Coolmay®
Automation Expert

MX2NC PLC User Manual

Thank you for choosing the Coolmay MX2NC series PLC. This manual mainly explains the features, general specifications and wiring methods of MX2NC series PLC. Detailed programming information please refer to "CoolmayMX2NC PLC Programming Manual". MX2NC series PLC has the following features:

1. Highly integrated and super functional. Maximum support 16 digital input and 16 digital output.
2. Support multi-channel high-speed counting and high-speed pulse functions, high-speed counting normally 6 channels single-phase 10KHz or 2 channels AB (Z) phase 10KHz; high-speed pulse normally 4 channels 10KHz.
3. Support special encryption. Setting 12345678 as password can thoroughly prevent the data from being read. (Note:Only supports 8-bit password encryption)
4. Support for external interrupts and watchdog functions.
5. Use DIN rail (35mm width) to install.
6. Use pluggable terminals with a pitch of 3.5mm, which is convenient for wiring.

Product Information

◆ Naming rules MX2NC - 32 M R
                   ①   ② ③ ④

1. Series   MX2NC: MX2NC series PLC
2. I/O Points   32: 16DI/16DO
3. Module   M: Main module
4. DO type   R: relay / T: transistor

◆ Basic parameters

Table 1: basic parameters

MX2NC series standard PLC	Digital value		COM port	High-speed counting		High-speed pulse output	Size
	DI	DO	RS232	Single-phase	AB(Z) phase	Output	Dimensions (mm)
MX2NC-16M	8	8	1	6 channels 10KHz	2 channels 10KHz	4 channels 10KHz	90*65*32
MX2NC-32M	16	16	1	6 channels 10KHz	2 channels 10KHz	4 channels 10KHz	90*65*32

MT means transistor output, MR means relay output.

Table 2: electrical parameters

Electrical Parameters	
Input Voltage	DC 24V
Digital Input Index	
Isolation Method	Photoelectric Coupling
Input Impedance	High-speed input 3.3KΩ / Common input 4.3KΩ

(Continued from the previous table)

Input ON	Electric current of high-speed input is higer than 4.5mA	Electric current of common input is higher than 3.5mA
Input OFF	High-speed input and normal input current are less than than 1.5mA	
Filter Function	With filter function, the filter time can be set among 0-100ms, defaulted as 10ms	
High - speed Counting	Normally 6 single-phase (X0-X5) 10KHz or 2 AB (Z) phase 10KHz;	
Input Level	Low level NPN, common terminal is negative	
Digital Relay Output Index		
Max Current	2A/point, 5A/8point COM	
Load Voltage	Below DC30V/ Below AC220V	
Circuit Insulation	Relay Mechanical Insulation	
On Respond Time	About 10ms	
Mechanical Life (without load)	10 million times	
Electrical Life (rated load)	300 thousand times	
Output Level	Normally open dry contact output, COM port can be connected to positive or negative	
Digital Transistor Output Index		
Max Current	0.5A/point, 1.6A/8point COM	
Load Voltage	DC12V~48V	
Circuit Insulation	Optocoupler Insulation	
Isolation Voltage (power supply-external terminal)	1500VAC	
On Response Time	High-speed output: 10µs / Other: 0.5ms	
High-speed Output Frequency	Y0-Y3 is normally 10KHz	
Output Common	COM port connected to the negative end	
External Interface		
Programming Port	Comes with 1 RS232 programming port	
Environment		
Operating Temperature	0℃~50℃	
Relative Humidity	5%~95%RH	
Storage Temperature	-20℃~70℃	
Vibration Frequency	10-57Hz, amplitude 0.035mm; 57Hz-150Hz, acceleration 4.9m/s² (10 times each in X, Y, and Z directions, a total of 80 minutes each)	

