

HCR8C-32T-D CPU UNIT

HCR8C

Instruction No.	HPPP1290000EN
Version	1.2
Date:	Aug, 2021

STARTUP AND MAINTENANCE PRECAUTIONS ⚠️ **CAUTION**

- Do not disassemble or modify the PLC. Doing so may cause fire, equipment failures, or malfunctions.
- For module repair, contact our HCFA distributor.
- Turn off the power to the PLC before connecting or disconnecting any extension cable. Failure to do so may cause equipment failures or malfunctions.
- Turn off the power to the PLC before attaching or detaching the following devices. Failure to do so may cause equipment failures or malfunctions
 - Display module, peripheral devices, expansion boards
 - Extension blocks and special adapters
 - Battery, terminal block and memory cassette

DISPOSAL PRECAUTIONS ⚠️ **CAUTION**

- Please contact a certified electronic waste disposal company for the environmentally safe recycling and disposal of your device.

TRANSPORT AND STORAGE PRECAUTIONS ⚠️ **CAUTION**

- The PLC is a precision instrument. During transportation, avoid impacts larger than those specified in Section 3.1. Failure to do so may cause failures in the PLC. After transportation, verify the operations of the PLC.

1 Preface

Thanks for choosing HCR8C-32T-D CPU unit developed and manufactured by HCFA Technology.

R series controller is an integrated equipment, which contains traditional PLC functions and supports multi-group I/O extension module and right extension special module. It is equipped with functions of motion control and high speed of input and output, and it supports multi-bus communications (Modbus TCP, Modbus RTU, CANOpen and serial communication, etc.).

For the users of HCFA R-series CPU units, refer to this manual to perform the wiring, installation, diagnosis and maintenance and requires the users to have the certain knowledge of electrical and automation.

This manual gives the necessary information for the use of HCFA R-series CPU units, please read this manual carefully before use and make the correct operation with full attention to safety.

1.1 Safety Precautions

1.1.1 Safety Symbols

When using this product, please follow the following safety precautions and instructions strictly.

Users can check more specific safety guidelines in sections such as mounting, wiring, communication, etc.

In this manual, the following safety guidelines must be followed.

Danger	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury or significant property damage.
Warning	Indicates that incorrect handling may cause hazardous conditions, resulting in medium or slight personal injury or physical damage.
Caution	Indicates that incorrect handling may cause slight injury or property damage.
NOTE	Indicates that incorrect handling may cause damage to the environment / equipment or data loss

※Tips: Key points or explanations to help with better operation and understanding of product.

1.1.2 Security precautions

STARTUP AND MAINTENANCE PRECAUTIONS ⚠️ **DANGER**

- Do not touch any terminal while the PLC's power is on. Doing so may cause electric shock or malfunctions.
- Before cleaning or retightening terminals externally cut off all phases of the power supply. Failure to do so may cause electric shock.
- Before modifying or disrupting the program in operation or Forced output, RUN, STOP etc., carefully read through this manual and the associated manuals and ensure the safety of the operation. An operation error may damage the machinery or cause accidents.

2 Product Overview

2.1 Model name description

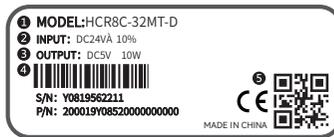
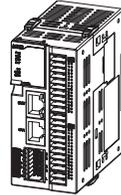
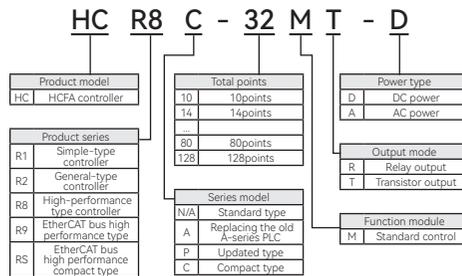


Figure 1 Description of model and label

- Model name
- Normal working voltage
- Output voltage and power
- The bar code, S/N and P/N code are internal serial numbers, and the first four numbers of PN code is the version number of the complete device. For example, above picture shows V2.000 version.
- QR code (S/N, model name)

