

# MC100/MC80 Series PLC Main Module & Expansion Module

## User Quick Start Manual

Thank you for using MC100/MC80 series PLC. Before using the product, please carefully read this manual so as to better understand it, fully use it, and ensure safety. This quick start manual is to offer you a quick guide to the design, installation, connection and maintenance of MC100/MC80 series PLC, convenient for on-site reference.

This manual is for the following series members:

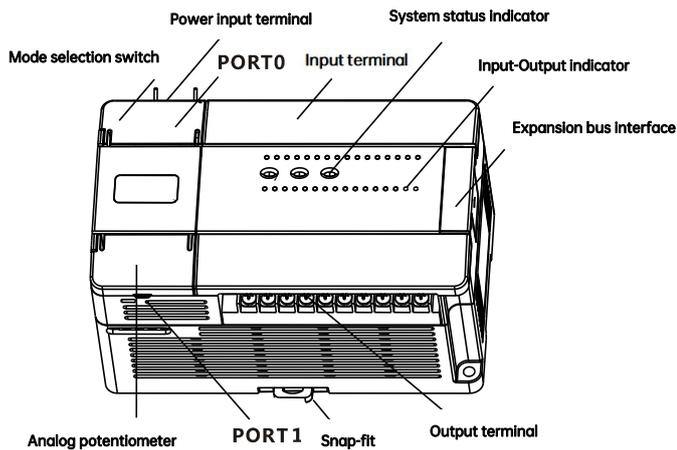
- MC100 Series Main Module (AC Power Supply)
- MC100 Series Main Module (DC Power Supply)
- MC100 Series Passive I/O Expansion Module
- MC80 Series Main Module

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 Revision Date: 2010-1-18  
 BOM Code: R29090027

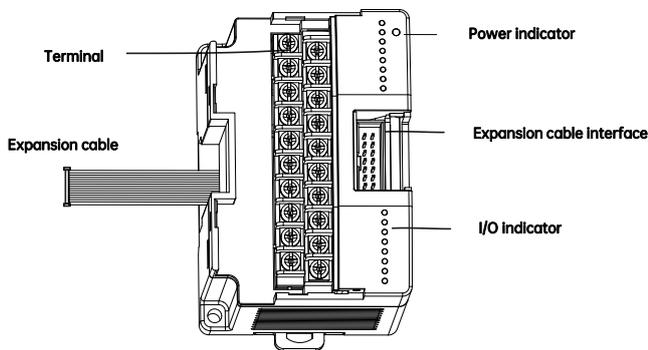
For detailed product information, please refer to *MC100/MC80 Series PLC User Manual*, *X-Builder Programming Software User Manual*, and *MC200/MC100 Series PLC Programming Reference Manual*. For ordering the above user manuals, contact your Megmeet distributor or sales office.

