Coolmay®
Automation Expert

L02 Series Programmable Logic Controller (PLC) User Manual

Thank you for purchasing Coolmay L02 series PLC. This manual mainly describes the product characteristics, general specifications and wiring methods of this series of PLC. For detailed programming, please refer to "Coolmay L02 Series PLC Programming Manual" and ""Coolmay PLC Instruction Programming Manuel".

L02 series PLC has the following characteristics:
1. Strong scalability, 31 modules can be expanded, and the maximum I/O can reach 512 points (Need to expand the module in case of power off).
2. It can be specially encrypted, and the password is set to 12345678 to completely prohibit reading the program.
3. Powerful positioning control function, which can simultaneously support 8-axis high-speed pulse function.
4. High-efficiency computing capability, basic instruction execution speed can reach 0.35μs.

◆ Product structure

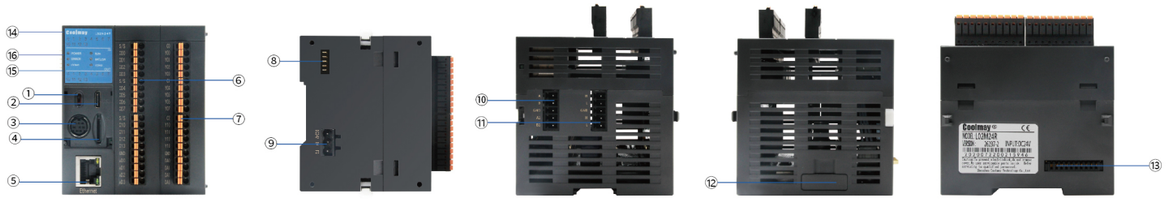
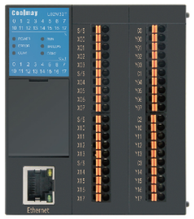


Figure 1 Product structure

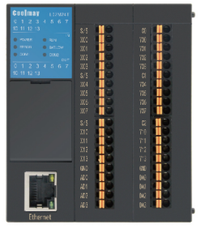
1. PLC dial switch
2. Type-c download port
3. RS-232
4. SD card slot
5. Ethernet
6. Digital input
7. Digital output
8. L02 power interface 1
9. DC24V power interface 2
10. RS-485
11. CAN
12. Battery slot
13. Expansion interface
14. Digital input indicator
15. Digital output indicator
16. POWER: Power indicator
    RUN: PLC running flashes
    ERROR: The indicator flashes when the program is wrong (it always lights when the CPU is wrong)
    BAT.LOW: When the battery is low, it will always be on
    COM1/COM2: flashing during RS-485 communication

◆ Hardware interface



S/S	C0
X00	Y00
X01	Y01
X02	Y02
X03	Y03
S/S	C1
X04	Y04
X05	Y05
X06	Y06
X07	Y07
S/S	C2
X10	Y10
X11	Y11
X12	Y12
X13	Y13
S/S	C3
X14	Y14
X15	Y15
X16	Y16
X17	Y17

Figure 2 L02M32T/L02M32R



S/S	C0
X00	Y00
X01	Y01
X02	Y02
X03	Y03
S/S	C1
X04	Y04
X05	Y05
X06	Y06
X07	Y07
S/S	C2
X10	Y10
X11	Y11
X12	Y12
X13	Y13
GNG	GNG
AD0	DA0
AD1	DA1
AD2	DA2
AD3	DA3

Figure 3 L02M24T/L02M24R

Note: S/S is the common terminal of digital input; Cx is the common terminal of digital output; GND is the common terminal of analog input/analog output