Mechanical Design Reference

◆ Installation size
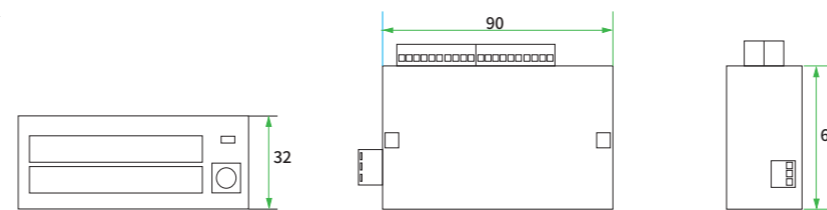
Dimensions: 90*65*32(mm)
Installation size: DIN rail (35mm) installation

Diagram 1 Installation dimension drawing
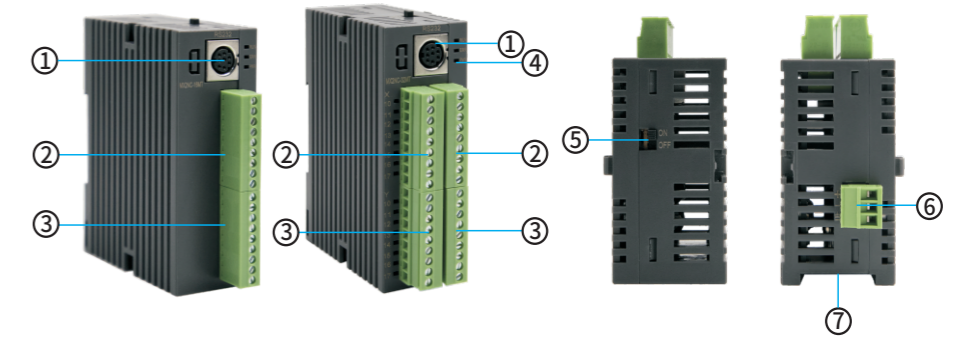
Electrical Design Reference

Diagram 2 Product structure

1. Programming port Rs232   2. Terminal block of digital input
4. PWR: Power-on state
   RUN: The light is on when the PLC is running
   ERR: The indicator light will flash when the program
   is wrong (the indicator light will be on when the CPU is wrong)
3.Terminal block of digital output
5. RUN/STOP PLC operation switch
6. Terminal block for power input signal
7. 35mm rail installation place

◆ Hardware interface

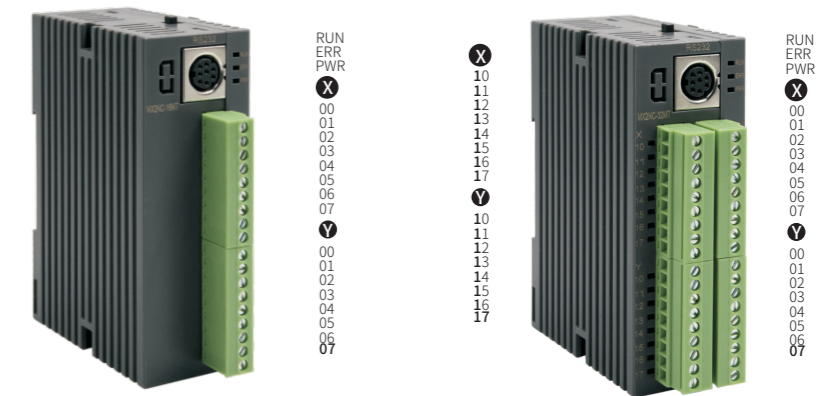Diagram 3 Hardware interface diagram

MX2NC series PLC PIN definition

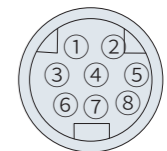| Pin NO.	Signal	Description
4	RXD	Receive date
5	TXD	Send data
8	GND	Ground

Diagram 4 PLC programming

◆ Rs232 (PLC programming port): Supports Mitsubishi programming port protocol, which can be used to download PLC programs or to communicate with devices that support Mitsubishi programming port protocol.

