

PLC+HMI

Hardware Manual

Preface

Dear customer:

Thank you for choosing our programmable controller.

This user manual mainly gives a brief introduction to the application of the controller. This user manual provides the knowledge and precautions required for using this controller. Please use it after being familiar with the safety precautions of this product.

Due to product improvements, changes in specifications, editing versions, etc., there will be appropriate changes without prior notice.

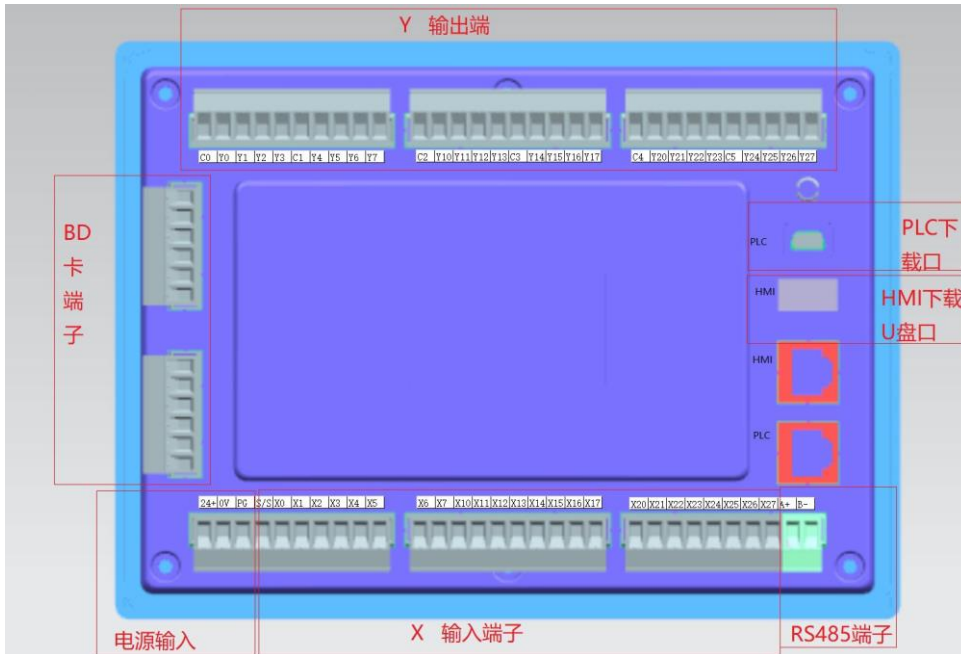
We do not assume any direct, indirect, special, incidental or consequential loss or liability caused by improper use of this manual or this product.

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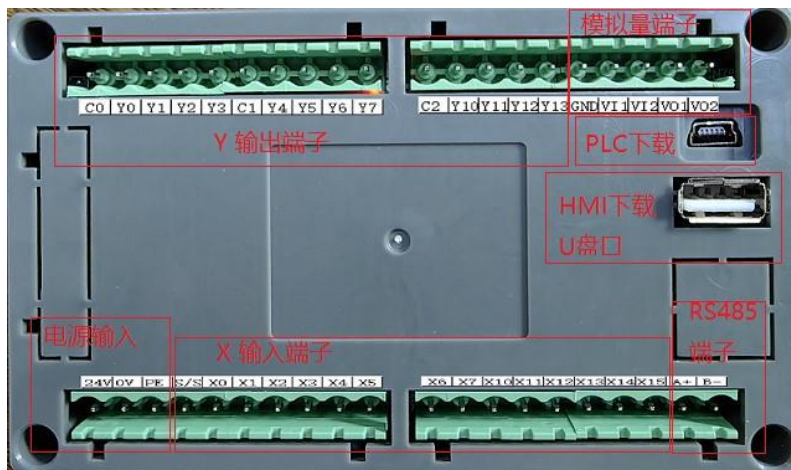
I.	PLC Hardware Introduction	1
1.	Interface introduction	1
2.	HC043M Interface	1
3.	Installation (unit: mm).....	2
4.	Terminal definition.....	2
1)	Power terminals	2
2)	PLC USB download	2
3)	HMI USB flash drive function.....	3
4)	PLC PORT1 setting	3
5)	PLC PORT2 setting	3
6)	HMI Configuration	3
7)	PLC Programming	3
5.	7" PLC terminal definition	4
6.	4.3" PLC terminal definition	6
7.	BD card terminal definition of 7" PLC+HMI all-in-one.....	7
8.	Internal communication of PLC+HMI all-in-one	8
II.	PLC Input and Output Ports	9
1.	Input specifications.....	9
2.	Output specifications	10
3.	Analog ports	11
III.	PLC Output and Servo Motor Wiring.....	12
1.	Single-end wiring between output port and driver.....	12
2.	Double-end wiring between output port and driver	13

