HC2 Series PLC User Manual

HNC Electric Limited

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PLC main unit

Safety Precautions

Thank you for purchasing our programmable logic controller (PLC). For safe use.be sure to read this manual.the manual of the PLC host and the reference manual of the corresponding module.

- Meaning of warning/caution

⚠ Warning	If used improperly, it may cause minor or moderate injury, and even serious injury or death under special circumstances. Material damage may also be caused.

⚠ Attention	If used improperly, it may cause minor or moderate injury, or Material damage may also be caused.

- **Warning**

⚠ Warning
Please do not disassemble the product or touch the inside of the product when it is powered on.otherwise there is a danger of electric shock.
Please do not touch the terminals when the power is on to avoid oxidation of the terminals or the risk of electric shock.
When the programmable controller (hereinafter referred to as PLC) detects an abnormality through the self-diagnosis function.stop the operation and turn off all outputs. In order for the system to operate on the safe side.take appropriate measures outside the PLC.
If the output of the PLC is overloaded or short-circuited.the voltage will drop and the output may turn OFF. In this case.take appropriate measures outside the PLC so that the system can operate on the safe side.
If an abnormal signal is generated due to the disconnection of the signal line or the instantaneous power failure.please take safety protection measures. Abnormal movements can cause major accidents.
Please use the voltage/current of the input/output module within the specified voltage/current range. Using out-of-range voltages/currents will cause malfunctions.

⚠ Attention
When wiring the DC power input.please pay attention to the ＋/－ polarity. If the connection is wrong.it will cause a system error.
Please tighten the terminal block screws on the input power side. Loose screws may cause system errors

Safety precautions

- Be sure to take safety measures such as the use of a circuit breaker in consideration of the short circuit of the external wiring.
- Installation of the unit should be carried out after a thorough inspection of its terminal block.
- Please install the reference manual to connect all wiring correctly.
- Please use the power supply voltage specified in the reference manual.
- Please take appropriate measures to ensure that the specified power supply with rated voltage and frequency is provided. Please pay special attention to the places where the power supply is unstable. An incorrect power supply may cause malfunction.
- Please use crimp terminals for wiring. Please do not connect the wires that are just twisted together directly to the terminal block.
- Do not connect a voltage or load that exceeds the maximum switching capacity to the output terminal.
- There is a locking mechanism on the PLC.please confirm it is locked before use.
- Please fully confirm the settings of wiring.switches.etc. before turning on the power.
- The user program needs to be fully checked before it is formally run in the unit.
- Please do not disassemble.repair or modify this product.
- Before starting any of the following work.please turn off the power supply added to the PLC.
    - When removing the Expansion Unit from the CPU Unit
    - When loading and unloading the optional board
    - When connecting cables or wires
- Please confirm that there is no impact on the device before performing the following operations.
- Forced setting/resetting of contacts
- Change of current value or set value
- When replacing parts.be sure to confirm that the ratings of the new parts are correct.
- When transporting or storing the circuit board.in order to prevent electrostatic damage.please pack the circuit board with conductive material or put it in an electrostatic bag.and pay attention to maintaining a proper storage temperature.
- Before wiring.please fully confirm the wiring number.
- Please follow the instructions in the reference manual for wiring.
- Unpredictable operation may result if inappropriate parameters are set. Even if the appropriate parameters have been set.verify that the control system will not be adversely affected before starting or stopping the parameters.
- During data transmission.do not cut off the power supply.otherwise the data transmission will be interrupted.
- About the disposal of the main unit.please abide by the relevant local laws and regulations on disposal.
- This product is suitable for EMC instruction when a complete PLC system is assembled in the specified PLC series.

Use caution

- Please follow the instructions in the reference manual to make the correct settings.
- Do not use in the following places:
  - Direct sunlight
  - Places where the ambient temperature and relative humidity exceed the specified values
  - Places where rapid temperature changes are likely to cause condensation
  - Places with corrosive gas and flammable gas
  - Places with a lot of dust.dust.salt and iron powder
  - Places that will be splashed with water.oil.medicine and other droplets
  - Places that bring direct vibration and shock to the host

Product Maintenance

In order to ensure the normal operation of the PLC system function.please check the product according to the following items.

Item	Check	Judgment standard	Disposal method
Visual inspection	Visual inspection	Whether there is dirt	Clean dust and dirt with alcohol and cotton cloth
Product installation	Whether the product and DIN rail are properly installed	Is the product installed securely?	Check DIN rail and plastic retaining clips
Connection	Check for loose terminals Check the connection port of the cable	Terminals cannot be loosened The connection port cannot be loose	Connect the terminals properly Check that cables and ports are securely installed
POW indicator	Check whether the RUN indicator is always ON when the PLC is running	POW indicator must be always ON	Check whether the 24VDC power supply is normal
RUN indicator	Check whether the RUN indicator is always ON when the PLC is running	RUN indicator must be always ON	Check whether the PLC program is running normally
ERR indicator	Check if the ERR indicator is OFF	ERR indicator must be OFF	

Commitments when using

When wiring the DC power input.please pay attention to the ＋/－ polarity. If the connection is wrong.it will cause a system error.
Please tighten the terminal block screws on the input power side. Loose screws may cause system errors

When using in the following conditions and environments.please consult with our technical staff and confirm the specifications.and at the same time.allow room for rated functions.etc..and take safety measures into consideration.and seek to control the risk even if a failure occurs Security countermeasures at a minimum.

- When used outdoors.where there is potential chemical pollution.electrical radiation.and conditions and environments that are not recorded in product samples or instructions
- Used in atomic energy control.railway.aviation.vehicle equipment.combustion equipment.medical equipment.safety
- Machinery.administrative organs and special industries.etc.
- Systems.machinery.devices.etc. that are expected to have a great impact on people and property
- Used for high-reliability equipment such as gas.water pipes.electricity and other supply systems and 24-hour uninterrupted operation systems

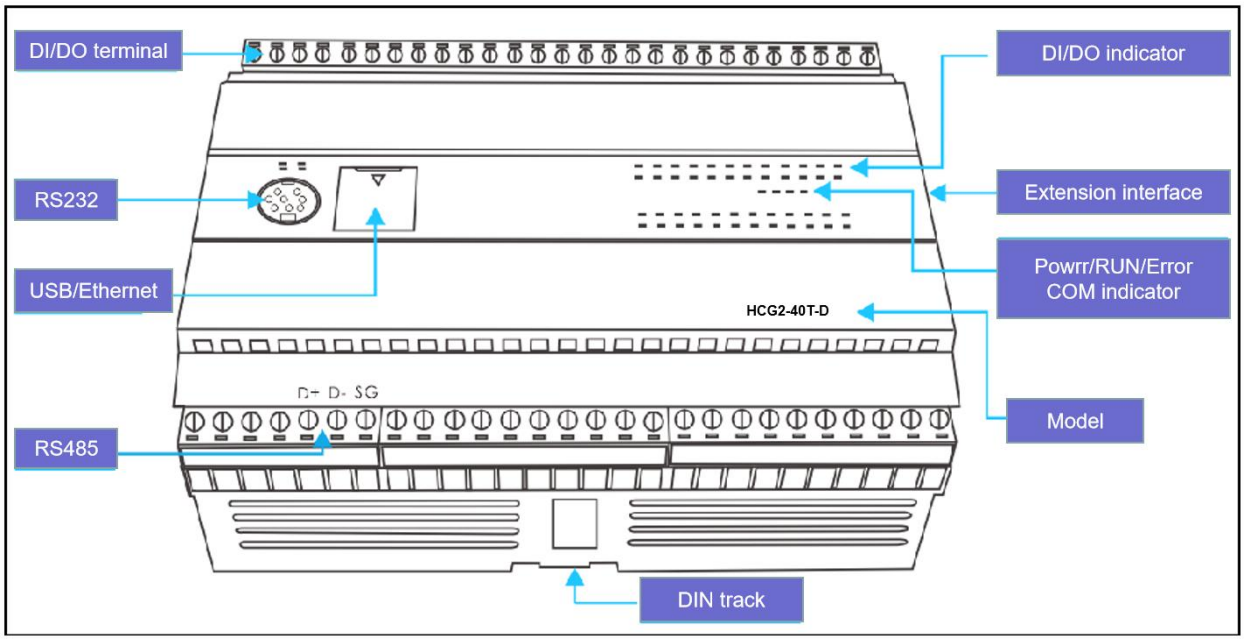
Specifications are subject to change without notice.

Chapter I. HCG2 standard series PLC

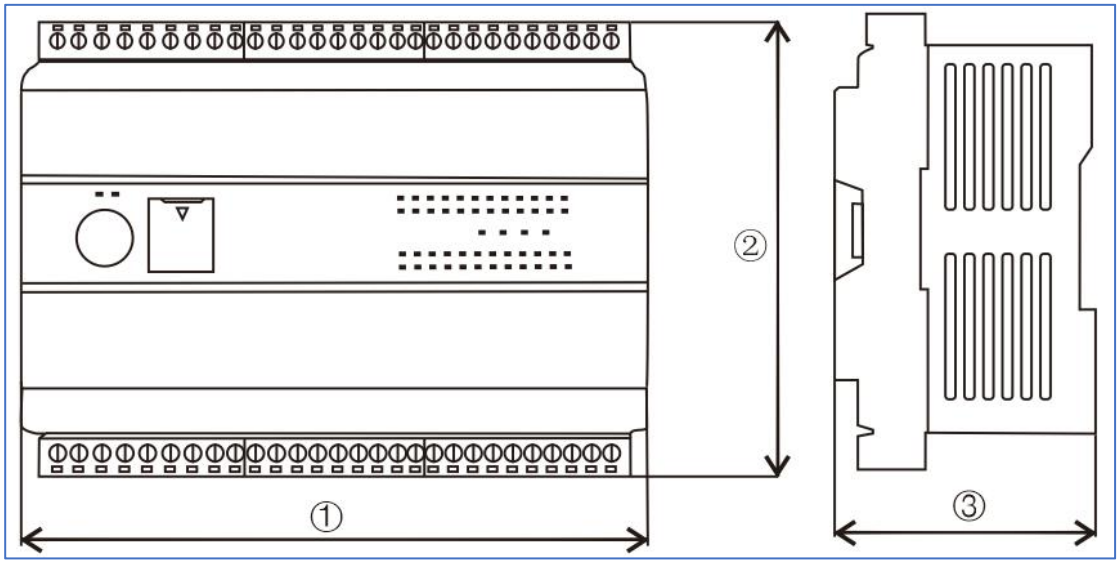
Thank you for using HCG2 standard PLC series programmable controllers. This series provides 14~68 points of host and 8~40 points of digital input/output modules.including the host.the maximum input/output expansion can reach up to 512 points. It can also be used with analog input/output modules.temperature modules.and weighing modules to meet various applications.

- This installation manual provides users with electrical specifications.functional specifications.and related precautions for installation and wiring.
- When the user uses the machine.it must be installed in a housing wiring box that is dust-proof.moisture-proof and free from electric shock/shock accidents. In addition.there must be protective measures (such as special tools or keys to open) to prevent non-maintenance personnel from operating or accidentally hitting the body.causing danger or damage.
- The AC power supply cannot be connected to the input/output signal terminals.otherwise serious damage may be caused. Please confirm the power wiring again before powering on. Do not touch any terminals while power is on.
- When installing the PLC.please install it in a closed control box.and keep a certain space around it to ensure the normal cooling function of the PLC.
- Installation method of DIN rail: When hanging the main unit on the rail.please insert the fixed plastic sheet under the main unit into the groove with a flat screwdriver.stretch it out and pull it out.then hang the main unit on the rail.and then Fasten the plastic sheet and snap it back. When you want to remove the main unit.also use a flat-blade screwdriver to open the fixed plastic sheet.and then take out the main unit in an outward-facing manner. The plastic sheet of the fixing mechanism is a retaining type.so it will not spring back after being stretched.

1. Product appearance



2. Product size



MPU	Dimension（mm）		
	①	②	③
14-16 points	60	110	61
24-40 points	141	110	61
48-68 points	201	110	61

3. Model list

Points	Model	Naming rule
14 points	HCG2-14R-D. HCG2-14P-D	HCG2 series standard MPU P/T: transistor output R: Relay output AI: analog input AO: Analog output E: Ethernet C: CAN bus D: DC24V DC power supply A: AC220V AC power supply
16 points	HCG2-16R-D. HCG2-16T-D.	
24 points	HCG2-24P-D/A. HCG2-1608R-D/A HCG2-24T-D/A. HCG2-1410R-D/A	
32 points	HCG2-32R-D/A. HCG2-32T-D/A HCG2-32TL-D/A. HCG2-32T-E-D/A HCG2-32P-D/A	
40 points	HCG2-40T-D/A. HCG2-40R-D/A HCG2-40T-C-D/A. HCG2-40T-E-D/A. HCG2-40T2AO-D. HCG2-40T1AI1AO-D	
48 points	HCG2-48R-D/A. HCG2-48T-D/A HCG2-48T6AO-D/A. HCG2-48R6AO-D/A HCG2-48T-6AB-D/A	
60 points	HCG2-60R-D/A. HCG2-60T-D/A. HCG2-60P-D/A. HCG2-60P-E-D/A	
68 points	HCG2-68T-D	

4. Electrical Specifications

Model	I/O total points	Input power supply	Output type	Communication	Program capacity
HCG2-14R-D	14	DC24V	Relay	RS232/RS485	16k steps
HCG2-14P-D	14	DC24V	NPN	RS232/RS485	16k steps
HCG2-16R-D	16	DC24V	Relay	RS232	16k steps
HCG2-16T-D	16	DC24V	NPN	RS232	16k steps
HCG2-24P-D	24	DC24V	NPN	RS232/RS485/USB	16k steps
HCG2-24P-A	24	AC100V-240V	NPN	RS232/RS485/USB	16k steps
HCG2-1608R-D	24	DC24V	Relay	RS232/RS485/USB	16k steps
HCG2-1608R-A	24	AC100V-240V	Relay	RS232/RS485/USB	16k steps
HCG2-24T-D	24	DC24V	NPN	RS232/RS485/USB	16k steps

HCG2-24T-A	24	AC100V-240V	NPN	RS232/RS485/USB	16k steps
HCG2-1410R-D	24	DC24V	Relay	RS232/RS485/USB	16k steps
HCG2-1410R-A	24	AC100V-240V	Relay	RS232/RS485/USB	16k steps
HCG2-32R-D	32	DC24V	Relay	RS232/RS485/USB	16k steps
HCG2-32R-A	32	AC100V-240V	Relay	RS232/RS485/USB	16k steps
HCG2-32T-D	32	DC24V	NPN	RS232/RS485/USB	16k steps
HCG2-32T-A	32	AC100V-240V	NPN	RS232/RS485/USB	16k steps
HCG2-32TL-D	32	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-32TL-A	32	AC100V-240V	NPN	RS232/RS485/USB	30k steps
HCG2-32T-E-D	32	DC24V	NPN	RS232/RS485/Ethernet	16k steps
HCG2-32T-E-A	32	AC100V-240V	NPN	RS232/RS485/Ethernet	16k steps
HCG2-32P-D	32	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-32P-A	32	AC100V-240V	NPN	RS232/RS485/USB	30k steps
HCG2-40T-D	40	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-40T-A	40	AC100V-240V	NPN	RS232/RS485/USB	30k steps
HCG2-40R-D	40	DC24V	Relay	RS232/RS485/USB	30k steps
HCG2-40R-A	40	AC100V-240V	Relay	RS232/RS485/USB	30k steps
HCG2-40T-C-D	40	DC24V	NPN	RS232/RS485/USB/CAN	30k steps
HCG2-40T-C-A	40	AC100V-240V	NPN	RS232/RS485/USB/CAN	30k steps
HCG2-40T-E-D	40	DC24V	NPN	RS232/RS485/Ethernet	30k steps
HCG2-40T-E-A	40	AC100V-240V	NPN	RS232/RS485/Ethernet	30k steps
HCG2-40T2AO-D	40	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-40T1AI1AO-D	40	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-48R-D	48	DC24V	Relay	RS232/RS485/USB	30k steps
HCG2-48R-A	48	AC100V-240V	Relay	RS232/RS485/USB	30k steps
HCG2-48T-D	48	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-48T-A	48	AC100V-240V	NPN	RS232/RS485/USB	30k steps
HCG2-48T6AO-D	48	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-48T6AO-A	48	AC100V-240V	NPN	RS232/RS485/USB	30k steps
HCG2-48R6AO-D	48	DC24V	Relay	RS232/RS485/USB	30k steps
HCG2-48R6AO-A	48	AC100V-240V	Relay	RS232/RS485/USB	30k steps
HCG2-48T-6AB-D	48	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-48T-6AB-A	48	AC100V-240V	NPN	RS232/RS485/USB	30k steps
HCG2-60R-D	60	DC24V	Relay	RS232/RS485/USB	30k steps
HCG2-60R-A	60	AC100V-240V	Relay	RS232/RS485/USB	30k steps
HCG2-60T-D	60	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-60T-A	60	AC100V-240V	NPN	RS232/RS485/USB	30k steps
HCG2-60P-D	60	DC24V	NPN	RS232/RS485/USB	30k steps
HCG2-60P-A	60	AC100V-240V	NPN	RS232/RS485/USB	30k steps
HCG2-60T-E-D	60	DC24V	NPN	RS232/2*RS485/Ethernet	60k steps
HCG2-60T-E-A	60	AC100V-240V	NPN	RS232/2*RS485/ Ethernet	60k steps
HCG2-60P-E-D	60	DC24V	NPN	RS232/2*RS485/ Ethernet	60k steps
HCG2-60P-E-A	60	AC100V-240V	NPN	RS232/2*RS485/ Ethernet	60k steps

HCG2-68T-D	68	DC24V	NPN	RS232/RS485/USB	30k steps

Model	Output rated current	Number of digital (high-speed) input points	Number of digital (high-speed) output points	DI maximum frequency	DO maximum frequency	Rated power
HCG2-14R-D	5A	8(4)	6(-)	20khz	-----	3W
HCG2-14P-D	0.5A	8(2)	6(3)	200khz	100khz	2W
HCG2-16R-D	5A	8(4)	8(-)	20khz	-----	3W
HCG2-16T-D	0.5A	8(4)	8(4)	20khz	10khz	2W
HCG2-24P-D	0.5A	12(2)	12(6)	200khz	200khz	2.5W
HCG2-24P-A	0.5A	12(2)	12(6)	200khz	200khz	30W
HCG2-1608R-D	5A	16(-)	8(-)	10khz	-----	3.5W
HCG2-1608R-A	5A	16(-)	8(-)	10khz	-----	30W
HCG2-24T-D	0.5A	12(2)	12(2)	200khz	200khz	2W
HCG2-24T-A	0.5A	12(2)	12(2)	200khz	200khz	30W
HCG2-1410R-D	5A	14(-)	10(-)	10khz	-----	3.5W
HCG2-1410R-A	5A	14(-)	10(-)	10khz	-----	30W
HCG2-32R-D	5A	16(2)	16(-)	200khz	-----	5W
HCG2-32R-A	5A	16(2)	16(-)	200khz	-----	30W
HCG2-32T-D	0.5A	16(2)	16(4)	200khz	200khz	3.5W
HCG2-32T-A	0.5A	16(2)	16(4)	200khz	200khz	30W
HCG2-32TL-D	0.5A	16(6)	16(4)	200khz	200khz	3.5W
HCG2-32TL-A	0.5A	16(6)	16(4)	200khz	200khz	30W
HCG2-32T-E-D	0.5A	16(6)	16(4)	200khz	200khz	3.5W
HCG2-32T-E-A	0.5A	16(6)	16(4)	200khz	200khz	30W
HCG2-32P-D	0.5A	16(6)	16(8)	200khz	200khz	3W
HCG2-32P-A	0.5A	16(6)	16(8)	200khz	200khz	30W
HCG2-40T-D	0.5A	24(6)	16(4)	200khz	200khz	4W
HCG2-40T-A	0.5A	24 (6)	16(4)	200khz	200khz	30W
HCG2-40R-D	5A	24 (6)	16(-)	200khz	-----	5W
HCG2-40R-A	5A	24 (6)	16(-)	200khz	-----	30W
HCG2-40T-C-D	0.5A	24 (6)	16(4)	200khz	200khz	4W
HCG2-40T-C-A	0.5A	24 (6)	16(4)	200khz	200khz	30W
HCG2-40T-E-D	0.5A	24 (6)	16(4)	200khz	200khz	4W
HCG2-40T-E-A	0.5A	24 (6)	16(4)	200khz	200khz	30W
HCG2-40T2AO-D	0.5A	24 (6)	16(4)	200khz	200khz	4W
HCG2-40T1AI1AO-D	0.5A	24 (6)	16(4)	200khz	200khz	4W
HCG2-48R-D	5A	24(6)	24(-)	200khz	-----	7.5W
HCG2-48R-A	5A	24(6)	24(-)	200khz	-----	30W
HCG2-48T-D	0.5A	24(6)	24(4)	200khz	200khz	4.5W
HCG2-48T-A	0.5A	24(6)	24(4)	200khz	200khz	30W
HCG2-48T6AO-D	0.5A	24(6)	24(4)	200khz	200khz	4.5W

HCG2-48T6AO-A	0.5A	24(6)	24(4)	200khz	200khz	30W
HCG2-48R6AO-D	5A	24(6)	24(-)	200khz	-----	7.5W
HCG2-48R6AO-A	5A	24(6)	24(-)	200khz	-----	30W
HCG2-48T-6AB-D	0.5A	24(12)	24(8)	200khz	200khz	4.5W
HCG2-48T-6AB-A	0.5A	24(12)	24(8)	200khz	200khz	30W
HCG2-60R-D	5A	36(6)	24(-)	200khz	-----	7.5W
HCG2-60R-A	5A	36(6)	24(-)	200khz	-----	30W
HCG2-60T-D	0.5A	36(6)	24(4)	200khz	200khz	4W
HCG2-60T-A	0.5A	36(6)	24(4)	200khz	200khz	30W
HCG2-60P-D	0.5A	36(6)	24(12)	200khz	200khz	4.5W
HCG2-60T-E-D	0.5A	36(6)	24(4)	200khz	200khz	4W
HCG2-60T-E-A	0.5A	36(6)	24(4)	200khz	200khz	30W
HCG2-60P-E-D	0.5A	36(6)	24(12)	200khz	200khz	4.5W
HCG2-60P-E-A	0.5A	36(6)	24(12)	200khz	200khz	30W
HCG2-60P-A	0.5A	36(6)	24(12)	200khz	200khz	30W
HCG2-68T-D	0.5A	36(6)	32(4)	200khz	200khz	4.5W

Input points electrical specifications

Specification		HCG2-14R-D. HCG2-16R-D. HCG2-16T-D		HCG2-14P-D HCG2-24P-D. HCG2-32T/R-D/A		HCG2-48T-6AB-D/A	
Input		X0~X3	X4	X0~X1	X2~X7,X10~	X0~X13	X14~
Input type		DI					
Input type		DC（NPN）					
Input current		DC24V，5mA					
Input resistance		4.7KΩ					
Max. frequency		20kHz	10kHz	200khz	10khz	200khz	10khz
Response time	Off→ON	<10us	<20us	<2.5us	<20us	<2.5us	<20us
	ON→Off	<20us	<50us	<5us	<50us	<5us	<50us
Specification		HCG2-32P-D/A. HCG2-32TL-D/A. HCG2-32T-E-D/A. HCG2-40T-D/A. HCG2-40R-D/A. HCG2-48R-D/A HCG2-60T-D/A. HCG2-60R-D/A. HCG2-60P-D/A. HCG2-40T-C-D/A. HCG2-40T-E-D/A. HCG2-48T-D HCG2-40T2AO-D/A. HCG2-40T1AI1AO-D/A. HCG2-48T6AO-D/A. HCG2-48R6A0-D/A. HCG2-60P-E-D/A					
Input		X0~X5		X6~X7,X10~			
Input type		DI					
Input type		DC（NPN）					
Input current		DC24V，5mA					
Input resistance		4.7KΩ					
Max. frequency		200khz		10khz			
Response time	Off→ON	<2.5us		<20us			
	ON→Off	<5us		<50us			

Output points electrical specifications

Specification		HCG2-40T-D/A . HCG2-40T2AO-D . HCG2-40T-C-D/A HCG2-40T1AI1AO-D. HCG2-32/40T-E-D/A HCG2-48T6AO-D. HCG2-60T-D. HCG2-60T-E-D. HCG2-68T-D		HCG2-48T-6AB-D/A	
Output type		NPN			
Output		Y0,Y2,Y4,Y6	Y1,Y3,Y5,Y7~	Y0,Y2,Y4 Y6,Y10,Y12 Y14,Y16	Y1,Y3,Y5 Y7,Y11,Y13 Y15,Y17
Max. frequency		200KHZ	10KHZ	200KHZ	10KHZ
Max. load	Resistive	0.5A/1point			
	Inductive	15W			
Response time	Off→ON	<2us	<20us	<2us	<20us
	ON→Off	<3us	<30us	<3us	<30us

Specification		HCG2-16T-D	HCG2-24P-D/A; HCG2-32P-D/A HCG2-60P-D/A	HCG2-24T-D/ HCG2-32T-D/A	
Output type		NPN			
Output		All	Y0,Y2,Y4,Y6…(Even)	Y0,Y2	Y1,Y3,Y5~
Max. frequency		10KHZ	200KHZ	200KHZ	10KHZ
Max. load	Resistive	0.5A/1point			
	Inductive	15W			
Response time	Off→ON	<20us	<2us	<2us	<20us
	ON→Off	<30us	<3us	<3us	<30us

Specification	HCG2-14R-D HCG2-16R-D HCG2-32R-D HCG2-40R-D HCG2-48R-D HCG2-48R6AO-D HCG2-60R-D HCG2-1608R-D HCG2-1410R-D
Output type	Relay
Output	All
Max. Load current	5A
Response time	About 10ms

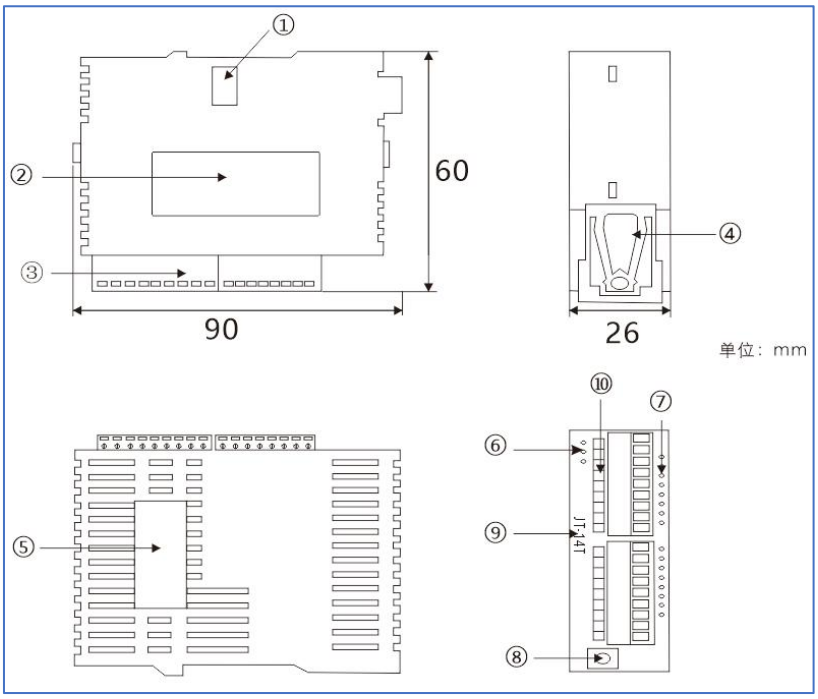
5. Analog register

The AI/AO range is 0-10V.corresponding to K0-K4095.12-bit resolution.

Model	**AI channel**	**AO channel**	**AI register**	**AO register**
HCG2-40T2AO-D	0	2	---	CH1~2：D1540~1541
HCG2-40T1AI1AO-D	1	1	CH1：D1538	CH1：D1540
HCG2-48T6AO-D	0	6	---	CH1~6：D1546~1551
HCG2-48T6AO-A	0	6	---	CH1~6：D1546~1551
HCG2-48R6AO-D	0	6	---	CH1~6：D1546~1551
HCG2-48R6AO-A	0	6	---	CH1~6：D1546~1551

Chapter II. HCS2 compact series PLC

1. Product appearance&Size



1 Extension ports	6 Power.Run.Error Indicators
2 Label	7 Input/output Indicators
3 Input/output terminal	8 RS232
4 DIN rail fixing buckle	9 Model
5 Company LOGO	10 Input/output mark

2. Electrical Specifications

Model	I/O total points	Input power supply	Output type	Communication	Program capacity
HCS2-14T	14	DC24V	NPN	RS232/RS485	16k steps
HCS2-14R	14	DC24V	Relay	RS232/RS485	16k steps
HCS2-16T	16	DC24V	NPN	RS232/RS485	16k steps

Model	Output rated current	Number of digital (high-speed) input points	Number of digital (high-speed) output points	DI maximum frequency	DO maximum frequency	Rated power
HCS2-14T	0.5A	8(4)	6(1)	20khz	200khz	2W
HCS2-16T	0.5A	8(4)	8(1)	20khz	200khz	2.5W
HCS2-14R	5A	8(4)	6(--)	20khz	-----	2.5W

Input points electrical specifications

Specification		HCS2-14T		HCS2-16T HCS2-14R	
Input		X0~X3	X4~X7	X0~X3	X4~X7
Input type		DI			
Input type		DC（NPN）			
Input current		DC24V，5mA			
Input resistance		4.7KΩ			
Max. frequency		20kHz	10kHz	20khz	10khz
Response time	Off→ON	<10us	<20us	<10us	<20us
	ON→Off	<20us	<50us	<20us	<50us

Output points electrical specifications

Specification		HCS2-14T HCS2-16T	
Output type		NPN	
Output		Y0	Y1~
Max. frequency		200KHZ	10KHZ
Max. load	Resistive	0.5A/1point（4A/COM）	
	Inductive	15W	
Response time	Off→ON	<2us	<20us
	ON→Off	<3us	<30us

Specification	HCS2-14R
Output type	Relay
Output	All
Max. frequency	5A
Response time	About 10ms

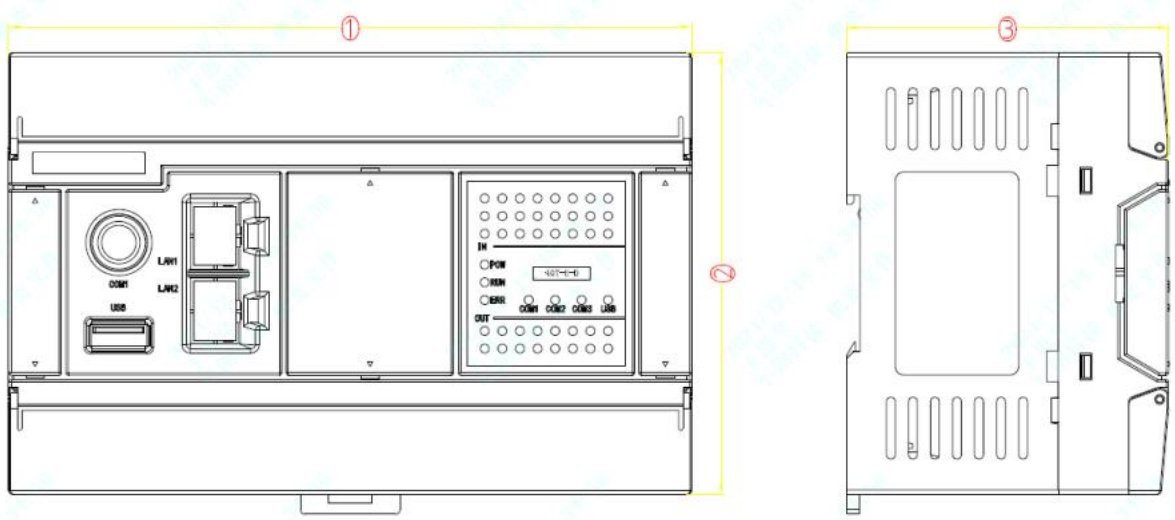
Chapter III. HCH2&HCM2 Field-bus(EtherCAT) series PLC

HCH2 series PLC function introduction

Thank you for using HCH2 high-end PLC series programmable controllers. This series provides 14~40 points of MPU and 8~40 points of digital input/output modules.including the MPU and expansion module.the maximum DI/DO can reach up to 512 points totally. It can also be used with AI/AO modules.temperature modules.and weighing modules to meet various applications.