### 1. Appearance and Part Name

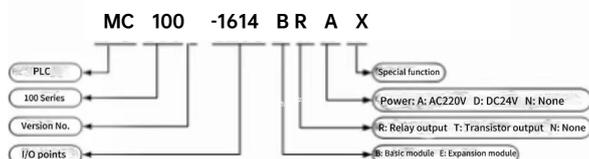
#### 1.1 Appearance of main module



#### 1.2 Appearance of expansion module



### 2. Model



### 3. Installation Description

#### 3.1 Environmental Temperature

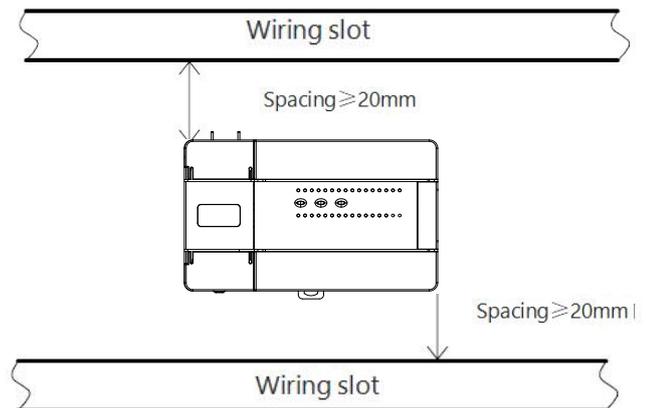
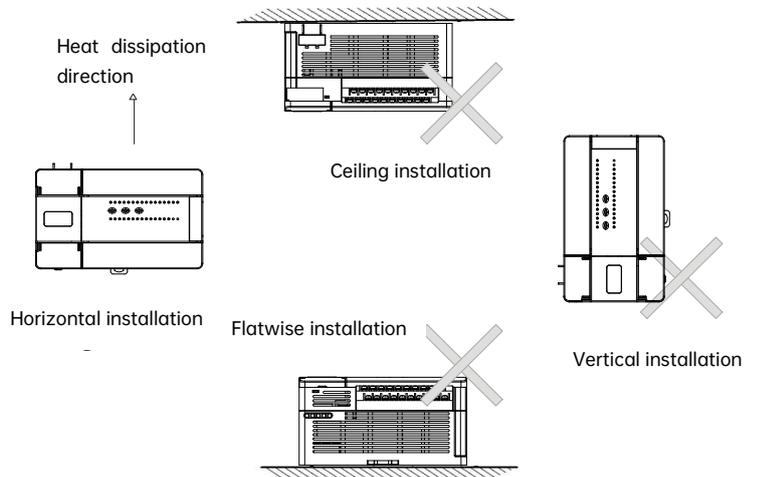
Temperature range for PLC usage: -5°C~55°C. A well-ventilated place should be selected when the ambient temperature exceeds 55° C for a long time.

#### 3.2 Installation Site

- ◆ Place without corrosion, flammable and explosive gas and liquid.
- ◆ Solid place without vibration.
- ◆ This controller is designed for II standard installation environment and 2-level pollution occasions.

#### 3.3 Installation Method

The PLC must be installed horizontally on the backplane of the electrical cabinet, and maintain a distance of more than 20cm from the peripheral equipment or cabinet wall. The installation in other directions is not conducive to the PLC heat dissipation, and there can be no heating equipment under the PLC. As shown in the picture below:

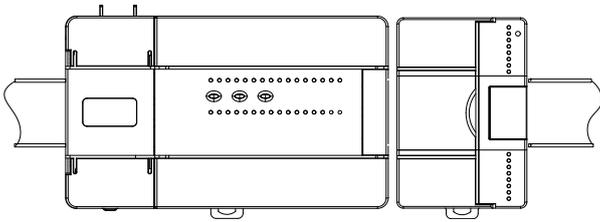


#### 3.4 Installation Method

##### DIN rail mounting

Generally, you can mount the PLC onto a 35mm-wide rail (DIN). Open the DIN snap-fit at the bottom of the module and lock the bottom of the module onto the DIN rail;

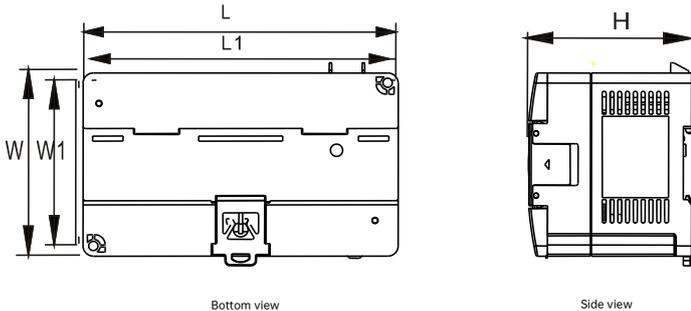
Rotate module close to the DIN guide rail and close the DIN snap-fit with a double-checking, as the following figure:



### Screw fixing

Fixing the PLC with screws can stand greater shock than DIN rail mounting. M3 screws can be chosen to fix the PLC onto the backboard of the electric cabinet through the mounting holes on PLC enclosure, as the following figure.

