JNC technology
銘祥科技實業股份有限公司

JNC

485 type digital signal conversion module



V1.01

Catalogue

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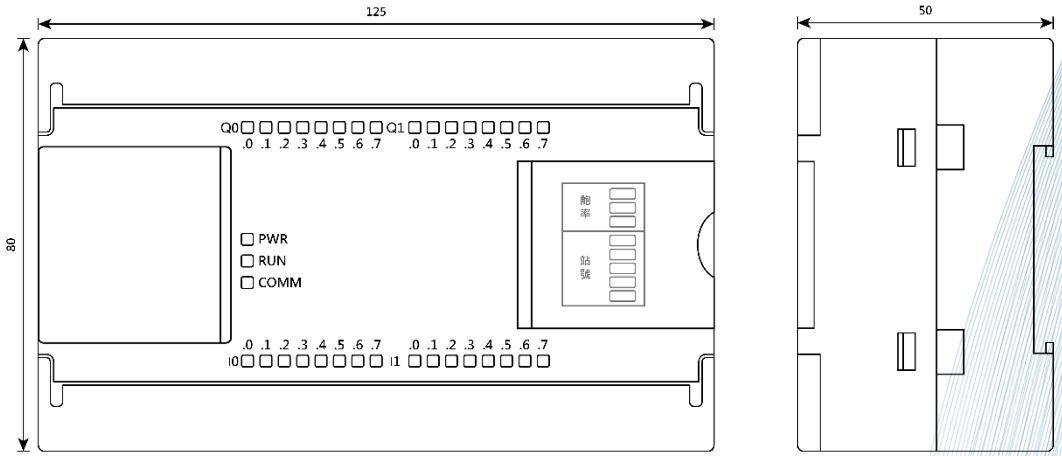
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PART 1.PRODUCT DESCRIPTION

1-1 Product Specifications

Model	16DIOR Specifications	
Power supply	DC 24V With reverse polarity protection	
Power consumption	≦ 4W	
Environment	Working Temp.	-20°C ~ +70°C
	Storage Temp.	-40°C~85°C
Input contact（DI）	The number of points	16 groups
	Input signal type	Dry contact
	Input signal valid range	DC 20 ~ 28V
Output contact（DO）	Output points	16 groups
	Output type	Relay output (dry contact)
	Load capacity	2A / 110VAC
Communication function	Communication interface	RS485
	Communication protocol	Modbus RTU
	Baud rate	1200 ~ 115200（Default is 9600, baud rate is determined by dip switch）
	Communication format	Default N,8,1 (fixed)
Physical conditions	Product size (mm)	125x80x50 （LxWxH）
	Installation method	Aluminum rail

1-2 Product Size(mm)