HCH2 series PLC is a multi-axis controller based on EtherCAT field bus. The bus transmission rate is 100Mbps. It adopts distributed clock.and the combination of pulse axis and bus axis can transmit data quickly.accurately and efficiently.which is convenient for users to get started quickly. Through the EtherCAT interface.it can control up to 12 axes.support single-axis motion commands such as position.speed.torque.and origin return.and support multi-axis commands such as electronic gear.electronic cam.linear interpolation.and circular interpolation. Built-in a variety of communication ports.RS232, 2 groups of RS485,USB,Ethernet for users to choose.

HCH2 Product size



MPU	Dimension（mm）		
	①	②	③
14-24 points	114	100	73
32-40 points	155	100	73

Model list

Points	Model	Naming rule
32 points	HCH2-32T/R-E-D/A	HCH2 high-end PLC T：Transistor R：Relay E：Ethernet/EtherCAT D：DC24V power supply A：AC220Vpower supply
40 points	HCH2-40T/R-E-D/A	

Electrical Specifications

Model	I/O points	Power supply	Output	Communication	Program capacity	Bus and pulse axis number totally
HCH2-32T-E-D	32	DC24V	NPN	RS232/ RS485*2/ Ethernet /EtherCAT/USB	60K steps	8
HCH2-32T-E-A	32	AC100V-240V	NPN			8
HCH2-32R-E-D	32	DC24V	Relay			8
HCH2-32R-E-A	32	AC100V-240V	Relay			8
HCH2-40T-E-D	40	DC24V	NPN			8
HCH2-40T-E-A	40	AC100V-240V	NPN			8
HCH2-40R-E-D	40	DC24V	Relay			8
HCH2-40R-E-A	40	AC100V-240V	Relay			8

Model	Output rated current	Number of digital (high-speed) input points	Number of digital (high-speed) output points	DI maximum frequency	DO maximum frequency
HCH2-40T-E-D	0.5A	24(8)	16(8)	200Khz	200Khz
HCH2-40T-E-A	0.5A	24(8)	16(8)	200Khz	200Khz
HCH2-40R-E-D	5A	24(8)	16(-)	200Khz	200Khz
HCH2-40R-E-A	5A	24(8)	16(-)	200Khz	200Khz

Input points electrical specifications

Specification		HCH2-32T-E-D/A. HCH2-40T-E-D/A	
Input		X0~X7	X10~
Input type		DI	
Input type		DC（NPN）	
Input current		DC24V，5mA	
Input resistance		4.7KΩ	
Max. frequency		200khz	10khz
Response time	Off→ON	<2.5us	<20us
	ON→Off	<5us	<50us

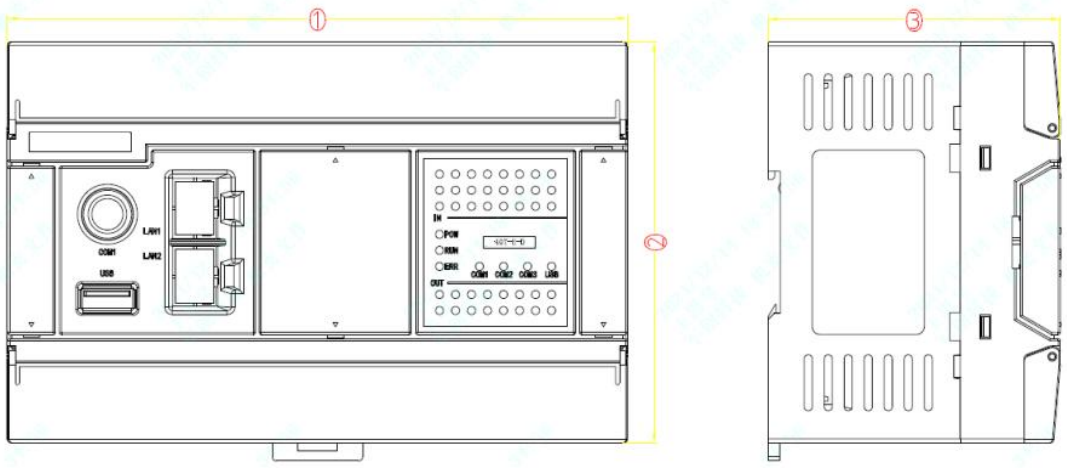
Transistor output points electrical specifications

Specification		HCH2-32T-E-D/A . HCH2-40T-E-D/A	
Output type		NPN	
Output		Y0~Y17（Even 8points.Y0,Y2…）	Y0~Y17（Odd 8points,Y1,Y3…）
Max. frequency		200KHZ	10KHZ
Max. load	Resistive	0.5A/1point	
	Inductive	15W	
Response time	Off→ON	<2us	<20us
	ON→Off	<3us	<30us

Relay output points electrical specifications

Specification	HCH2-32R-E-D/A. HCH2-40R-E-D/A
Output type	Relay
Output	All
Max. Load current	5A
Response time	About 10ms

HCM2 Product size



MPU	Dimension（mm）		
	③	④	③
16-24 points	114	100	73
32-40 points	155	100	73
48-60 points	278	100	73

Model list

Points	Model	Naming rule
16 points	HCM2-16T-E-D/A	HCM2 high-end PLC T：Transistor E：Ethernet/EtherCAT D：DC24V power supply A：AC220Vpower supply
24 points	HCM2-24T-E-D/A	
32 points	HCM2-32T-E-D/A	
40 points	HCM2-32T-E-D/A	

Electrical Specifications

Model	I/O points	Power supply	Output	Communication	Program capacity	Bus and pulse axis number totally
HCM2-16T-E-D	16	DC24V	NPN	RS232 RS485*2 Ethernet EtherCAT USB	60K steps	8
HCM2-16T-E-A	16	AC100V-240V	NPN			8
HCM2-24T-E-D	24	DC24V	NPN			8
HCM2-24T-E-A	24	AC100V-240V	NPN			8
HCM2-32T-E-D	32	DC24V	NPN			8
HCM2-32T-E-A	32	AC100V-240V	NPN			8
HCM2-40T-E-D	40	DC24V	NPN			8
HCM2-40T-E-A	40	AC100V-240V	NPN			8

Note 1: HCM2 is a bus type PLC with electronic cam function. Other functions are the same as those of the corresponding model of HCH2. For its parameter specifications, please refer to the description of HCH2.

Example: HCM2-32T-E-D type PLC has more motion control functions than HCH2-32T-E-D type PLC, and other functions are the same. Other models are the same.

Note 2: For motion control type HCM2 series PLC, please refer to "HCM2 Motion Control User Guide" for the use of electronic cam and multi-axis control.

Bus programing method

3.1. EtherCAT axis configuration

D1500 is defined as follows.configure the number of bus and pulse axes:

System D register	Set value	Pulse axis number	Bus start axis
D1500 (Power-down non-retentive)	K4 (Default)	4 CH0-CH3 (Y0,Y2,Y4,Y6)	CH4 (Y10)
	K0	0	CH0 (Y0)
	K1	1 CH0 (Y0)	CH1 (Y2)
	K2	2 CH0-CH1 (Y0,Y2)	CH2 (Y4)
	……	……	……

Channel	Pulse	Direction	Axis. No define
CH0 (Y0,Y1)	Y0	Y1	K0
CH1 (Y2,Y3)	Y2	Y3	K1
CH2 (Y4,Y5)	Y4	Y5	K2
CH3 (Y6,Y7)	Y6	Y7	K3
CH4 (Y10,Y11)	Y10	Y11	K4
……	……	……	……

System D register	Function	Description
D1450	Number of detected bus servos	---
D1451	EtherCAT current state	K0: The current state is to restart initialization K9: Bus initialization complete

System M register	Function	Description
M1197	EtherCAT initialization flag	Triggering method: After turning ON.will automatically turn OFF.

- D1451 indicates the bus status. M1197 is the bus initialization flag. When M1197 is triggered and turned ON once.D1451 is K0.indicating that the current state is restarting initialization. When D1451 is K9.the initialization is completed.

3.2 Position mode CSP

CSP (Cyclic Synchronous Position Mode).its motion trajectory is calculated by the PLC.and periodically

sends the target position to the slave station.

Example:

1） Execute the position command.the program defines D1500 as K4.then the EtherCAT bus Y10 is the starting axis.and the bus axis does not occupy the PLC hardware output port.

2） It is recommended to enable the servo after the EtherCAT initialization is completed.that is.when D1451 is K9 (if the current state is not K9.try to turn on M1197).

3） The bus position mode command is the same as the programming method of the pulse axis positioning command.

4） Write the current position of the servo: If the current position of the servo is cleared or assigned other values.the value of the target position can be directly changed. At the same time.after turning M1476 ON.there is no need to turn OFF the PLC program.the system will automatically turn OFF.and the current position is written successfully. After that.the current encoder position D1716 corresponding to the Y10 axis and the output current pulse numbers D1712 and D1714 are the same values. The example is as follows:

Note: Take the Y10 axis as an example.if you change the current position of the servo.you cannot directly change the value of the current pulse number D1712.otherwise it will cause a speeding.

➢ When the bus axis is K0-K15.the system M register and system D register corresponding to the bus positioning command are shown in the following table.

Axis number (channel)	Servo Enable	Clear Servo Alarm	Set the current coordinates of the servo		ECAT encoder position (read-only 32-bit)	Current servo torque (read only 16 bits)	Current servo status 6041h (read only 16 bits)	Current servo alarm code (read only 16 bits)
			Change the coordinate enable flag bit	Coordinate address (R/W 32 bits)				
CH0 (Y0,Y1)	M1440	M1456	M1472	D1650	D1652	D1468	D1452	D1484
CH1 (Y2,Y3)	M1441	M1457	M1473	D1666	D1668	D1469	D1453	D1485
CH2 (Y4,Y5)	M1442	M1458	M1474	D1682	D1684	D1470	D1454	D1486
CH3 (Y6,Y7)	M1443	M1459	M1475	D1698	D1700	D1471	D1455	D1487
CH4 (Y10,Y11)	M1444	M1460	M1476	D1714	D1716	D1472	D1456	D1488
CH5 (Y12,Y13)	M1445	M1461	M1477	D1730	D1732	D1473	D1457	D1489
CH6 (Y14,Y15)	M1446	M1462	M1478	D1746	D1748	D1474	D1458	D1490
CH7 (Y16,Y17)	M1447	M1463	M1479	D1762	D1764	D1475	D1459	D1491
CH8 (Y20,Y21)	M1448	M1464	M1480	D1778	D1780	D1476	D1460	D1492
CH9 (Y22,Y23)	M1449	M1465	M1481	D1794	D1796	D1477	D1461	D1493
CH10 (Y24,Y25)	M1450	M1466	M1482	D1810	D1812	D1478	D1462	D1494
CH11 (Y26,Y27)	M1451	M1467	M1483	D1826	D1828	D1479	D1463	D1495
CH12 (Y30,Y31)	M1452	M1468	M1484	D1842	D1844	D1480	D1464	D1496
CH13 (Y32,Y33)	M1453	M1469	M1485	D1858	D1860	D1481	D1465	D1497
CH14 (Y34,Y35)	M1454	M1470	M1486	D1874	D1876	D1482	D1466	D1498
CH15 (Y36,Y37)	M1455	M1471	M1487	D1890	D1892	D1483	D1467	D1499
Effective trigger method	ON (Hold)	ON (Auto OFF)	ON (Auto OFF)					

Channel	Pulse	Direction	Current output pulse number	Pulse complete flag	Pulse sending	E-stop without deceleration	Start frequency (K10-K32767) default K200	Acc/Dec Time (K10-K10000) Default K100	Dec Time
CH0 (Y0,Y1)	Y0	Y1	D1648	M1029	M1344	M1308	D1340	D1343	D1936
CH1 (Y2,Y3)	Y2	Y3	D1664	M1030	M1345	M1309	D1352	D1353	D1937
CH2 (Y4,Y5)	Y4	Y5	D1680	M1036	M1346	M1310	D1379	D1381	D1938
CH3 (Y6,Y7)	Y6	Y7	D1696	M1037	M1347	M1311	D1380	D1382	D1939
CH4 (Y10,Y11)	Y10	Y11	D1712	M1102	M1348	M1312	D1400	D1383	D1940
CH5 (Y12,Y13)	Y12	Y13	D1728	M1103	M1349	M1313	D1401	D1384	D1941
CH6 (Y14,Y15)	Y14	Y15	D1744	M1104	M1350	M1314	D1402	D1385	D1942
CH7 (Y16,Y17)	Y16	Y17	D1760	M1105	M1351	M1315	D1403	D1386	D1943

CH8 (Y20,Y21)	Y20	Y21	D1776	M1106	M1352	M1316	D1404	D1387	D1944
CH9 (Y22,Y23)	Y22	Y23	D1792	M1107	M1353	M1317	D1405	D1388	D1945
CH10 (Y24,Y25)	Y24	Y25	D1808	M1108	M1354	M1318	D1406	D1389	D1946
CH11 (Y26,Y27)	Y26	Y27	D1824	M1109	M1355	M1319	D1407	D1390	D1947
CH12 (Y30,Y31)	Y30	Y31	D1840	M1110	M1356	M1320	D1408	D1391	D1948
CH13 (Y32,Y33)	Y32	Y33	D1856	M1111	M1357	M1321	D1409	D1392	D1949
CH14 (Y34,Y35)	Y34	Y35	D1872	M1112	M1358	M1322	D1410	D1393	
CH15 (Y36,Y37)	Y36	Y37	D1888	M1113	M1359	M1323	D1411	D1394	

- When the bus axis is K16-K31.the bus axis building command needs to be used separately. The details are as follows:

JC 500		**EC.AXIS**			S1 S2 S3 S4 S5										Build axis above 16 axes
	Bit				Byte										
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	
S1					*								*			16bits instruction
S2													*			EC.AXIS Continuous execution
S3													*			32bits instruction
S4													*			
S5			*													
The detailed parameters are described as follows																

1、Instruction description

- S1: The axis number corresponding to the bus axis that executes this command.the range is: K16-K31.and the axis number is defined as follows:

Channel	Pulse	Direction	Axis No.
CH0（Y0,Y1）	Y0	Y1	K0
CH1（Y2,Y3）	Y2	Y3	K1
CH2（Y4,Y5）	Y4	Y5	K2
CH3（Y6,Y7）	Y6	Y7	K3
CH4（Y10,Y11）	Y10	Y11	K4
……	……	……	……

✧ S2: parameter set

Operation No.	Function	Type
(S2)- S2)+1	The number of pulses of the current axis (same function as D1648)	Read only(32bits)
(S2)+2~ S2)+3	Current axis target position (same as D1650 function)	R/W（32bits）
(S2)+4~ S2)+5	Current axis encoder position (same as D1652 function)	Read only(32bits)
(S2)+6~ S2)+7	Current axis acceleration (floating point) (same as D1654 function)	Read only(32bits)
(S2)+8~ S2)+9	Current axis current speed (floating point number) (same as D1656 function)	Read only(32bits)
(S2)+10~ S2)+11	Current axis target speed (floating point number) (same as D1658 function)	R/W（32bits）
(S2)+12~ S2)+15	System occupy	

✧ S3: parameter set

Operation No.	Function	Type
(S3)- (S3+1	Current axis maximum frequency	R/W（32bits）
(S3)+2	Current axis acceleration time (same as D1343 function)	R/W（16bits）
(S3)+3	Current axis deceleration time (same as D1936 function)	R/W（16bits）
(S3)+4	Current axis start frequency (same as D1340 function)	R/W（16bits）
(S3)+5~ (S3)+9	System occupy	

✧ S4: parameter set。

Operation No.	Function	Type
S_4	Current axis servo status (same as D1452 function)	R/W（16bits）
S_4+1	Current axis servo alarm code (same function as D1484)	Read only(16bits)
S_4+2	Current axis servo torque (same function as D1468)	Read only(16bits)

S_4+3~ S_4+9	System occupy

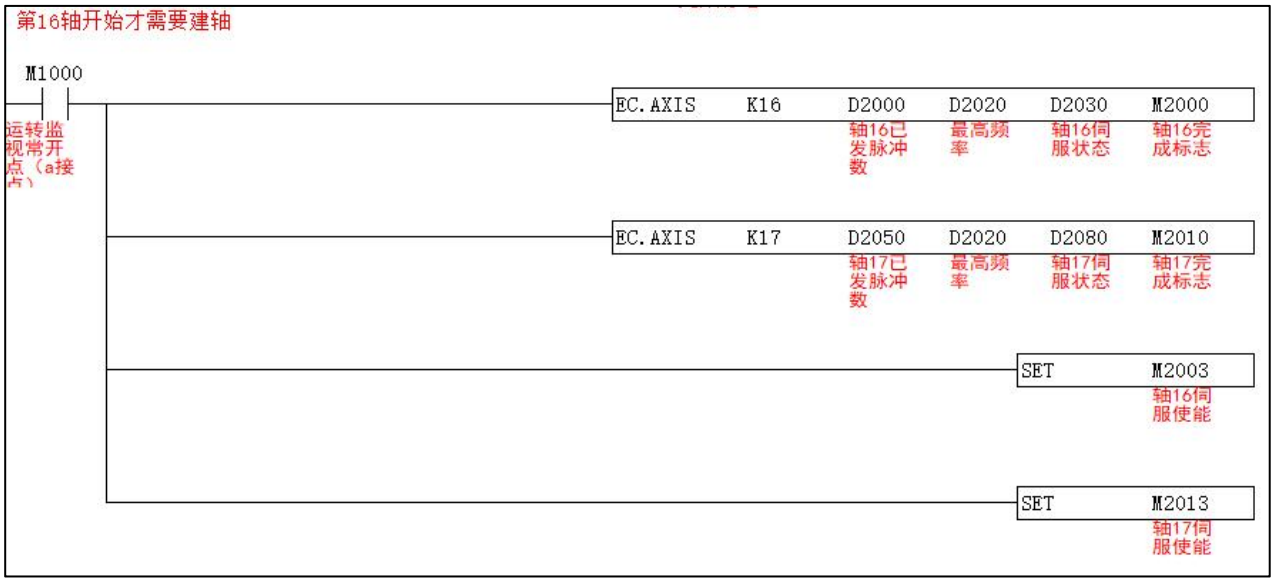
✧ S5（M bit）：Status set

Operation No.	Function	Type
M	Positioning completion mark (same as M1029 function)	Read only
M+1	Pulse sending flag (reserved)	Read only
M+2	E-Stop flag (reserved)	Read only
M+3	SVON (same as M1440 function)	R/W (continuous retention)
M+4	Alarm clear (same as D1456 function)	R/W (triggered.OFF by the system)
M+5	Coordinate setting (same as D1472 function)	R/W (triggered.OFF by the system)

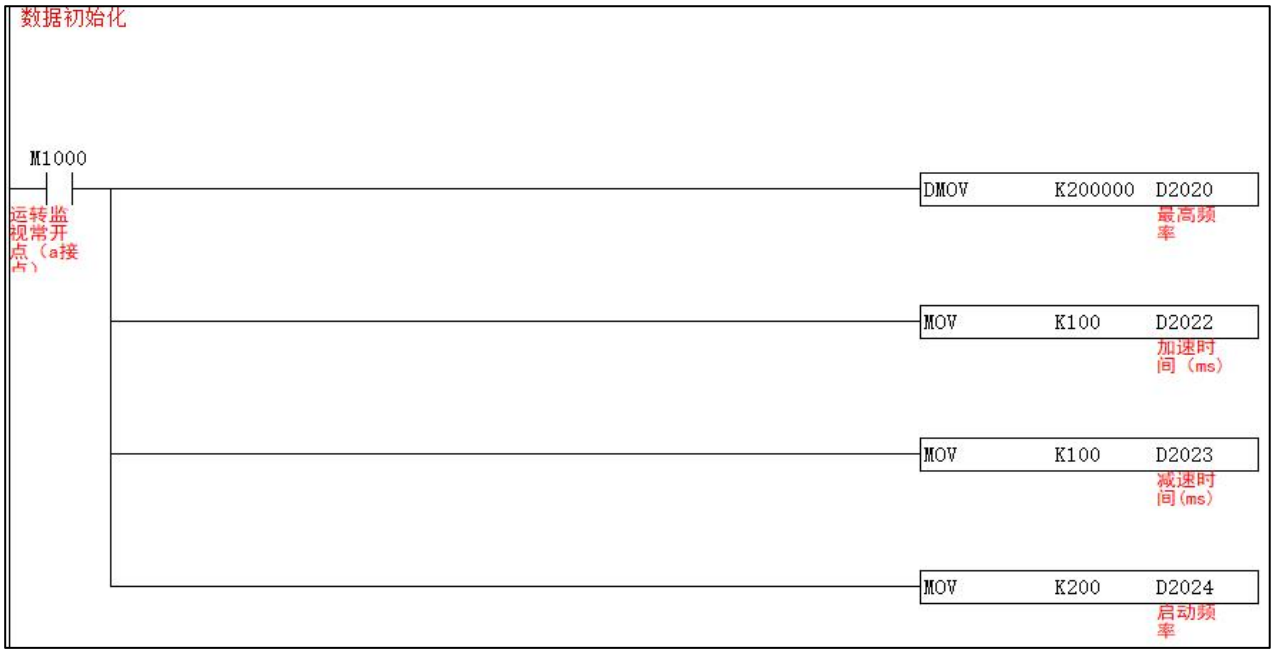
2. Instruction example:

The example is to build the bus axis 16 axis (Y40.Y41).17 axis (Y42.Y43).

Note: If the parameters corresponding to each axis of S3 need to be the same.it is recommended to set S3 repeatedly.



Data initialization



Write the current position and send the position command

3.3 Speed mode CSV

CSV (Cyclic Synchronous Speed Mode) gives the speed through PLC to make the motor run at a constant speed.

JC		EC.CSV				S1 S2 S3										speed mode
501																
	Bit					Byte										16-bit instructions
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	EC.CSV continuous execution type
S1					*								*			32-bit instructions
S2					*								*			None
S3					*								*			Only HCD22.HCS25 bus type PLC
S1: axis number S2: set speed S3: current speed																supports

1. Instruction description

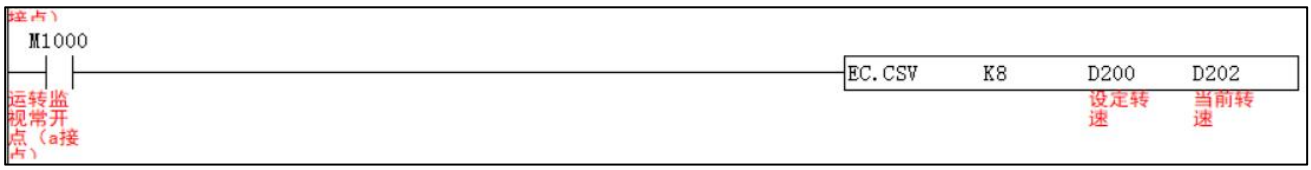
- S1: The bus axis that executes this command corresponds to the axis number.and the definition method of the axis number is as follows:

Channel	Pulse	Direction	Axis No.
CH0 (Y0,Y1)	Y0	Y1	K0
CH1 (Y2,Y3)	Y2	Y3	K1
CH2 (Y4,Y5)	Y4	Y5	K2
CH3 (Y6,Y7)	Y6	Y7	K3
CH4 (Y10,Y11)	Y10	Y11	K4
……	……	……	……

No.	Function	Range	Type
S1	axis number	0-31	16-bit constant or single-word register
S2	set speed		16-bit constant or single-word register
S3	current speed		16-bit constant or single-word register

2. Instruction example

Define Y20.Y21 bus axis to execute speed mode.so the axis number is defined as K8.



3.4 Torque mode CST

CST (cyclical torque mode) gives torque through controller to make the motor run with constant torque

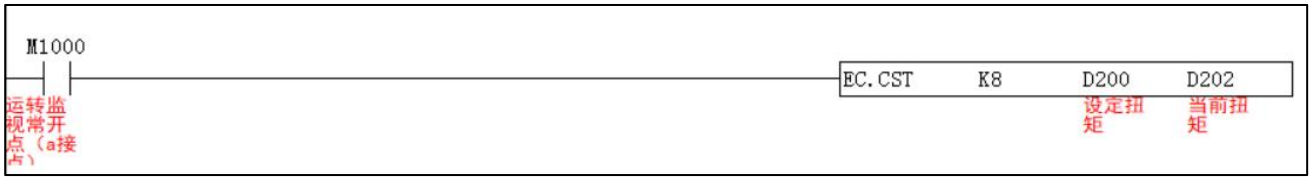
JC 502		EC.CST			S1 S2 S3										Torque mode
	Bit				Byte										16-bit instructions EC.CST Continuous execution type 32-bit instructions None JE bus type does not support
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F
S1					*								*		
S2					*								*		
S3					*								*		
S1：Axis No S2：Set torque S3：Current torque															

1. Instruction description

- S1：The bus axis that executes this command corresponds to the axis number. For the definition method of the axis number.please refer to 4.1 EtherCAT Axis Configuration Description.

No.	Function	Range	Type
S1	axis number	0-31	16-bit constant or single-word register
S2	set torque		16-bit constant or single-word register
S3	current torque		16-bit constant or single-word register

2. Instruction example



3.5 Homing mode HM

HM mode (i.e. homing mode).used for initialization of the slave position

JC 508		DZRN			S1 S2 S3 D											Homing mode
	Bit				Byte											
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	16-bit instructions
S1					*								*			DZRN continuous execution type
S2					*								*			32-bit instructions
S3													*			None
D		*														Only HCD22.HCS25 bus type PLC supports
S1：Homing return speed S2：JOG speed S3：Homing mode D：Slave bus axis number																

1、Instruction description

- This command is applicable to the EtherCAT bus application.and the origin signal is connected to the bus servo or stepper driver. If the origin signal is the actual physical point connected to the input of the PLC.please refer to the general JC156 ZRN instruction in the "Programming Manual" for the homing instruction.
- This command starts to perform the origin return operation at the frequency set by S1. When the origin signal is ON.it will run in the opposite direction at the frequency of the jog speed S2 until the origin signal is OFF.and the origin return is completed.
- The homing method is subject to the description in the slave manual of the corresponding brand.

Operand	associated object	Function	Range	Type
S1		Homing speed	------	constant or double word register
S2		JOG speed	------	constant or double word register
(S3)+0	RXPDO[0x6098]	Homing method	------	16-bit constant or single-word register
(S3)+1		Reserved	------	16-bit constant or single-word register
(S3)+2~(S3)+3	RXPDO[0x609A]	Homing acceleration	------	constant or double word register
(S3)+4~(S3)+5		Homing position offset	------	constant or double word register
D		Slave bus axis number	0-31	Y device

3.6 Two-axis copy EC.COPY

JC		EC.COPY	S1 S2	Two-axis copy
503				

	Bit				Byte										
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F
S1					*								*		
S2					*								*		

S1：Master axis No. S2：Slave axis No.

16-bit instructions

EC.COPY Continuous execution type

32-bit instructions

None

Only HCD22.HCS25 bus type PLC supports

1、Instruction description

- Bind the master axis to the slave axis.copy the axis motion.copy the data of the axis S1 to the S2 axis in real time.and the movement of the S2 axis is completely consistent with the S1 axis.
- This command is only applicable to the case where the one-turn distance and one-turn pulse number of the master axis and the slave axis are consistent.
- Before this command is turned on.the ECAT encoders corresponding to the master and slave axes need to be consistent.and then turn on the EC.COPY command.otherwise it will cause speeding.

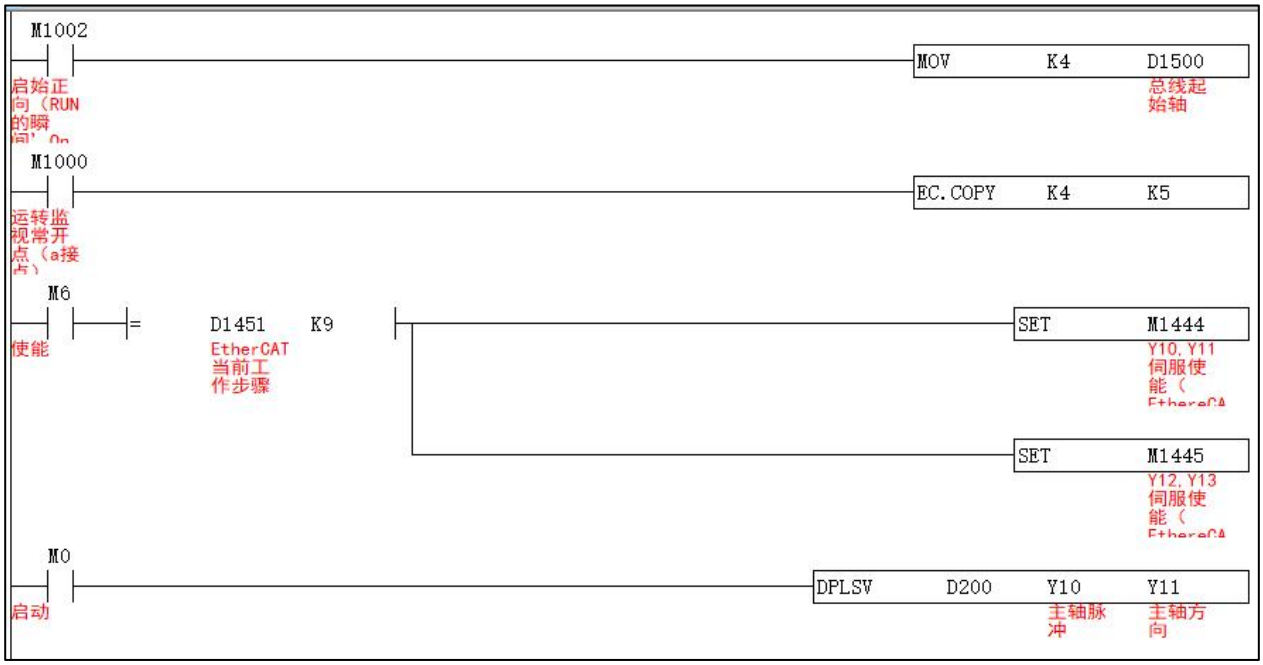
Operand	Function	Range	Type
S1	Master axis No.	0-31	16-bit constant or single-word register
S2	Slave axis No.	0-31	16-bit constant or single-word register

- The axis numbers are defined in the following table:

Channel	Pulse	Direction	Axis. No
CH0（Y0,Y1）	Y0	Y1	K0
CH1（Y2,Y3）	Y2	Y3	K1
CH2（Y4,Y5）	Y4	Y5	K2
CH3（Y6,Y7）	Y6	Y7	K3
CH4（Y10,Y11）	Y10	Y11	K4
……	……	……	……

- The axis number of the master axis must be smaller than that of the slave axis.otherwise the function will be abnormally executed.
- If multiple slave axes need to be bound to the master axis.multiple EC.COPY instructions can be executed. The S1 spindle axis number remains unchanged.and the slave axis number S2 corresponding to each EC.COPY instruction can be changed.

2. Instruction example



1) First define the bus start axis number.D1500 is K4.that is.the bus start axis is Y10 axis.

2) S1 is K4 and S2 is K5.then the master axis of the EC.COPY instruction is Y10 axis.and the slave axis is Y12 axis.

3) Turn on the enable flag bits M1444 and M1445 corresponding to the Y10 and Y12 axes.and you can refer to the corresponding system M register table of the Position Mode .

4) The master axis Y10 executes the motion control command.and the slave axis Y12 and the master axis keep the same motion.

5) For the usage of relevant position commands.please refer to the description of position mode in section 5.1.