I. PLC Hardware Introduction

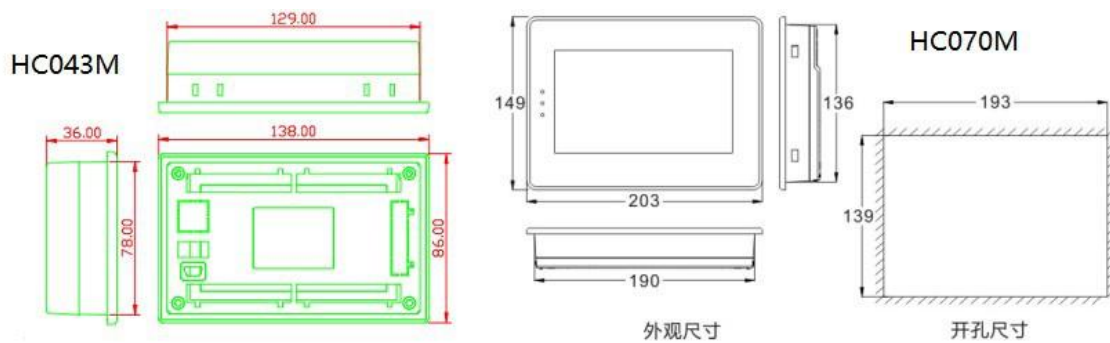
1. Interface introduction



2. HC043M Interface



3. Installation (unit: mm)



4. Terminal definition

1) Power terminals

The integrated touch screen HMI is powered by a DC24V power supply. If the HMI does not display within two seconds after the product is powered on, please disconnect the power supply immediately and ensure that the wiring is correct before powering on again. The DC power line and the high-voltage AC power line must be properly isolated. Avoid the low-voltage line and the high-voltage line from being entangled with each other.

Wiring steps:

- Step 1 : After stripping the 24V power cord, insert it into the power plug terminal, and then use a suitable flat-blade screwdriver to tighten the corresponding screws of the terminal;
- Step 2 : Insert the power terminal into the power socket of the HMI.

2) PLC USB download



The HMI PLC all in one is connected to the PC via mini USB to download PLC program; it occupies PLC PORT0. The serial port driver must be installed before downloading; select the corresponding serial port number.



3) HMI USB flash drive function

The touch screen has a standard USB port, which allows customers to use the USB flash drive function.



4) PLC PORT1 setting

PORT1 supports RS485 and can be used to complete device communication networking with PC, inverter, servo, instrument and other equipment through MODBUS. PORT1 default setting is 9600-7- even parity -1, FX3U communication protocol.

5) PLC PORT2 setting

PORT2 internally communicates with the HMI without external wiring.

6) HMI Configuration

Using MCGS configuration software, 4.3" models select TPC4013 Ef/ Ei (480 * 272); 7" models select other (800 * 480); Serial port select COM1. The default baud rate for 3U models is 9600-7-Even-1. Honyee other series, please use customized drivers.

7) PLC Programming

For 3U models, use GXWorks2 software and select model FX3U.