Terminal wiring specifications: 22-14AWG wire. The terminals of this series of models are all pluggable terminals. Please refer to the product silk screen for the interface identification of special models.

Equivalent Circuit

The PLC has a built-in user switch state detection power supply (DC24V), and the user only needs to access the dry contact switch signal. If the user wants to connect the output signal of the active transistor sensor, the OC output mode signal is required. The input wiring mode is NPN, COM common cathode.
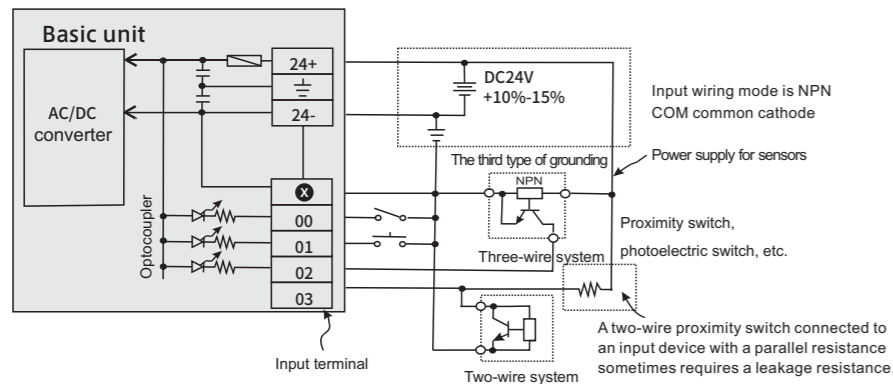

Diagram 5 Input wiring diagram

Diagram 6 shows the equivalent circuit diagram of the relay output module. The output terminals are in several groups, each group is electrically isolated, and the output contacts of different groups are connected to different power circuits.
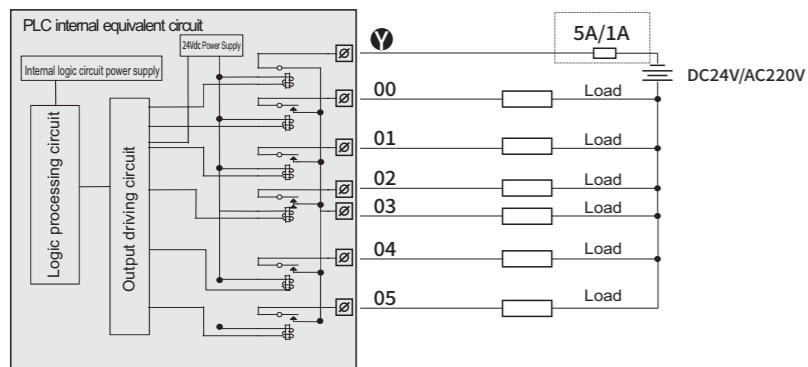

Diagram 6 Relay output equivalent circuit

The equivalent circuit of the transistor output type PLC output part is shown in Diagram 7. It is also known from the figure that there are several groups of output terminals, and each group is electrically isolated, and the output contacts of different groups can be connected to different power circuits. Transistor output stage can only be used for DC 24V load circuit, the output wiring mode is NPN, COM common cathode.
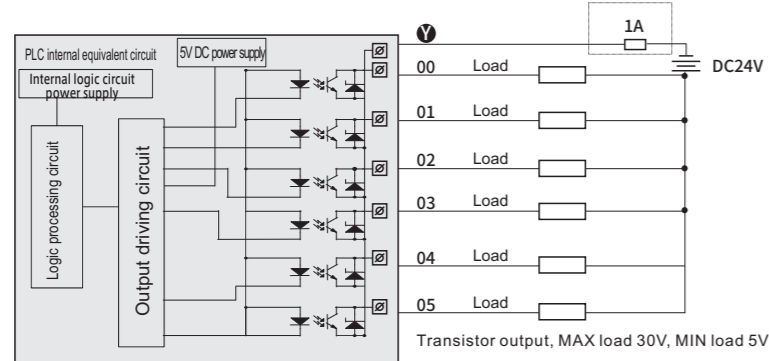