RS-232 programming port pin definition

Pin number	Signal	Description
4	RXD	Accept
5	TXD	Send
8	GND	Ground

Figure 4 RS-232 programming port

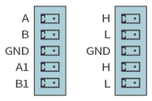


Figure 5 RS-485 & CAN

Communication port description

- Serial port 1: RS-232 (PLC programming port): supports Mitsubishi programming port protocol, which can be used to download PLC programs or communicate with devices that support Mitsubishi.
- Serial port 2: RS-485 (A B): Support Mitsubishi programming port protocol, Mitsubishi BD protocol, RS protocol and Modbus RTU protocol.
  ※Support RS, RS2, WR3A, RD3A, ADPRW instructions.
- Serial port 3: RS-485 (A1 B1): supports Mitsubishi programming port protocol, RS2 protocol and Modbus RTU protocol.
  ※Support RS2, WR3A, RD3A, ADPRW instructions.
- CAN (H L) communication port: supports RS2 protocol and Modbus RTU protocol(The communication wiring needs to be connected to the upper HL; short-circuit the lower HL, CAN has a terminal resistance of 120Ω; otherwise, there is no terminal resistance.)
  ※Support RS2, WR3A, RD3A, ADPRW instructions.
- Ethernet: Support Mitsubishi programming port protocol, Modbus TCP/UDP protocol, Ethernet/IP protocol.

Host Module size

L02M32T、L02M32R、L02M24T、L02M24R

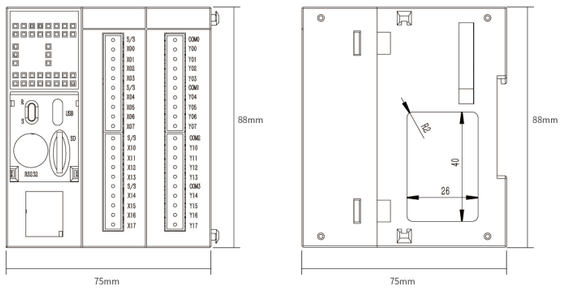


Figure 6 Host module size

◆ Installation

Snap-in installation

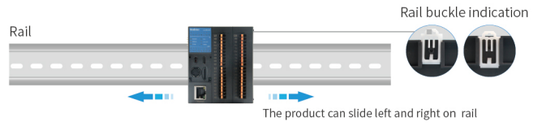
Push back into the buckle between the groups, directly push the module in, and when you hear a "click", the module is installed.

Neatly arranged modules　Module push　Press the buckle

Figure 7 Snap-in installation

Rail installation method

The CPU module and the expansion modules can be directly installed on the standard rail DIN35mm without a backplane; press the rail buckle to directly lock the product on the rail.



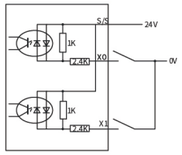
Put into the rail slot, press the rail buckle, the installation is complete

Figure 8 Rail installation

◆ Equivalent Circuit

The input of L02 series is dual-phase optocoupler, users can choose NPN or PNP connection when using. Note, however, because the common ends of the input points are all connected, so a module or a host can only have one wiring method, not mixing.

PLC input (X) is external power supply DC24V sink type (passive NPN), the input signal is isolated from the power supply. When using, you need to connect S/S to the 24V positive of the external power supply.

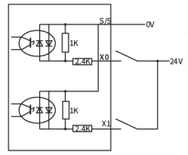


PLC digital NPN input wiring:

Port short connection: The S/S of the PLC input terminal is connected to 24V, and the X terminal is connected to the power supply 0V, that is, the input has a signal;
Two-wire system (magnetic control switch): PLC digital input is connected to a two-wire magnetic control switch, the positive pole of the magnetic control switch is connected to the X terminal, and the negative pole is connected to 0V;
Three-wire system (photoelectric sensor or encoder): PLC switch is connected to a three-wire photoelectric sensor or encoder, the power supply of the sensor or encoder is connected to the positive electrode of the power supply, and the signal line is connected to the X terminal; the encoder and photoelectric sensor must be of NPN type.

Figure 9 Input wiring diagram

PLC input (X) is an external power supply DC24V source type (passive PNP), and the input signal is isolated from the power supply. When using, you need to connect S/S to the 0V of the external power supply.