5. 7" PLC terminal definition

Model				32BT 48BT	32BC 48BC		40BC- 6AM		
Power supply	24+	Input power, connect to 24V+	Y Output Terminals	C0	Output common point, connected to 0V			24V	Analog power supply
	24-	Input power, connect to 0V		Y0	Y0 output (pulse 100KHz)	T	T	I1+	Analog input 1
	PE	Input grounding		Y1	Y1 output (pulse 100KHz)	T	T	AG	Analog common terminal
X input	S/S	X common terminal, connected to 24V+		Y2	Y2 output (pulse 100KHz)	T	T	5V	Analog power supply
	X0	X0 input (counting 50KHz)		Y3	Y3 output (pulse 100KHz)	T	T	A2+	Analog input 2
	X1	X1 input (counting 50KHz)		C1	Output common point, connected to 0V			A3+	Analog input 3
	X2	X2 input (counting 10KHz)		Y4	Y4 output (pulse 10KHz)	T	T	A4+	Analog input 4
	X3	X3 input (counting 10KHz)		Y5	Y5 output (pulse 10KHz)	T	T	AG	Analog common terminal
	X4	X4 input (counting 10KHz)		Y6	Y6 output	T	T	OV1+	Analog output 1
	X5	X5 input (counting 10KHz)	Y7	Y7 output	T	T	OI2+	Analog output 2	
	X6	X6 input (counting	C2	Output common			C2		

		10KHz)			point, connected to 0V				
	X7	X7 input (counting 10KHz)		Y10	Y10 output	T	R	Y10	R
	X10	X10 Input		Y11	Y11 output	T	R	Y11	R
	X11	X11 Input		Y12	Y12 output	T	R	Y12	R
	X12	X12 Input		Y13	Y13 output	T	R	Y13	R
	X13	X13 Input		C3	Output common point, connected to 0V			C3	
	X14	X14 Input		Y14	Y14 output	T	R	Y14	R
	X15	X15 Input		Y15	Y15 output	T	R	Y15	R
	X16	X16 Input		Y16	Y16 output	T	R	Y16	R
	X17	X17 Input		Y17	Y17 output	T	R	Y17	R
	X20	X20 Input		C4	Output common point, connected to 0V			C0	
	X21	X21 Input		Y20	Y20 output	T	R	Y0	T
	X22	X22 Input		Y21	Y21 output	T	R	Y1	T
	X23	X23 Input		Y22	Y22 output	T	R	Y2	T
	X24	X24 Input		Y23	Y23 output	T	R	Y3	T
	X25	X25 Input		C5	Output common point, connected to 0V			C1	

	X26	X26 Input		Y24	Y24 output	T	R	Y4	T
	X27	X27 Input		Y25	Y25 output	T	R	Y5	T
Serial port	A+	RS485 positive, PORT1		Y26	Y26 output	T	R	Y6	T
	B-	RS485 negative pole, PORT1		Y27	Y27 output	T	R	Y7	T

6. 4.3" PLC terminal definition

Power supply	24+	Input power, connect to 24V+	Y output terminals	C0	Output common point, connected to 0V
	24-	Input power, connect to 0V		Y0	Y0 output (pulse 100KHz)
	PE	Input grounding		Y1	Y1 output (pulse 100KHz)
X input	S/S	Input and output power supply, connect to 24V+		Y2	Y2 output (pulse 100KHz)
	X0	X0 input (counting 50KHz)		Y3	Y3 output (pulse 100KHz)
	X1	X1 input (counting 50KHz)		C1	Output common point, connected to 0V
	X2	X2 input (counting 10KHz)		Y4	Y4 output
	X3	X3 input (counting 10KHz)		Y5	Y5 output
	X4	X4 input (counting 10KHz)		Y6	Y6 output
	X5	X5 input (counting 10KHz)		Y7	Y7 output
	X6	X6 input (counting 10KHz)	C2	Output common point, connected to 0V	
	X7	X7 input (counting 10KHz)		Y10	Y4 output
	X10	X10 Input		Y11	Y5 output
	X11	X11 Input		Y12	Y6 output