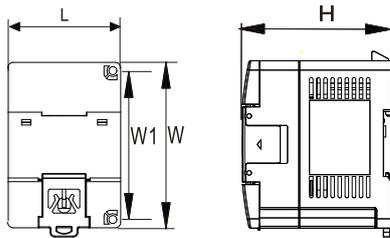
Main module dimensions



Bottom view

Side view

Expansion module dimensions



Bottom view

Side view

Model	L(mm)	L1(mm)	W(mm)	W1(mm)	H(mm)
MC100-1006BRA MC100-1006BTA	135	125	90	80	79.2
MC100-1410BRA MC100-1410BTA	135	125	90	80	79.2
MC100-1614BRA MC100-1614BTA	150	140	90	80	79.2
MC100-1614BRA1 MC100-1614BTA1	182	172	90	80	79.2
MC100-2416BRA MC100-2416BTA	182	172	90	80	79.2
MC100-3624BRA MC100-3624BTA	224.5	214.5	90	80	79.2
MC100-0800ENN MC100-0808ETN MC100-0808ERN MC100-0016ETN MC100-0016ERN MC100-0008ETN MC100-1600ENN MC100-0008ERN	61	/	90	81	71.2

\* The DC power module has the same dimensions as the AC power module.

### 3.5 Cable connection and specification

#### Cable specification

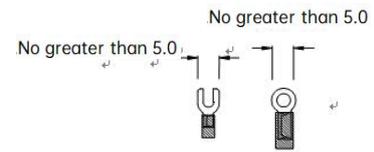
It is recommended to use stranded copper cables and prefabricate insulated ends to ensure connection quality. The following table lists the sectional areas and models of the recommended cables.

Cable	Recommended NO.	Cross-Section
AC power (L、N)	AWG12、18	1.0~2.0mm <sup>2</sup>
Ground (⊕)	AWG12	2.0mm <sup>2</sup>
Input signal (X)	AWG18、20	0.8~1.0mm <sup>2</sup>
Output signal (Y)	AWG18、20	0.8~1.0mm <sup>2</sup>

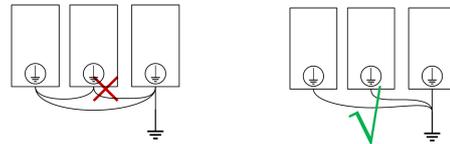
Fix the prepared cable end onto the PLC terminals with screws correctly.

Fastening torque: 0.5~0.8Nm.

The recommended cable preparation method is shown in the following figure.



◆ For the safety (to prevent electric shock and fire accidents) and lower noise, the ground terminal of the controller should be connected in accordance with the requirements from national electrical regulations, and the ground resistance should be less than 100 Ω. Single point grounding should be used when wiring multiple controllers, and the ground wire cannot form a loop. As shown in the diagram below:



### 4. Power Consumption

Each MC100 main module has an internal power supply that provides power to the main module itself, expansion modules, and other electrical devices. The main module of the MC200 provides 5V DC logic power (5V/GND) and 24V DC logic power (24V/GND) for itself and all expansion modules. The MC200 main module can also provide 24VDC power (24V/COM), which can be used to power the input point, the relay coil on the expansion module, or other equipment.

Item	Unit	Min.	Rated	Max.	Note
Power supply voltage	Vac	90	220	264	Normal startup and operation
Input current	A	/	/	1.5	Input: 90Vac, 100% output

In particular, it should be noted that there is no 24V/COM power output in DC power module.

Model	5V/GND Max. capacity for expansion module	24V/GND Max. capacity for expansion module*	24V/COM Capacity for external device
MC100-1006BRA	700mA	260mA	520 mA
MC100-1006BTA	600 mA	300 mA	
MC100-1410BRA	670mA	250mA	500 mA

MC100-1410BTA	550 mA	300 mA	
MC100-1614BRA	650 mA	230 mA	460 mA
MC100-1614BTA	500 mA	300 mA	
MC100-2416BRA	580 mA	150 mA	420 mA
MC100-2416BTA	420 mA	300 mA	
MC100-1614BRA1	650 mA	230 mA	460 mA
MC100-1614BTA1	400 mA	300 mA	
MC100-3624BRA	550 mA	100mA	300 mA
MC100-3624BTA	500 mA	300 mA	

\*The maximum capacity for external device of 5V/GND (24V/GND) refers to the maximum output capacity that can be provided when 5V/GND (24V/GND) is not loaded.