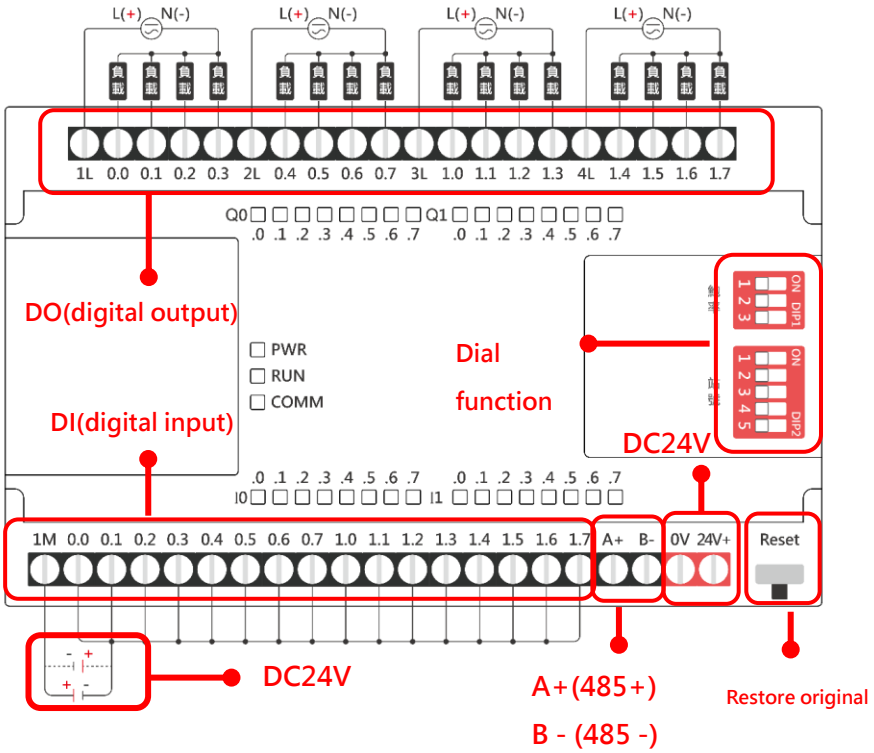
1-3 Product Features

- 16 sets of digital inputs, with built-in optical coupling protection circuit.
- 16 groups of relay outputs.
- Standard Modbus communication protocol, can be used for various RS485 hosts.
- Dip switch can switch station number and baud rate, easy to set.
- The power supply has reverse polarity protection.

1-4 Product Application Scenarios

PLC control, automation industry, monitoring system and other equipment or systems containing RS485 communication.

1-5 Wiring Instructions



1-6 Hardware details

1-6-1 Contact description

Function	Name	Description
Power supply	24V+	24V DC (positive pole)
	0V	24V DC (negative pole)
RS-485	A+	RS-485(D+)
	B-	RS-485(D-)
Input COM point	1M	Input column 1~16 contacts, total COM points
Input 16 contacts	0.0~1.7	The order is 1~16 input independent contacts
Output the first set of COM points	1L	Output columns 1~4 contacts have a total of COM points.
The first group of output 4 contacts	0.0~0.3	The order is 1~4 output independent contacts
Output the second set of COM points	2L	Output columns 5~8 contacts have a total of COM points.
The second set of output 4 contacts	0.4~0.7	The order is 5~8 output independent contacts
Output the third set of COM points	3L	Output columns 9~12 contacts have a total of COM points
The third group of output 4 contacts	1.0~1.3	The order is 9~12 output independent contacts
Output the fourth group of COM points	4L	Output columns 13~16 contacts have a total of COM points
The fourth group of output 4 contacts	1.4~1.7	The order is 13~16 output independent contacts
Station No (ID)	Station number dial	Modify range 1~32
Baud rate	Baud rate dial	Modify range 1200~115200

1-6-2 Display light description

Function	Name	Description
PWR	Power light	● The green light is always on: The power supply is normal
RUN	System light	● Flash once every 1S: The device is normal
		● The light flashes quickly: Reset is executed
COMM	Communication light	● Flashing green light: Communicating

1-6-3 Device initialization instructions (restore original settings)

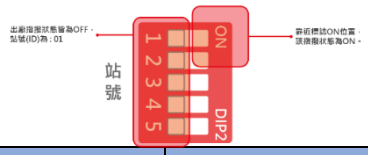
Within 30 seconds after the device is powered on, long press the Reset button, then the RUN light flashes quickly, release the button until the RUN light flashes slowly, and power off for 3 seconds to restart the device, the device will restore its original factory settings. The original factory settings are as follows:

Setting name	Description
Equipment ID	● If the station number dialing is not fully ON, it will be determined according to the dialing status.
	● If the station number dialing is all ON, the station number is:32
Equipment Baudrate	● Baudrate Mainly dialed by baud rate, communication format: N,8,1

1-6-4 ID Instructions for dialing

If you modify the station number range from 1 to 32, you can use the "Station Number Dial" setting. Please note! If you adjust the "Station Number Dial", you must power off the device for 3 seconds and restart the device,the station number is set. Detailed dialing is complete.

The corresponding station number table is as follows:

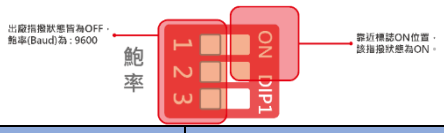


Number 1 dial status	Number 2 dial status	Number 3 dial status	Number 4 dial status	Number 5 dial status	Station No (ID)
OFF	OFF	OFF	OFF	OFF	01
ON	OFF	OFF	OFF	OFF	02
OFF	ON	OFF	OFF	OFF	03
ON	ON	OFF	OFF	OFF	04
OFF	OFF	ON	OFF	OFF	05
ON	OFF	ON	OFF	OFF	06
OFF	ON	ON	OFF	OFF	07
ON	ON	ON	OFF	OFF	08
OFF	OFF	OFF	ON	OFF	09
ON	OFF	OFF	ON	OFF	10
OFF	ON	OFF	ON	OFF	11
ON	ON	OFF	ON	OFF	12
OFF	OFF	ON	ON	OFF	13
ON	OFF	ON	ON	OFF	14
OFF	ON	ON	ON	OFF	15