	X12	X12 Input	Analog	Y13	Y7 output	
	X13	X13 Input		GND	Analog signal GND	
	X14	X14 Input		AI1	Analog input 0 positive signal, D8110/SD4 10	0~10V corresponds to 2000 , NTC/PT/4~20mA A input can be customized
	X15	X15 Input		AI2	Analog input 1 positive signal, D8111/SD4 11	
Serial port	A+	RS485 positive, PORT1	DA1	Analog output 0 positive signal, D8114/SD4 14	0~10V corresponds to 2000	
	B-	RS485 negative pole, PORT1	DA2	Analog output 1 positive signal, D8115/SD4 15		

7. BD card terminal definition of 7" PLC+HMI all-in-one

		6AD 2DA	8AD	4AD2 DA	4AD4D A	2AD4D A	Remark	
CN1	11	VI5+	VI5+		VI5+		AI 5 positive signal, D8116	AI: 0~10V corresponds to 0~2000 Customizable
	12	VI6+	VI6+		VI6+		AI 6 positive signal, D8117	
	13	GND	GND		GND			
CN2	1	VI1+	VI1+	VI1+	VI1+	VI1+	AI 1 positive signal, D8110	NTC/PT/0~20 mA input NTC : 0~200 degrees (unit: 0.1 degrees)
	2	VI2+	VI2+	VI2+	VI2+	VI2+	AI 2 positive signal, D8111	
	3	VI3+	VI3+	VI3+	VO3+	VO3+	Analog 3 positive signal, D8112	
	4	VI4+	VI4+	VI4+	VO4+	VO4+	Analog 4 positive signal, D8113	

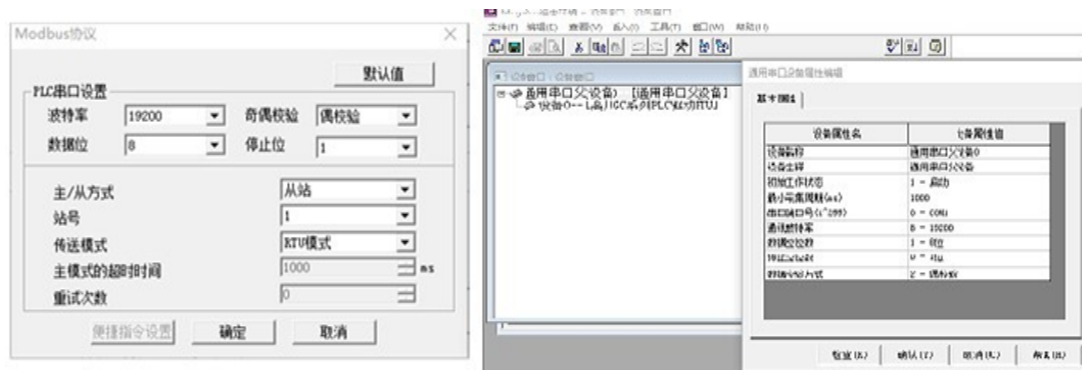
5	GND	GND	GND	GND	GND		PT100 : -
6	VO1 +	VI7+	VO 1+	VO1+	VO1+	AO 1 positive signal, D8114 AI 7 Positive signal, D8118	150~600 degrees (unit: 0.1 degrees)
7	VO2 +	VI8+	VO 2+	VO2+	VO2+	AO 2 Positive signal, D8115 AI 8 Positive signal, D8119	0~20mA: 0~2000 AO: 0~10V
8	GND	GND	GND	GND	GND		corresponds to 0~2000

8. Internal communication of PLC+HMI all-in-one

For the internal communication, the PLC uses PORT2 to communicate with the touch screen COM1.

Under 3U mode, PLC PORT2 COM port is 9600-7-E-1 as default settings, and can be changed by configuring D8420 via program. For touch screen, COM1 select Mitsubishi-FX3U_fx3g_master series.

