

ML20 Series Digital Quantity Module User Manual

Thank you for purchasing the ML20 expansion module. This manual mainly explains the product characteristics, general specifications, and wiring methods of the module. Please refer to the "Coolmay M300 Series PLC Programming Manual" for detailed usage instructions.

The ML20 series expansion module has the following characteristics:

The ML20 series blade module is a new generation module launched by Gu Mei Technology, suitable for M300 series PLC bus expansion, which can quickly and reliably collect signals in your system. At the same time, it has a body as thin as 15mm, which can achieve microsecond level response speed, a flexible IO system, and a more stable structural design.

◆ Product structure

Naming rules

ML 20 - 16 EX
① ② ③ ④

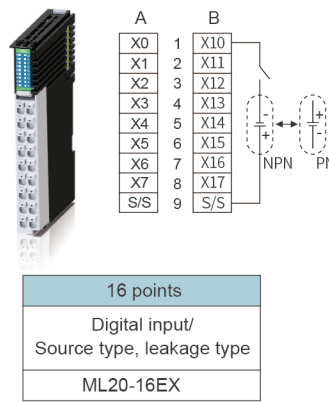
① Production information ML: Coolmay M300 Universal Module	② Serial number 20:20Series modules
③ IO points 16: 16 channels	④ Module Type EX: digital input EYT: Transistor output ET: Digital quantity mixing module

Component Description

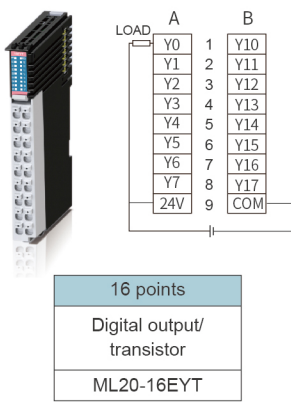
No.	Name	Functional definition
1	Signal indicator light	PR(POWER+RUN) Power on/running indicator light Red 1. Slow flashing: The module is running normally 2. Always on: Module communication interrupted 3. Flash: Module not registered 4. Extinguish: The module is not powered on or the module is abnormal
2	IO signal indicator light	Corresponding to each output signal indication, the effective output indicator light is on, otherwise it is off
3	Connecting terminal	For detailed definition, please refer to the hardware port
4	Rail lock buckle	Automatic rebound buckle
5	Extension Interface	Expansion interface with host/module
6	DIN rail	35mm rail installation

◆ Hardware interface and parameters

Digital input module



Digital output module



Digital quantity mixing module

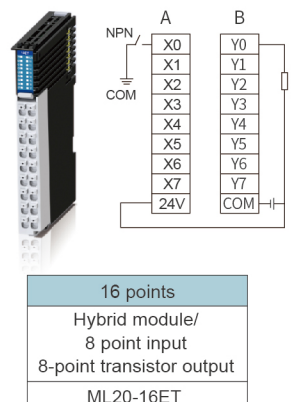


Figure 1 Hardware Interface

Product Type	ML20-16EX	ML20-16EYT	ML20-16ET
Size	103*75*15mm	103*75*15mm	103*75*15mm
Weight	About 62g	About 63g	About 63g
Rated power input	DC24V±10%/50mA	DC24V±10%/100mA	DC24V±10%/100mA
Input/output channel	16-channel digital input	16 channel digital output	8-point input and 8-point output hybrid module
Input/output type	Supports NPN or PNP input	NPN transistor output	Input NPN, output NPN transistor
Output voltage level	/	24V DC±10%	24V DC±10%
Output load (resistive load)	/	0.5A/point, 4A/module	0.5A/point, 2A/module
Output load (inductive load)	/	7.2W/point, 24W/module	7.2W/point, 12W/module
Output load (lamp load)	/	5W/point, 18W/module	5W/point, 9W/module
Response time	ON/OFF:100us	ON/OFF:100us	ON/OFF:100us
Switching frequency	Input impedance: 3.3K	Resistance load 100Hz, inductance load 0.5Hz, lamp load 10Hz	Resistance load 100Hz, inductance load 0.5Hz, lamp load 10Hz
Isolate	Yes	Yes	Yes
Protection function	/	Short circuit protection, overcurrent protection	Short circuit protection, overcurrent protection
Protection grade	IP20	IP20	IP20
Ambient Temperature	-20°C-55°C	-20°C-55°C	-20°C-55°C