Diagram 7 Transistor output equivalent circuit

For the inductive load connected to the AC circuit, the external circuit should consider the RC instantaneous voltage absorption circuit; for the inductive load of the DC circuit, consider adding a freewheeling diode, as shown in Diagram 8.
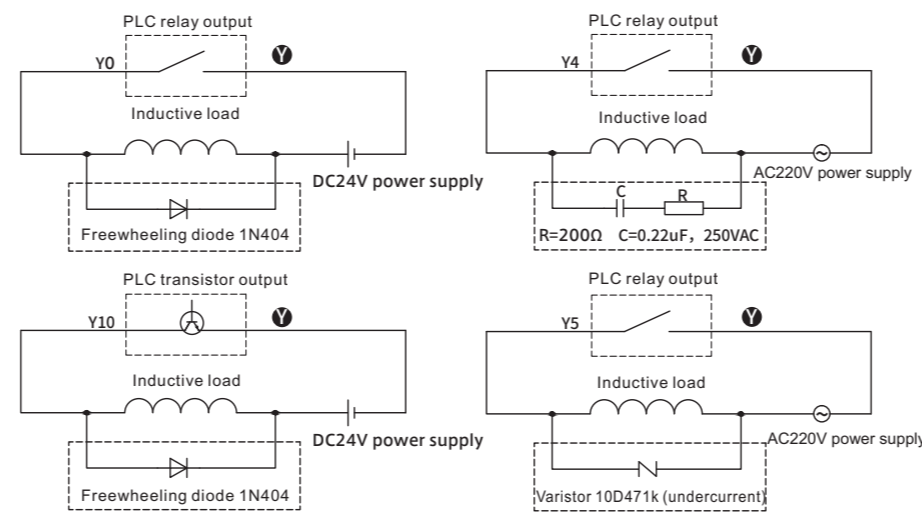

Diagram 8 Transistor output equivalent circuit

The wiring of stepper motor or servo motor is shown in Diagram 10. MX2NC series PLC defaults Y0-Y3 as pulse points, and the direction can be customized.

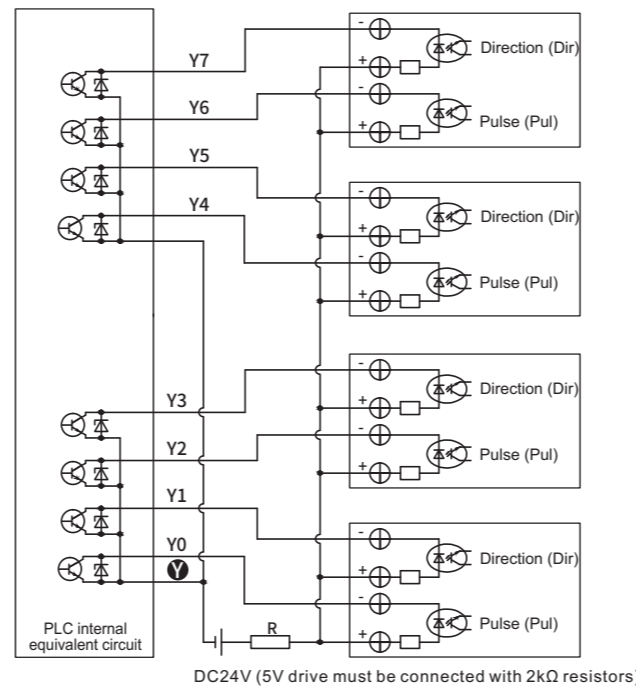Note: 5V drive must be connected with a 2KΩ resistor on DC24V.