Under Honyee "GC mode", PLC PORT2 is set through the system block. Select MODBUS RTU slave, set the station number and baud rate, as shown in the figure below. For touch screen, COM1 selects the Honyee "GC series PLC driver RTU", and make the serial port settings corresponding to the PLC.



II. PLC Input and Output Ports

1. Input specifications

Item		High-speed input port X0~X7	Common input terminal
Signal input method		Sink type, NPN	
Electrical parameters	Detection voltage	DC24V	
	Input resistance	3.3KΩ	4.3KΩ
	Input ON	External loop resistance < 400Ω	
	Input OFF	External loop resistance > 24KΩ	
Filter	Software filtering	Can be set between 1~64ms by user program	
	Hardware filtering	X0~X1: 10us X2~X7: 50us	10ms
High-speed function		X0 ~ X7 high-speed counting, interruption, pulse capture function X0~X1: 50KHz, X2~X7: 10KHz The total input frequency must be less than 80KHz	
Common terminal		S/Sn	

The counter input port has a corresponding maximum frequency limit. When the input frequency exceeds this limit, it may cause inaccurate counting or the system may not operate normally. Please arrange the input ports reasonably and select appropriate external sensors. PLC input terminals are divided into several groups. Each group provides a port "S/Sn" to select the input mode of the signal, which can be set to sink mode or source input mode. Connect "S/Sn " to " 24V+ ", that is, set the circuit to sink input mode, and NPN type sensor can be connected. The wiring diagram is shown in the figure below.

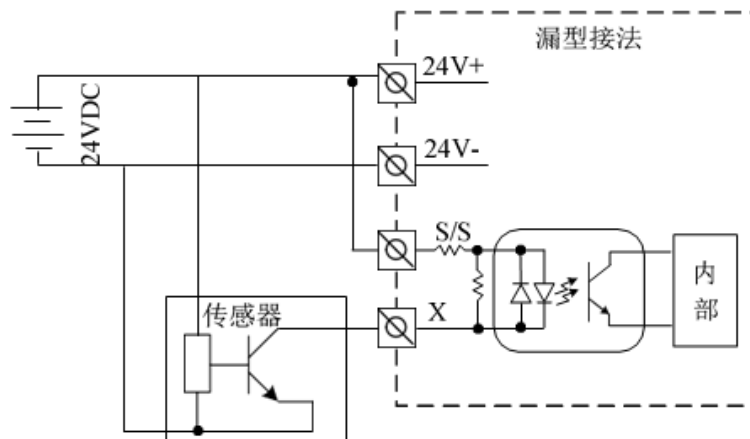


Figure 2-1 NPN input diagram

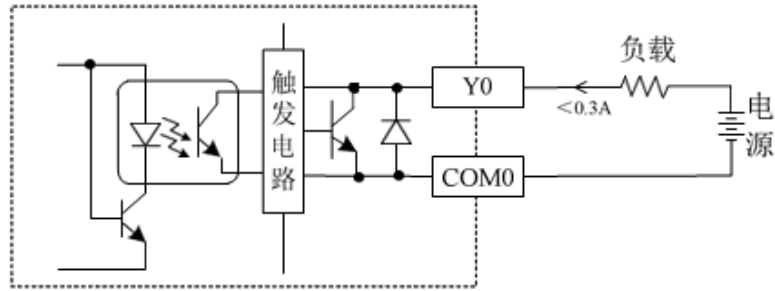


Figure 2-2 Transistor output diagram

2. Output specifications

PLC output terminal are divided into several groups, each group is electrically isolated, and the output contacts of different groups are connected to different power supply circuits. The outputs include relay and transistor output types.

For transistor output type, Y0~Y3 can be used as high-speed pulse output ports.