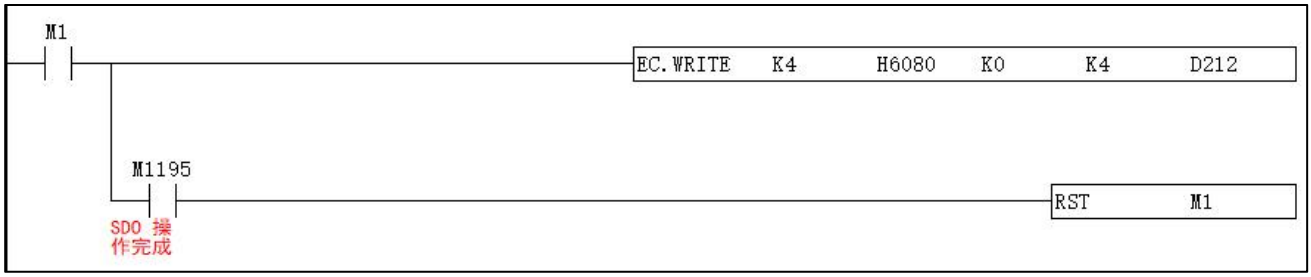
3.7 SDO R/W instruction

JC		EC.WRITE			S1 S2 S3 S4 S5										SD0 data write-in
504															
	Bit				Byte										16-bit instructions
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	EC.WRITE Continuous
S1					*								*			execution type
S2					*	*							*			32-bit instructions
S3					*								*			None
S4					*								*			Flag bit
S5													*			M1195
S1: Axis number S2: Object index S3: Object sub-index S4: Object byte number S5: write-in register																Only HCD22.HCS25 bus type PLC supports

1. Instruction description

Operand	Function	Range	Type
S1	Axis No.	0-31	16-bit constant or single-word register
S2	Object index	0x1000-0xffff	16-bit constant or single-word register
S3	Object sub-index	0-255	16-bit constant or single-word register
S4	Object byte number	---	16-bit constant or single-word register
S5	write-in register	---	Single-word register

2. Instruction example



- Note:

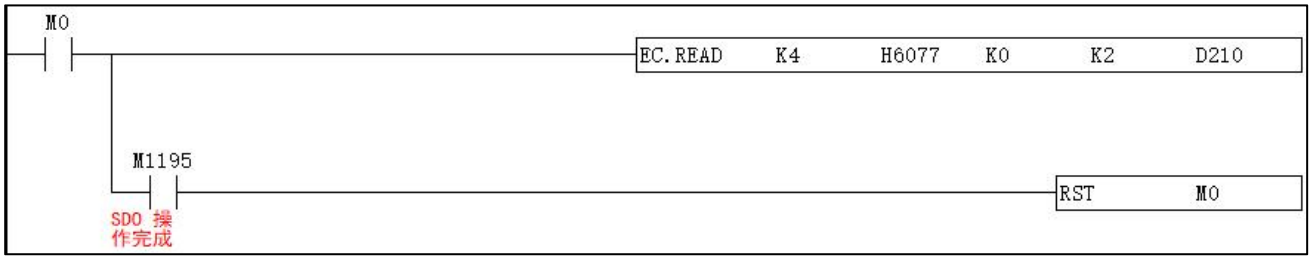
1) Write the starting address of D212 into the slave object dictionary 0x6080:00 corresponding to the current bus axis number four bytes later.
2) M1195 is the SDO operation completion flag.which is turned off by the system.
3) For the definition of the axis number of the S1 bus.see 4.1 EtherCAT axis configuration description.

JC		EC.READ			S1 S2 S3 S4 S5											SD0 data read
505																
	Bit				Byte											
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	16-bit instructions
S1					*								*			EC.READ continuous execution
S2					*	*							*			type
S					*								*			32-bit instructions
S4					*								*			None
S5													*			flag bit
S1: axis number S2: object index S3: object sub-index S4: object byte number S5: Start register of stored value																M1195

1. Instruction description

Operand	Function	Range	Type
S1	Axis No.	0-31	16-bit constant or single-word register
S2	Object index	0x1000-0xffff	16-bit constant or single-word register
S3	Object sub-index	0-255	16-bit constant or single-word register
S4	Object byte number	---	16-bit constant or single-word register
S5	Start register of stored value	---	Single-word register

2. Instruction example



- Note:

1) Read the value of the slave ESC register address 0x6077:00 corresponding to the current bus axis number to D210.

2) M1195 is the SDO operation completion flag.which is automatically turned off by the system.

3) For the definition of the axis number of the S1 bus.see 4.1 EtherCAT axis configuration description.

4) S4: K2 means that the ESC address corresponds to 2 bytes and 16 bits.which means reading H6077 to D210.and so on.

3.8 I/O Mapping

Mapping digital modules

JC 506		EC.IO				S1 D1 D2										Mapping digital modules
	Bit				Byte											16-bit instructions
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	EC.IO continuous execution type
S1					*											32-bit instructions
S1	*															None
S2		*														Only HCD22.HCS25 bus type PLC supports
S1: slave station number D1: input port mapping D2: output port mapping																

1. Instruction description

- S1: The bus axis that executes this command corresponds to the axis number. For the definition method of the axis number.please refer to 4.1 EtherCAT Axis Configuration Description.

Operand	Function	Range	Type
S1	Slave station number	0-31	16-bit constant
D1	Input port mapping address of distributed (remote) IO	-----	
D2	Output port mapping address of distributed (remote) IO	-----	

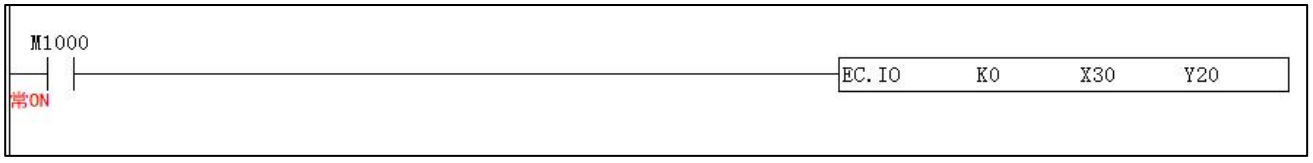
2、 DI/DO definition number assignment

The starting number of the remote I/O input and output of the slave station starts with the last number of the input/output point of the PLC connected to the master station. The numbers of distributed remote I/Os are arranged in sequential order. If the last point of the host PLC is X n□ (the range of numbers in □ is 0-7).the starting number of the remote I/O input is X (n +1)0.the output start number is the same.

Example: If the last point of the PLC host is Y27.the starting number of the output port mapping address of the slave IO is Y30. If the last point of the host is Y34.the starting number of the output port mapping address of the slave IO is Y40.

3、 Instruction example

Use bus type PLC.the model is HCH2-40T-E-D.the input is (X0-X27).and the output is (Y0-Y17). Then the starting number of the mapping address of the first input port of the distributed (remote IO) is X30.and the starting number of the mapping address of the first output port is Y20.



Mapping analog modules

JC		EC.D	S1 D1 D2	Mapping analog modules
507				

	Bit				Byte										
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F
S1					*										
S1													*		
S2													*		

S1: slave station number D1: input port mapping D2: output port mapping

16-bit instructions

EC.D continuous execution type

32-bit instructions

None

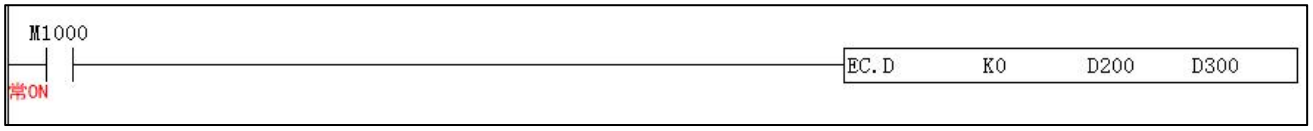
Only HCD22.HCS25 bus type PLC supports

1. Instruction description

- S1: The bus axis that executes this command corresponds to the axis number. For the definition method of the axis number.please refer to 4.1 EtherCAT Axis Configuration Description.

Operand	Function	Range	Type
S1	Slave station number	0-31	16-bit constant
D1	AI port mapping address of distributed (remote) IO	-----	
D2	AO port mapping address of distributed (remote) IO	-----	

2、Instruction example



Note: If a slave station is a coupler.and the coupler is connected to both a digital module and an analog module.the EC.D and EC.IO instructions can be directed to the same station number.

3.9 Probe function

The probe function is the position latch function. When the trigger condition is met.the probe function is triggered and the motor encoder value when the condition is triggered is latched. According to the setting of probe control word 60B8.single trigger or multiple trigger can be realized.

JC 509		EC.PROBE			S1 S2 S3										Probe function
	Bit				Byte										16-bit instructions
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	EC.PROBE continuous execution type
S1					*								*			
S2					*								*			32-bit instructions
S3													*			None
S1: Slave bus axis number S2: Probe function S3: Probe status																Only HCD22.HCS25 bus type PLC supports

1. Instructions

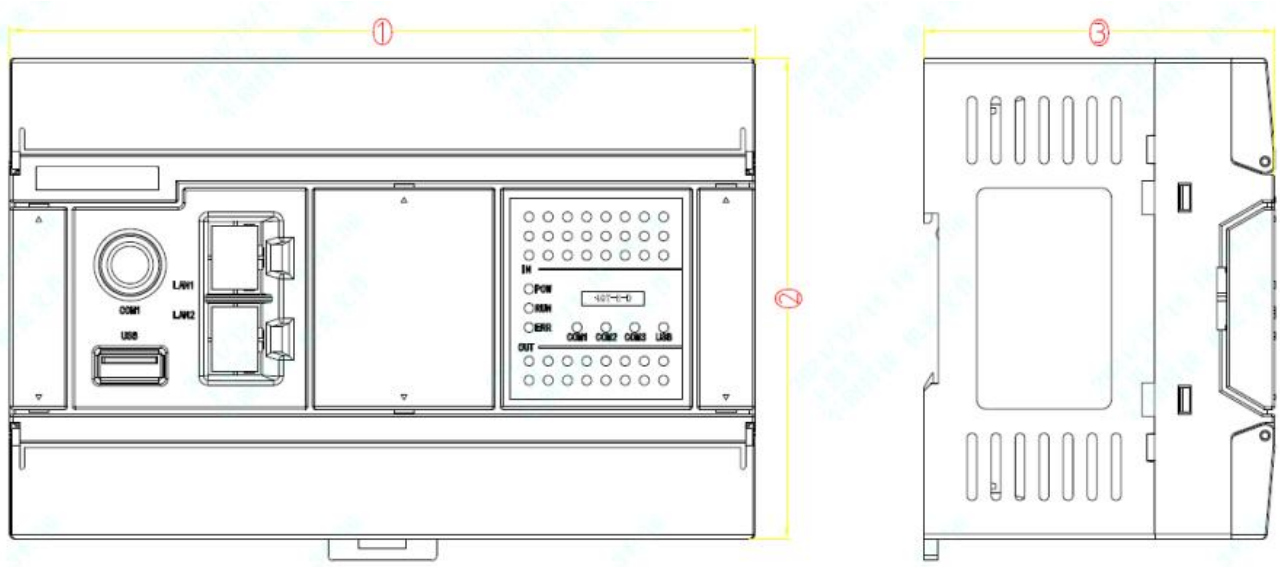
- The probe function is not supported in Hm homing mode. .
- Currently only supports external signal as trigger source.
- The probe function is based on the description in the slave manual of the corresponding brand.

Operand	Associated object	Function	Range	Type
S1		Slave bus axis number	0-31	16-bit constant or single-word register(R/W)
S2	RXPDO[0x60B8]	Execute the setting of the Touch probe function	-----	16-bit constant or single-word register(R/W)
S3	TXPDO[0x60B9]	Indicates the status of the Touch probe function	-----	Single-word register(Read only)
(S3)+1		Reserved	-----	
(S3)+2~(S3)+3	TXPDO[0x60BA]	Indicates the rising edge clamping position of Touch probe1	-----	Double-word register(Read only)
(S3)+4~(S3)+5	TXPDO[0x60BC]	Indicates the rising edge clamping position of Touch probe2	-----	Double-word register(Read only)

Chapter IV. HCD2 Standard Series PLC

Thank you for using HCD2 standard PLC series programmable controller. This series provides 14~40 points of host and 8~40 points of digital input/output modules.including the host.the maximum input/output expansion can reach up to 512 points. It can also be used with analog input/output modules.temperature modules.and weighing modules to meet various applications.

1. Product size



MPU	Dimension（mm）		
	①	②	③
14-16 points	114	100	73
24-40 points	155	100	73

2. Model list

Points	Model	Naming rule
32 Points 40 Points	HCD2-32T/R-E-D/A HCD2-40T/R-E-D/A	HCD2: HCD2 standard MPU T: transistor output R: Relay output E: Ethernet D: DC24V DC power supply A: AC220V AC power supply

3. Electrical Specifications

Model	I/O total points	Input power supply	Output type	Communication	Program capacity
HCD2-32T-D	32	DC24V	NPN	RS232/ RS485*2/ Ethernet*2/USB	60 steps
HCD2-32T-A	32	AC100V-240V	NPN	RS232/ RS485*2/USB	60 steps
HCD2-32T-2E-D	32	DC24V	NPN	RS232/ RS485*2/ Ethernet*2/USB	60 steps
HCD2-32T-2E-A	32	AC100V-240V	NPN	RS232/ RS485*2/ Ethernet*2/USB	60 steps
HCD2-40T-D	40	DC24V	NPN	RS232/ RS485*2/USB	60 steps
HCD2-40T-A	40	AC100V-240V	NPN	RS232/ RS485*2/USB	60 steps
HCD2-40T-2E-D	40	DC24V	NPN	RS232/ RS485*2/ Ethernet*2/USB	60 steps
HCD2-40T-2E-A	40	AC100V-240V	NPN	RS232/ RS485*2/ Ethernet*2/USB	60 steps

Model	Output rated current	Number of digital (high-speed) input points	Number of digital (high-speed) output points	DI maximum frequency	DO maximum frequency
HCD2-32T-D	0.5A	16(8)	16(4)	200Khz	200Khz
HCD2-32T-A	0.5A	16(8)	16(4)	200Khz	200Khz
HCD2-32T-2E-D	0.5A	16(8)	16(4)	200Khz	200Khz
HCD2-32T-2E-A	0.5A	16(8)	16(4)	200Khz	200Khz
HCD2-40T-D	0.5A	24(8)	16(4)	200Khz	200Khz
HCD2-40T-A	0.5A	24(8)	16(4)	200Khz	200Khz
HCD2-40T-2E-D	0.5A	24(8)	16(4)	200Khz	200Khz
HCD2-40T-2E-A	0.5A	24(8)	16(4)	200Khz	200Khz

Input points electrical specifications

Specification		32 points. 40 points	
Input		X0~X7	X10~
Input type		DI	
Input type		DC（PNP）	
Input current		DC24V，5mA	
Input resistance		4.7KΩ	
Max. frequency		200khz	10khz
Response time	Off→ON	<2.5us	<20us
	ON→Off	<5us	<50us

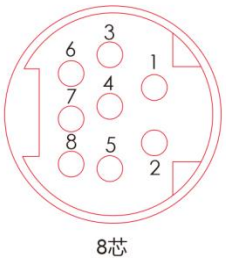
Transistor Output Electrical Specifications

Specification		32 points. 40 points	
Output type		NPN	
Output		Y0. Y2. Y4. Y6	Y0~Y7（Odd output 4 points）,Y10~Y17
Max. frequency		200KHZ	10KHZ
Max. load	Resistive	0.5A/1point	
	Inductive	15W	
Response time	Off→ON	<2us	<20us
	ON→Off	<3us	<30us

Chapter V. Communication

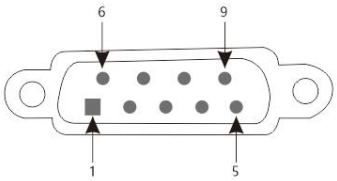
1 RS232

1.1 Interface and Pins



RS232 round port 8-pin definition

Pin No	Description	Function
5	TXD	Send data
4	RXD	Receive data
8	GND	GND



DB9

RS232 DB9 interface definition

Pin No	Description	Function
2	TXD	Send data
3	RXD	Receive data
5	GND	GND
9	GND	GND

1.2 Communication format settings

Note: 8-bit data length.need to work in RTU mode

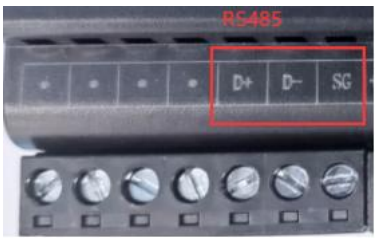
Serial port	Format	Mode		Communication settings remain
RS232 (COM1)	D1036 (Default H86)	M1139		M1138
	See 1.3 parameter configuration	ASCII: OFF (Default)	RTU: ON	

1.3 Parameter configuration：

	Content	0	1
b0	Data length	b0=0:7 （Default）	b0=1:8
b1 b2	Parity check	b2，b1=00	None
		b2，b1=01	Odd
		b2，b1=11	Even （Default）
b3	Stop bit	1bit （Default）	2bit
b4 b5 b6 b7	b7~b4=0001 (H1)	110bps	
	b7~b4=0010 (H2)	150bps	
	b7~b4=0011 (H3)	300bps	
	b7~b4=0100 (H4)	600bps	
	b7~b4=0101 (H5)	1200bps	
	b7~b4=0110 (H6)	2400bps	
	b7~b4=0111 (H7)	4800bps	
	b7~b4=1000 (H8)	9600bps （Default）	
	b7~b4=1001 (H9)	19200bps	
	b7~b4=1010 (HA)	38400bps	
	b7~b4=1011 (HB)	57600bps	
	b7~b4=1100 (HC)	115200bps	

2 RS485

2.1 Interface pin definition



RS485 pin definition as below

Pin	Function
D+	485 A
D-	485 B
SG	485 GND

2.2 Communication format settings

Note: 8-bit data length.need to work in RTU mode

Serial port	Format	Mode		Communication settings remain	Station No
RS485 (COM2)	D1120 (Default H86)	M1143		M1120	**D1121**
	See 2.3 parameter configuration	ASCII: OFF (Default)	RTU: ON		**1-255** (Default 1)

Serial port	Format	Mode		Communication settings remain	Station No
RS485 (COM3)	D1109 (Default H86)	M1320		M1136	**D1121**
	See 2.3 parameter configuration	ASCII: OFF (Default)	RTU: ON		**1-255** (Default 1)

2.3Parameter configuration:

	Content	0	1
b0	Data length	b0=0:7 (Default)	b0=1:8
b1 b2	Parity check	b2, b1=00	None
		b2, b1=01	Odd
		b2, b1=11	Even (Default)
b3	Stop bit	1bit (Default)	2bit
b4 b5 b6 b7	b7~b4=0001 (H1)	110bps	
	b7~b4=0010 (H2)	150bps	
	b7~b4=0011 (H3)	300bps	
	b7~b4=0100 (H4)	600bps	
	b7~b4=0101 (H5)	1200bps	
	b7~b4=0110 (H6)	2400bps	
	b7~b4=0111 (H7)	4800bps	
	b7~b4=1000 (H8)	9600bps (Default)	
	b7~b4=1001 (H9)	19200bps	
	b7~b4=1010 (HA)	38400bps	
	b7~b4=1011 (HB)	57600bps	
	b7~b4=1100 (HC)	115200bps	

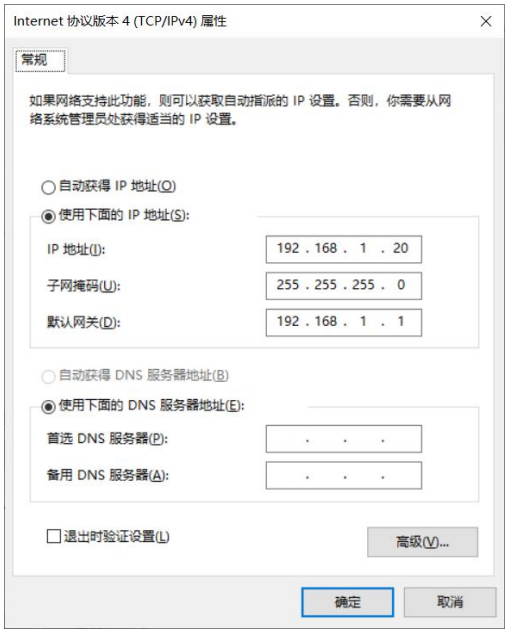
3 Ethernet communication

3.1 IP setting

The factory default IP address of PLC is: 192.168.1.25 (Note: the address can be modified).

Before connecting the PC to the PLC.set the IP address of the PC. The IP address of the controller can be set arbitrarily. Users can set different IP addresses according to their own needs. The IP address in this example is 192.168.1.25. The IP set by the PC should be the same as the PLC IP. fields are different. As shown in the figure below.the IP of the PC setting can be set to 192.168.1.20.

The peripherals that establish a link with the PLC must be in the same network segment as the PLC (that is.the same as the first 3 segments) and the IP address cannot be repeated.otherwise the link will fail.



3.2 IP address register

1) IP setting: 2 D register will be continuously occupied.D1212 and D1213.

2) IP definition: IP3.IP2.IP1.IP0 is 192.168.1.25

K192 hex is HC0

K168 hex is HA8

K1 hex is H1

K25 hex is H19

Then D1212=HA8C0.D1213=H1901

D1212		D1213	
High	Low	High	Low
IP1	IP0	IP3	IP2
192(HC0)	168(HA8)	1(H1)	25(H19)
HA8C0		H1901	

1) Select the communication port: the device port number (factory 502.cannot be changed).the address is D1211.

Program as below:

1) The programming software setting method is as follows:

Note: If you need to change the sub-net mask and gateway.the sub-net mask in the above figure is 255.255.255.0 (factory default).and the gateway is 192.168.1.1 (factory default) as an example.
Sub-net mask address:

D1220		D1221	
High	Low	High	Low
IP1	IP0	IP3	IP2
255(HFF)	255(HFF)	255(HFF)	0(H0)
HFFFF		HFF	

Gateway address:

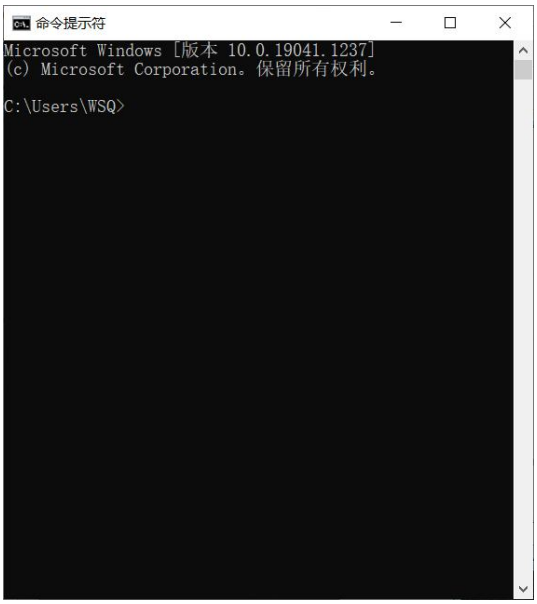
D1222		D1223	
High	Low	High	Low
IP1	IP0	IP3	IP2
192(HC0)	168(HA8)	1(H1)	1(H1)
HA8C0		H0101	

3.3 PING command

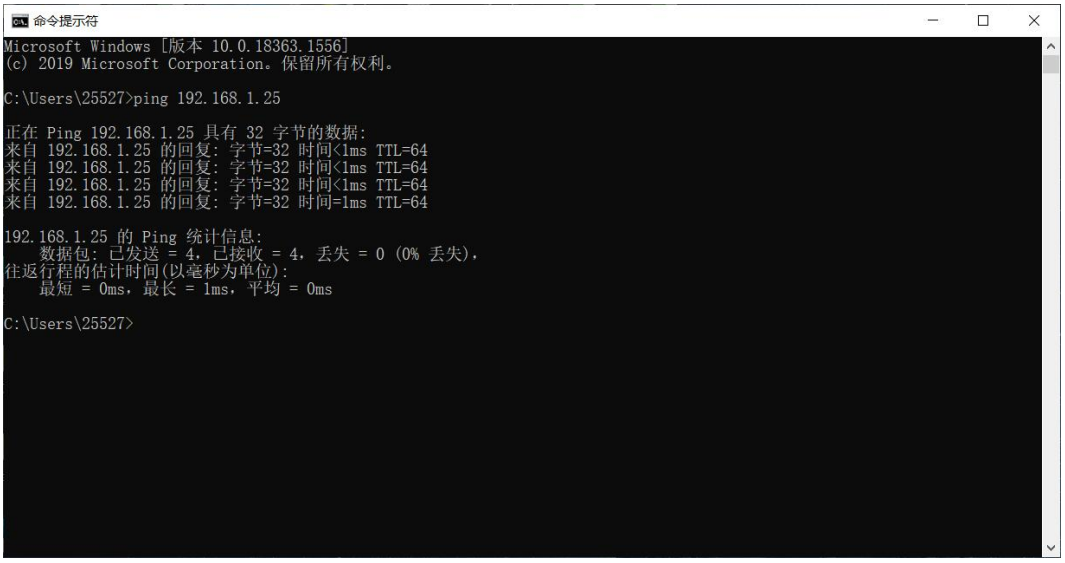
Through the PING command.you can check whether the local TCP/IP protocol is normal.and whether it can connect to other computers in the local area network normally. If your computer is Win7 operating system.you can follow the steps below:

1. Click "Start" - "Run".enter "cmd" in the input box:

1、Click OK to pop up the command window.



2、Enter the "ping 192.168.1.25" command to check whether the local TCP/IP protocol is normal. It is normal to send and receive the same data.as shown in the following figure:



3.4 Ethernet Socket communication function command

Socket communication function commands are shown below.

Command	Content
SP.SOCOPEN	Establish connection
SP.SOCCLOSE	Disconnect
SP.SOCSND	Data sending
SP.SOCRCV	Data reception

➢ Establish connection

JC		SP.SOCOPEN	S1 S2 M	Establish connection
506				

	Bit				Byte										
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F
S1													*		
S2													*		
M			*												

See the instructions below for details.

16-bit instructions

SP.SOCOPEN trigger execution type

32-bit instructions

None

Instruction：SP.SOCOPEN（S1） (S2) （M）

Content.range.data type:

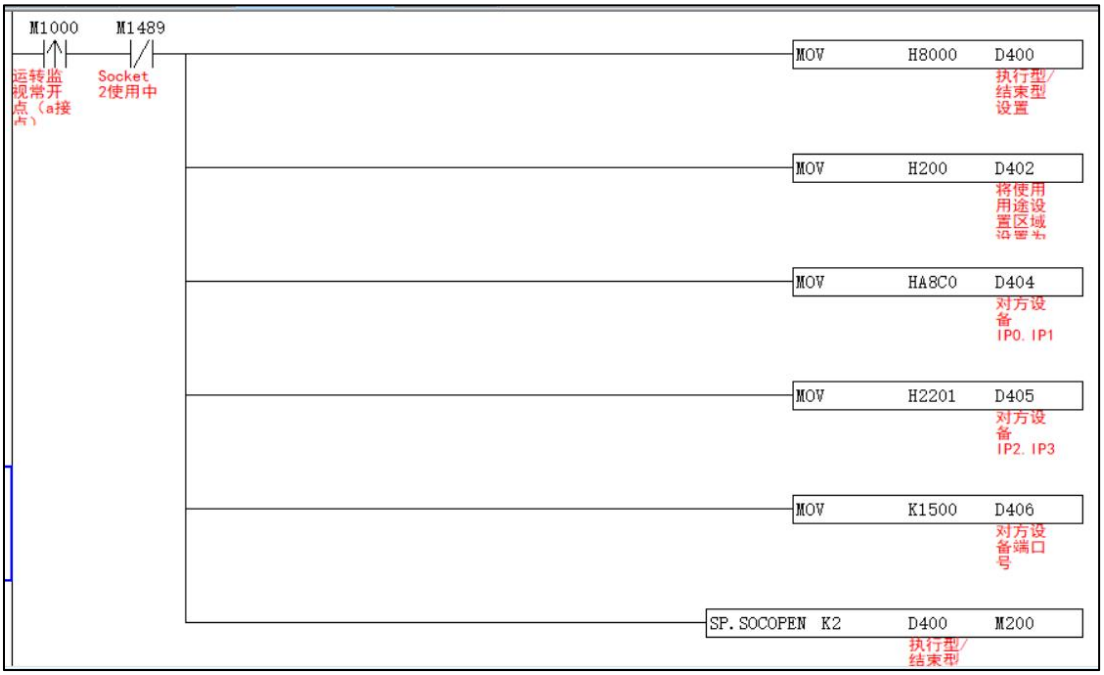
Operand	Function	Range	Type	Device
（S1）	Connection number	1~8	Unsigned BIN 16 bits	Constant：K
（S2）	Device start number for storing control data	Please refer to the following instructions: Range of control Data	Byte	D
（M）	At the end of the command.the start number of the device that is ON for 1 scan	---	Bit	M

Control data

Device	Item	Content	Range	Set side
(S2)+0	Execute/end	Specify whether to use the parameter setting value set by the engineering tool or the setting value of the control data (S2)+2~(S2)+9 when the connection is opened.	0000H 8000H	User
(S2)+1	End state	state when the store is complete 0000H: normal end	---	System
(S2)+2	Use the purpose setting area	b9 b8 b7~b0 【2】 【1】 0 b15 b14 b13~b11 b10 【4】 0 【3】 【1】Communication method (protocol) 0: TCP/IP 【2】Communication means 1: Fixed 【3】Communication means 0: Fixed	---	User

		【4】Open way 00: Active open 10: Unpassive open (the IP address of the target device and the port number of the target device will be ignored) 11: Fullpassive opening		
(S2)+3	Local port number	Specify the local port number	1~1023	User
(S2)+4-(S2)+5	The IP address of the external device	Specify the IP address of the external device	00000001H-DFFFFFFEH	User
(S2)+6	External device port number	Specify the external device port number	1~65535（0001H~FFFFH）	User
(S2)+7~(S2)+9	---	Prohibited to use	---	System

Program example:



➢ Disconnect

JC		SP.SOCCLOSE	S1 S2 M	Disconnect
507				

	Bit				Byte										
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F
S1													*		
S2													*		
M			*												

See the instructions below for details.

16-bit instructions

SP.SOCCLOSE trigger execution type

32-bit instructions

None

Instruction: SP.SOCCLOSE （S1） (S2) （M）

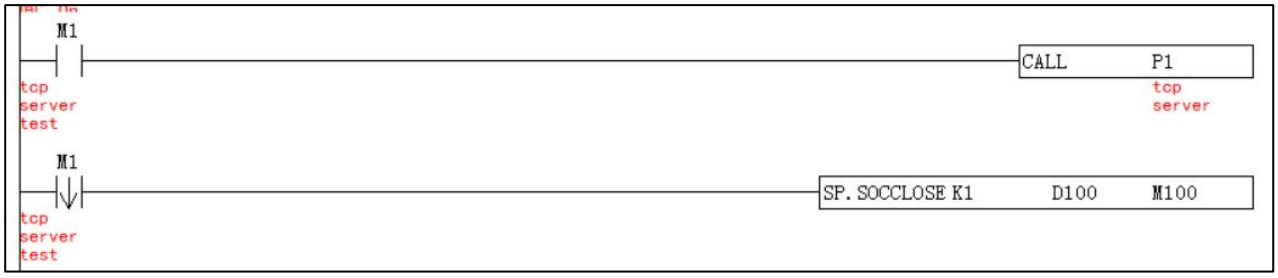
Content.range.data type:

Operand	Function	Range	Type	Device
（S1）	Connection number	1~8	Unsigned BIN 16 bits	Constant：K
（S2）	Device start number for storing control data	Please refer to the following instructions: Range of control Data	Byte	D
（M）	At the end of the command.the start number of the device that is ON for 1 scan	---	Bit	M

Control data

Device	Item	Content	Range	Set side
(S2)+0	System area	Specify whether to use the parameter setting value set by the engineering tool or the setting value of the control data (S2)+2~(S2)+9 when the connection is opened.	0000H 8000H	User
(S2)+1	End state	State when the store is complete 0000H: normal end	---	System

Program example：



➢ **Data sending**

JC		SP.SOCNSD	S1 S2 S3 M	Data sending
508				

	Bit				Byte										
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F
S1													*		
S2													*		
S3													*		
M			*												

See the instructions below for details.