\*The programming software X-Builder provides the calculation tool for power supply, which can calculate the load of the power supply conveniently.

Please pay attention to the power supply during system designing. Excessive loads may cause unstable system operation. The maximum current consumed by the expansion modules is as follows:

Model	5V/GND	24V/GND	24V/COM
MC100-0808ERN	70mA	50mA	50mA
MC100-0808ETN	170mA	0	50mA
MC100-0800ENN	85mA	0	50mA
MC100-0008ERN	70mA	50mA	0
MC100-0008ETN	170mA	0	0
MC100-4AD	60mA	0	50mA
MC100-4DA	60mA	0	120mA Note1
MC100-4TC	50mA	0	55mA
MC100-5AM	50mA	0	90mA Note1
MC100-4PT	60mA	0	90mA Note1

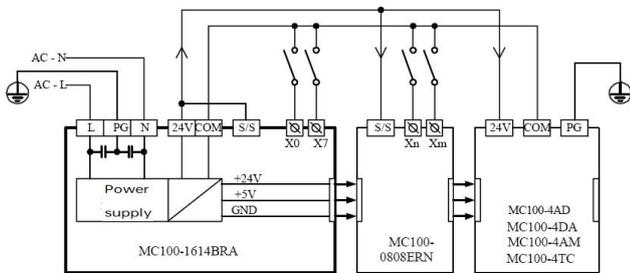
Note 1: Analog power consumption when the output terminal is connected to the load. If the current output terminal (0-20 mA) is not used, the current can be reduced to 50mA.

\*Note 1: The above is the current value when the ambient temperature is 25°C.

If the maximum temperature of the working environment exceeds +50°C, you need to reduce the input-output load and the expansion module number to ensure the stable and reliable operation of the PLC.

## 5. Power Cable and Ground Cable

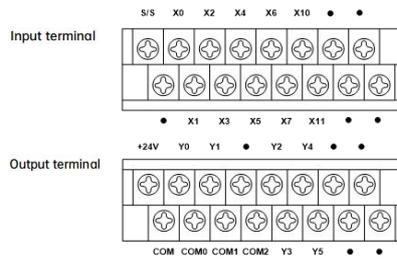
The following is an example of the AC power module and auxiliary power supply connection of the MC100:



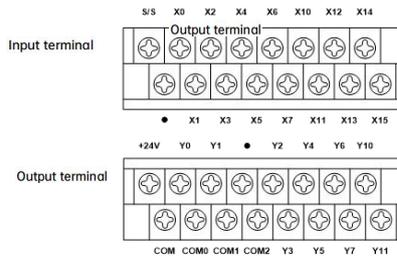
## 6. Terminal Introduction

### 6.1 Terminal

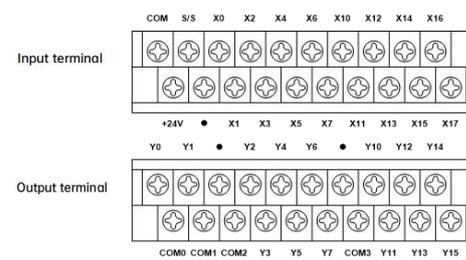
MC100-1006BRA, MC100-1006BTA, MC100-1006BRD, MC100-1006BTD



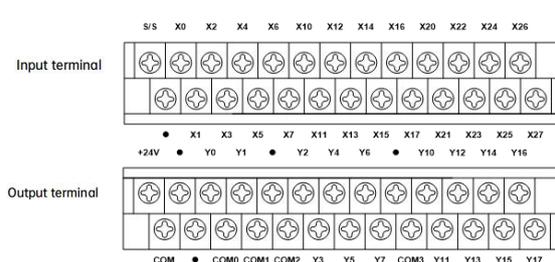
MC100-1410BRA, MC100-1410BTA, MC100-1410BRD, MC100-1410BTD