Item	Content	
Output	The output state is " On", the contact is closed. When the output state is " Off ", the contact is open.	
Common terminal	There are 2 groups, each with a common terminal C0n, which is suitable for control circuits with different potentials. The common terminals are insulated and isolated from each other.	
Features	Low driving current, high frequency and long life	
Applications	Applications that require high frequency and long life, such as controlling servo amplifiers and frequently operated electromagnets	
Loop power supply rated voltage	5~24VDC	
Circuit insulation	Optocoupler insulation	
Action Instructions	The LED lights up when the optocoupler is driven	
Open circuit leakage current	Less than 0.1 mA/24VDC	
Minimum load	5mA (5 to 24 VDC)	
Maximum output current	Resistive load	0.8A/4 point 1.6A/8 point
	Inductive load	7.2W/24VDC
Response time	Y0 ~ Y3 : less than 5us/ (10mA above) Others: less than 0.5ms/ (100mA or more)	
High-speed pulse output port	Y0~Y3 are high-speed pulse output ports Can control up to 4 axes, with a maximum output speed of 100K pulses	
Fuse protection	none	

3. Analog ports

Item		Specifications	
Conversion speed		2ms/ channel	
Analog input	Voltage	0~10V, input impedance 500kΩ	4 channels can be used simultaneously, and the input range can be selected by setting BFM (see the description of Table 3-3 for details)
	Current	-20mA~20mA, input impedance is 500Ω	
Digital output		Input voltage 0~2000, input current 0~1000	
Resolution	Voltage	5mV	
	Current	20μA	
Accuracy		Full scale ±1%	

Item		Specifications	
Conversion speed		1ms/channel (changing the number of channels used does not change the conversion speed)	
Analog output	Voltage	0 ~ 10VDC (external load impedance > 1kΩ)	
	Current	0 ~ 20mA (external load impedance < 500Ω) 4 ~ 20mA (external load impedance is < 500Ω)	
Digital input		Output voltage: 0 ~ 2000, output current: 0~1000	
Resolution	Voltage	5mV	
	Current	20μA	
Accuracy		±1% (for 10V full scale) ±1% (for 20mA full scale)	

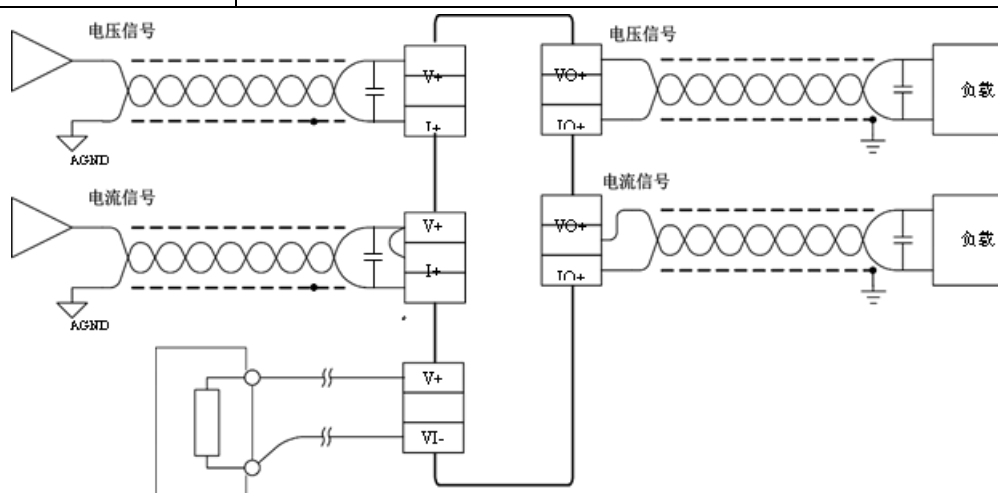


Figure 2-3 Analog circuit diagram

III. PLC Output and Servo Motor Wiring

Y0~Y3 of U series PLC are high-speed pulse output ports, which apply single-ended pulse transmission to control the servo motor. Figure 3-1 shows the wiring method with the servo motor driver. The power supply can use the servo driver's internal 24V power supply or an external 24V power supply.