16-bit instructions

SP.SOCNSD trigger/continuous execution type

32-bit instructions

None

Instruction：SP.SOCSND（S1） (S2) (S3)（M）

Content.range.data type:

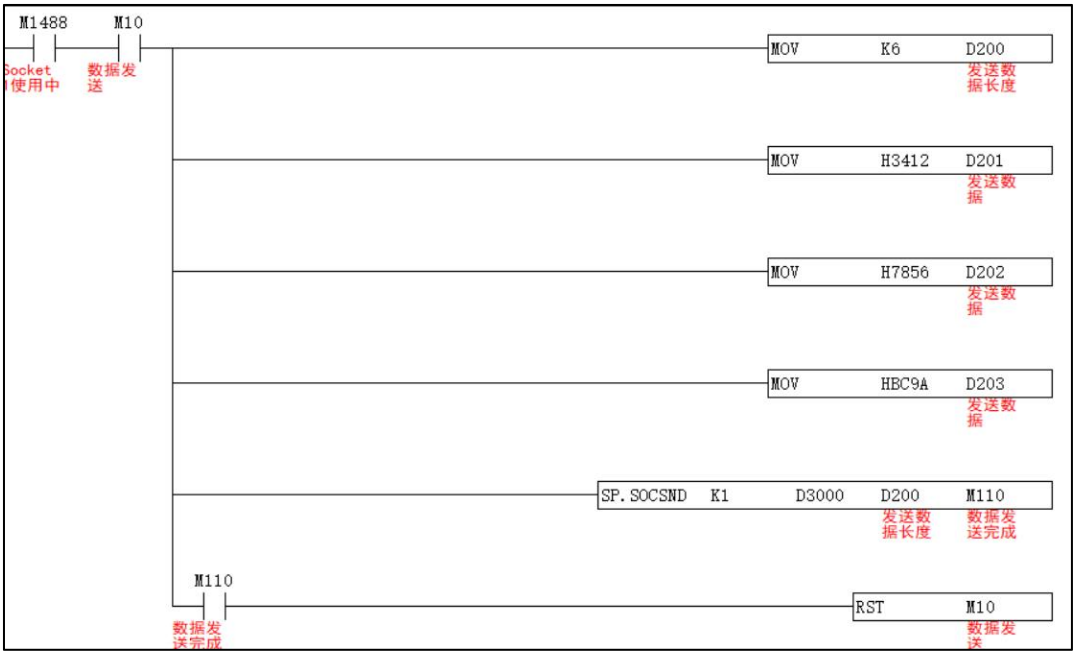
Operand	Function	Range	Type	Device
（S1）	Connection number	1~8	Unsigned BIN 16 bits	Constant：K
（S2）	Device start number for storing control data	Please refer to the following instructions: Range of control Data	Byte	D
（S3）	The start number of the device that stores the send data	---	Byte	D
（M）	At the end of the command.the start number of the device that is ON for 1 scan	---	Unsigned BIN 16 bits	M

Control data

Operand	Function	Range	Type	Device
(S2)+0	System area	---	---	---
(S2)+1	End state	State when the store is complete 0000H: normal end Other than 0000H: Abnormal end	---	System
(S3)+0	send data length	Specifies the send data length. (bytes)	1~2046	User
(S3)+1~（S3）+n	send data	Specify send data	---	User

Note: In the case of TCP.please control the length of the sent data to be less than the maximum window size (the TCP receive buffer) of the other device. Data that exceeds the maximum window size of the partner device cannot be sent.

Program example



➢ Data reception

JC		SP.SOCRCV			S1 S2 S3 M											Data reception
510																
	Bit				Byte											
	X	Y	M	S	K	H	KnX	KnY	KnM	KnS	T	C	D	E	F	16-bit instructions
S1													*			SP.SOCRCV trigger/continuous
S2													*			execution type
S3													*			32-bit instructions
M			*													None
See the instructions below for details.																

Instruction：SP.SOCRCV（S1） (S2) (D1)（M）

Content.range.data type:

Operand	Function	Range	Type	Device
(S1)	Connection number	1~8	Unsigned BIN 16 bits	Constant：K
(S2)	Device start number for storing control data	Please refer to the following instructions: Range of control Data	Byte	D
(D1)	The start number of the device where the received data is stored	---	Byte	D
(M)	At the end of the command.the start number of the device that is ON for 1 scan	---	Bit	M

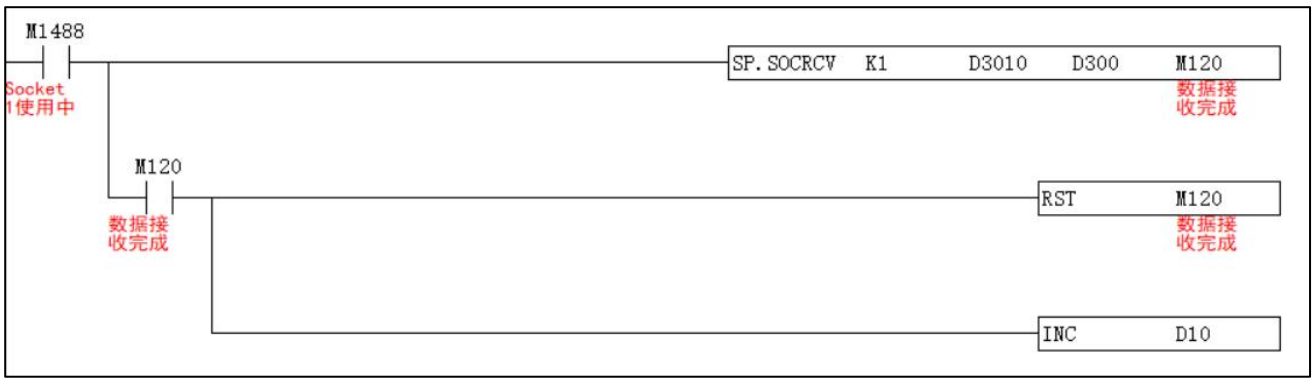
Control data

Operand	Function	Range	Type	Device
(S2)+0	System area	---	---	---
(S2)+1	End state	State when the store is complete 0000H: normal end Other than 0000H: Abnormal end	---	System
(D1)+0	Received data length	Stores the data length of the data read from the socket communication receive data area. (bytes)	0~2046	System
(D1)+1~（D1）+n	Received data	Stores the data read from the socket communication receive data area in sequence	---	System

Note:

1. When the SP.SOCRCV command is executed.the received data will be read from the Socket communication receive data area during END processing. Therefore.the scan time will be extended when the SP.SOCRCV instruction is executed.
2. When odd-byte data is received.invalid data will be placed in the high-order byte of the device that stores the last received data.

Program example

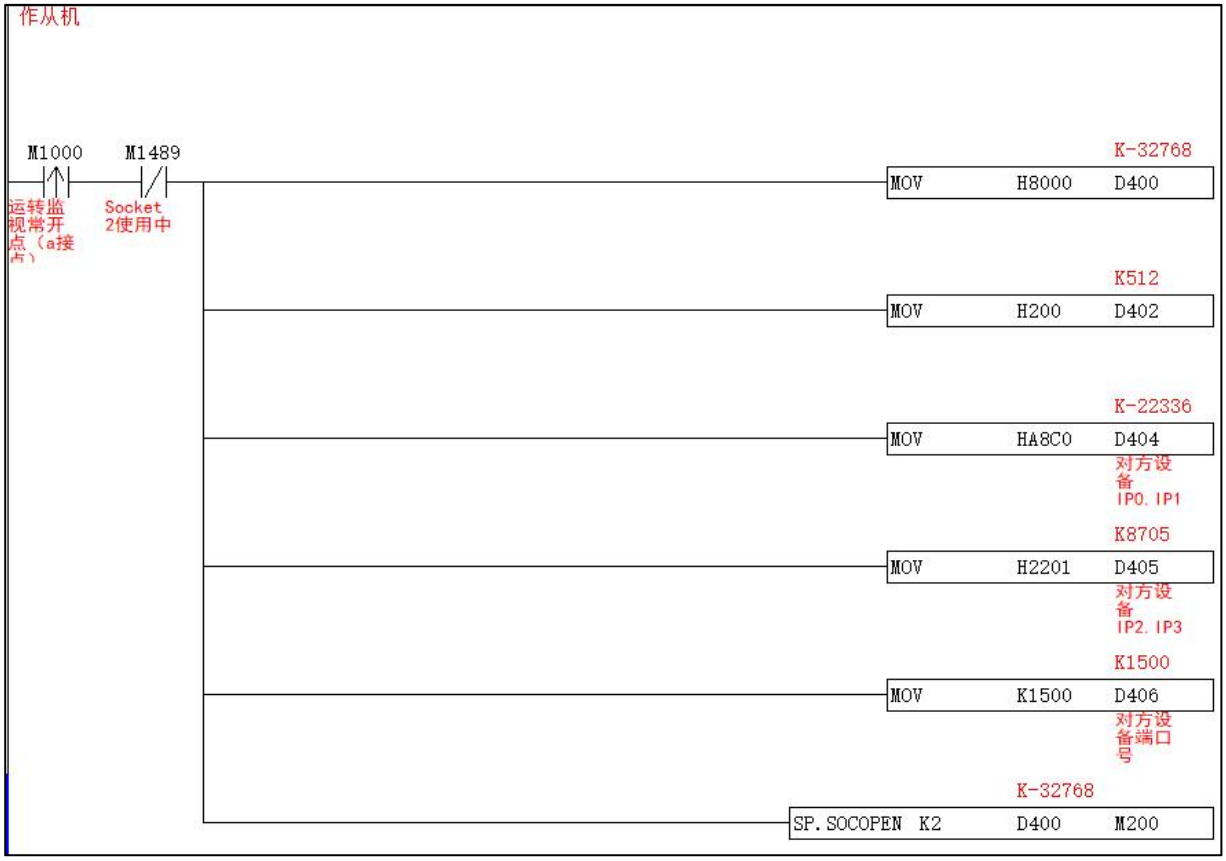


3.5 Ethernet communication case

3.5.1 PLC controller works on the client side.

Example: the port number of the peer device is 1500.and the IP address is 192.168.1.34

- 1：Establish connection



- 2：PLC send data

1) Set M20 from OFF to ON.the data sent by D501~D503 are 12 34 56 78 9A BC respectively.and the successful data reception is monitored through the serial port debugging assistant.

2) After the data is sent successfully.the M210 system will automatically ON and keep it.and the

program will output the M20 to OFF. If the data transmission fails.the M210 cannot be turned ON automatically. If the M20 is manually turned ON again.when the sending command is executed successfully.the M210 system will automatically turn OFF until the data is successfully sent.and M210 is turned ON again.

3) Since the data length D500 is set to K6.the sending data address occupies D501~D503. If the data length is set to K8.the data address occupies D501~D504.and so on.

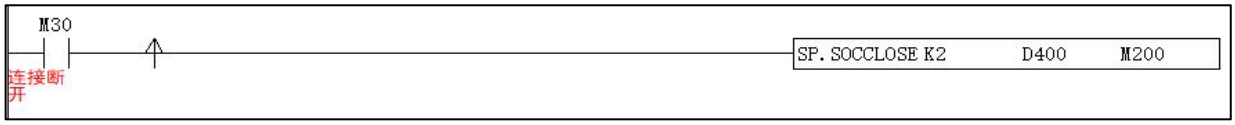
- 3：PLC receive data

Device	Function	Status	Set value	Current value (16bit)
D601	System area			H73ab
D602	End state			H6715
D603	send data length			H3421

1) The serial port debugging assistant sends data.and data is successfully received by PLC . At this time.the M220 system is turned on once and then turned off. It can be observed that the data of D601~D603 are AB 73 15 67 21 34 respectively.

2) Since the data length D600 is set to K6.the received data address occupies D601~D603. If the data length is set to K8.the data address occupies D601~D604.and so on.

- 4：Disconnect



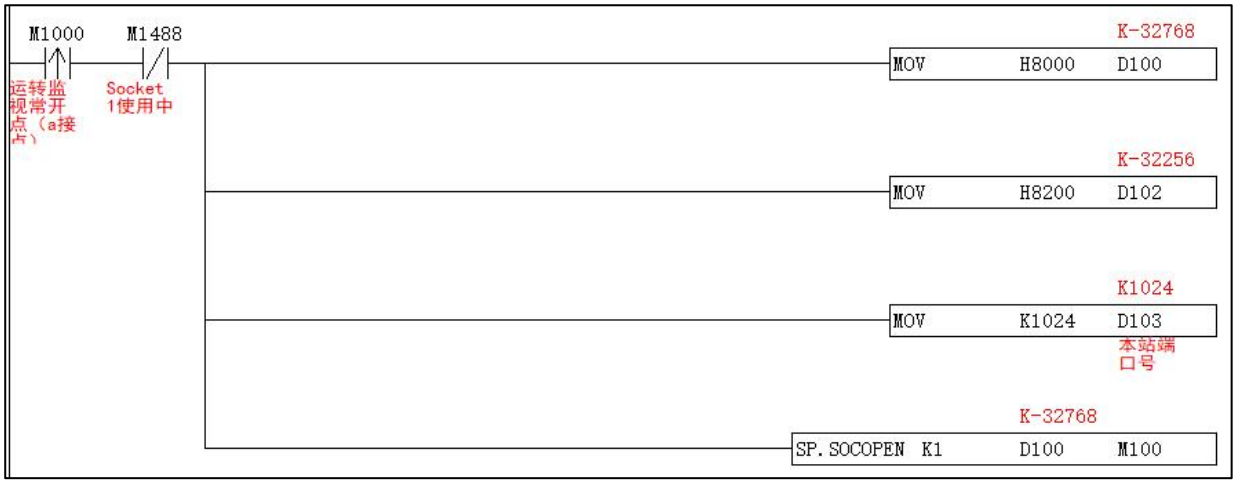
1) When executing the SP.SOCCLOSE instruction.the conditions in front of SP.SOCOREN.SP.SOCSND and SP.SOCRCV need to be disconnected.

2) The (S1).(S2).(M) operand addresses of the SP.SOCCLOSE instruction must be consistent with the operand addresses of SP.SOCOPEN.

3.5.2 PLC works on the server side.

For example: PLC port number is 1024.IP address is 192.168.1.25

- 1：Establish connection



- 2：PLC send data

1) Set M10 from OFF to ON.the data sent by D201~D203 are 12 34 56 78 9A BC respectively.and the successful data reception is monitored through the serial port debugging assistant.

2) After the data is sent successfully.the M110 system will automatically ON and keep it.and the program will turn the M10 output OFF at the same time. If the M10 is manually turned ON again.when the sending command is successfully executed.the M110 system will automatically turn OFF until the data is successfully sent.and M110 is turned ON again.

3) Since the data length D200 is set to K6.the sending data address occupies D201~D203. If the data length is set to K8.the data address occupies D201~D204.and so on.

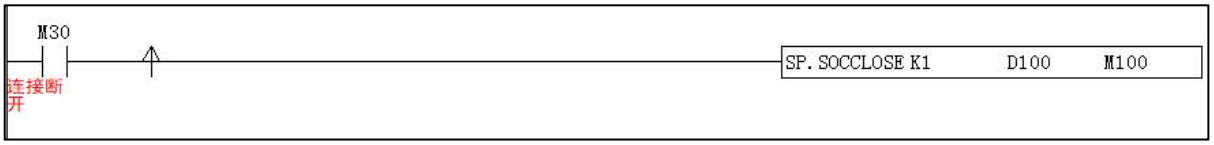
- **3：PLC Receive data**

Device	Function	Status	Set value	Current value (16bit)
D301	Receive data address			H3412
D302	Receive data address			H7856

1) The serial port debugging assistant sends data.and the data is successfully received by PLC. At this time.the M120 system is turned on once and then turned off. It can be observed that the data of D301~D302 are 12 34 56 78 respectively.

2) Since the data length D300 is set to K4.the received data address occupies D301~D302. If the data length is set to K6.the data address occupies D301~D303.and so on.

- 4：Disconnect



1) When executing the SP.SOCCLOSE instruction.the conditions in front of SP.SOCOREN.SP.SOCSND and SP.SOCRCV need to be disconnected.

2) The (S1).(S2).(M) operand addresses of the SP.SOCCLOSE instruction must be consistent with the operand addresses of SP.SOCOPEN.

4 USB operation guide

- If you use a double-headed USB cable to download the program.download the corresponding USB driver according to the computer system (common for WIN8 and WIN10 drivers)
- It is recommended to set an M1293 switch button on the touch screen (M1293 factory default is OFF.and it is not retained when power off)
  M1293: When ON.work in PC mode M1293: When OFF.work in U disk mode

4.1 U disk download program

When M1293 is OFF.it works in U-disk mode.you can use U-disk to download programs.
Operation steps: (Tool: U disk (USB2.0 interface.FAT32 properties)
1) Using programming software.the file format of PLC.UJC will be automatically generated in the root directory of the program storage path after the compilation is completed.
2) Copy the file directly to the U disk without changing the name of the file.
3) Power off the PLC and insert the U disk into the USB interface of the PLC.
4) Power on the PLC again.and the program is updated successfully after 1S.

Note: How to confirm that the PLC program is updated successfully？ It is recommended to make a version number in the program and display the address on the touch screen. For example.MOV K100 D100.when the program is updated.then MOV K101 D100. The value of D100 is changed every time the program is updated.

4.2 Download the program with a double-headed USB cable

When M1293 is ON.it works in PC mode.and a double-ended USB cable can be used to connect both ends of the PC and PLC to download and monitor programs online.

Operation steps:

If it is working in PC mode (that is.M1293 is ON).after installing the driver on the PC.turn M1293 ON on the touch screen.and a virtual serial port will be generated on the PC.which can be used directly as a common serial port.but the common serial port must be selected correctly The baud rate can only be connected to the PLC. The virtual serial port.the baud rate is not important.and any baud rate can be connected to the PLC.

Special attention:

When the PLC power is turned off.since the PC uses a double-ended USB cable to connect to the PLC.it will also supply power to the PLC's CPU.so the PLC is still in the running state. When the PLC is powered on again.the USB cable may be damaged. Cannot communicate properly.

Therefore.the specific operation must be followed: when the PLC is powered off.the USB cable at one end of the computer or PLC must be unplugged. When the PLC is powered on again.the POW and RUN lights are on.and the USB cable can be plugged in.

The communication setting using the double-ended USB cable is shown in the figure:

PLC expansion module series

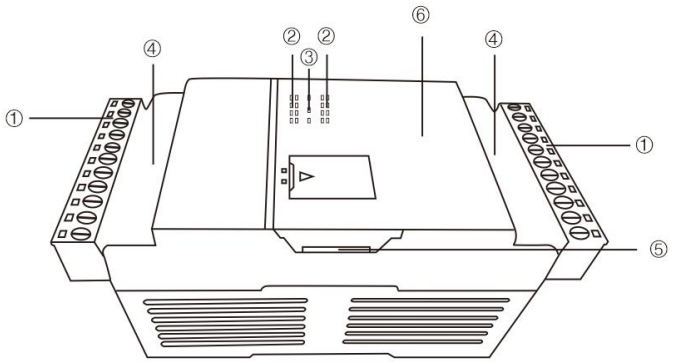
Chapter I. HSE series expansion

Thank you for using the HSE Series Standard Expansion Module. This series provides digital modules.analog modules.temperature modules.function modules.etc. Expansion modules can only be connected to the company's mainframe. To ensure the correct installation and operation of this product.please read this manual carefully before use.

Note: HSE series expansion match HCG2 series MPU.

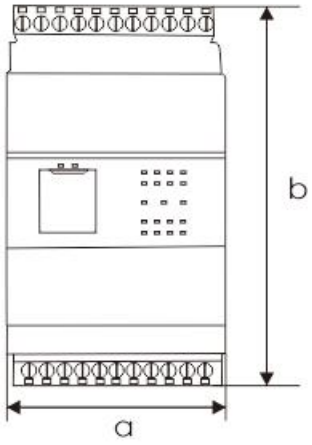
- This installation manual provides users with electrical specifications.functional specifications.and related precautions for installation and wiring.
- When the user uses the machine.it must be installed in a housing wiring box that is dust-proof.moisture-proof and free from electric shock/shock accidents. In addition.there must be protective measures (such as special tools or keys to open) to prevent non-maintenance personnel from operating or accidentally hitting the body.causing danger or damage.
- The AC power supply cannot be connected to the input/output signal terminals.otherwise serious damage may be caused. Please confirm the power wiring again before powering on. Do not touch any terminals while power is on.
- When installing the PLC.please install it in a closed control box.and keep a certain space around it to ensure the normal cooling function of the PLC.
- Installation method of DIN rail: When hanging the main unit on the rail.please insert the fixed plastic sheet under the main unit into the groove with a flat screwdriver.stretch it out and pull it out.then hang the main unit on the rail.and then Fasten the plastic sheet and snap it back. When you want to remove the main unit.also use a flat-blade screwdriver to open the fixed plastic sheet.and then take out the main unit in an outward-facing manner. The plastic sheet of the fixing mechanism is a retaining type.so it will not spring back after being stretched.

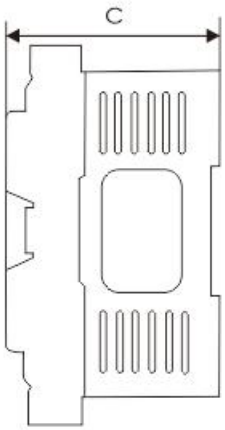
Appearance



① Input/output terminal	④ Input/output mark
② Input/output indicator	⑤ Extension ports
③ Power.extension indicator	⑥ Model

Product Size





MPU	Dimension（mm）		
	a	b	c
8-16 points digital expansion Analog expansion (excluding HSE-8TCY)	60	110	60
32-40points digital expansion HSE-8TCY	141	110	60

LED System status self-diagnosis

- POW (24V power indicator)
  On: 24VDC power supply is normal
  Off: No 24VDC power supply
- COM (extension indicator)
  On: The expansion module is successfully connected
  Off: The expansion module is not connected/incorrectly connected

Note:
Expansion modules must not be plugged or unplugged under power.otherwise normal use will be affected.

HSE series digital expansion

Note: The starting number of expansion I/O input and output starts with the last number of the host or expansion input/output point connected to the module. The numbers of the expansion I/O are arranged in sequential order. If the last point of the host is X n□ (the range of numbers in □ is 0-7).the starting number of the digital expansion input is X (n+1)0 . The same is true for the extended output start number.

Example: If the last point of the host is Y27.the starting number of the first extension output point connected to the host is Y30. If the last point of the host is Y34.the starting number of the extended output point is Y40.

Model	I/O point	DI	DO	DO type
HSE-8XT	8	8	---	---
HSE-8YT	8	---	8	Transistor NPN
HSE-8T	8	4	4	Transistor NPN
HSE-16XT	16	16	---	---
HSE-16YT	16	---	16	Transistor NPN
HSE-16T	16	8	8	Transistor NPN
HSE-16YR	16	---	16	Relay
HSE-16R	16	8	8	Relay
HSE-32T	32	16	16	Transistor NPN
HSE-32R	32	16	16	Relay
HSE-40T	40	24	16	Transistor NPN

HSE analog expansion HSE-4AI2AOS

1. HSE-4AI2AOS specification

Model	HSE-4AI2AOS
AI channel	4
AO channel	2
AI voltage type	0-5V；0-10V
AO voltage type	0-10V
AI/AO current type	0-20mA；4-20mA

Resolution：

Type	Resolution
0-5V；0-10V（AI）	K0-K4095（12bits）
0-20mA	K0-K4095（12bits）
0-10V（AO）	K0-K4095（12bits）

2. Wiring

Input: Current type (0-20mA)

Wiring method: I and V are short-circuited.the signal is connected to V.and G is connected to 0V

Voltage type (0-10V; 0-5V)

Wiring method: I do not connect.the signal connects to V.and G connects to 0V

Output: current type (0-20mA)

Wiring method: V is not connected.signal is connected to I.G is connected to 0V

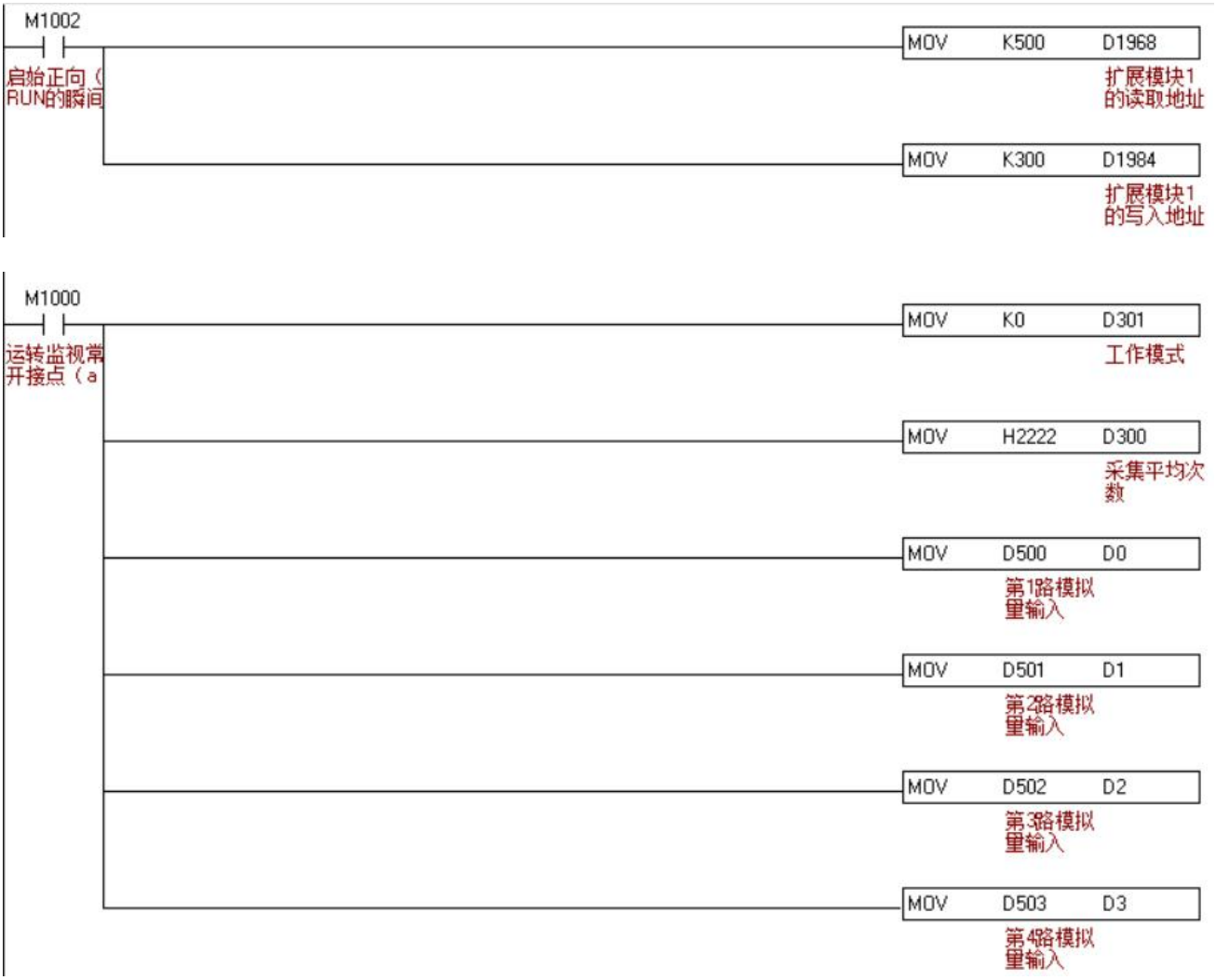
Voltage type (0-10V; 0-5V)

Wiring method: I do not connect.the signal connects to V.and G connects to 0V

3. Programming example

3.1 Analog input sample program description

Note: The example is based on the 1st extension connected to the host.and the analog input type is current input as an example.



Example description:

1) Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

1）D300 representation is as follows:

✧ In the example program.the read address D1984 of the first expansion module is assigned as K300.which means that the starting address of the channel output of the expansion module is D300 (S1). The user can define the starting address.that is.change the value of K300.

Output start address	Function
D300（S1）	Average number of acquisitions (default is H2222)

4）The representation of D301 analog input working mode is as follows:

Channel	AI type		D301（S1）+1
	Current type; Voltage type (0-5V)	Voltage type (0-10V)	
CH1 analog input bit0	0	1	（bit3~bit0）
CH2 analog input bit1	0	1	
CH3 analog input bit2	0	1	
CH4 analog input bit3	0	1	
Example: Input: The CH1 and CH4 are current type.the CH2 and CH3 are voltage type (0-10V) Then: the CH1 bit0 =0.theCH2 bit1 =1.theCH3 bit2 =1.the CH4 input bit3=0 Then the binary representation of bit3~bit0 of D301 is 0110.which should be converted into hexadecimal and assigned as MOV H6 D301			

5）AI address

✧ In the example program.the read address D1968 of the first expansion module is assigned as K500.which means that the starting address of the channel input of the expansion module is D500 (S2). The user can define the starting address.that is.change the value of K500. The specific representation is as follows:

Channel	Function	AI address
CH0-IN	Channel 1 analog input	D500（S2）
CH1-IN	Channel 2 analog input	D501（S2）+1
CH2-IN	Channel 3 analog input	D502（S2）+2
CH3-IN	Channel 4 analog input	D503（S2）+3

3.2 Analog output sample program description

Example description

Analog output address:

✧ As mentioned above.assign the write address D1984 of the first expansion module to K300.indicating that the starting address of the channel output of the expansion module is D300 (S1).and the user can customize the starting address.that is.change the value of K300. The specific representation of the analog output address is as follows:

Channel	Function	AO address
	Average number of sampling (default is H2222)	D300（S1）
	Working mode	D301（S1）+1
CH0-OUT	Channel 1 analog output	D302（S1）+2
CH1-OUT	Channel 2 analog output	D303（S1）+3

In the example.D302 is assigned K4095.which means the output voltage is 10V.

HSE analog expansion HSE-4AI2AO

1. HSE-4AI2AO specification

Model	HSE-4AI2AO
AI channel	4
AO channel	2
AI/AO voltage type	-10v~10v
AI current channel	0~20mA

Resolution:

Type	Resolution
-10v~10v（AI）	K-32767~K32767（16bits）
0~20mA（AI）	K0~K65535（16bits）
-10v~10v（AO）	K-2047~K2047（12bits）
0~20mA（AO）	K0~K4095（12bits）

2. Wiring

Input: Current type (0-20mA)

Wiring method: I and V are short-circuited.the signal is connected to V.and G is connected to 0V

Voltage type (-10~10V)

Wiring method: I do not connect.the signal connects to V.and G connects to 0V

Output: current type (0-20mA)

Wiring method: V is not connected.signal is connected to I.G is connected to 0V

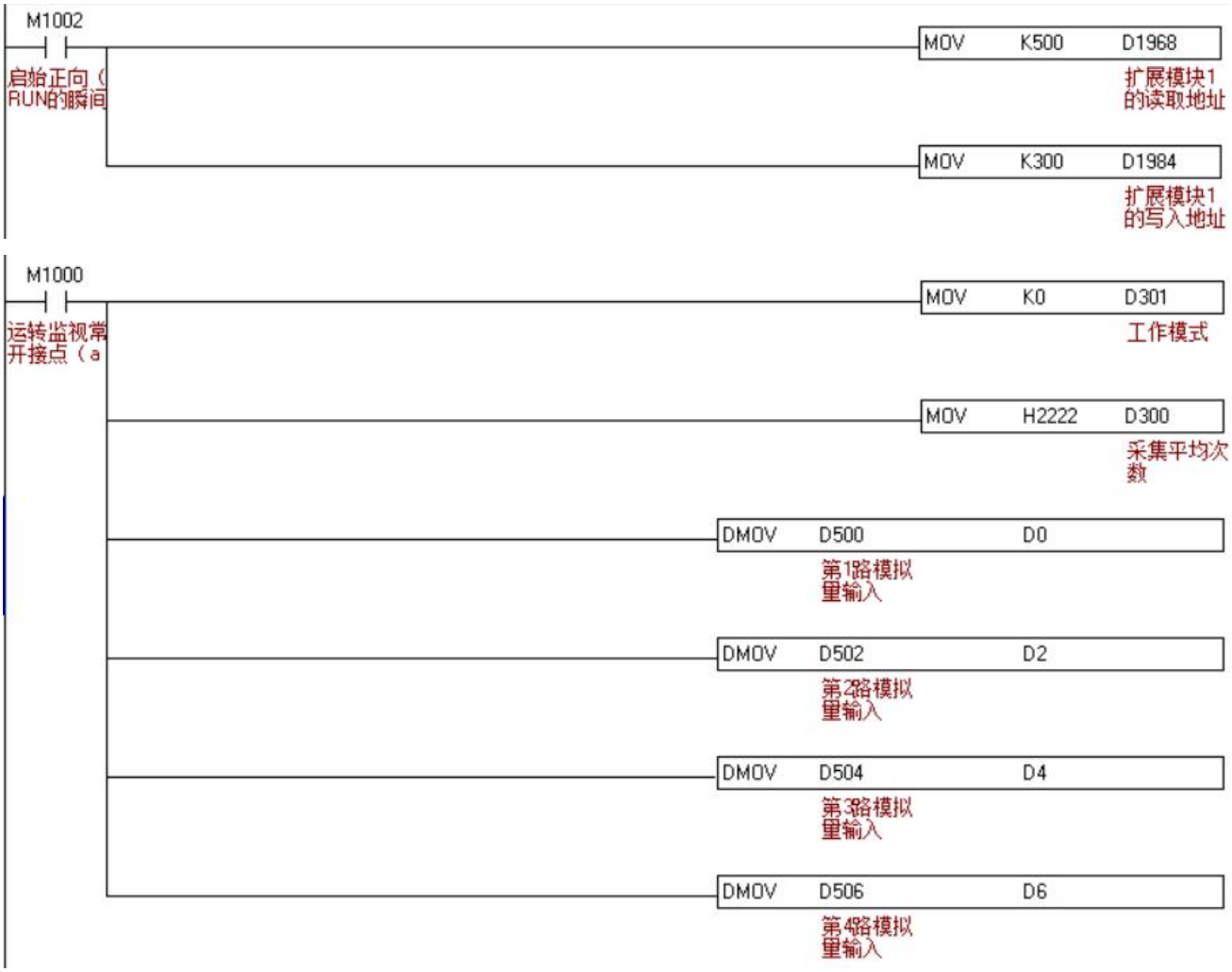
Voltage type (-10~10V)

Wiring method: I do not connect.the signal connects to V.and G connects to 0V

3. Programming example

3.1 Analog input sample program description：

Note: The example is based on the 1st extension connected to the host.and the analog input type is current input as an example.