Moduel size

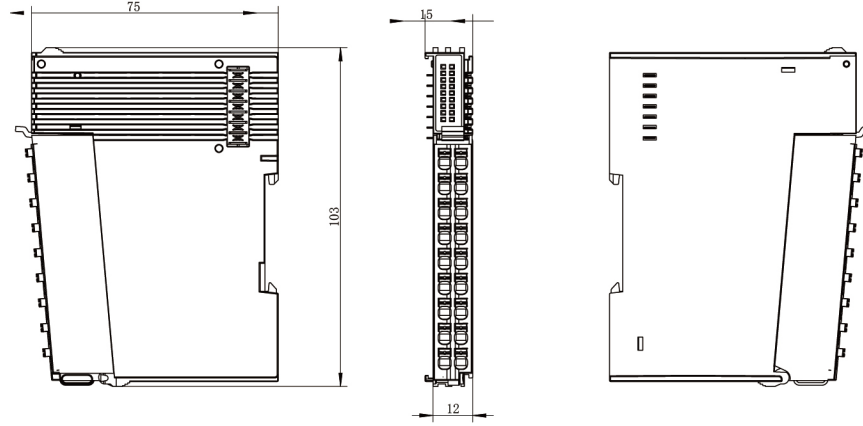
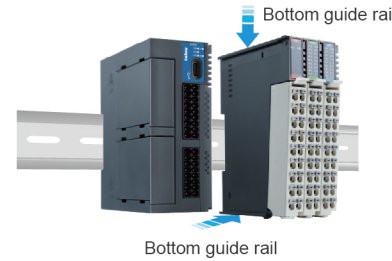


Figure 2 Schematic diagram of installation dimensions

◆ Installation instructions

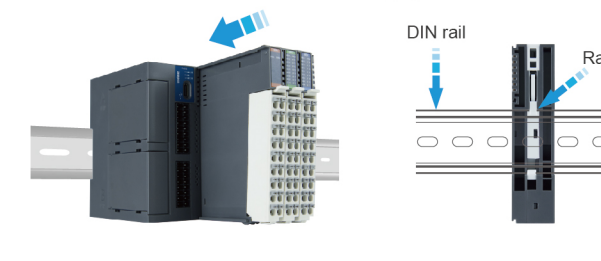
Installation between modules

The assembly between IO modules is carried out by sliding installation through the top and bottom guide rails of the modules, as shown in the following figure



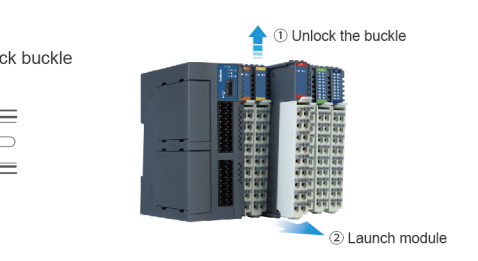
Install the module on the guide rail

During installation, align the module with the DIN rail and press the module in the direction indicated by the arrow. After installation, there is a noticeable locking sound. Confirm that the DIN rail lock of the module is in the locked state, as shown in the following figure.



Quick release

Use a straight screwdriver or similar tool to pry up the guide rail lock, pull the module straight forward at the handle position (protruding part), and press down on the top of the lock after completion.



Module installation and disassembly in Figure 3

Installation precautions

- Before installing or disassembling the module, please ensure that the module is in a power-off state.
- Do not hot plug modules, as they pose risks of overcurrent and overvoltage impacts on the module itself, which may result in module damage; Communication interface modules or PLC hosts may cause restarts, loss or damage of user data, etc.
- Do not let the module's casing or terminals fall off or be impacted to avoid module damage.

◆ Digital wiring

Input wiring

The ML20-16EX input is a dual phase optocoupler, and users can choose between NPN or PNP connections when using it. However, please note that since the common terminals of the input points are all connected, each module or host can only have one wiring method and cannot be mixed.

1. The PLC input (X) is an externally powered DC24V leakage type (passive NPN), and the input signal is isolated from the power supply. When using, connect the S/S to an external power source with 24V positive.

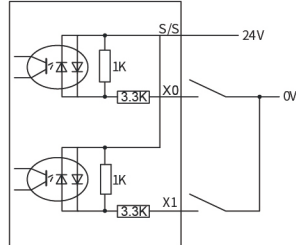


Figure 4 Input (NPN) wiring diagram

2. The 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, connect the S/S to an external power source at 0V.

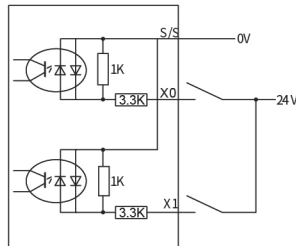


Figure 5 Input (PNP) wiring diagram

PLC digital NPN input wiring:

Port short circuit: The S/S of the PLC input terminal is connected to 24V, and the X terminal is connected to the power supply 0V, indicating that there is a signal input;
Two wire system (magnetic control switch): PLC switch input is connected to a two-wire magnetic control switch, with the positive pole of the magnetic control switch connected to the X terminal and the negative pole connected to 0V;
Three wire system (photoelectric sensor or encoder): The PLC switch is connected to the photoelectric sensor or encoder of the three wire system. The power supply of the sensor or encoder is connected to the positive pole of the power supply, and the signal line is connected to the X terminal; Encoders and photoelectric sensors require NPN type.