PLC digital PNP input wiring:

Port short connection: The S/S of the PLC input terminal is connected to 0V, and the X terminal is connected to the power supply 24V, that is, the input has a signal;
Two-wire system (magnetic control switch): PLC digital input is connected to a two-wire magnetic control switch, the positive pole of the magnetic control switch is connected to the X terminal, and the negative pole is connected to 24V;
Three-wire system (photoelectric sensor or encoder): PLC switch is connected to a three-wire photoelectric sensor or encoder, the power supply of the sensor or encoder is connected to the positive power supply, and the signal line is connected to the X terminal; the encoder and photoelectric sensor are required to be of PNP type.

Figure 10 Input wiring diagram

Figure 11 shows the equivalent circuit diagram of the relay output module. The output terminals are in several groups, and each group is electrically isolated. The output contacts of different groups are connected to different power circuits.

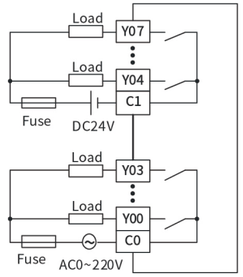


Figure 11 Relay output equivalent circuit

The equivalent circuit of the transistor output type PLC output part is shown in Figure 12. It can also be seen from the figure that the output terminals are in several groups, and each group is electrically isolated. The output contacts of different groups can be connected to different power circuits; the transistor output can only be used for DC 24V load circuits. Output wiring mode NPN, COM common cathode.

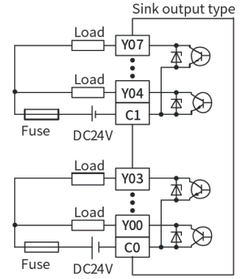
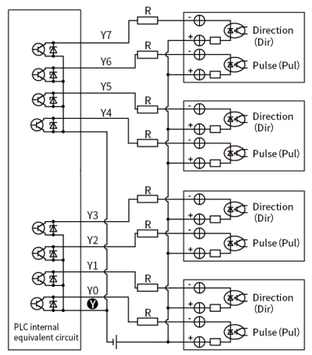


Figure 12 Transistor output equivalent circuit

The wiring of stepper or servo motor is shown in Figure 13. The L02 series PLC defaults Y0-Y7 as pulse points, and the direction can be customized.

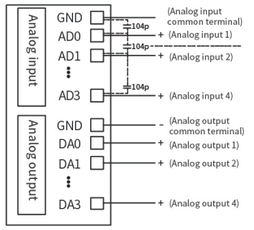
Note: 5V drive must be connected with a 2KΩ resistor in DC24V.



DC24V (5V drive must be connected with 2kΩ resistance)

Figure 13 Pulse output wiring diagram

The L02M24T/L02M24R host comes with 4 analog inputs and 4 analog outputs; the fixed type of analog input/output is 2 0-10V and 2 0-20mA (4-20mA). The wiring is shown in Figure 14.



If the analog input is unstable, please add 104p ceramic capacitor or external magnetic ring filter as appropriate to increase the anti-interference ability

Figure 14 PLC analog wiring

PLC analog wiring

Two-wire system: the positive pole of the power supply is connected to the positive pole of the transmitter, the negative pole of the transmitter is connected to the AD terminal, and the negative pole of the power supply is connected to the GND terminal. Generally, it is the connection method of 0-20mA/4-20mA transmitter;
Three-wire system: the positive pole of the power supply is connected to the positive pole of the transmitter, the negative pole of the power supply and the negative pole of the signal output are the same terminal, and the positive and negative poles of the signal output of the transmitter are respectively connected to the AD terminal and the GND terminal
Four-wire system: the positive and negative poles of the power supply are connected to the positive and negative poles of the transmitter respectively, and the positive and negative poles of the transmitter signal output are respectively connected to the AD and GND terminals;