1）Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

3）D300 representation is as follows:

✧ In the example program.the read address D1984 of the first expansion module is assigned as K300.which means that the starting address of the channel output of the expansion module is D300 (S1). The user can define the starting address.that is.change the value of K300.

Output start address	Function
D300（S1）	Average number of acquisitions (default is H2222)

4）The representation of D301(S1)+1 analog input/output working mode is as follows:

Channel	AI/AO type		D301（S1）+1
	Current	Voltage	
CH1 analog input bit0	0	1	（bit5~bit0）
CH2 analog input bit1	0	1	
CH3 analog input bit2	0	1	
CH4 analog input bit3	0	1	
CH1 analog output bit4	0	1	
CH2 analog output bit5	0	1	

Example:

Input: The 1st and 4th analog inputs are current type.and the 2nd and 3rd analog inputs are voltage type.

Output:The 1st and 2nd analog outputs are voltage type

Then: the 1st AI bit0 =0.the 2nd AI bit1 =1.the3rd AI bit2 =1.the 4th AI bit3=0.the 1st AO bit4 = 1. The the 2nd AO bit5 =1.

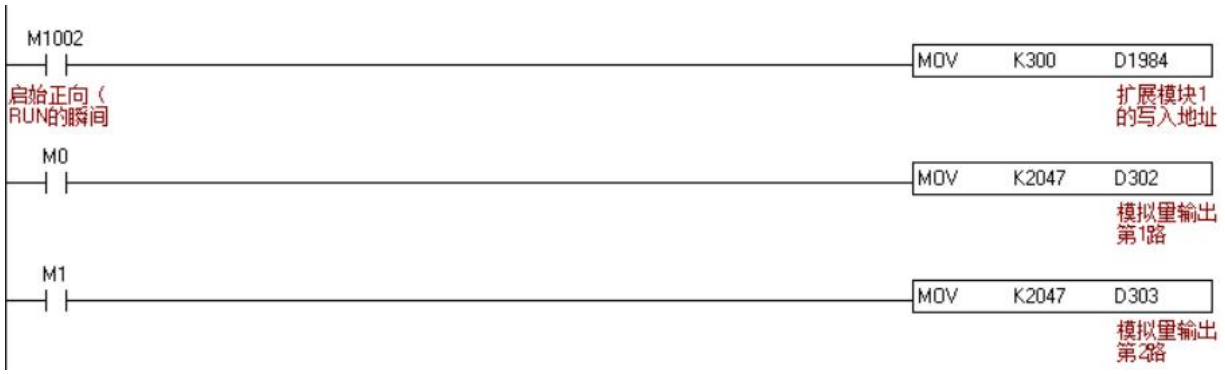
Then the binary representation of bit5~bit0 of D301 is 11 0110.which should be converted into hexadecimal and should be assigned as MOV H36 D301

5）AI address

✧ In the example program.the read address D1968 of the first expansion module is assigned as K500.which means that the starting address of the channel input of the expansion module is D500 (S2). The user can define the starting address.that is.change the value of K500. The specific representation is as follows:

AI address	Function
D500（32bits） （S）	Channel 1 analog input
D502（32bits） （S）+2	Channel 2 analog input
D504（32bits） （S）+4	Channel 3 analog input
D506（32bits） （S）+6	Channel 4 analog input

3.2 Analog output sample program description



Example description

Analog output address:

✧ As mentioned above.assign the write address D1984 of the first expansion module to K300.indicating that the starting address of the channel output of the expansion module is D300 (S1).and the user can customize the starting address.that is.change the value of K300. The specific representation of the analog output address is as follows:

Channel	Function	AO address
	Average number of sampling (default is H2222)	D300（S1）
	Working mode	D301（S1）+1
CH0-OUT	Channel 1 analog output	D302（S1）+2
CH1-OUT	Channel 2 analog output	D303（S1 ）+3

HSE analog expansion HSE-4AOS. HSE-4AO

1. HSE-4AO. HSE-4AOS specification

Model	HSE-4AOS	HSE-4AO
AO channel	4	4
Voltage output	0-10V（K0-K4095）	-10V-10V（K-2047~K2047）
Current output	0-20mA（K0-K4095）；4-20mA	0-20mA（K0-K4095）；4-20mA
Resolution	12bits	12bits

2. Wiring

Output: current type

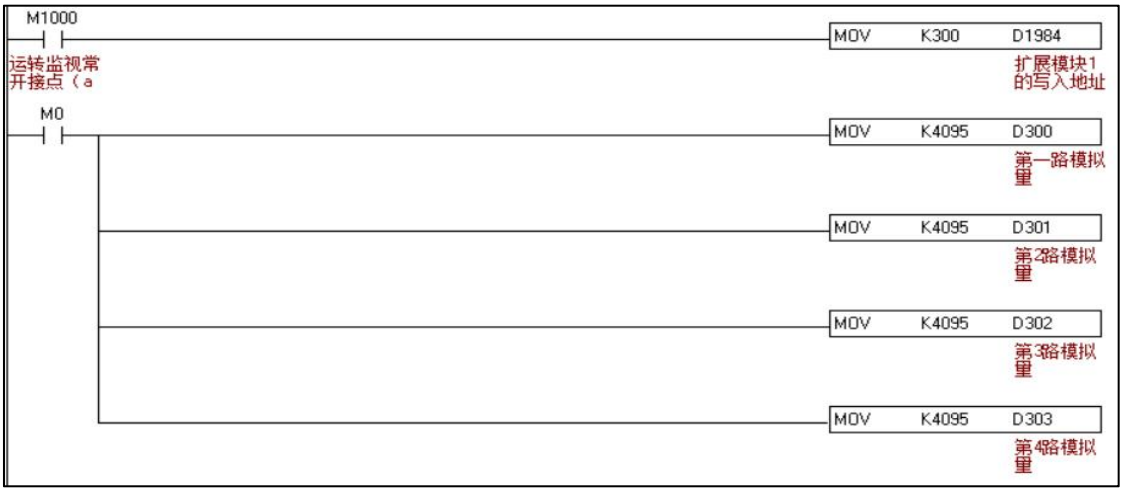
Wiring method: V is not connected.signal is connected to I.G is connected to 0V

Voltage type

Wiring method: I do not connect.the signal connects to V.and G connects to 0V

3. Programming example

Note: The example is based on the 1st extension connected to the host.



✧ In the example program.the read address D1984 of the first expansion module is assigned as K300.which means that the starting address of the channel output of the expansion module is D300 (S1). The user can define the starting address.that is.change the value of K300.

Channel	AO address	Function
CH0-OUT	D300（S）	Channel 1 analog output
CH1-OUT	D301（S）+1	Channel 2 analog output
CH2-OUT	D302（S）+2	Channel 3 analog output
CH3-OUT	D303（S ）+3	Channel 4 analog output

HSE RTD temperature expansion HSE-8PT

1. HSE-8PT specification

Model	HSE-8PT
AI Channel	8
Sensor type	Support 3-wire PT100
Measuring range	-50℃-300℃

2. Wiring

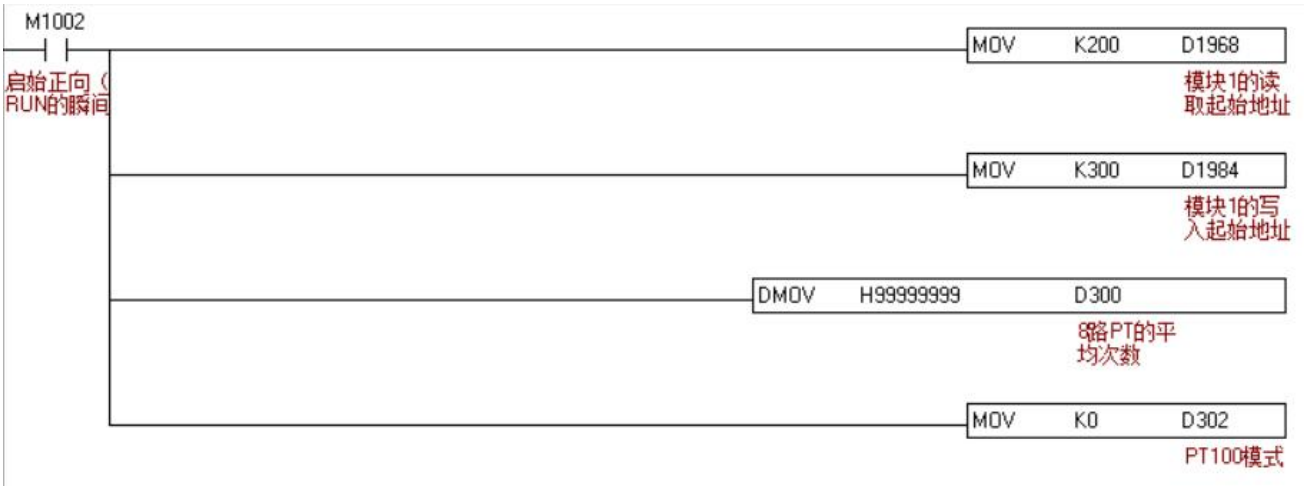
3-wire PT100: If the 3 wires are A.B.and C respectively.if the resistance value between A and B.A and C is about 100 ohms with a multimeter.then A is the common wire.connect to L- of HSE-8PT .and the other two wires B and C can be connected to L+ and I+ of HSE-8PT at will.

2-wire PT100: connect one to L-.the other to L+.and short-circuit L+ and I+ at the same time.

3. Programming example

3.1Analog input sample program description

Note: The example is based on the 1st extension connected to the MPU.



1）Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

3）Analog temperature input address

✧ In the example.the read address D1968 of the first expansion module is assigned as K200.which means the start address D200 (S) for reading the temperature of the expansion module. The user can define the start address.that is.change the value of K200. The specific representation of the analog temperature input address is as follows:

Channel	Temperature input address	Function
CH0	D200（S）	1st channel temperature reading
CH1	D201（S）+1	2nd channel temperature reading
CH2	D202（S）+2	3rd channel temperature reading
CH3	D203（S）+3	4th channel temperature reading
CH4	D204（S）+4	5th channel temperature reading
CH5	D205（S）+5	6th channel temperature reading
CH6	D206（S）+6	7th channel temperature reading
CH7	D207（S）+7	8th channel temperature reading
CH8	D208~D210（S）+8~（S）+10	System parameters.users should not use

3）Analog temperature output address

✧ In the example.the write address D1984 of the first expansion module is assigned as K300.which means the start address D300 (S2) for temperature writing of the expansion module. The user can define the start address.that is.change the value of K300. The specific representation is as follows:

Output address	Function
D300（S2）~ D301（S2）+1	The average number of sampling (default is H99999999).the larger the average value.the slower the temperature response.but the more stable the temperature
D302（S2）+2	PT100mode (default is 0)
D303~D334（S2）+3~（S2）+34	System parameters.users should not use

HSE thermocouple Temperature Extension HSE-2TC-A

1. HSE-2TC-A specification

Input/output	Function	Port
AI points	2 channel temperature thermocouple input，0-900℃	TC0，TC1
AC output point	2 channel SSR solid-state Relay AC output).driving heating rods within 500W	Y0，Y1
DC transistor output	2 channel NPN transistor output.Irate = 0.5A	Y2，Y3

2. Programming example

2.1. Analog input sample program description：

Note: The example is based on the 1st extension connected to the MPU.

1）Expansion module read address definition

Expansion module read address	**Function**
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

3）Analog temperature input address

✧ In the example.the read address D1968 of the first expansion module is assigned as K200.which means the start address D200 (S) for reading the temperature of the expansion module. The user can define the start address.that is.change the value of K200. The specific representation of the analog temperature input address is as follows:

Temperature input address	Function
D200（S）	CH1 temperature compensation (for system)
D201（S）+1	CH2 temperature compensation (for system)
D202（S）+2	CH1 channel temperature reading
D203（S）+3	CH2 channel temperature reading
D204~D208（S）+4~（S）+8	System occupied

3) Analog output address

✧ In the example.the write address D1984 of the first expansion module is assigned as K301.which means the start address D301 (S2) written by the expansion module. The user can define the start address.that is.change the value of K301. The specific representation is as follows:

Output address	Function
D301（S2）+1	Average times of 2-channels TC (default H99)
D302（S2）+2	TC work mode，default K0
D303~ D312（S2）+3~（S2）+12	System occupied

HSE thermocouple Temperature Extension HSE-8TC

1. HSE-8TC specification

Model	HSE-8TC
AI points	8 points
Sensor type	Type K thermocouple
Measuring range	0-900℃
Resolution	0.1℃

2. Programming example

Note: The example is based on the 1st extension connected to the MPU.

2.1. Analog input sample program description：

1）Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

3）Analog temperature input address

✧ In the example.the read address D1968 of the first expansion module is assigned as K200.which means the start address D200 (S) for reading the temperature of the expansion module. The user can define the start address.that is.change the value of K200. The specific representation of the analog temperature input address is as follows:

Temperature input address	Function
D200（S）	CH1 temperature compensation (for system)
D201（S）+1	CH2 temperature compensation (for system)
D202（S）+2	CH3 temperature compensation (for system)
D203（S）+3	CH4 temperature compensation (for system)
D204（S）+4	CH5 temperature compensation (for system)
D205（S）+5	CH6 temperature compensation (for system)
D206（S）+6	CH7 temperature compensation (for system)
D207（S）+7	CH8 temperature compensation (for system)
D208（S）+8	CH1 channel temperature reading
D209（S）+9	CH2 channel temperature reading
D210（S）+10	CH3 channel temperature reading
D211（S）+11	CH4 channel temperature reading
D212（S）+12	CH5 channel temperature reading
D213（S）+13	CH6 channel temperature reading
D214（S）+14	CH7 channel temperature reading
D215（S）+15	CH8 channel temperature reading
D216~ D229（S）+16~（S）+29	System occupied

3) Analog output address

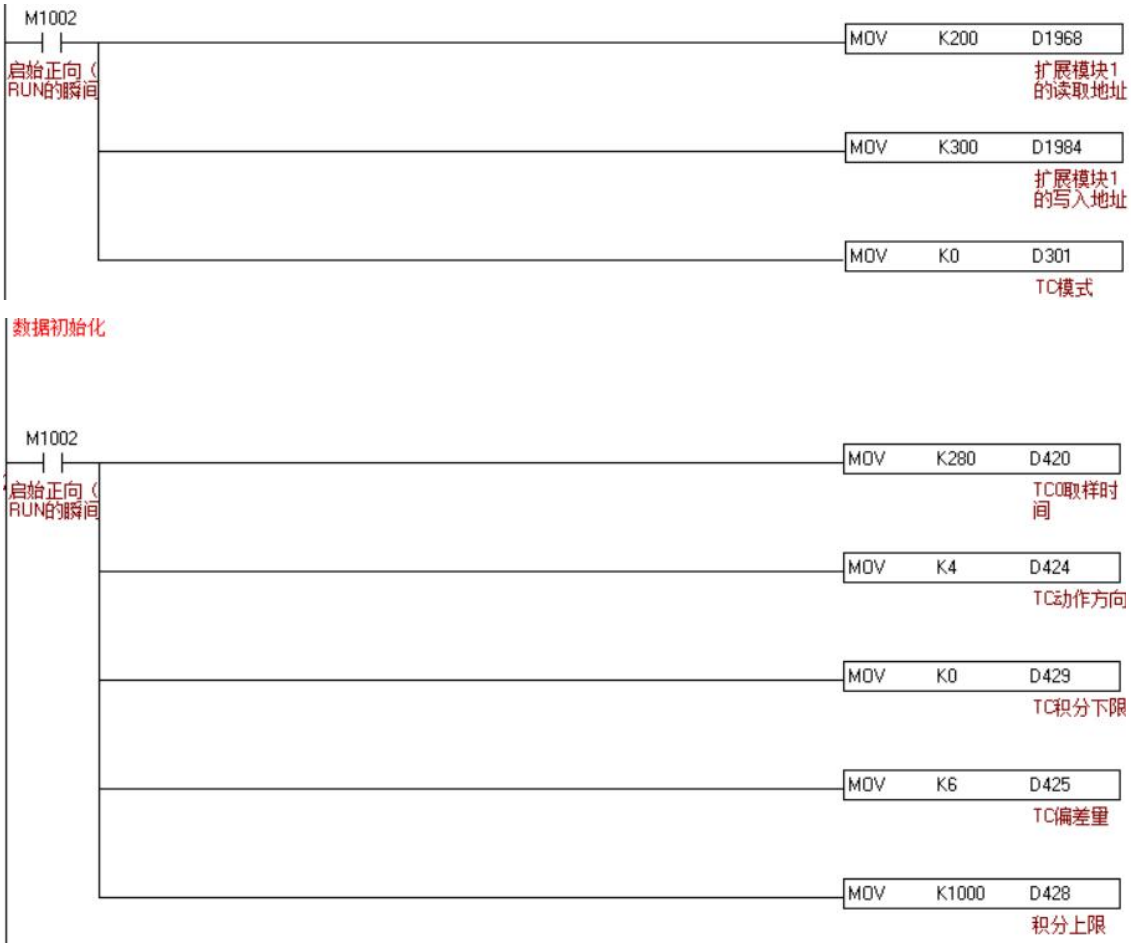
✧ In the example.the write address D1984 of the first expansion module is assigned as K300.which means the start address D300 (S2) for temperature writing of the expansion module. The user can define the start address.that is.change the value of K300.
The specific representation is as follows:

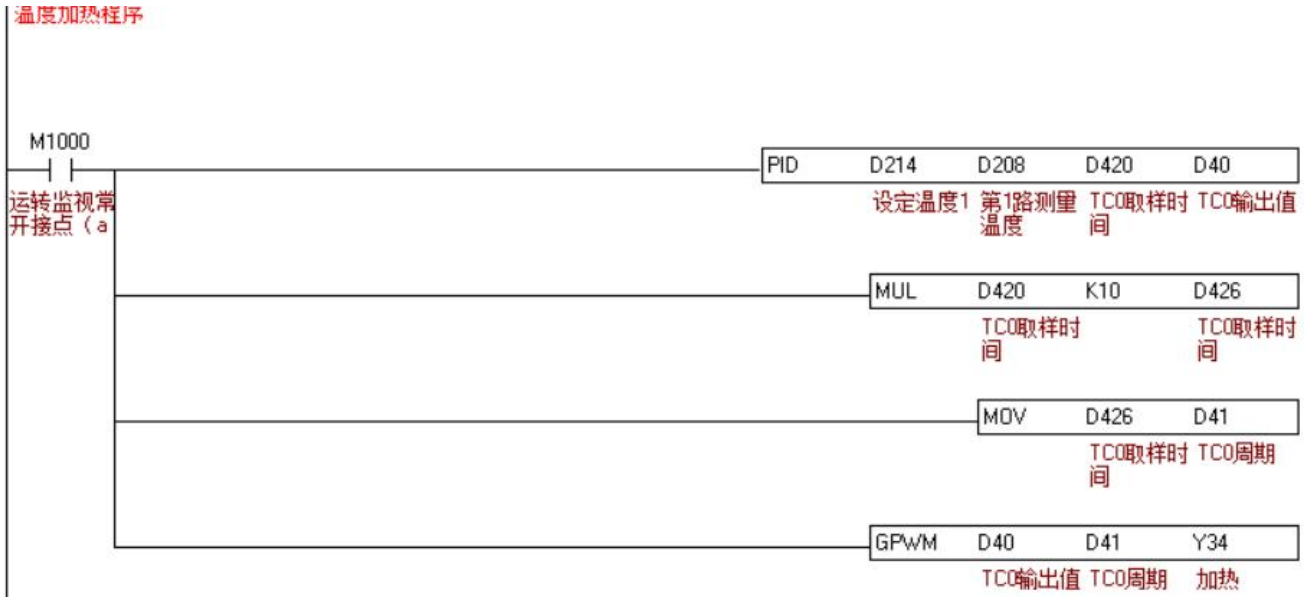
Output address	Function
D300（S2）	System occupied
D301（S2）+1	TC work mode，default K0
D302~ D334（S2）+2~（S2）+34	System occupied

Example: Detailed Explanation of Temperature PID Control

Control purpose: Calculate the best PID temperature control parameters by using the auto-tuning function.

Control description: Since the general users do not know much about the temperature environment characteristics of the first control.they can use the automatic tuning function (S3+4=K3) to make a preliminary adjustment. After the tuning is completed.this command will be automatically modified. The control function is a dedicated function for temperature control (S3+4=K4). The control environment in this example is an oven. The sample program is shown in the figure below: the sampling time is recommended to be set to K280.and the integral upper limit is recommended to be set to K1000. HSE-8TC is the first extension after the MPU.




温度加热程序
M1000
运转监视常开接点（a
PID
D214
D208
D420
D40
设定温度1
第1路测量温度
TC0取样时间
TC0输出值
MUL
D420
K10
D426
TC0取样时间
TC0取样时间
MOV
D426
D41
TC0取样时间
TC0周期
GPWM
D40
D41
Y34
TC0输出值
TC0周期
加热

HSE thermocouple Temperature Extension HSE-4TCY

1. HSE-4TCY specification

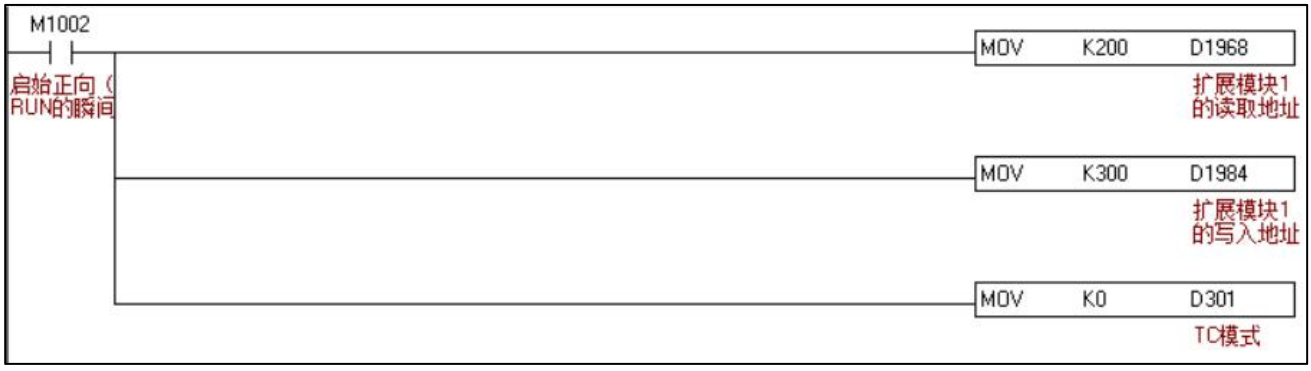
Model	**HSE-4TCY**
AI points	4points（TC0~TC3），Isolated
Sensor type	Type K thermocouple
Measuring range	0-900℃
Resolution	1℃
NPN type transistor output	Y0~Y3（Rated output current0.5A）

Output port definition method:

- Note: The starting number of expansion I/O input and output starts with the last number of the MPU or expansion input/output point connected to the module. The numbers of the expansion I/O are arranged in sequential order. If the last point of the host is X n□ (the range of numbers in □ is 0-7).the starting number of the digital expansion input is X (n+1)0 . The same rule for the extended output start number.
  Example: If the last point of the host is Y27.the starting number of the first extension output point connected to the host is Y30. If the last point of the host is Y34.the starting number of the extended output point is Y40.

2. Programming example

Note: The example is based on the 1st extension connected to the MPU.



2.1. Analog input sample program description：

1）Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

3）Analog temperature input address

✧ In the example.the read address D1968 of the first expansion module is assigned as K200.which means the start address D200 (S) for reading the temperature of the expansion module. The user can define the start address.that is.change the value of K200. The specific representation of the analog temperature input address is as follows:

Temperature input address	Function
D200（S）	CH1 temperature compensation (for system)
D201（S）+1	CH2 temperature compensation (for system)
D202（S）+2	CH3 temperature compensation (for system)
D203（S）+3	CH4 temperature compensation (for system)
D204（S）+4	CH1 channel temperature reading
D205（S）+5	CH2 channel temperature reading
D206（S）+6	CH3 channel temperature reading
D207（S）+7	CH4 channel temperature reading
D208（S）+8~ D208（S）+9	System occupied

3) Analog output address

✧ In the example.the write address D1984 of the first expansion module is assigned as K300.which means the start address D300 (S2) for temperature writing of the expansion module. The user can define the start address.that is.change the value of K300.
The specific representation is as follows:

Output address	Function
D300（S2）	System occupied
D301（S2）+1	TC work mode，default K0
D302~ D334（S2）+2~（S2）+19	System occupied

- Temperature control.see HSE-8TC example introduction

HSE thermocouple Temperature Extension HSE-8TCY

1. HSE-8TCY specification

Model	**HSE-8TCY**
AI points	4points（TC0~TC7），Isolated
Sensor type	Type K thermocouple
Measuring range	0-900℃
Resolution	1℃
NPN type transistor output	Y0~Y7（Rated output current0.5A）

Output port definition method:

- Note: The starting number of expansion I/O input and output starts with the last number of the MPU or expansion input/output point connected to the module. The numbers of the expansion I/O are arranged in sequential order. If the last point of the host is X n□ (the range of numbers in □ is 0-7).the starting number of the digital expansion input is X (n+1)0 . The same rule for the extended output start number.

  Example: If the last point of the host is Y27.the starting number of the first extension output point connected to the host is Y30. If the last point of the host is Y34.the starting number of the extended output point is Y40.

2. Programming example

Note: The example is based on the 1st extension connected to the MPU.

2.1. Analog input sample program description：

1）Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
and so on	and so on
…	…

3）Analog temperature input address

✧ In the example, the read address D1968 of the first expansion module is assigned as K200, which means the start address D200 (S) read by the expansion module. The user can define the start address, that is, change the value of K200. The specific representation of the analog temperature input address is as follows:

Temperature input address	Function
D200（S）	CH1 temperature compensation (for system)
D201（S）+1	CH2 temperature compensation (for system)
D202（S）+2	CH3 temperature compensation (for system)
D203（S）+3	CH4 temperature compensation (for system)
D204（S）+4	CH5 temperature compensation (for system)
D205（S）+5	CH6 temperature compensation (for system)
D206（S）+6	CH7 temperature compensation (for system)
D207（S）+7	CH8 temperature compensation (for system)
D208（S）+8	CH1 channel temperature reading
D209（S）+9	CH2 channel temperature reading
D210（S）+10	CH3 channel temperature reading
D211（S）+11	CH4 channel temperature reading
D212（S）+12	CH5 channel temperature reading
D213（S）+13	CH6 channel temperature reading
D214（S）+14	CH7 channel temperature reading
D215（S）+15	CH8 channel temperature reading
D216~ D229（S）+16~（S）+19	System occupied

3) Analog output address

✧ In the example.the write address D1984 of the first expansion module is assigned as K300.which means the start address D300 (S2) for temperature writing of the expansion module. The user can define the start address.that is.change the value of K300.
The specific representation is as follows:

Output address	Function
D300（S2）	System occupied
D301（S2）+1	TC work mode，default K0
D302~ D334（S2）+2~（S2）+34	System occupied

- Temperature control.see HSE-8TC example introduction

HSE weighing extension HSE-2L. HSE-4L

1. HSE-2L. HSE-4L specification

Model		HSE-2L	HSE-4L
AI points		2	4
Resolution		24bits	24bits
Mark	EX+	+5V	
	EX-	0V	
	CH+	Signal+	
	CH-	Signal-	

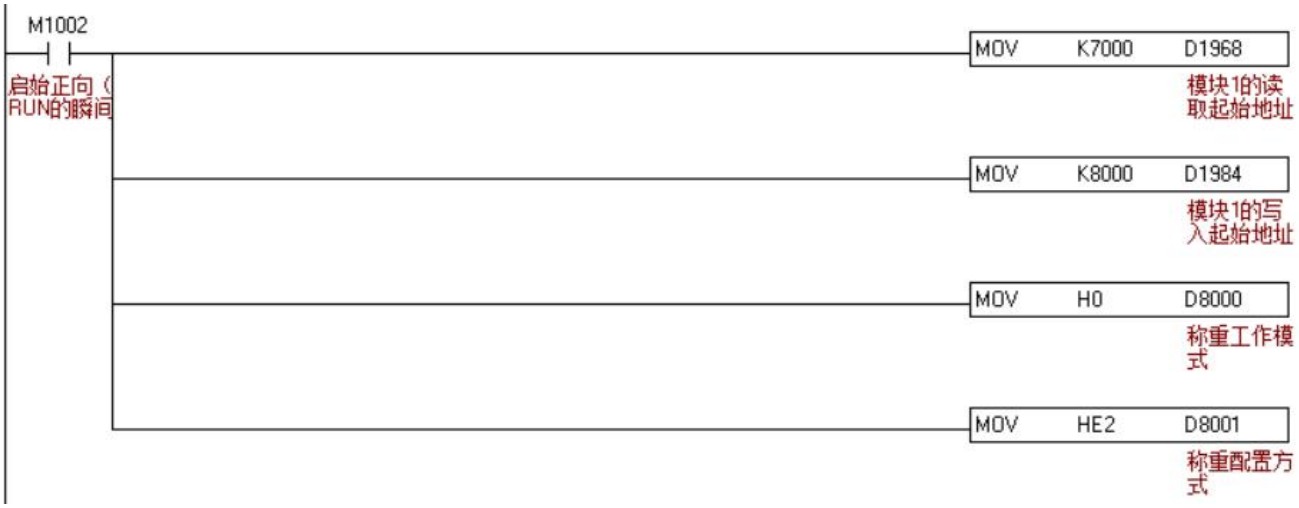
2. Programming example

2.1 Analog input sample program description

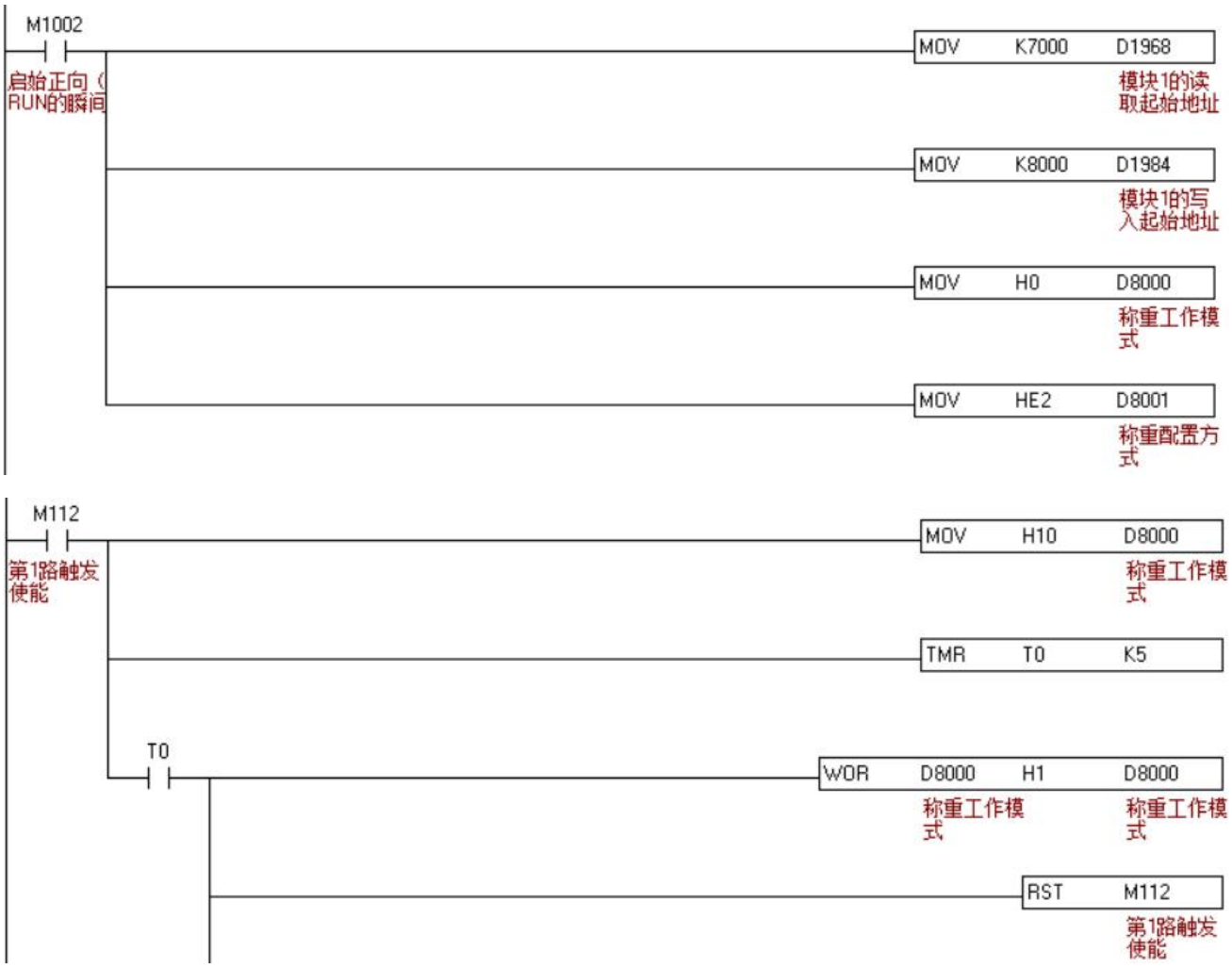
Note: HSE-2L program can refer to HSE-4L. The example is the first one after the extension is connected to the host.