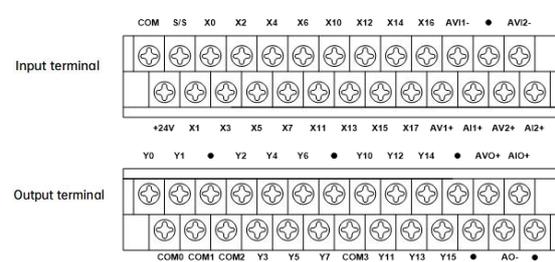
MC100-1614BRA, MC100-1614BTA, MC100-1614BRD, MC100-1614BTD



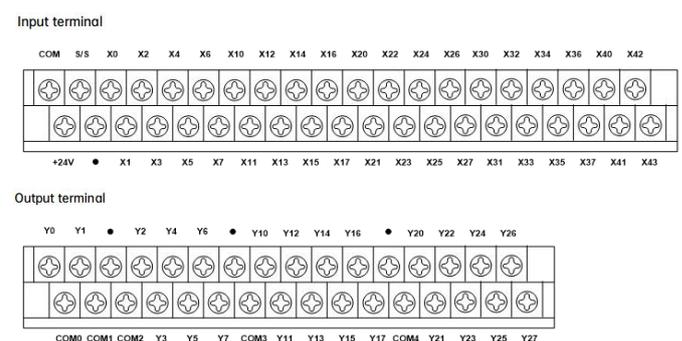
MC100-2416BRA, MC100-2416BTA, MC100-2416BRD, MC100-2416BTD



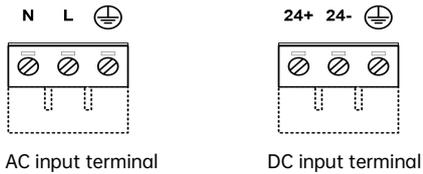
MC100-1614BRA1, MC100-1614BTA1



MC100-3624BRA, MC100-3624BTA, MC100-3624BRD, MC100-3624BTD



## 6.2 Power supply terminal



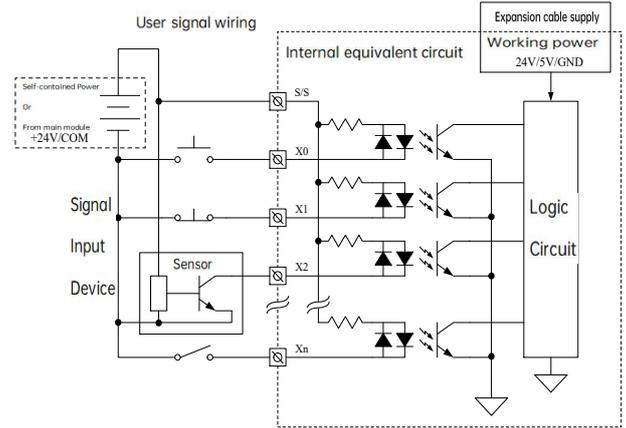
## 7. Input and Output Characteristic of Switch Quantity

### 7.1 Input Characteristic and Signal Specification

There is a corresponding maximum frequency limit for counter input port. If the input frequency exceeds the limit, the count may be inaccurate or the system may run abnormally. Therefore, it is necessary to arrange the input ports properly and select appropriate external sensor.

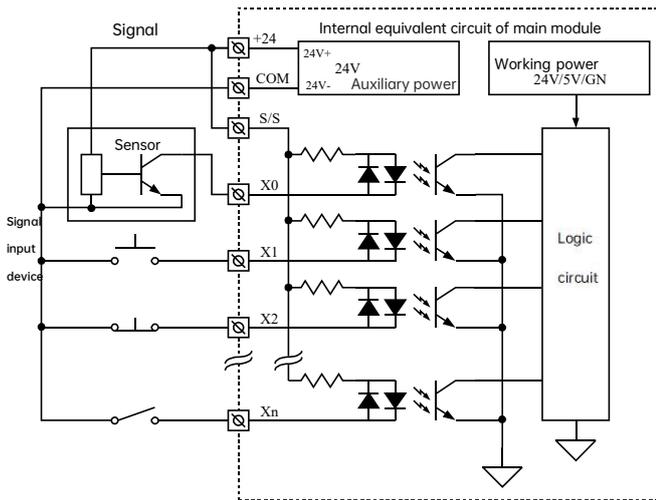
MC100 series PLC can provide a "S/S" terminal, in which user can select the signal input mode to be source type or leakage type. Connect S/S terminal to + 24 V power supply, that is the input channel is set to leakage type mode, and the NPN type sensor can be connected. The internal equivalent circuit and external wiring of leakage mode is shown below:

The internal equivalent circuit of I/O expansion module and the external wiring mode are shown in the figure.