Diagram 9 Pulse output wiring diagram

※ Note: The internal circuit in all diagrams is for reference only

PLC anti-interference processing

1. Strong and weak currents should be separated and wired, and not common ground; when there is strong electric interference, magnetic rings should be added on the power supply side; and properly and effectively grounded according to the type of the chassis.

※ Note: For more detailed information, please refer to Coolmay official website "PLC Anti-interference Processing Method"

Programming Reference

◆ Devices distribution and statement of power-down retention

	MX2NC-16M	MX2NC-32M
Digital input X	X00~X07 8 points	X00~X017 16 points
Digital output Y	Y00~Y07 8 points	Y00~Y017 16 points

Auxiliary relay M	[M0~M499] 500 points general/ [M500~M1535] 1036 points holding/ [M8000~M8255] 256 points special		
State relay S	[S0~S9] 10 points general / [S10~S999] 990 points holding		
Timer T	[T0~T199] 200 points 100ms general/ [T200~T245] 46 points 10ms general/ [T246~T249] 4 points 1ms holding/ [T250~T255] 6 points 100ms holding		
Counter C	16-bit up counter	32-bit up/down counter	High-speed counter
	[C0~C15] 16 points general, [C16~C199] 184 points holding	[C200~C219] 20 points general, [C220~C234] 15 points holding	[C235~C240 single phase] [C251, C253, C254 AB phase] 9 points holding
Data register D, V, Z	[D0~D199] 200 points general/ [D8000~D8195] 196 points special holding/	[D200~D7999] 7800 points holding [D8196~D8255] 59 points special	[V0~V7], [Z0~Z7] 16 points variable address
Nested pointer	[N0~N7] 8 points Master control/[P 0~P127] 128 points Branch pointer for jumps and subroutines/[I0□□~I5□□] 6 points External interrupt		
Constant K	16-bit -32,768~32,767	32-bit -2,147,483,648~2,147,483,647	
Constant H	16 bits 0~FFFFH	32-bit 0~FFFFFFFFH	

MX2NC PLC's device power-down retention is permanent retention, that is, all the devices in the retention area will not be lost after the module is powered-off. The real-time clock uses a rechargeable battery to ensure that the clock is the current time. All power-down retention functions must ensure that the voltage of the DC24V power supply with load is above 23V, and the PLC power-on time is longer than 2 minutes, otherwise the power-down function will be abnormal.

---

* Programming software   PLC: Compatible with PLC programming software GX Developer8.52 and GX Works2
*Detailed materials please refer to "Coolmay MX2NC Series PLC Programming Manual" "MX2NC Series Programmable Logic Controller (PLC) User Manual" "Coolmay PLC instruction programming manual"

MX2NC PLC User Manual

TIPS —— Before using this product, please read the relevant manual carefully and use the product under the environmental conditions specified in the manual.

1. In case of damaging the product, please confirm power supply range first (the regular power supply only limitied to 24V DC, we suggest you to use the power supply which output voltage is 18W or higher than 18W), and wiring correctly, then electrify it.
2. When installing the product, be sure to tighten the screws or clamp the guide rails to avoid falling off.
3. Please do not wiring or plug cable when the power is on, otherwise it may cause electric shock or circuit damagement. Disconnect the power switch immediately when the product smells or sounds abnormal. Do not drop metal shavings and wire tips into the control vent holes during screwing hole and wiring, which may cause product malfunctions and faults.
4. Please do not tie the power cord and communication cable together or let them too close, you should keep them for more than 10cm distance. The strong and weak electricity should be separated and properly grounded. If the interference is serious the communication and high frequency signal input and output cables should be the shielded cables to improve anti-jamming performance.
5. The COM of the digital input / output (transistor) is common to the cathode
6. Do not disassemble the product or modify the wiring optionally. Otherwise it may cause fault, malfunction, loss or fire.
7. Please make sure to turn off the all power when you install or dismantle the product, otherwise it may cause malfuction or fault.

Catalog