Weighing working mode configuration

1. Continuous mode.unipolar. Gain=64.rate is 25 Sps



2. Trigger mode.unipolar.Gain=64.rate is 25 Sps



1）Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

3）Definition of analog write-in address

Address	Function
D8000（S）	Weighing work mode
D8001（S）+1	Weighing configuration mode

In the example.the write address D1984 of the first expansion module is assigned as K8000.which means that the start address written by the expansion module is D8000 (S). The user can define the start address.that is.change the value of K8000.

Weighing working mode address D8000 (S) parameter settings are as follows:

- ✧ Continuous mode: means to read the original AD value of the current weight in real time
- ✧ Trigger mode: means that the original AD value of the current weight is only read at the moment of triggering
- ✧ D8000 system works in continuous mode by default

D8000 (S) factory default is continuous working mode (D8000=H0)	Bit0	CH0 weighing trigger signal	Start trigger (Working in trigger mode)	Trigger not started (Working in continuous mode)	Note
			ON：1	OFF：0	For each trigger signal of Bit0~Bit3.if the trigger signal is ON.the system will automatically OFF after a scan period is valid.
	Bit1	CH1 weighing trigger signal	Start trigger (Working in trigger mode)	Trigger not started (Working in continuous mode)	
			ON：1	OFF：0	
	Bit2	CH2 weighing trigger signal	Start trigger (Working in trigger mode)	Trigger not started (Working in continuous mode)	
			ON：1	OFF：0	
	Bit3	CH3 weighing trigger signal	Start trigger (Working in trigger mode)	Trigger not started (Working in continuous mode)	
			ON：1	OFF：0	
	Bit4	CH0 weighing working mode	Work in trigger mode	Working in continuous mode	
			ON：1	OFF：0	
	Bit5	CH1 weighing working mode	Work in trigger mode	Working in continuous mode	
			ON：1	OFF：0	
	Bit6	CH2 weighing working mode	Work in trigger mode	Working in continuous mode	
			ON：1	OFF：0	
	Bit7	CH3 weighing working mode	Work in trigger mode	Working in continuous mode	
			ON：1	OFF：0	

Working mode	D8000(S)	Bit7~ Bit0							
		bit4~bit7 indicate the working mode of CH0~CH3. 1 means working in trigger mode.0 means working in continuous mode							
		Bit0~bit3 indicate the status of CH0~CH3 when trigger is executed. 1 means the trigger is executed.0 means no trigger is executed.							
CH0-CH3 work in continuous mode	Value	Bit7 (CH3)	Bit6 (CH2)	Bit5 (CH1)	Bit4 (CH0)	Bit3 (CH3)	Bit2 (CH2)	Bit1 (CH1)	Bit0 (CH0)
	(H0)	0	0	0	0	0	0	0	0
Only CH0 works in trigger mode	Value	Bit7 (CH3)	Bit6 (CH2)	Bit5 (CH1)	Bit4 (CH0)	Bit3 (CH3)	Bit2 (CH2)	Bit1 (CH1)	Bit0 (CH0)
	when not triggered (H10)	0	0	0	1	0	0	0	0
	trigger moment (H11)	0	0	0	1	0	0	0	1
Only CH1 works in trigger mode	Value	Bit7 (CH3)	Bit6 (CH2)	Bit5 (CH1)	Bit4 (CH0)	Bit3 (CH3)	Bit2 (CH2)	Bit1 (CH1)	Bit0 (CH0)
	when not triggered (H20)	0	0	1	0	0	0	0	0
	trigger moment (H22)	0	0	1	0	0	0	1	0
Only CH2 works in trigger mode	Value	Bit7 (CH3)	Bit6 (CH2)	Bit5 (CH1)	Bit4 (CH0)	Bit3 (CH3)	Bit2 (CH2)	Bit1 (CH1)	Bit0 (CH0)
	when not triggered (H40)	0	1	0	0	0	0	0	0
	trigger moment (H44)	0	1	0	0	0	1	0	0

- Other channels work mode and so on
- If working in trigger mode with more than 2 channels.each channel can be triggered independently.and set to 1 when the corresponding channel is triggered

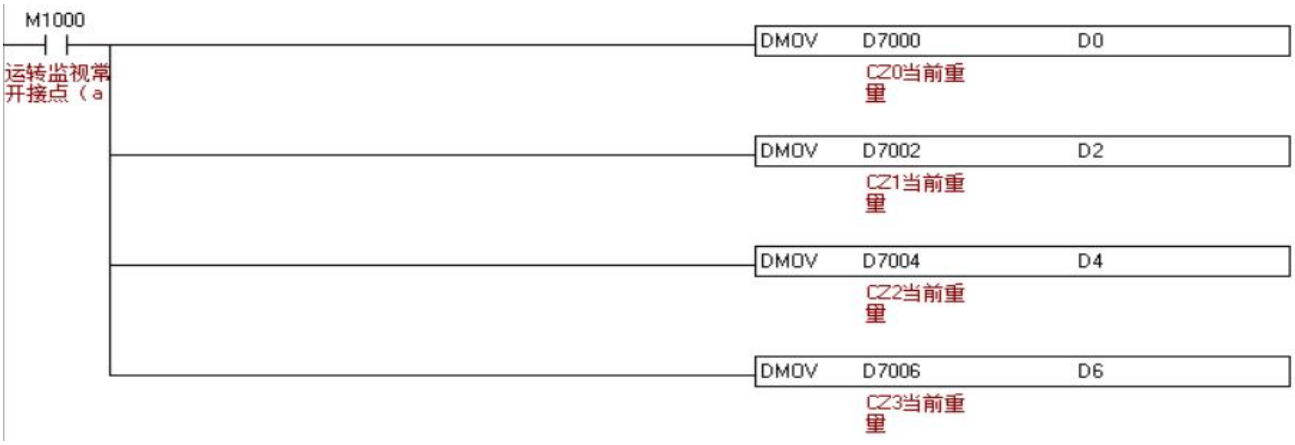
4）Weighing configuration mode address D8001 (S) + 1 parameter settings are as follows:

D8001（S）+1										
Polarity		**Bit4~ Bit6 is Gain**				**Bit0~ Bit3 is the weighing acquisition speed**				
Bit7		Bit6	Bit5	Bit4	Gain	Bit3	Bit2	Bit1	Bit0	Speed（Sps）
1	0	0	0	0	Gain=1	0	0	0	0	100 Sps
Unipolar (default)	bipolar	0	0	1	Gain=2	0	0	0	1	50 Sps
		0	1	0	Gain=4	0	0	1	0	25 Sps
		0	1	1	Gain=8	0	0	1	1	12.5 Sps（default）
		1	0	0	Gain=16	0	1	0	0	6.25 Sps
		1	0	1	Gain=32	The slower the acquisition speed.the more stable the weighing				
		1	1	0	Gain=64（default）					
The factory default is HE3 (unipolar.Gain=64.rate is 12.5Sps)										

Example:

D8001（S）+1	**Polarity**	**Bit4~ Bit6 is Gain**			**Bit0~ Bit3 is the weighing acquisition speed**			
Set value	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
HE3（Unipolar.Gain=64. 12.5Sps）	1	1	1	0	0	0	1	1
HD2(Unipolar.Gain=32. 25Sps）	1	1	0	1	0	0	1	0

5). The weighing read address is as follows:



In the example.the write address D1984 of the first expansion module is assigned as K8000.which means that the start address written by the expansion module is D8000 (S). The user can define the start address.that is.change the value of K8000.

Weighing working mode address D8000 (S) parameter settings are as follows:

✧ In the example.the write address D1968 of the first expansion module is assigned as K7000.which means that the start address written by the expansion module is D7000 (S). The user can define the start address.that is.change the value of K7000.

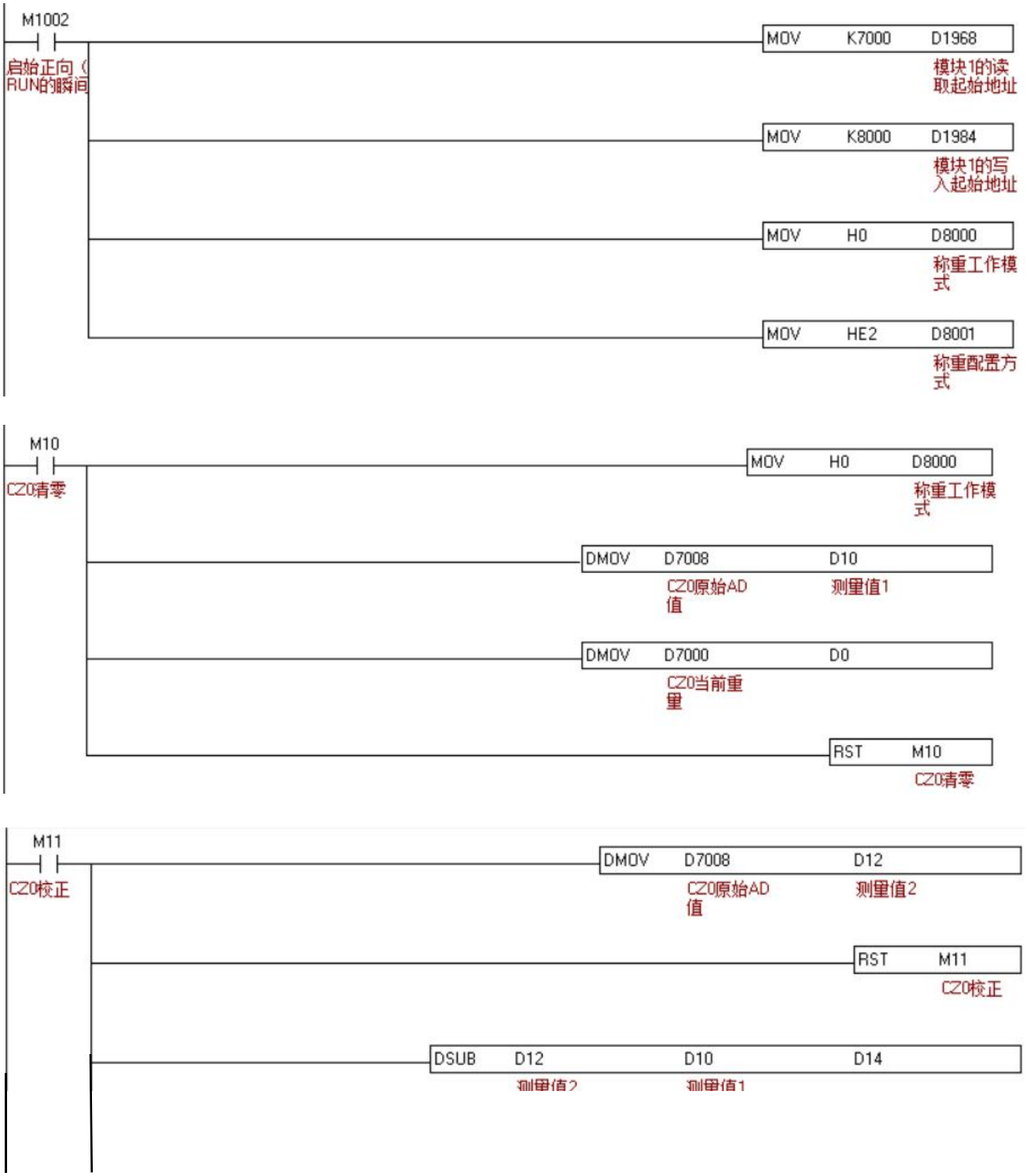
The specific representation is as follows:

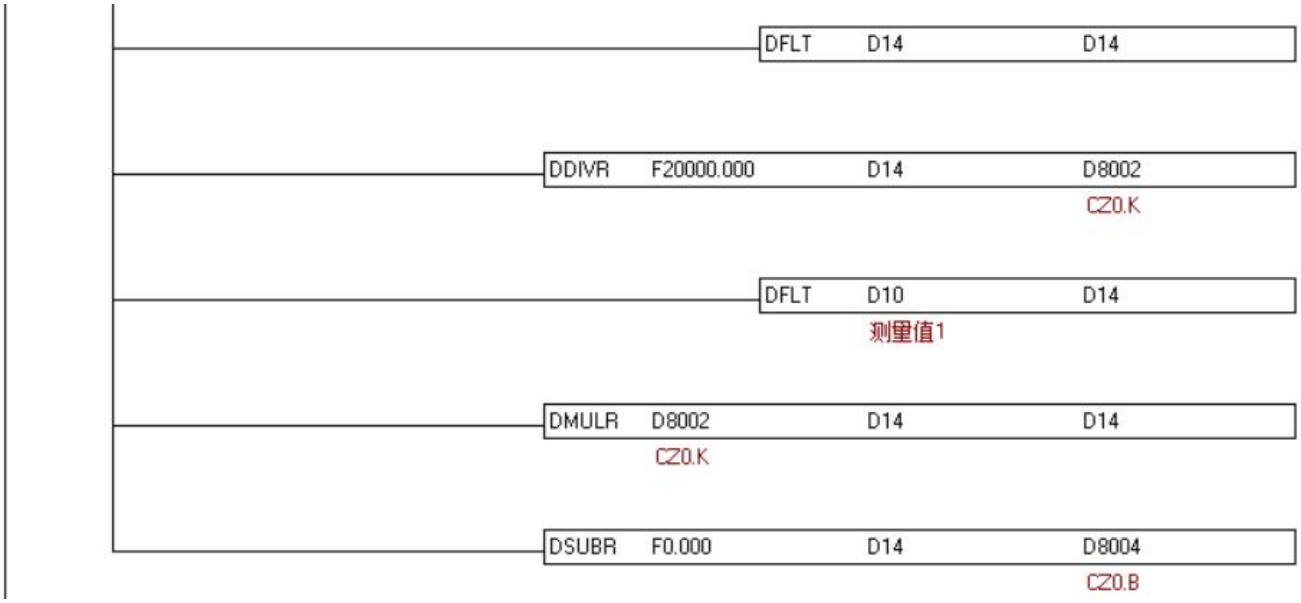
Weighing input address	Function
32bits：D7000（S2）	CH0 current weight
32bits：D7002（S2）+2	CH1 current weight
32bits：D7004（S2）+4	CH2 current weight
32bits：D7006（S2）+6	CH3 current weight
32bits：D7008（S2）+8	CH0 the original AD value
32bits：D7010（S2）+10	CH1 the original AD value
32bits：D7012（S2）+12	CH2 the original AD value
32bits：D7014（S2）+14	CH3 the original AD value

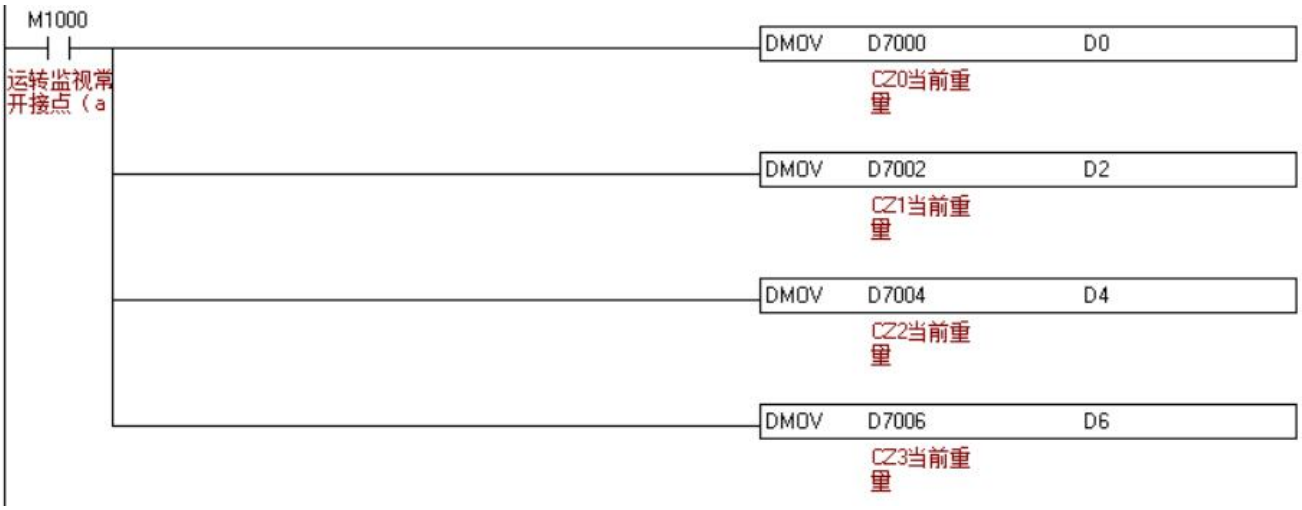
32bits：D8002（S）+2（floating）	CH0 weigh CZ0.k
32bits：D8004（S）+4（floating）	CH0 weigh CZ0.b
32bits：D8006（S）+6（floating）	CH1 weigh CZ1.k
32bits：D8008（S）+8（floating）	CH1 weigh CZ1.b
32bits：D8010（S）+10（floating）	CH2 weigh CZ2.k
32bits：D8012（S）+12（floating）	CH2 weigh CZ2.b
32bits：D8014（S）+14（floating）	CH3 weigh CZ3.k
32bits：D8016（S）+16（floating）	CH3 weigh CZ3.b

2.2 Explanation of the example program (the CH0 weighing example)

Example of weighing calibration program (it needs to work in continuous mode.i.e. D8000=H0)







Since the current weight AD value has a linear relationship with the engineering value.it can be deduced by the formula y=kx+b

- Before calibration (there is no weight on the scale)

  Operation method: Do not put any material on the scale after the line is connected. When the scale is stationary.turn M10 ON.and the analog value of the current weight is transmitted to D10. At this time.there is no weight on the scale.and the actual weight is 0.

Address	Function	Mathematical representation
D7008	AD value of the CH0 of weighing without weight	x_0
D8002（floating）	The CH0 weighing **k** value	k
D8004（floating）	The CH0 weighing **b** value	b

Therefore.after M10 is ON.it can be obtained that

$$x_0 = D10 \quad (1)$$

$$kx_0 + b = 0 \quad (2)$$

- Calibration (The calibration weight depends on the actual situation. In the example.a 200-gram weight is used.and the accuracy is 0.01g.that is.if the current weight of D7000 in the program displays K20000.it means the actual weight is 20000*0.01=200g)
  Operation method: Put a 200g weight on the scale.and after it is still stable.set M11 ON. At this time.the calibration is over.and the D7000 will display K20000.that is.the current weight is 200g.

Address	Function	Mathematical representation
D12	AD value of the CH0 of weighing with weight	x
D14	Difference = AD value before calibration - AD value after calibration	$x-x_0$
D8002（floating）	The CH0 weighing **k** value	k
D8004（floating）	The CH0 weighing **b** value	b

Therefore.after M10 is ON.it can be obtained that

$$x = D12 \quad (3)$$

$$x - x_0 = D12 - D10 = D14 \quad (4)$$

$$kx + b = 20000 \quad (5)$$

Formula (5) - formula (4) can be obtained

$$k\ (x - x_0) = 20000 \quad (6)$$

Substituting formula (4) into formula (6) can be obtained:

$$kD14 = 20000 \quad (7)$$

Then:

$$k = \frac{20000}{D14} = D8002 \quad (8)$$

Substituting the value of k from formula (8) into formula (2) yields b:

$$D8002x_0 + b = 0 \quad (9)$$

$$b = 0 - D8002 * D10 = D8004 \quad (10)$$

S0:

$$y = D8002x + D8004 \quad (11)$$

And: x=D7008（Current weight AD value）

y=D7000（Current weight engineering value）

Note:

- ◆ If the accuracy needs to be 0.01g and calibrated with a weight of 500g.then change F20000 to F50000.then D200 displays K50000.and the actual weight is 500g
- ◆ If the accuracy is 0.1g and the calibration is performed with a weight of 500g.then change F20000 to F5000.then D200 displays K5000.and the actual weight is 500g

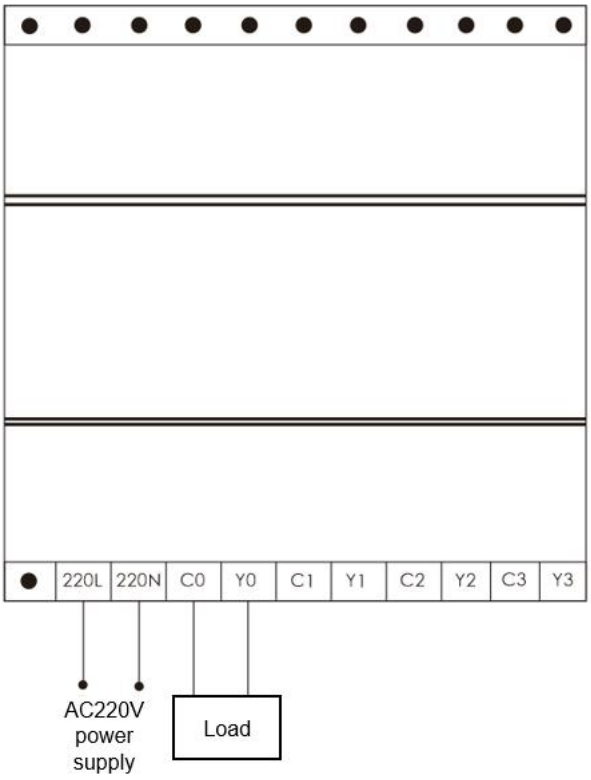
HSE Solid Relay Output Extension HSE-4S-A

1. HSE-4S-A specification

Model	**HSE-4S-A**
AO points	4points（SSR Solid Relay AC Output）

2. Wiring

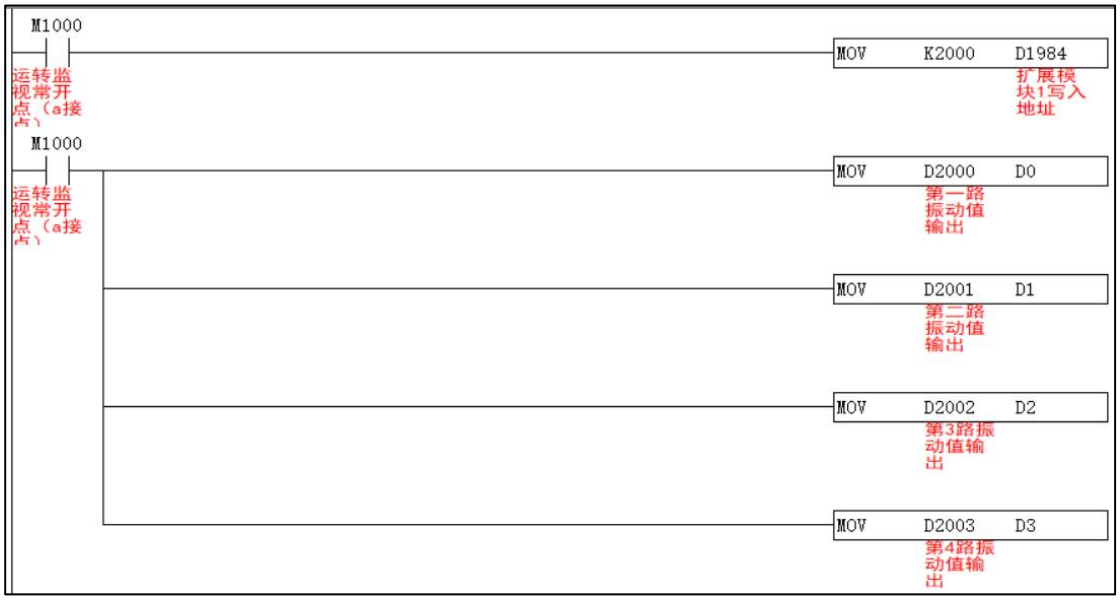
HSE-4S-A mainly used to drive the AC vibrating plate.the wiring method is as follows：



3. Programming example

3.1 Analog input sample program description

Note: The example is the first one after the extension is connected to the host.



1）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

2）AO address

In the example.the write address D1984 of the first expansion module is assigned as K2000.which means that the start address written by the expansion module is D2000 (S).

The user can define the start address.that is.change the value of K2000.

The specific representation is as follows:

Channel	Temperature input address	Function	Range
CH0	D2000（S）	CH1 vibration output	0-380
CH1	D2001（S）+1	CH2 vibration output	0-380
CH2	D2002（S）+2	CH3 vibration output	0-380
CH3	D2003（S）+3	CH4 vibration output	0-380

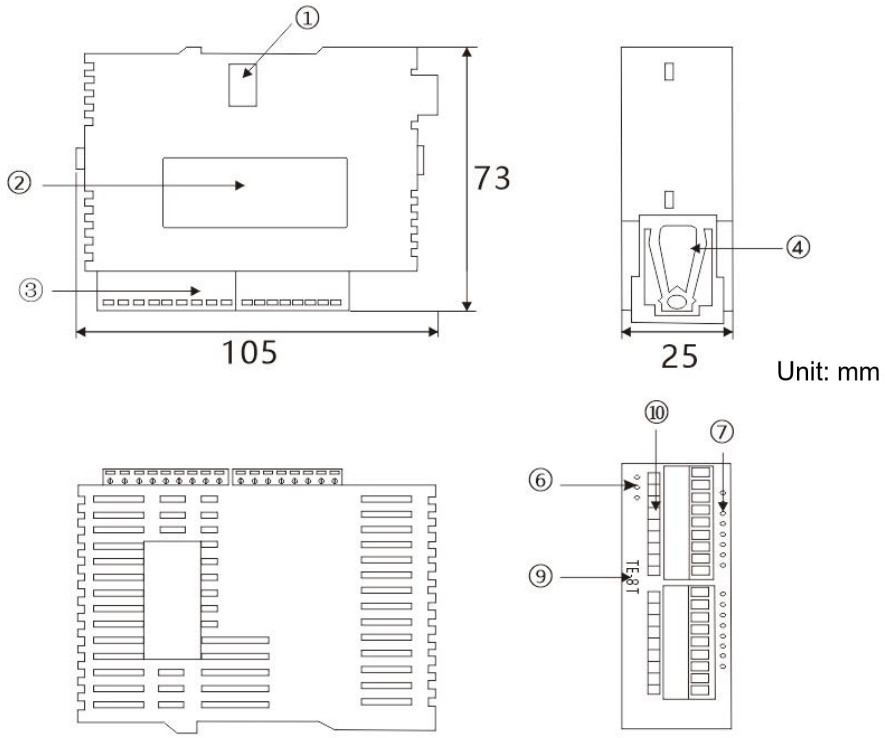
Chapter II. HTE series expansion

Thank you for using HTE series standard expansion modules. This series provides digital modules.analog modules.temperature modules.function modules.etc. Expansion modules can only be connected to the company's mainframe. To ensure the correct installation and operation of this product.please read this manual carefully before use.

Note: HTE series expansion match HCS2 series MPU.

- This installation manual provides users with electrical specifications.functional specifications.and related precautions for installation and wiring.
- When the user uses the machine.it must be installed in a housing wiring box that is dust-proof.moisture-proof and free from electric shock/shock accidents. In addition.there must be protective measures (such as special tools or keys to open) to prevent non-maintenance personnel from operating or accidentally hitting the body.causing danger or damage.
- The AC power supply cannot be connected to the input/output signal terminals.otherwise serious damage may be caused. Please confirm the power wiring again before powering on. Do not touch any terminals while power is on.
- When installing the PLC.please install it in a closed control box.and keep a certain space around it to ensure the normal cooling function of the PLC.
- Installation method of DIN rail: When hanging the main unit on the rail.please insert the fixed plastic sheet under the main unit into the groove with a flat screwdriver.stretch it out and pull it out.then hang the main unit on the rail.and then Fasten the plastic sheet and snap it back. When you want to remove the main unit.also use a flat-blade screwdriver to open the fixed plastic sheet.and then take out the main unit in an outward-facing manner. The plastic sheet of the fixing mechanism is a retaining type.so it will not spring back after being stretched.

Product Size



1 Extension ports	6 Power.Run.Error Indicators
2 Label	7 Input/output Indicators
3 Input/output terminal	9 Model
4 DIN rail fixing buckle	10 Input/output mark

LED System status self-diagnosis

- POW (24V power indicator)
  On: 24VDC power supply is normal
  Off: No 24VDC power supply
- COM (extension indicator)
  On: The expansion module is successfully connected
  Off: The expansion module is not connected/incorrectly connected

Note:
Expansion modules must not be plugged or unplugged under power.otherwise normal use will be affected.

HTE series digital expansion

Note:

The starting number of expansion I/O input and output starts with the last number of the input/output point of the host. The numbers of the expansion I/O are arranged in sequential order. If the last point of the host is X n□ (the range of numbers in □ is 0-7).the starting number of the digital expansion input is X (n+1)0 . The same is true for the extended output start number.

For example: the last point of the host is Y5.then the starting number of the extended input is Y10. The last point of the host is Y7.then the starting number of the extended input is Y10.