Number 1 dial status	Number 2 dial status	Number 3 dial status	Number 4 dial status	Number 5 dial status	Station No (ID)
ON	ON	ON	ON	OFF	16
OFF	OFF	OFF	OFF	ON	17
ON	OFF	OFF	OFF	ON	18
OFF	ON	OFF	OFF	ON	19
ON	ON	OFF	OFF	ON	20
OFF	OFF	ON	OFF	ON	21
ON	OFF	ON	OFF	ON	22
OFF	ON	ON	OFF	ON	23
ON	ON	ON	OFF	ON	24
OFF	OFF	OFF	ON	ON	25
ON	OFF	OFF	ON	ON	26
OFF	ON	OFF	ON	ON	27
ON	ON	OFF	ON	ON	28
OFF	OFF	ON	ON	ON	29
ON	OFF	ON	ON	ON	30
OFF	ON	ON	ON	ON	31
ON	ON	ON	ON	ON	32

1-6-5 Baudrate Instructions for dialing

The baud rate of the device is determined by the switch status of the "Baud Rate Dial". Please note! If you adjust the "Baud Rate Dial", you must power off the device for 3 seconds and restart the device. The baud rate setting is completed. The detailed baud rate table corresponding to the baud rate dial is as follows:



Number 1 dial status	Number 2 dial status	Number 3 dial status	Station No (ID)
OFF	OFF	OFF	9600
ON	OFF	OFF	19200
OFF	ON	OFF	38400
ON	ON	OFF	57600
OFF	OFF	ON	115200
ON	OFF	ON	1200
OFF	ON	ON	2400
ON	ON	ON	4800

PART 2.MODBUS FORM

2-1 Digital input (02)

Function 02 to Read					
Address	Setting Value	Item	Type	R/W	Remarks
0x0000	10001	No. 01 DI status	INT16	R	Value range: 0 or 1 0: The digital input signal is turned off and the light is off. 1: The digital input signal is connected and the light is always on.
0x0001	10002	No. 02 DI status			
0x0002	10003	No. 03 DI status			
0x0003	10004	No. 04 DI status			
0x0004	10005	No. 05 DI status			
0x0005	10006	No. 06 DI status			
0x0006	10007	No. 07 DI status			
0x0007	10008	No. 08 DI status			
0x0008	10009	No. 09 DI status			
0x0009	10010	No. 10 DI status			
0x0010	10011	No. 11 DI status			
0x0011	10012	No. 12 DI status			
0x0012	10013	No.13 DI status			
0x0013	10014	No. 14 DI status			
0x0014	10015	No. 15 DI status			
0x0015	10016	No. 16 DI status			

2-1-1 INT16 Read input value (Function 02)

Example: Read the status of DI input contacts 1~16, and the input contacts 3, 8, 9, and 14 are "signal connected"

Content	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	01	02	00	00	00	10	79	C6
Number of bytes	1	1	2		2		2	

Content	Equipment station number	Function	Data bytes	Input point 1~16 status		16 CRC code	
Reply from machine	01	02	02	84	21	1A	A0
Number of bytes	1	1	1	2		2	

2-1-2 Status value description (Function 02)

In reply from machine, you can see that the "input point 1~16 status" is "84 21".
The high bit "84" is converted into binary as "1000 0100". The low byte to the high byte correspond to input contacts 1 to 8 respectively. 0 means that the digital input signal is turned off and the light is off; 1 means that the digital input signal is connected and the light is off. If the number stays on, the input contact No. 3 and No. 8 DI status is connected.
The low-order bit "21" is converted into binary as "0010 0001". The low-order byte to the high-order byte correspond to input contacts 9~16 respectively. 0 means that the digital input signal is turned off and the light is off; 1 means that the digital input signal is connected and the light is on. If the number stays on, the 9th and 14th DI input contacts are connected.