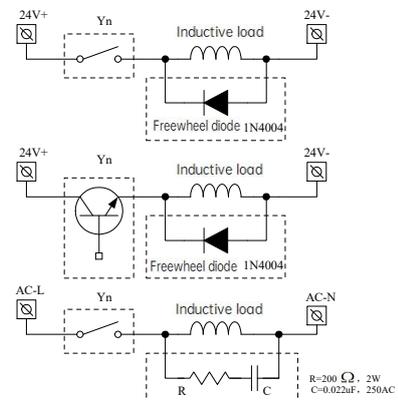
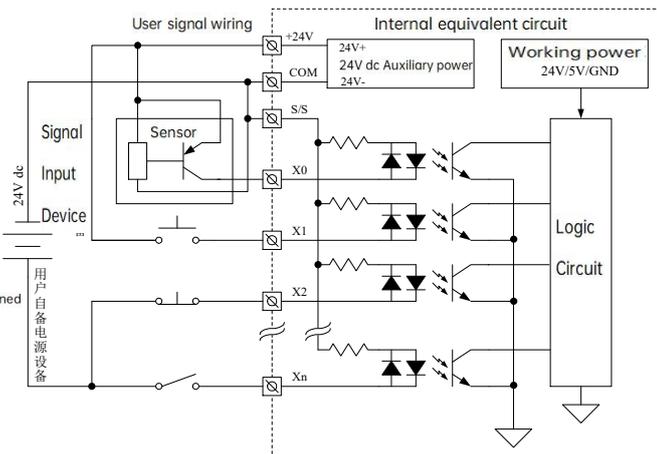


### 7.2 Output Characteristic and Signal Specification

The output terminals of MC100 series PLC are composed of several groups, which are electrically isolated each other, and the output contacts of different groups are connected to different power circuits; The output type can be divided into relay and transistor. Transistor output can only be used in 24Vdc load circuit with the attention of power supply polarity. For the inductive load of DC circuit, adding freewheeling diode should be considered; For the inductive load of AC circuit, the RC instantaneous voltage absorption circuit should be considered in external circuit.



The user can also short-circuit the S/S terminal with the COM terminal to connect the PNP sensor according to the source input mode. The internal equivalent circuit of the source input mode and the external wiring mode are shown in the figure.



### 7.3 Function of Output port

The transistor output type main module contains two high-speed output ports Y0 and Y1, which can output high-speed pulses independently with a maximum frequency of 100kHz. This main module provides high-speed I/O instruction and positioning instruction to manage high-speed output channels. It is recommended to use twisted-pair shielded cables for the corresponding input ports during high-speed output, and ground the shielded layer (connecting it to the ⊕ terminal or signal ground) to improve immunity.

## 8. Addressing of I/O Expansion Module

The expansion module of MC100 is automatically addressed once the PLC is powered on properly. Users need to avoid the I/O expansion module or

special function module connecting or removing action during PLC is running. The expansion module must be powered on at the same time or before the active module to ensure reliable addressing of the expansion module. IO points are numbered in octal.

For example, in the MC100-1410BRA module, the input points are 14, the terminals numbered from X0 to X15, and the terminals numbered from X16 to X17 do not exist, and then the X terminals of subsequent expansion modules are numbered from X20. Similarly, if the output number is 10, terminals numbered from Y0 to Y11, and terminals numbered from Y12 to Y17 do not exist, and then the Y terminals of subsequent expansion modules are numbered from Y20.