Model	I/O point	DI	DO	DO type
HTE-8XT	8	8	---	---
HTE-8YT	8	---	8	Transistor NPN
HTE-16YT	16	---	16	Transistor NPN
HTE-16T	16	8	8	Transistor NPN

HTE series analog expansion HTE-4AI2AOS

1. HTE-4AI2AOS specification

Model	HTE-4AI2AOS
AI channel	4
AO channel	2
AI voltage type	0-5V；0-10V
AO voltage type	0-10V
AI/AO current type	0-20mA；4-20mA

Resolution：

Type	Resolution
0-5V；0-10V（AI）	K0-K4095（12bits）
0-20mA	K0-K4095（12bits）
0-10V（AO）	K0-K4095（12bits）

2. Wiring

Input: Current type (0-20mA)

Wiring method: I and V are short-circuited.the signal is connected to V.and G is connected to 0V

Voltage type (0-10V; 0-5V)

Wiring method: I do not connect.the signal connects to V.and G connects to 0V

Output: current type (0-20mA)

Wiring method: V is not connected.signal is connected to I.G is connected to 0V

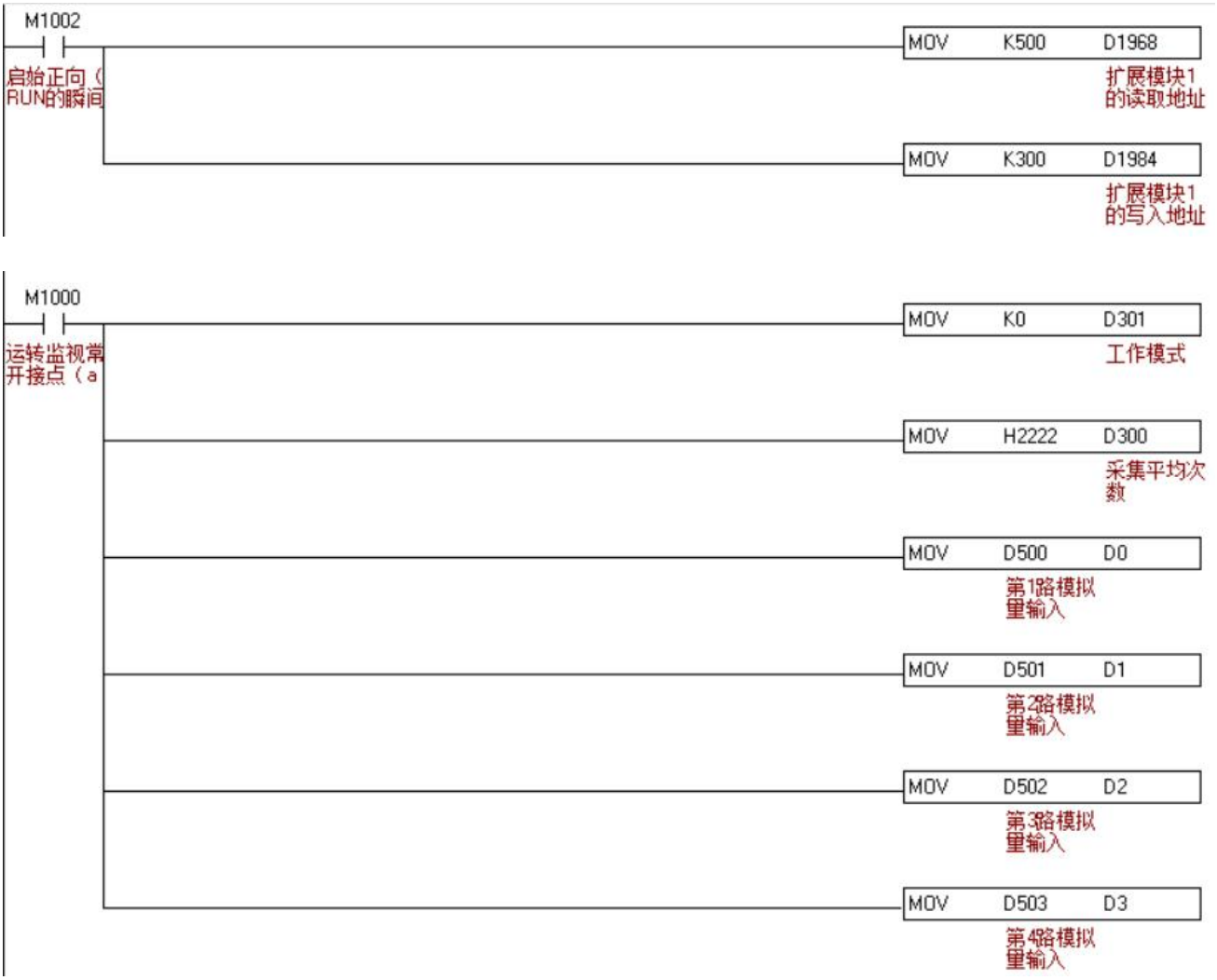
Voltage type (0-10V; 0-5V)

Wiring method: I do not connect.the signal connects to V.and G connects to 0V

3. Programming example

3.1 Analog input sample program description

Note: The example is based on the 1st extension connected to the MPU



Example description:

1) Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

2）D300 representation is as follows:

✧ In the example program.the read address D1984 of the first expansion module is assigned as K300.which means that the starting address of the channel output of the expansion module is D300 (S1). The user can define the starting address.that is.change the value of K300.

Output start address	Function
D300（S1）	Average number of acquisitions (default is H2222)

4）The representation of D301 analog input working mode is as follows:

Channel	AI type		D301（S1）+1
	Current type; Voltage type (0-5V)	Voltage type (0-10V)	
CH1 analog input bit0	0	1	（bit3~bit0）
CH2 analog input bit1	0	1	
CH3 analog input bit2	0	1	
CH4 analog input bit3	0	1	
Example: Input: The CH1 and CH4 are current type.the CH2 and CH3 are voltage type (0-10V) Then: the CH1 bit0 =0.theCH2 bit1 =1.theCH3 bit2 =1.the CH4 input bit3=0 Then the binary representation of bit3~bit0 of D301 is 0110.which should be converted into hexadecimal and assigned as MOV H6 D301			

5）AI address

✧ In the example program.the read address D1968 of the first expansion module is assigned as K500.which means that the starting address of the channel input of the expansion module is D500 (S2). The user can define the starting address.that is.change the value of K500. The specific representation is as follows:

Channel	Function	AI address
CH0-IN	Channel 1 analog input	D500（S2）
CH1-IN	Channel 2 analog input	D501（S2）+1
CH2-IN	Channel 3 analog input	D502（S2）+2
CH3-IN	Channel 4 analog input	D503（S2）+3

3.2 Analog output sample program description

Example description

Analog output address:

✧ As mentioned above.assign the write address D1984 of the first expansion module to K300.indicating that the starting address of the channel output of the expansion module is D300 (S1).and the user can customize the starting address.that is.change the value of K300. The specific representation of the analog output address is as follows:

Channel	Function	AO address
	Average number of sampling (default is H2222)	D300（S1）
	Working mode	D301（S1）+1
CH0-OUT	Channel 1 analog output	D302（S1）+2
CH1-OUT	Channel 2 analog output	D303（S1）+3

In the example.D302 is assigned K4095.which means the output voltage is 10V.

HTE analog expansion HTE-4AO

1. HTE-4AO specification

Model	HTE-4AO
AO channel	4
Voltage output	-10V-10V（K-2047~K2047）
Current output	0-20mA（K0-K4095）；4-20mA
Resolution	12bit

2. Wiring

Output: current type

Wiring method: V is not connected.signal is connected to I.G is connected to 0V

Voltage type

Wiring method: I do not connect.the signal connects to V.and G connects to 0V

3. Programming example

The function of HTE-4AO is exactly the same as that of HSE-4AO. Please refer to the parameter SE analog expansion HSE-4AO description for its programming method.

HTE analog expansion HTE-8AI

1. HTE-8AI

Model	HTE-8AI
AI channel	8
AI voltage type	0-10V（ K0-K4095，12bits）;
AO voltage type	0-20mA（ K0-K4095，12bits）;

2. Wiring

Input: Current type (0-20mA)

Wiring method: I and V are short-circuited.the signal is connected to V.and G is connected to 0V

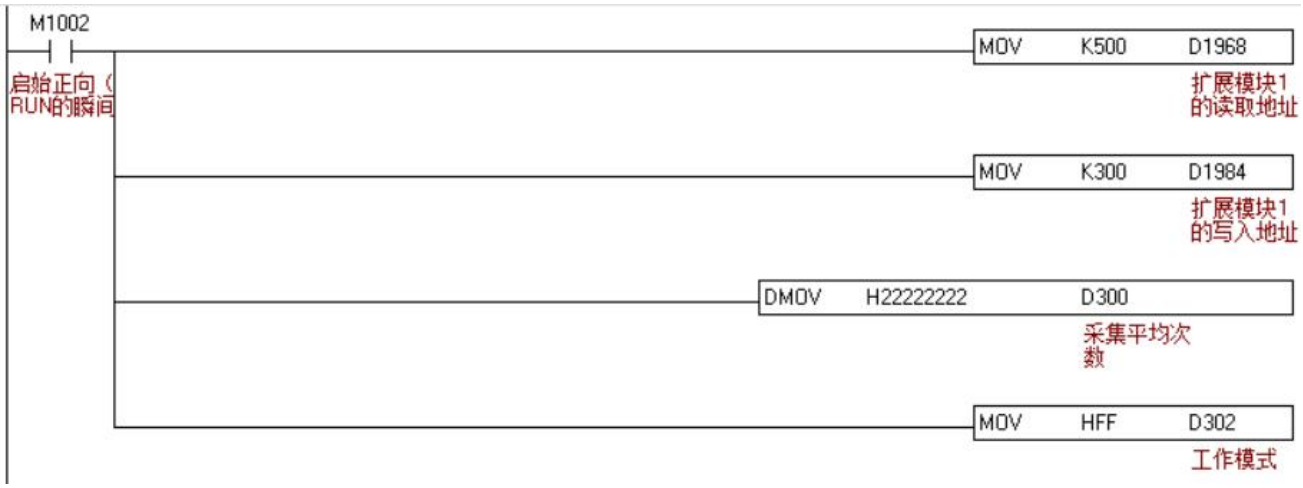
Voltage type (0-10V)

Wiring method: I do not connect.the signal connects to V.and G connects to 0V

3. Programming example

3.1 Analog input sample program description

Note: The example is based on the 1st extension connected to the host.and the analog input type is voltage input as an example.



1) Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

3）D300 representation is as follows:

✧ In the example program.the read address D1984 of the first expansion module is assigned as K300.which means that the starting address of the channel output of the expansion module is D300 (S1). The user can define the starting address.that is.change the value of K300.

Output start address	Function
D300-D301　S1-(S1)+1	Average number of acquisitions (default is H22222222)

4）The representation of D302 analog input working mode is as follows:

Channel	AI type		D302（S1）+2
	Current type; Voltage type (0-5V)	Voltage type (0-10V)	
CH1 analog input bit0	0	1	（bit7~bit0）
CH2 analog input bit1	0	1	
CH3 analog input bit2	0	1	
CH4 analog input bit3	0	1	
And son on	And son on		
Example: Input: The CH1 and CH4 are current type.the CH2 and CH3 are voltage type (0-10V) Then: the CH1 bit0 =0.theCH2 bit1 =1.theCH3 bit2 =1.the CH4 input bit3=0 Then the binary representation of bit7~bit0 of D302 is 0000 0110.which should be converted into hexadecimal and assigned as MOV H6 D301			

5）AI address

✧ In the example program.the read address D1968 of the first expansion module is assigned as K500.which means that the starting address of the channel input of the expansion module is D500 (S2). The user can define the starting address.that is.change the value of K500. The specific representation is as follows:

Channel	Function	AI address
CH0-IN	Channel 1 analog input	D500（S2）
CH1-IN	Channel 2 analog input	D501（S2）+1
CH2-IN	Channel 3 analog input	D502（S2）+2
CH3-IN	Channel 4 analog input	D503（S2）+3
CH4-IN	Channel 5 analog input	D504（S2）+4
CH5-IN	Channel 6 analog input	D505（S2）+5
CH6-IN	Channel 7 analog input	D506（S2）+6
CH7-IN	Channel 8 analog input	D507（S2）+7

HTE weighing extension HTE-2L. HTE-4L

1. HTE-2L. HTE-4L specification

Model		HTE-2L	HTE-4L
AI points		2	4
Resolution		24bits	24bits
Mark	EX+	+5V	
	EX-	0V	
	CH+	Signal+	
	CH-	Signal-	

2. Programming example

The functions of HTE-4L and HTE-2L are exactly the same as those of HSE-2L and HSE-4L. For the programming method.please explain the parameter SE weighing extension HSE-2L and HSE-4L.

HTE Series Analog Expansion HTE-1T-1AO

1. Specification

Model	HTE-1T-1AO
AI channel	1
AO channel	1

Resolution:

Type	Resolution
0-5V	K0-K4095（12bits）

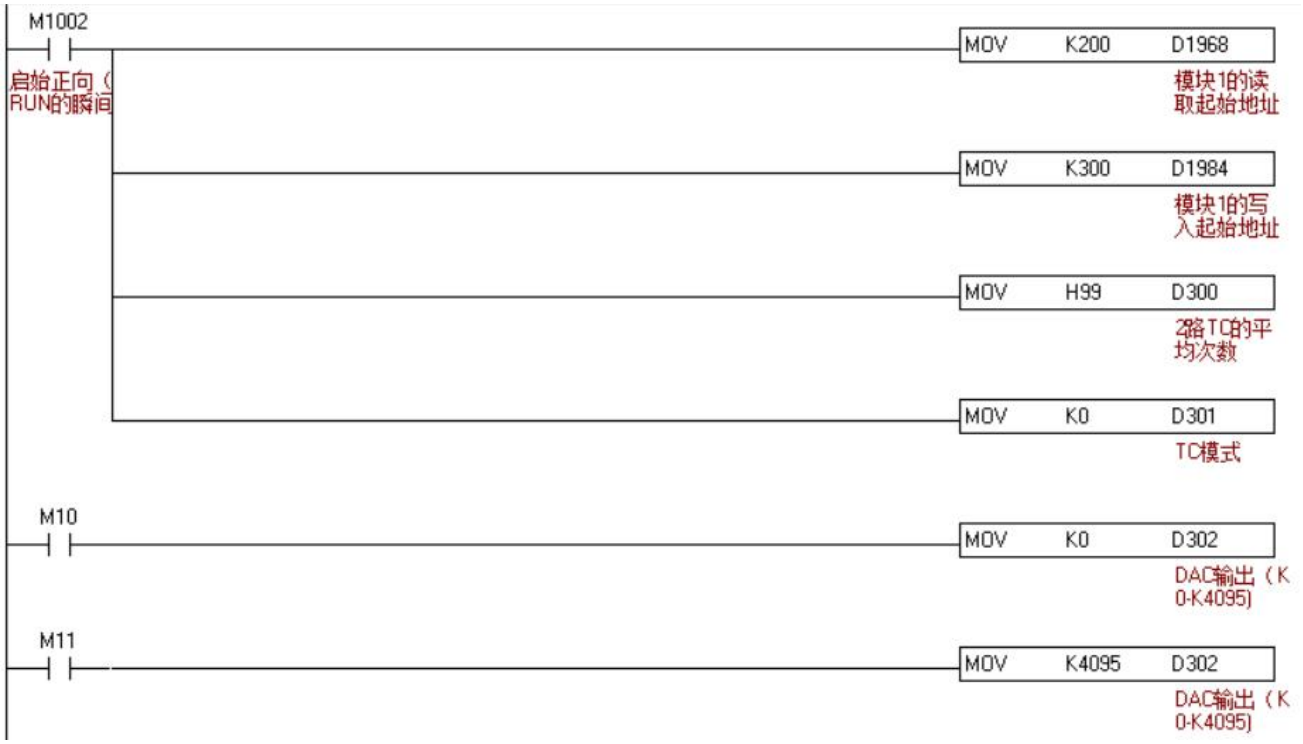
2. Wiring

Voltage type (0-10V; 0-5V)

Wiring method: I do not connect. the signal connects to V.and G connects to 0V

3. Programming example

Note: The example is based on the 1st extension connected to the host.



Example description:

1) Expansion module read address definition

Expansion module read address	Function
D1968	Expansion 1
D1969	Expansion 2
D1970	Expansion 3
D1971	Expansion 4
D1972	Expansion 5
and so on	and so on
…	…

2）Expansion module write-in address definition

Expansion module write-in address definition	Function
D1984	Expansion 1
D1985	Expansion 2
D1986	Expansion 3
D1987	Expansion 4
D1988	Expansion 5
and so on	and so on
…	…

3) Analog address description

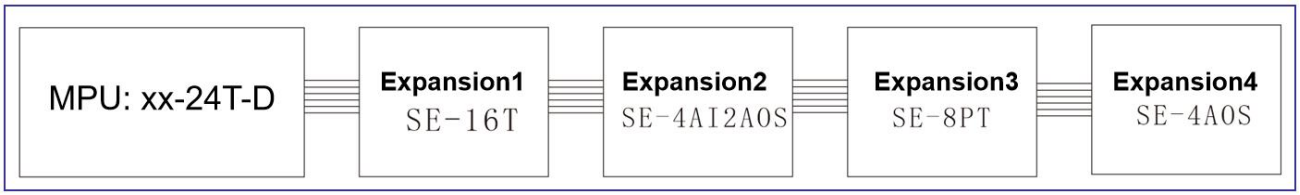
- ✧ In the example program.the read address D1968 of the first analog expansion module is assigned as K200.which means that the starting address of the extended read is D200 (S1). The read starting address value can be changed.and the value of K200 can be changed directly.
- ✧ In the example program.the write address D1984 of the first analog expansion module is K300.which means that the starting address of the extended write is D300 (S2). The write starting address value can be changed.the value of K300 can be changed directly.

The specific representation is as follows:

Address	Function
D200（S1）	System occupied
D201（S1）+1	Current temperature reading
D202-D209 (S1）+2~(S1）+9	System occupied
D300（S2）	Average times of temperature (default H99)
D301（S2）+1）	Temperature working mode (default K0)
D302（S2）+2）	AO（K0-K4095）
D303~D306（S2）+3~ (S2）+6	System occupied

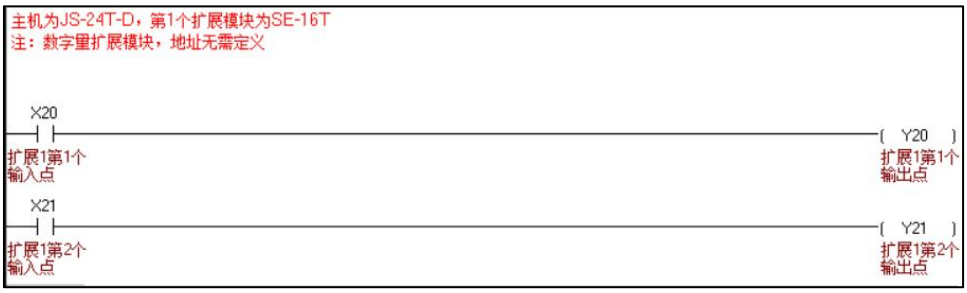
Appendix I Example of Multiple Extension Definition

Example: The following figure shows the PLC installation sequence

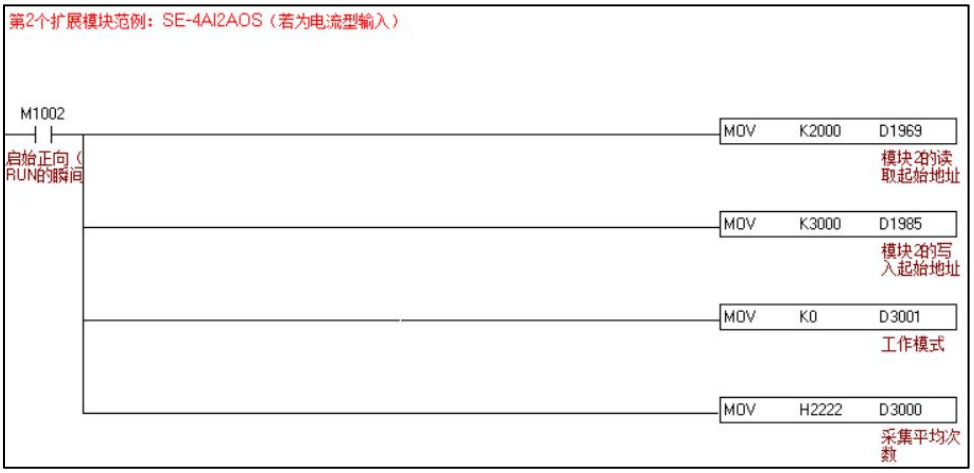


Model	Extension1	Extension2	Extension3	Extension4
HCG2-24T-D	HSE-16T (Digital expansion does not need to be defined.but still occupies)	HSE-4AI2AOS	HSE-8PT	HSE-4AOS
read system address	D1968	D1969	D1970	D1971
Write system address	D1984	D1985	D1986	D1987

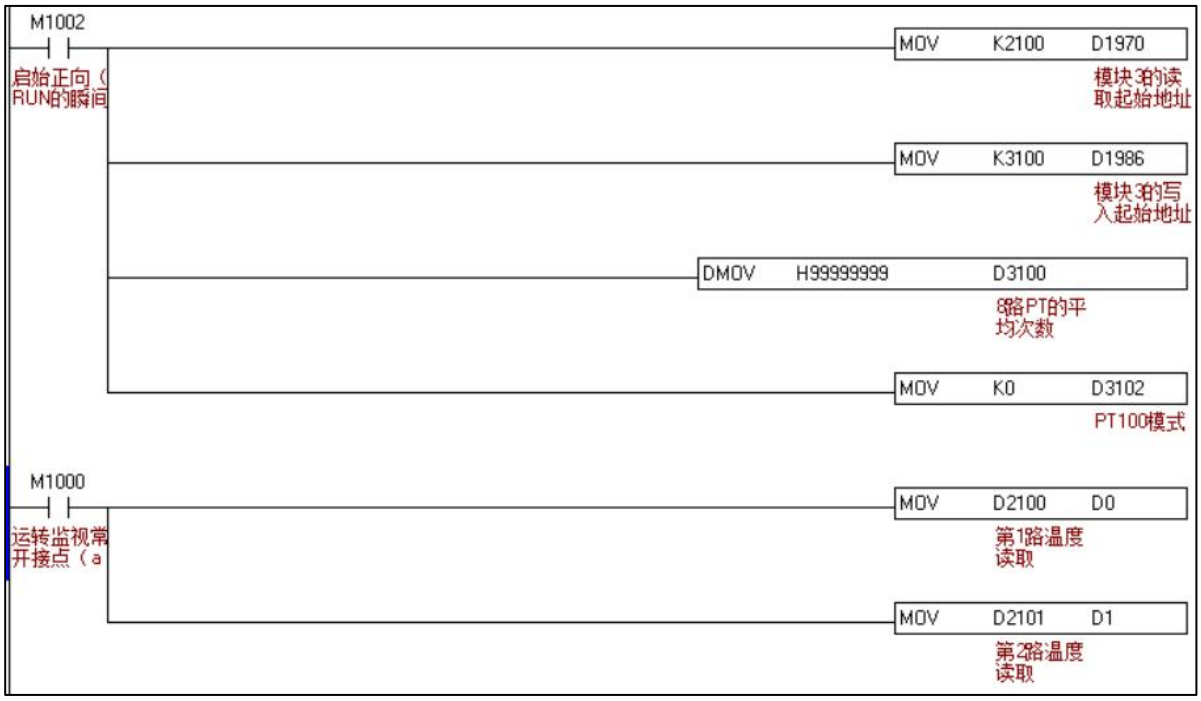
1. HSE-16T is the first extension connected to the host.so the extension definition reads and writes the starting system address as D1968/D1984 (digital expansion only occupies the system address.no need to define).the sample program is:



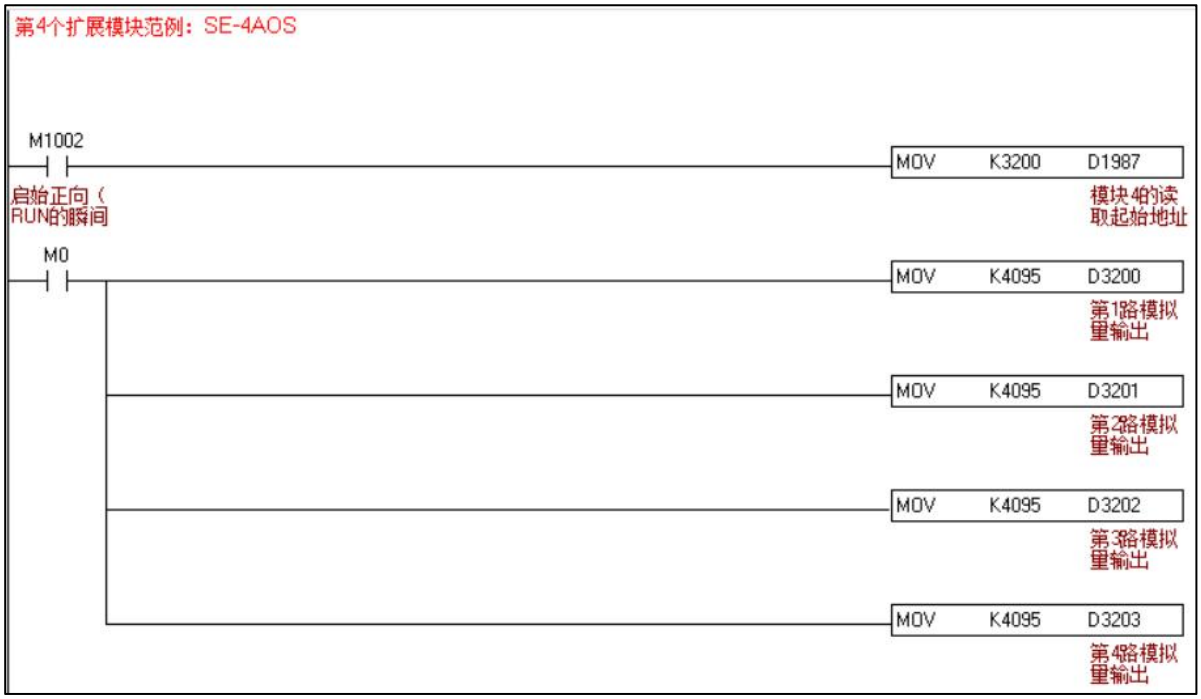
2. HSE-4AI2AOS is the second extension connected to the host.so the extension defines the read/write system address as D1969/D1985.and the sample program is:



3. HSE-8PT is the third extension connected to the host.so the extension definition read/write start system address is D1970/D1986.the sample program is:



4. HSE-4AOS is the fourth extension connected to the host.so the extension defines the read/write start system address as D1971/D1987. Since HSE-4AOS is an analog input.D1987 does not need to be defined. The sample program is :



Appendix II Motor Command Parameter Table

Channel	Pulse	Direction	Current output pulse number	Pulse complete flag	Pulse sending	E-stop without deceleration	Pulse transmission pause	Start frequency (K10-K32767) default K200
			32bits integer					16bits integer
CH0 (Y0,Y1)	Y0	Y1	D1648	M1029	M1344	M1308	M1504	D1340
CH1 (Y2,Y3)	Y2	Y3	D1664	M1030	M1345	M1309	M1505	D1352
CH2 (Y4,Y5)	Y4	Y5	D1680	M1036	M1346	M1310	M1506	D1379
CH3 (Y6,Y7)	Y6	Y7	D1696	M1037	M1347	M1311	M1507	D1380
CH4 (Y10,Y11)	Y10	Y11	D1712	M1102	M1348	M1312	M1508	D1400
CH5 (Y12,Y13)	Y12	Y13	D1728	M1103	M1349	M1313	M1509	D1401
CH6 (Y14,Y15)	Y14	Y15	D1744	M1104	M1350	M1314	M1510	D1402
CH7 (Y16,Y17)	Y16	Y17	D1760	M1105	M1351	M1315	M1511	D1403
CH8 (Y20,Y21)	Y20	Y21	D1776	M1106	M1352		M1512	D1404
CH9 (Y22,Y23)	Y22	Y23	D1792	M1107	M1353		M1513	D1405
CH10 (Y24,Y25)	Y24	Y25	D1808	M1108	M1354		M1514	D1406
CH11 (Y26,Y27)	Y26	Y27	D1824	M1109	M1355		M1515	D1407
CH12 (Y30,Y31)	Y30	Y31	D1840	M1110	M1356		M1516	D1408
CH13 (Y32,Y33)	Y32	Y33	D1856	M1111	M1357		M1517	D1409
CH14 (Y34,Y35)	Y34	Y35	D1872	M1112	M1358		M1518	D1410
CH15 (Y36,Y37)	Y36	Y37	D1888	M1113	M1359		M1519	D1411
CH16 (Y40,Y41)	Y40	Y41	D1904	M1114	M1360			D1412
CH17 (Y42,Y43)	Y42	Y43	D1920	M1115	M1361			D1413
CH18 (Y44,Y45)	Y44	Y45	D1472	M1116	M1362			D1414
CH19 (Y46,Y47)	Y46	Y47	D1488	M1117	M1363			D1415
CH20 (Y50,Y51)	Y50	Y51	D1504	M1118	M1364			D1416
CH21 (Y52,Y53)	Y52	Y53	D1520	M1119	M1365			D1417
CH22 (Y54,Y55)	Y54	Y55	D1536	M1205	M1366			D1418
CH23 (Y56,Y57)	Y56	Y57	D1552	M1206	M1367			D1419

Channel	Acc/Dec Time (K10-K10000) Default K100	Dec Time	Target position	Acceleration	Current speed	Target speed	Absolute position after ZRN execution
	16bits integer	16bits integer	16bits integer	32bits floating	32bits floating	32bits floating	16bits integer
CH0 (Y0,Y1)	D1343	D1936	D1650	D1654	D1656	D1658	D1568
CH1 (Y2,Y3)	D1353	D1937	D1666	D1670	D1672	D1674	D1569
CH2 (Y4,Y5)	D1381	D1938	D1682	D1686	D1688	D1690	D1570
CH3 (Y6,Y7)	D1382	D1939	D1698	D1702	D1704	D1706	D1571
CH4 (Y10,Y11)	D1383	D1940	D1714	D1718	D1720	D1722	D1572
CH5 (Y12,Y13)	D1384	D1941	D1730	D1734	D1736	D1738	D1573
CH6 (Y14,Y15)	D1385	D1942	D1746	D1750	D1752	D1754	D1574
CH7 (Y16,Y17)	D1386	D1943	D1762	D1766	D1768	D1770	D1575
CH8 (Y20,Y21)	D1387	D1944	D1778	D1782	D1784	D1786	D1576
CH9 (Y22,Y23)	D1388	D1945	D1794	D1798	D1800	D1802	D1577
CH10 (Y24,Y25)	D1389	D1946	D1810	D1814	D1816	D1818	D1578
CH11 (Y26,Y27)	D1390	D1947	D1826	D1830	D1832	D1834	D1579
CH12 (Y30,Y31)	D1391	D1948	D1842	D1846	D1848	D1850	D1580
CH13 (Y32,Y33)	D1392	D1949	D1858	D1862	D1864	D1866	D1581
CH14 (Y34,Y35)	D1393		D1874	D1878	D1880	D1882	D1582
CH15 (Y36,Y37)	D1394		D1890	D1894	D1896	D1898	D1583
CH16 (Y40,Y41)	D1395		D1906	D1910	D1912	D1914	D1584
CH17 (Y42,Y43)	D1396		D1922	D1926	D1928	D1930	D1585
CH18 (Y44,Y45)	D1397		D1474	D1478	D1480	D1482	D1586
CH19 (Y46,Y47)	D1398		D1490	D1494	D1496	D1498	D1587
CH20 (Y50,Y51)	D1399		D1506	D1510	D1512	D1514	D1588
CH21 (Y52,Y53)	D1420		D1522	D1526	D1528	D1530	D1589
CH22 (Y54,Y55)	D1421		D1538	D1542	D1544	D1546	D1590
CH23 (Y56,Y57)	D1422		D1554	D1558	D1560	D1562	D1591

Example:

1. Pulse completed flag bit M1029:
Start pulse command.when the pulse output is completed.the corresponding pulse output completed flag bit will be automatically turned on. When the instruction is restarted next time.the corresponding pulse completion flag M1029 will automatically change from ON to OFF. After the pulse is sent.the system will turn ON again.

2. Pulse sending flag M1344: Start pulse command. When the pulse is in the process of sending.the corresponding pulse sending flag M1344 will be automatically turned on. When the pulse output is completed.the flag bit M1344 in the pulse sending system is automatically OFF.

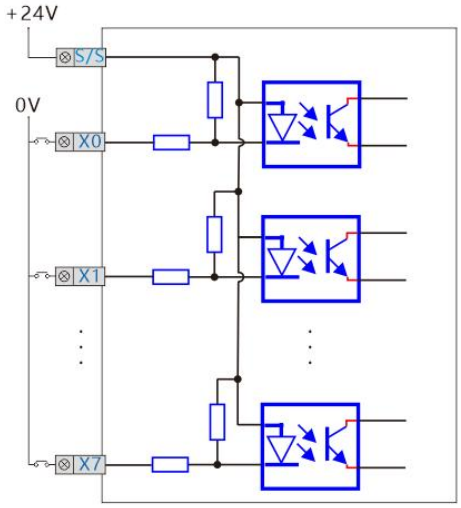
3. E-Stop without deceleration flag M1308 : After the E-Stop.in addition to the related M1308 to be turned off.the front condition switches of DRVA.DRVI.ZRN and other instructions need to be turned off and then turned on to continue working.

