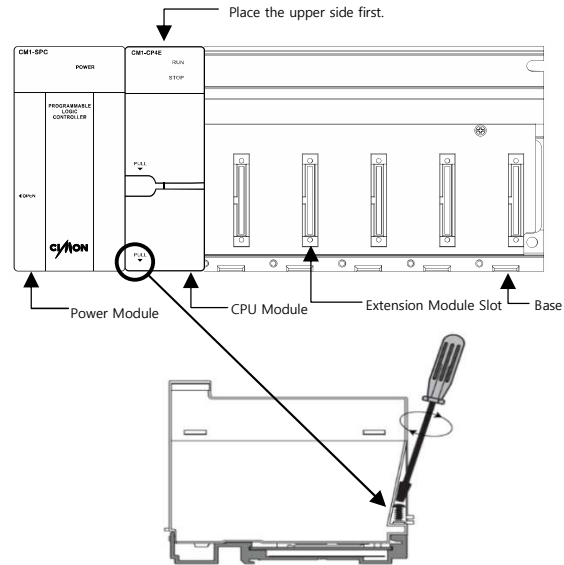
(Unit: mm)



English

## Installation

1. When installing the module, mount the upper side of the module at the top of the base first.  
And push down the bottom side of the module until it clicks.
2. Then, tighten the screw at the bottom of the module to avoid falling out of the slot in case of vibration or shock.
3. Place the power module on the leftmost slot of the base, and then place the CPU module on the next slot. The position of the power module and CPU module are marked on the base. If you place modules in the wrong slot, the module will not be fully attached.
4. Supporting Modules are as follows:
  - 1) Power Module: CM1-SPA, CM1-SPC, CM1-SP2B, CM1-SPW  
\* Power redundancy system: Only CM1-SPR (Power module), CM1-XP1R (CPU Module)
  - 2) Base Modules: CM1-BS03A/04A/05A/08A/10A/12A  
\* Power redundancy system: Only CM1-BS05S/08S/10S



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**Repaired or replaced Products provided as a result of this warranty are warranted for a period of 90 days from the shipment to buyer or the remainder of the original warranty term for that particular product, whichever is longer.** CIMON's standard policy is that all customers are responsible for freight charges to CIMON when returning products under the warranty return policy.

This warranty will be void if Products date codes, serial numbers, or seals are removed or defaced. Warranties do not apply to products that have been subjected to abnormal use, abnormal conditions, improper storage, exposure to moisture or dampness, unauthorized modifications, unauthorized repair, misuse, neglect, accident, alteration, improper installation or other acts which are not the fault of CIMON, including damage caused in shipping. Our warranty also does not apply to any product that has been damaged by external causes such as fire, flood, sand, dirt, lightning, acts of God, battery leakage, theft, blown fuses, improper use of any electrical source or connection to product not recommended in writing for interconnection by CIMON.

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To minimize the risk of potential safety problems, you should follow all applicable local and national codes that regulate the installation and operation of your equipment. These codes vary from area to area and usually change with time. It is your responsibility to determine which codes should be followed, and to verify that the equipment, installation and operation is in compliance with the latest revision of these codes.

English

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English

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