2-2 Digital Output (01/05/0F)

Function 01 to Read/ Function 05,0F to Write					
Address	Setting Value	Item	Type	R/W	Remarks
0x0000	00001	No. 01 D0 status	INT16	R/W	Value range: 0 or 1 0: The digital input signal is turned off and the light is off. 1: The digital input signal is connected and the light is always on.
0x0001	00002	No. 02 D0 status			
0x0002	00003	No. 03 D0 status			
0x0003	00004	No. 04 D0 status			
0x0004	00005	No. 05 D0 status			
0x0005	00006	No. 06 D0 status			
0x0006	00007	No. 07 D0 status			
0x0007	00008	No. 08 D0 status			
0x0008	00009	No. 09 D0 status			
0x0009	00010	No. 10 D0 status			
0x0010	00011	No. 11 D0 status			
0x0011	00012	No. 12 D0 status			
0x0012	00013	No.13 D0 status			
0x0013	00014	No. 14 D0 status			
0x0014	00015	No. 15 D0 status			
0x0015	00016	No. 16 D0 status			

2-2-1 INT16 reads the output value (Function 01)

Example: Read the status of DO output contacts 1~16, and the output contacts 2, 4, 5, 11, and 16 are "signal connected"

Content	Equipment station number	Function	Starting address		Number of data (Word)		16 CRC code	
Host command	01	01	00	00	00	10	3D	C6
Number of bytes	1	1	2		2		2	

Content	Equipment station number	Function	Data bytes	Output point 1~16 status		16 CRC code	
Reply from machine	01	01	02	1A	84	B2	FF
Number of bytes	1	1	1	2		2	

2-2-2 Status value description (Function 01)

In reply from machine, you can see that the "output point 1~16 status" is "1A 84".

The high bit "1A" is converted into binary as "0001 1010". The low byte to the high byte correspond to output contacts 1~8 respectively, and 0 means that the digital output signal is turned off and the light is off; 1 means that the digital output signal is connected and the light is on. If the number stays on, the DO status of output contacts No. 2, 4, and 5 is connected.

The low bit "84" is converted into binary as "1000 0100". The low byte to the high byte correspond to output contacts 9~16 respectively. 0 means that the digital output signal is turned off and the light is off; 1 means that the digital input signal is connected and the light is on. If the number is always on, the DO status of output contacts No. 11 and No. 16 is connected.

2-2-3、INT16 writes output value (Function 05)

Example: Write the status of a single DO output contact to make the 7th output contact "signal connected"

Content	Equipment station number	Function	Starting address		Write value: FF 00 contact connected 00 00 contact closed		16 CRC code	
Host command	01	05	00	06	FF	00	6C	3B
Number of bytes	1	1	2		2		2	

Content	Equipment station number	Function	Data bytes		Output point 1~16 status		16 CRC code	
Reply from machine	01	05	00	06	FF	00	6C	3B
Number of bytes	1	1	2		2		2	

2-2-4 INT16 writes output value (Function 0F)

Example: Write the multi-channel status of DO output contacts to make the output contacts 1, 3, 8, 10, and 15 "signal connected" and the remaining contacts closed.

Content	Equipment station number	Function	Starting address		Number of data (Word)		Number of bytes	Status value		16 CRC code	
Host command	01	0F	00	00	00	10	02	85	42	00	81
Number of bytes	1	1	2		2		1	2		2	

Content	Equipment station number	Function	Starting address		Data bytes		16 CRC code	
Reply from machine	01	0F	00	00	00	10	54	07
Number of bytes	1	1	2		2		2	

2-2-5 Status value description (Function 0F)

In reply from machine, you can see that the "status value" is written as "85 42".

The high-order bit "85" is converted into binary as "1000 0101". The low byte to the high byte correspond to output contacts 1 to 8 respectively. 0 means that the digital output signal is turned off and the light is off; 1 means that the digital output signal is connected and the light is on. If the number stays on, the DO status of output contacts 1, 3, and 8 is connected.

The low-order bit "42" is converted into binary as "0100 0010". The low-order byte to the high-order byte correspond to output contacts 9~16 respectively. 0 means that the digital output signal is turned off and the light is off; 1 means that the digital input signal is connected and the light is on. If the number is always on, the DO status of output contacts No. 10 and No. 15 is connected.