Appendix III MPU Wiring Diagram

Input wiring method

Sink input: S/S connected to external +24V

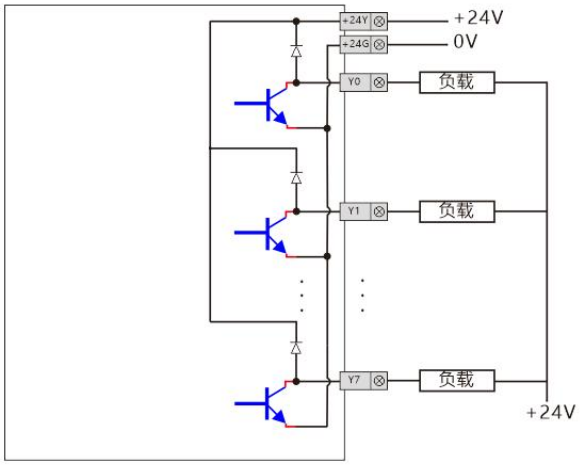
Connect a no-voltage contact or NPN open-collector transistor output between the input (X) terminal and the [0V] terminal.and the input (X) is ON when it is turned on. At this time.the LED for indicating input lights up.



NPN input

Output wiring method

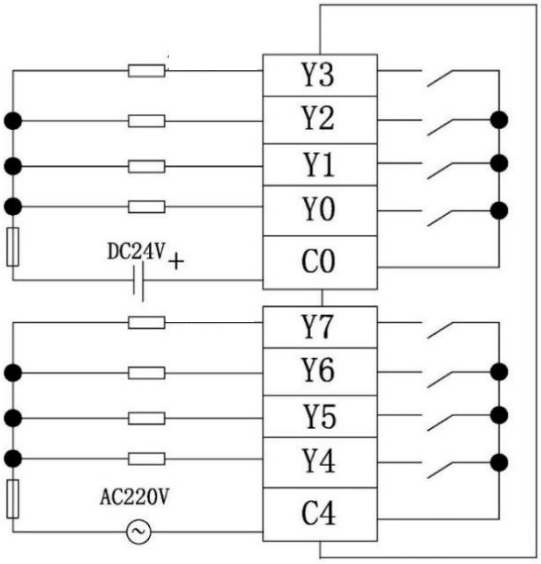
NPN transistor output



NPN transistor output

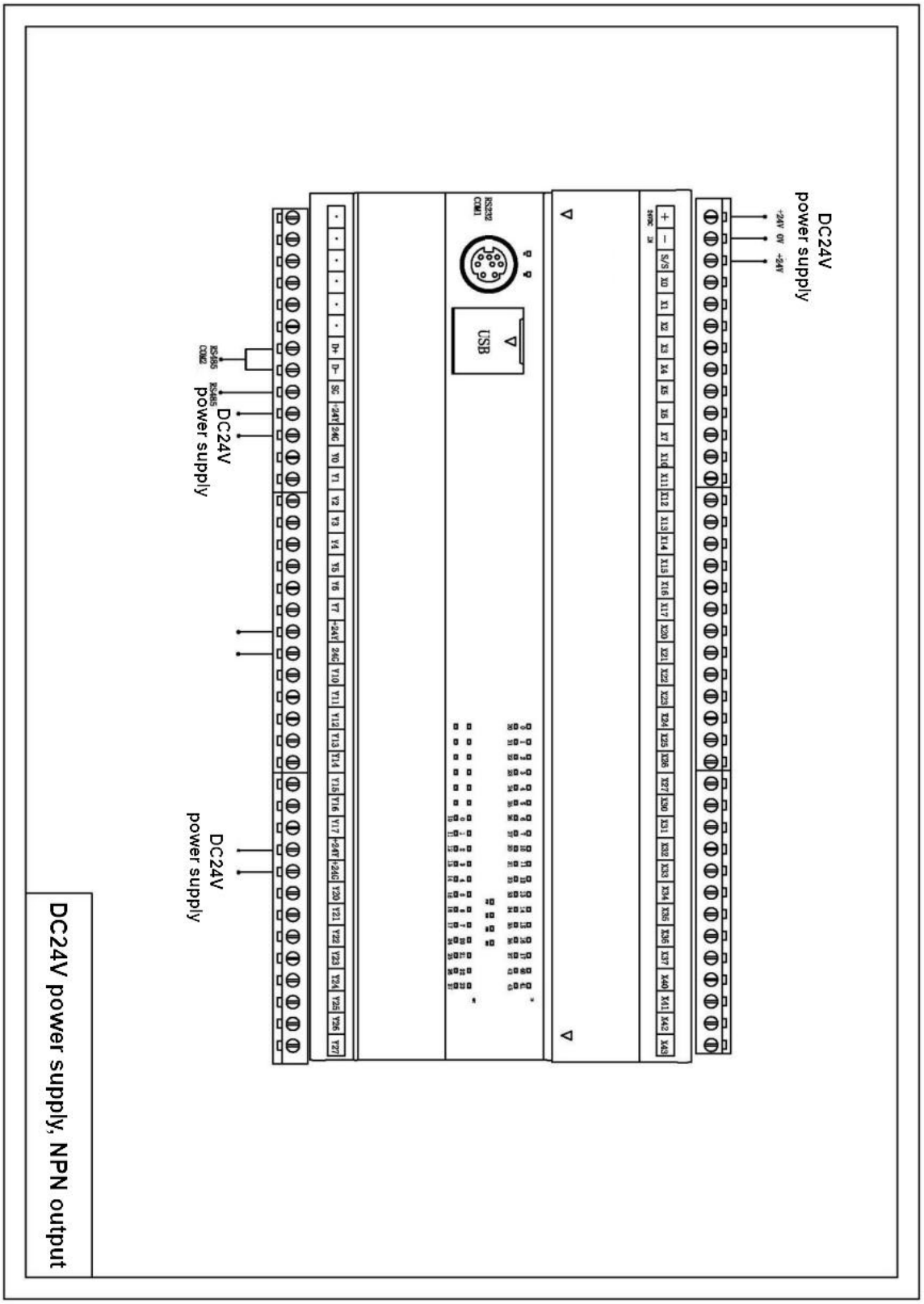
Relay output

The relay output type product is a 4-point common terminal output type product.which can drive loads of different loop voltage systems (such as AC200V.DC24V.etc.) with each common terminal as a unit.

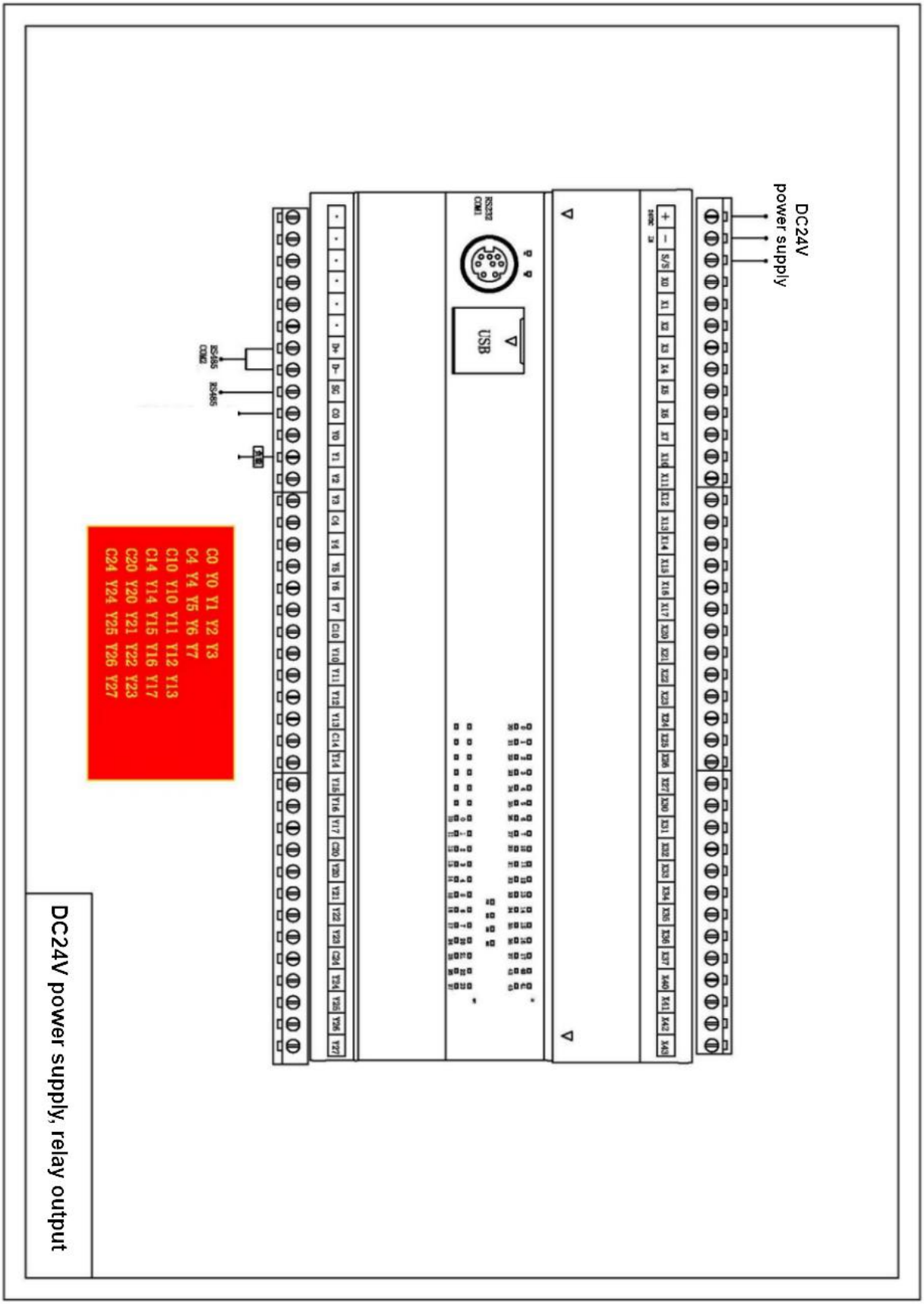


HCG2 series PLC wiring diagram

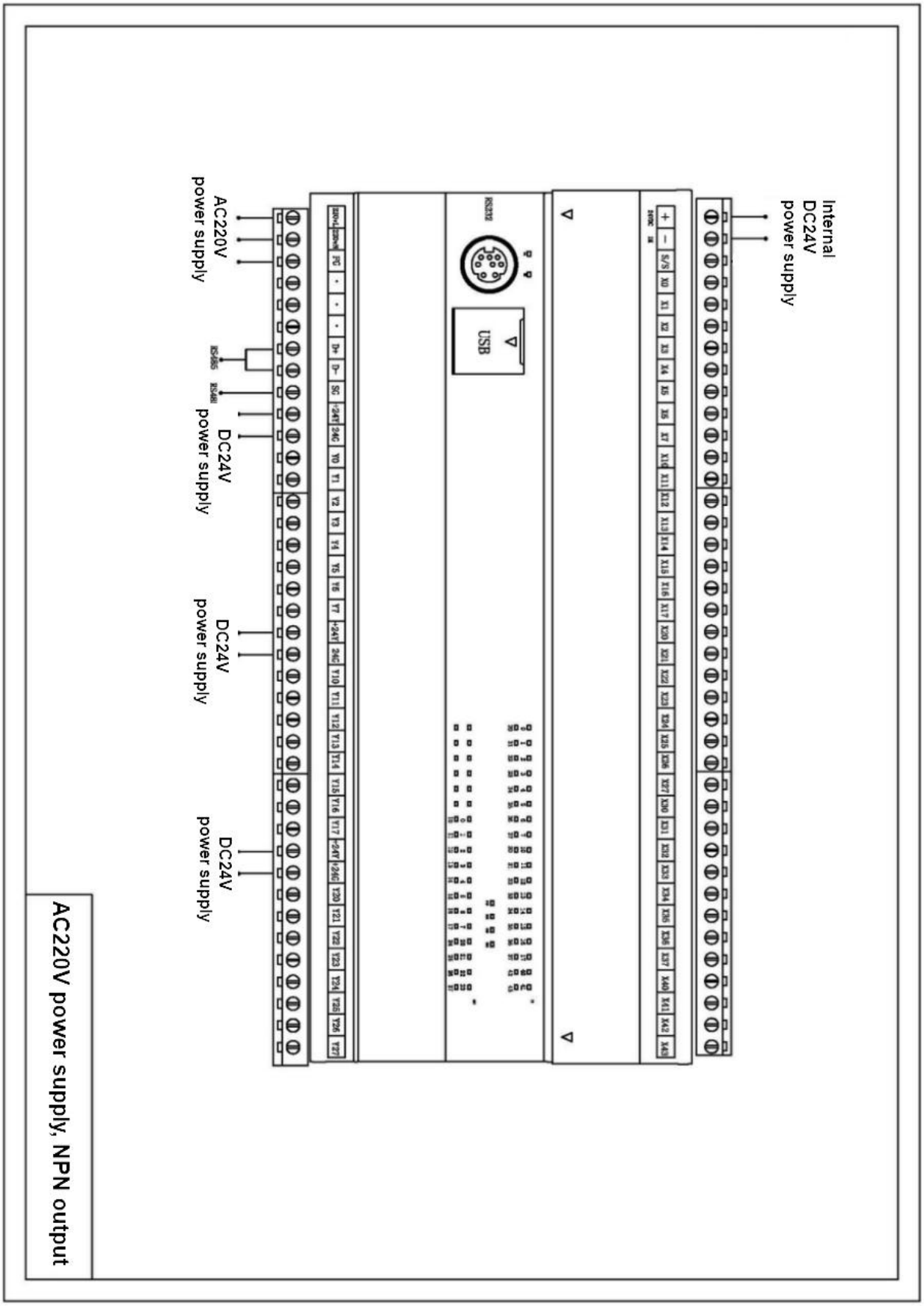
DC24V power input.transistor NPN output



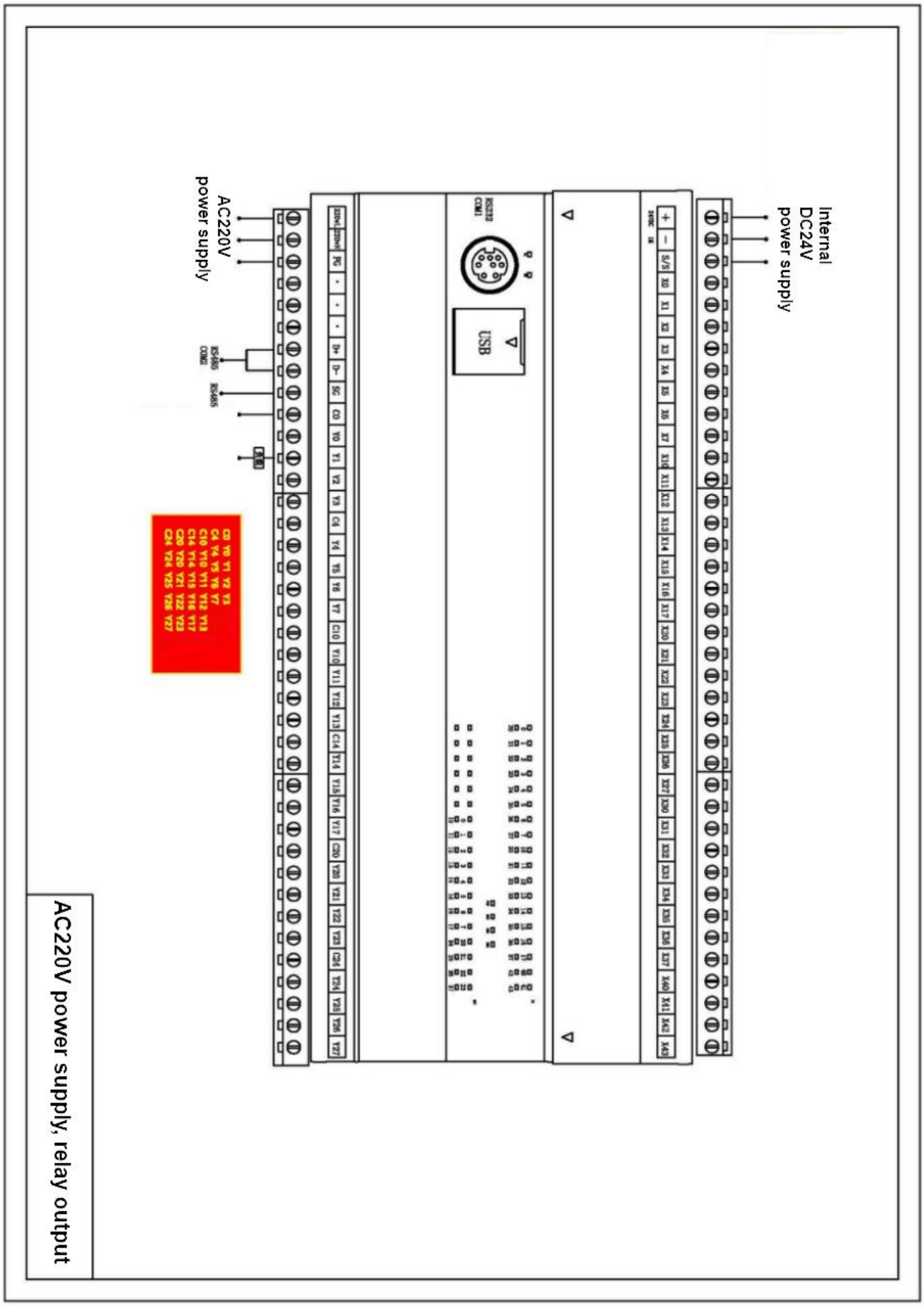
DC24V power input，relay output



AC220V power input.transistor NPN output



AC220V power input.Relay output

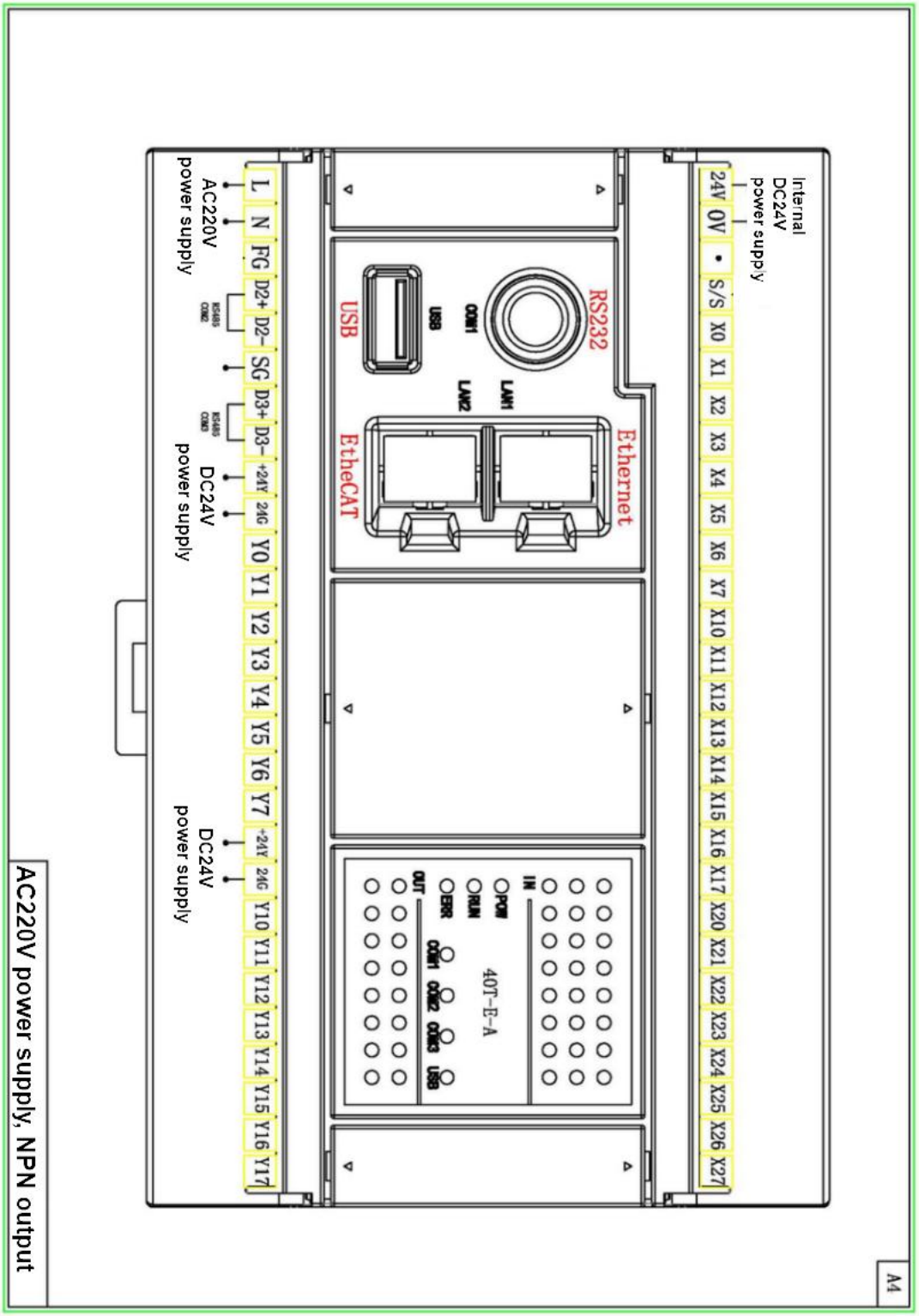


HCD2/HCH2 series PLC wiring diagram

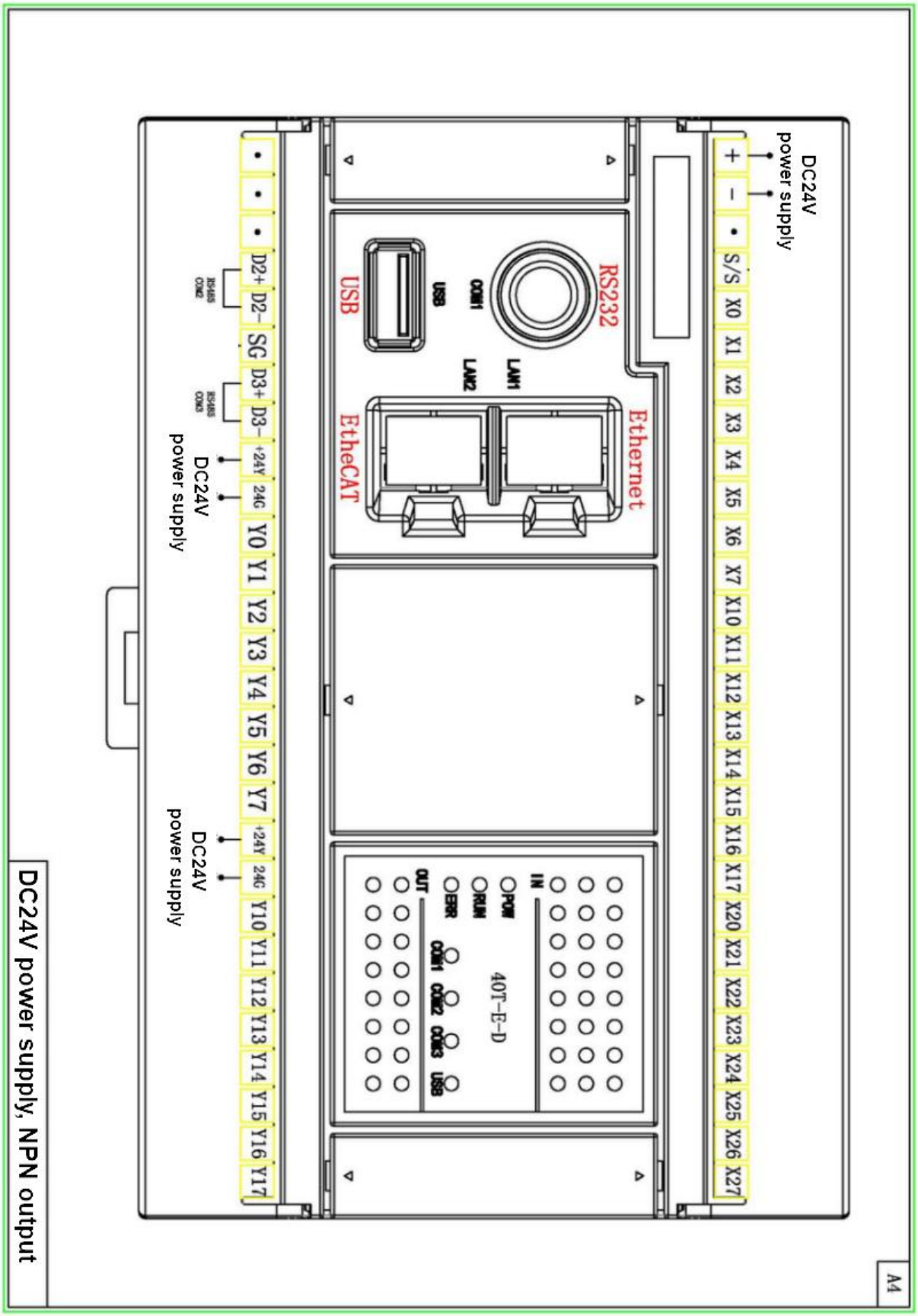
AC220V power input.transistor NPN output

HCD2 series hosts with dual network ports LAN1 and LAN2 are both Ethernet.

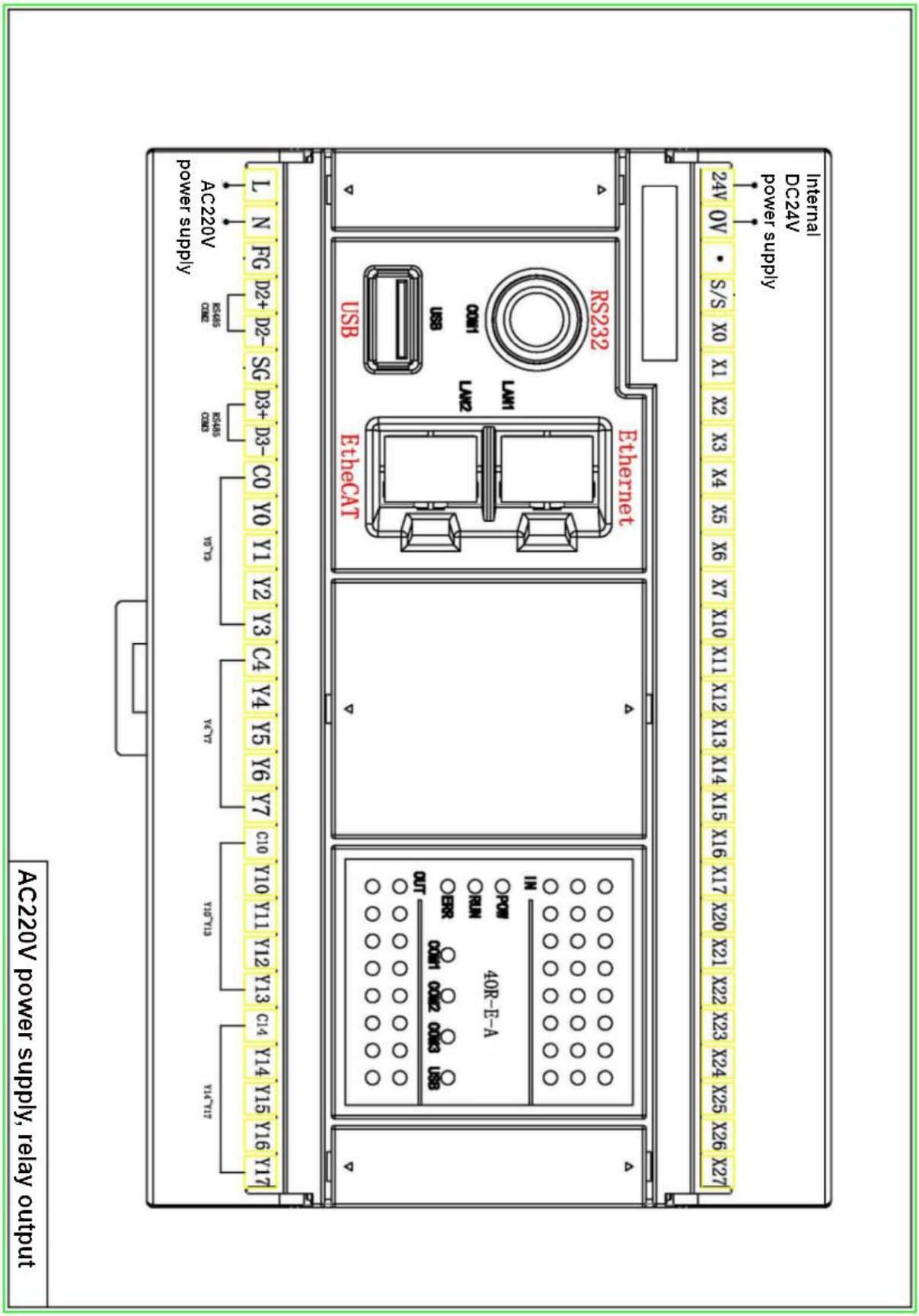
HCH2 series host with dual network ports LAN1 is Ethernet.LAN2 is EtherCAT.



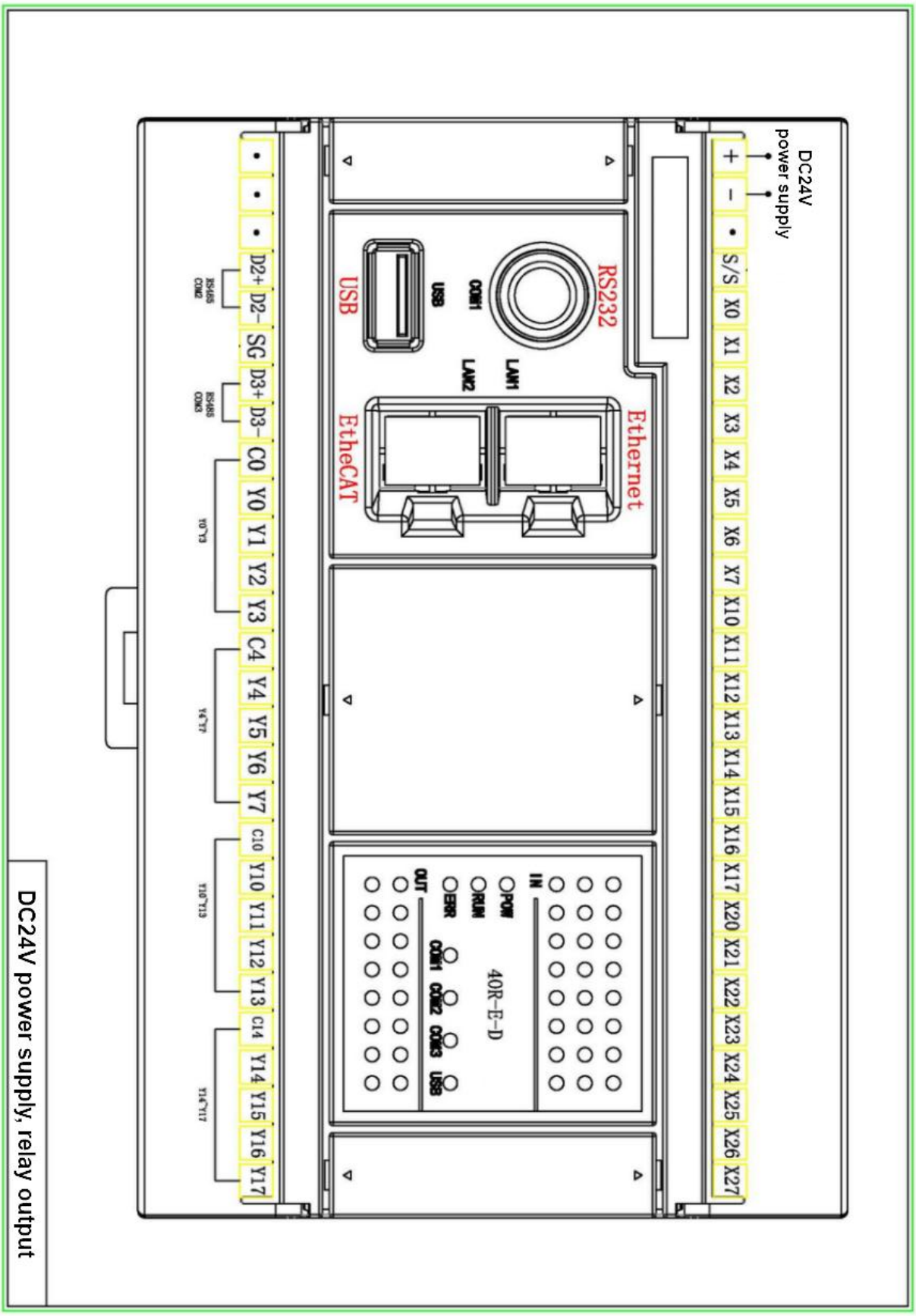
DC24V power input.transistor NPN output



AC220V power input. relay output



DC24V power input. relay output



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