The direction signal can be connected using a non-high-speed pulse output port. Y10 is used for demonstration here.

1. Single-end wiring between output port and driver

The direction signal can be connected using a non-high-speed pulse output port. Y10 is used for demonstration here.

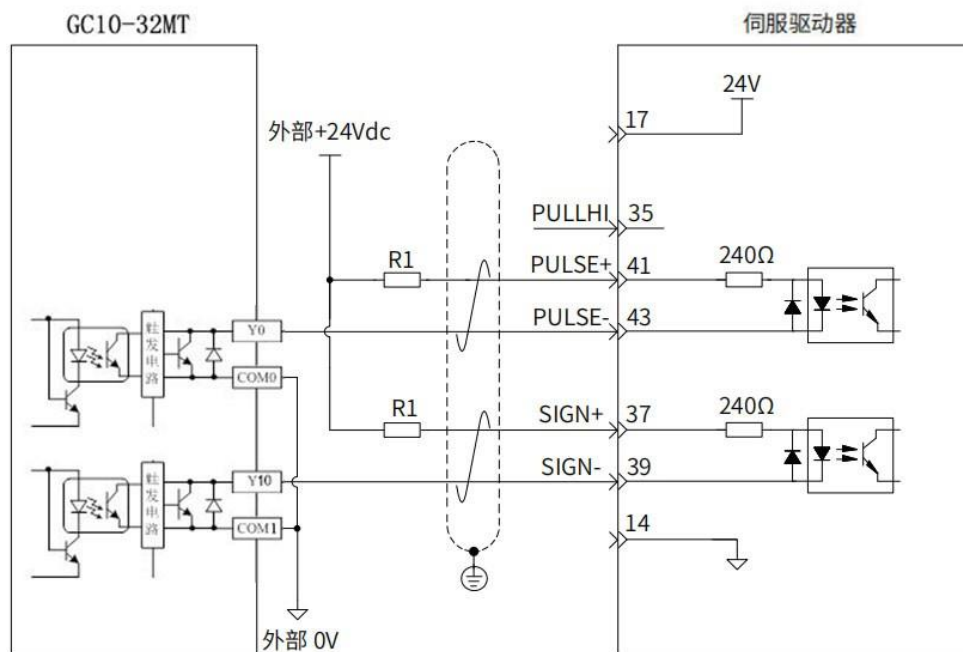


Figure 3-1 Wiring between PLC and servo drive

2. Double-end wiring between output port and driver

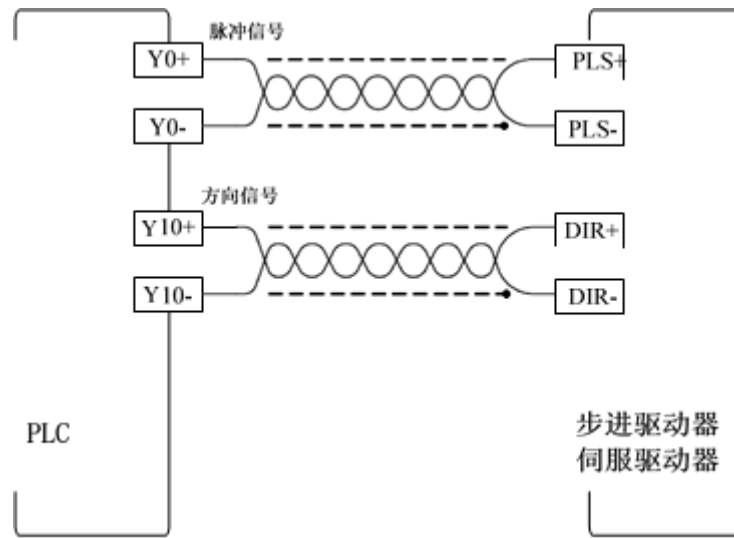


Figure 3-2 Differential wiring between PLC and driver