PART 3.UTILITY SOFTWARE APPLICATION

※ Versions v2.99 (inclusive) and later support MBS-16DIOR product reading & setting

3-1 Software Application

3-1-1 Open the Utility software





After opening the Utility software, you can see the "User Experience Prompt Window" with three options:

1. Strange:

   It is the first time I come into contact with Utility software and I am not sure what products the software supports. You can click this option to get an overview of supported products.

2. Not bad:

   It has been used more than 2 times and has operational experience. This option provides the updated content of this version for users to quickly understand.

3. Familiarity:

   Frequent use and operational experience. This option provides users with the option to skip and go directly to the main page.

3-1-2 Home page settings

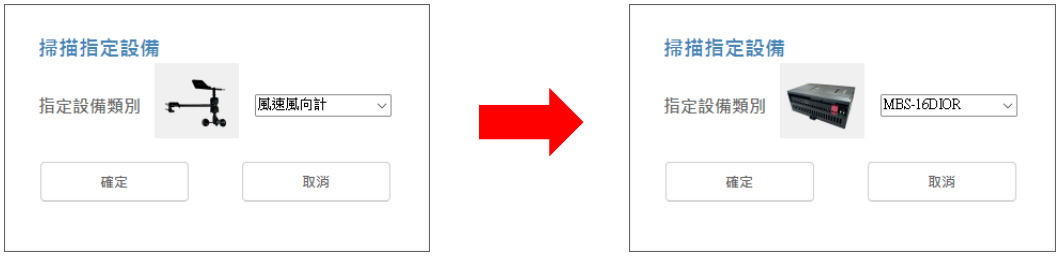


Step process:

(1) Click the Settings button in the upper left corner. After the "Communication Settings" window pops up, select the communication port to be connected to the device and select the corresponding transmission rate (baud rate). After the selection is completed, press the OK button.



(2) Click the "Specify Device" button. After the "Scan Specified Device" window pops up, click on the drop-down menu on the right of "Specify Device Category" and select "MBS-16DIOR" as shown in the picture on the right. After the selection is completed, click OK button.



(3) After pressing the OK button, the middle pane will scan the specified device in the selected communication port and arrange the selected device information, such as ID, baud rate, and version.



3-1-3 Equipment page (preliminary description)



After double-clicking "MBS-16DIOR" in the device list on the main page, you can see the "MBS-16DIOR Preliminary Instruction Window". The relevant functions on the screen above are:

1. Wiring instructions:

   Provides a comprehensive description of each contact on the "MBS-16DIOR" hardware, and provides "Baud Dial" simulation.

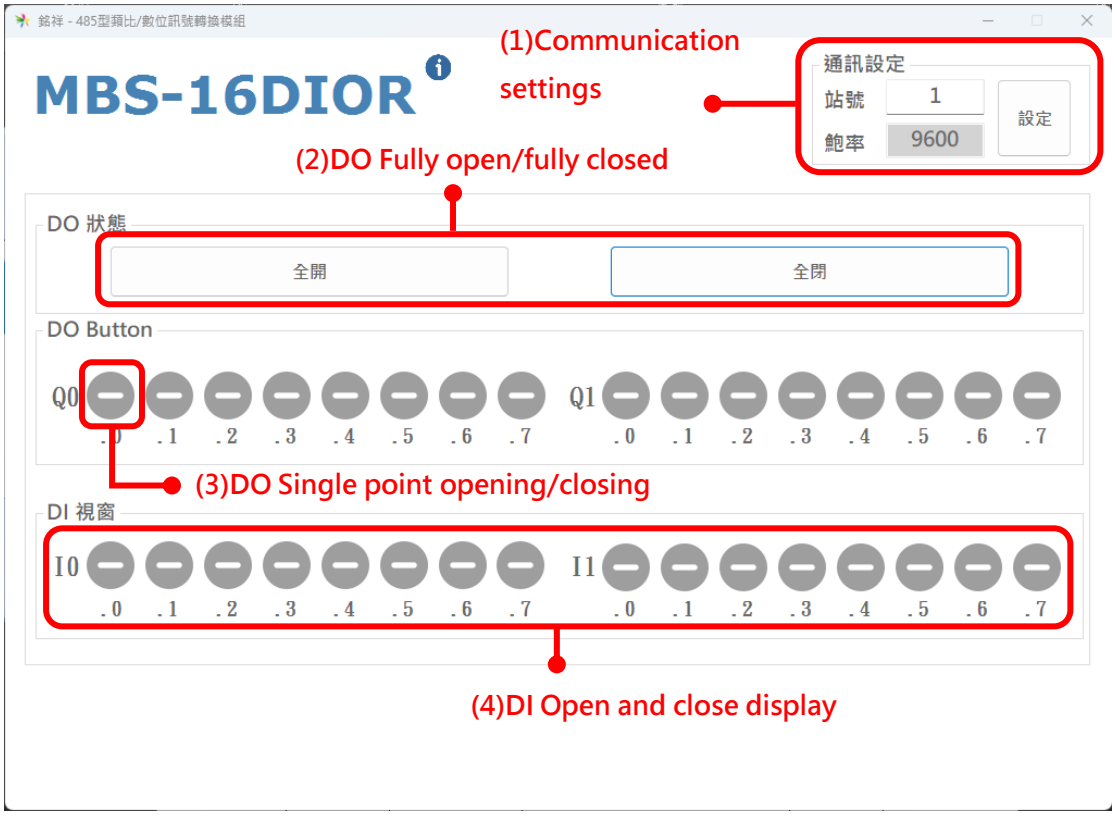
2. Function 1/5:

   Provides a table of Modbus RTU commands related to device "DO".。

3. Function 2:

   Provides a table of Modbus RTU commands related to device "DI".

3-1-4 Device page



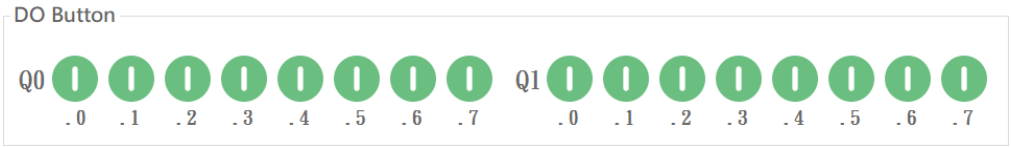
After closing the "MBS-16DIOR Introduction Window", you can see the relevant functions on the "MBS-16DIOR Operation Page" shown above:

1. Communication settings:

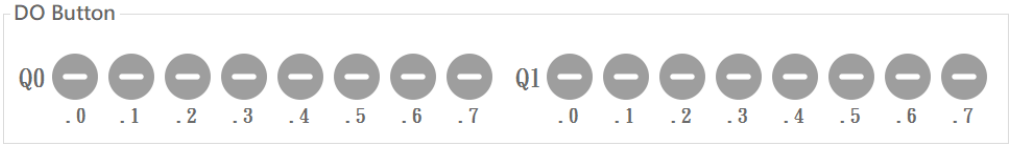
   For the "MBS-16DIOR" station number change, the range is 1~125, the baud rate cannot be set, please set the "baud rate dial" on the hardware.

2. DO fully open/fully closed:

   Provides "DO" 1~16 channels to control "all channels connected/off" function.



(DO Fully open)



(DO fully close)

3. DO single-click open/close button:

Provides "DO" 1~16 channels to control "single channel connection/off", and the number of each channel is synchronized according to the number displayed on the hardware.

 (The green icon indicates that the road is connected)  (The gray icon indicates that the road is closed)

4. DI single point on/off display:

Providing "DI" 1~16 channels only displays "single channel connected/closed", and each channel number is synchronized according to the number displayed on the hardware.

 (The green icon indicates that the road is connected)  (The gray icon indicates that the road is closed)

PART 4.TROUBLESHOOTING

Exception Category	Cause of issue	Solution
Wrong ID	The station number dip switch conflicts with the station number setting inside the hardware.	● Turn the station number dip switch to OFF, and refer to 1-6-3 Device Initialization Instructions. After operation, the station number ID is: 1
Communication abnormality	Abnormal power supply and wiring	● Please confirm that the power supply of the device is 24V
		● According to the 1-6-1 contact description, actually check whether the hardware contacts comply with the list.
DI already has contacts But no light is displayed	Abnormal power supply and wiring	● Please confirm that the contact power supply is DC20~28V
		● According to the wiring instructions in 1-5, actually check whether the hardware circuit is consistent with the list.

REVISION HISTORY

Version	Revision date	Revision description	Maintenance personnel
V1.00	2023/08/01	First version	bin
V1.01	2024/01/02	Added cover and label styles	bin

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