## 9. Power-on Operation and Routine Maintenance

### 9.1 Power-on Operation

Check the connection item by item after wiring, to ensure that no foreign connections fall into the cabinet inside and heat flow:

1. Switch on the POWER of the PLC, POWER indicator should be light;
2. Start the X-Builder programming software, and then download the prepared program into the controller;
3. Set the PLC status to the ON after verifying the download program, and the RUN indicator lights. However, ERR indicator lighting indicates that there is an error in the program or system. Please troubleshoot the error according to the instructions in *MC100 Series Programmable Controller Programming User Manual*;
4. Then connect to the external power supply and debug the system.

### 9.2 Routine Maintenance

Routine maintenance checking should pay attention to the following:

1. Ensure that the PLC working environment clean to avoid foreign bodies and dust into the machine.
2. Maintain good ventilation status of controller;
3. All wiring and terminal connections are firmly fixed in good condition.

## 10. Common Problem and Solution

When the controller can not work normally, please check in turn:

1. Check the power circuit connection and condition of related switches and protection apparatus to ensure controller has been reliable power supply;
2. Check the terminal wiring;
3. Check whether the switch of mode selection is in correct position.

If the above checks are done and the controller still unable to work, you can refer to the table for analysis, based on the working status of PLC and I/O status indicator.

Phenomenon	Possible cause	Solution
POWER and other indicators are off	Power supply voltage loss or low voltage	Check the power supply condition
	Disconnect the power switch or fuse blown	Check the switch, wire or fuse condition
	Abnormal power wiring	
	Power board damage	<b>Check and confirm:</b> 1. Whether the voltage between L and N terminals is within the normal range; 2. Whether exist short circuit or overload between 24V and COM terminal
POWER indicator flash intermittently	Poor contact of power circuit	
	Over-connection of expansion modules, to cause current limiting	
Short circuit in 24V/COM auxiliary power output, to cause current limiting		
	ERR indicator flashing	User program error
Actual running time exceeds WDT setting		Increase WDT set time
RUN indicator is OFF	Mode selection switch is not ON	Set the switch to ON
	Set the run control mode to terminal mode, and the terminal is in the OFF	Close the set terminal
	Remotely stopped by the upper machine	Turn on remotely by the upper machine
	STOP from system error	Check the PLC application system
Inconsistency between input status indicator and input terminal status	Over on-resistance of user circuit	Set the external-circuit electrical parameters to appropriate range, such as shortening wire length, and rejecting extremely thin wires
	Poor signal circuit contact	Check the cable connection and troubleshoot the fault
Output cannot be closed(OFF)	Poor external wiring	
	Relay contact damage	Swap with idle port
Inconsistency between output status indicator and output terminal status	Indicator damage or indicator damage	
Upload, download, and monitor disable	Poor cable connection, and ON/TM/OFF in wrong position	Use the special cable of Megmeet PLC
Non-response of expansion module	Poor connection	Check in power-down status, and power on after rectifying the fault
Serial port controls other equipment unsuccessfully	Poor cable connection or incorrect wiring signal property	Connect communication cables correctly
	Inconsistent settings of communication master and slave devices, such as baud rate, parity check, data bit, and address	Set the same communication parameter
	Serial port controls other	Set the same

	equipment unsuccessfully	communication protocol
Low-speed miscounting	In most cases, the input signal is interfered	Parallel the capacitor around 22uF50V at the count input, noting the capacitor polarity
	In other case, the period of the detected signal is shorter than the program execution period	If the execution time of program is too long, it is recommended to arrange the counting signal at the high-speed counting port. A reason time is important if the constant scan is set

#### Notice

1. The warranty range is confined to the PLC only.
2. Warranty period is 18 months, within which period Megmeet conducts free maintenance and repairing to the PLC that has any fault or damage under the normal operation conditions.
3. The start time of warranty period is the delivery date of the product, of which the product SN is the sole basis of judgment. PLC without a product SN shall be regarded as out of warranty.
4. Even within 18 months, maintenance will also be charged in the following situations:
  - Damages incurred to the PLC due to mis-operations, which are not in compliance with the User Manual;
  - Damages incurred to the PLC due to fire, flood, abnormal voltage, etc;
  - Damages incurred to the PLC due to the improper use of PLC functions.
  - Remove the PLC personally.
5. The service fee will be charged according to the actual costs. If there is any contract, the contract prevails.
6. If you have any question, please contact the distributor or our company directly.

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