PLC digital PNP input wiring:

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

Output wiring

The NPN, COM common cathode output type transistor shown in Figure 6 has several groups of output terminals, which are electrically isolated from each other. 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.

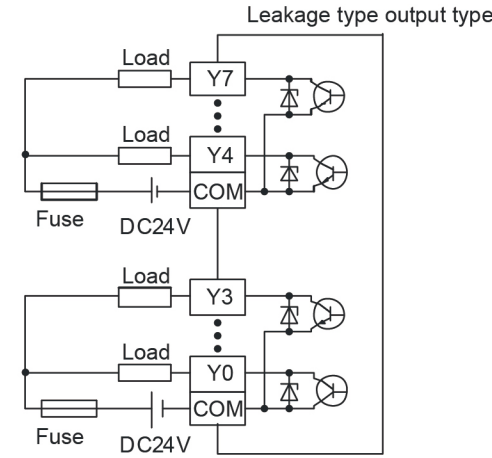


Figure 6 Equivalent circuit of transistor (NPN) output

Wiring precautions

When expanding cable wiring, avoid bundling cables that transmit strong interference signals such as power lines (high voltage, high current) together, as this may increase the impact of noise, surges, and induction. Separate wiring should be used and parallel wiring should be avoided. Recommended cables and adapter boards should be used for connection, and shielded cables are recommended for expansion cables to improve anti-interference ability. Single point grounding treatment shall be applied to the shielding of shielded wires and sealed cables.

TIPS

ML20 Series Digital Module User Manual

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

- Only professional maintenance personnel who have received electrical equipment related training and have sufficient electrical knowledge can install this product.
- The input power specifications of this product are specified in the technical specifications. Please strictly provide the power supply according to the data in the technical specifications. If the supplied power is not within the required range, it will seriously damage this product.
- When disassembling and assembling modules, all external power supplies used by the system must be disconnected before performing the operation. If the power supply is not completely disconnected, it may cause electric shock or module failure and misoperation.
- Do not use in the following places: places with dust, oil fumes, conductive dust, corrosive gases, and flammable gases; Exposed to high temperatures, condensation, wind and rain; In situations with vibration and impact. Electric shock, fire, and misoperation can also cause product damage and deterioration.
- The module is an Open type device, please install it in a control cabinet with a door lock (enclosure protection>IP20). Only operators who have received electrical equipment training and have sufficient electrical knowledge can open the control cabinet.
- Cable terminals should be well insulated to ensure that the insulation distance between cables will not decrease after installation on the terminal block. Otherwise, it may cause electric shock or equipment damage.
- During installation, avoid metal shavings and wire ends from falling into the ventilation holes of the controller. After installation, ensure that there are no foreign objects on the ventilation surface, otherwise it may cause poor heat dissipation, fire, malfunction, and misoperation.
- During installation, it should be tightly connected to its respective connectors and the module connection hooks should be securely locked. If the module is installed improperly, it can lead to misoperation, malfunction, and detachment.

Product Warranty Statement

Dear customer:

Sincerely thank you for choosing this product. As our user, you will receive our company's high-quality service of "free repair service and lifelong technical support for product quality problems caused by non-human damage or disassembly within two years from the date of purchase". During the warranty period, if there is a hardware malfunction caused by the product itself, our company will provide customers with free replacement or repair services. Please do not disassemble and repair the product yourself. Our products are labeled with anti disassembly labels, and only our company and authorized professionals can repair our products. Any unauthorized disassembly and repair of the product by other personnel is equivalent to automatically waiving the warranty services provided by our company.

The following situations are not within the scope of free warranty service:

- Damage caused by human factors (such as external impact or collision, improper use, etc.);
- The product has been disassembled, modified, or repaired without authorization;
- Damage caused by external factors such as lightning strikes, water ingress into the power supply, and falls;
- Damage caused by incorrect installation or use by the user;
- The device has exceeded the warranty service period

If you need to repair, please fill in the following items:

Product Name: _____ Customer Name: _____
Product model: _____ contact number: _____
Product serial number: _____ Purchase date: _____
Problem remarks: _____

Shenzhen Coolmay Technology Co., Ltd

Address: Room 902, Block A, Building 4, Software Industry Base, Nanshan District, Shenzhen, Guangdong Province

Tel: 0755-86950416

Fax: 0755-26400661-808

Email: cm2@coolmay.net

Web: en.coolmay.com

V 2025/31

The model specifications and information related to the product in this manual are subject to change without prior notice



Alibaba



AliExpress