2.2 Parts Name

2.2.1 Main view

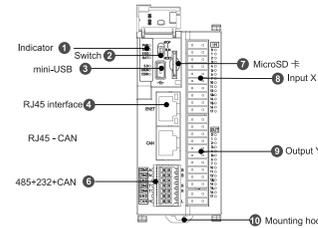


Figure 1: Interface description for the main view

Table 1 Description for main view

No	Item	Function
(1)	Indicator	Indicating status of the CPU unit and connection status of communication port and SD card
(2)	Switch	Start, stop and reset program of the CPU unit. Move it upward to stop, in the middle to start and downward to reset.
(3)	Mini-USB	Connect with the computer through Mini-USB cable to achieve MCU firmware download.
(4)	RJ45 interface	IP Address: 192.168.188.200 Can be connected with devices like the touch screen by changing the interface.
(5)	RJ45-CAN	CAN 2.0 interface, which is parallel connection of internal lines, same as the interface of Item (4)
(6)	485+232+CAN	Communication interface
(7)	MicroSD card	Data storage for user
(8)	Input X	Input terminal
(9)	Output Y	Output terminal
(10)	Mounting hook	To fix the controller on DIN guide rail.

2.2.2 Description of IO terminal

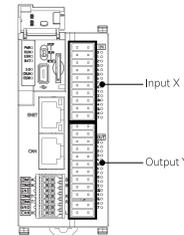


Figure 2: IO terminal description

16-ch input terminals arrangements

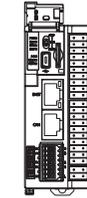
Common terminal	SS	SS
Input	0	10
Input	1	11
Input	2	12
Input	3	13
Input	4	14
Input	5	15
Input	6	16
Input	7	17
Empty port	---	---

16-ch output terminals arrangements

Empty port	---	---
Output	0	10
Output	1	11
Output	2	12
Output	3	13
Output	4	14
Output	5	15
Output	6	16
Output	7	17
Common terminal	COM1	COM2
Common terminal	COM1	COM2

- ※Tips: (1) 8 channels of input terminals match with 1 common terminal (SS), No internal connection between 2 common terminals.
(2) 8 channels of output terminals match with 2 common terminals and no internal connection between COM 1 and COM 2

2.2.3 Description of communication interface



Terminal arrangements of 485+232+CAN interface

COM1	A1	B1
COM2	A2	B2
GND	GND	GND
COM3	TX3	RX3
COM4	TX4	RX4
GND	GND	GND
CAN	CAN H	CAN L

Figure 3: Communication interface description

2.2.4 Indicator description

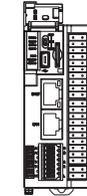


Figure 4: Indicator description

Table 2: Indicator description

PWR	Power indicator
RUN	Operation indicator
ERR	Error indicator
BAT	Battery indicator
SD	SD card indicator
CRUN	CANOPEN operation indicator
CERR	CANOPEN error indicator

2.2.5 Description of bottom view

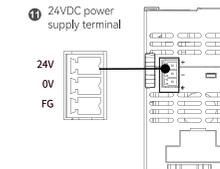


Figure 5: Description of bottom view

Table 3: Description table of bottom view

No	Item	Function
(11)	24VDC power supply terminal	24VDC power supply terminal. Refer to the figure above for the wiring diagram

2.3 Product dimension

Product dimension

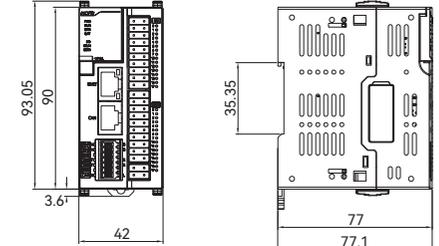


Figure 6: Installation sizes of HCR8C-32MT-D CPU unit (mm)

3 Specifications

3.1 Electrical specifications

Item	Specification
Working temperature	0 to 55°C
Storage temperature	-25 to 70°C (no condensation)
Relative temperature	10% to 95% (no condensation)
Altitude	2,000 m MAX.
Electromagnetic interference	EFT 2KV (power, signal cable)
Vibration	5 ~ 8.4Hz amplitude 3.5mm, 8.4~150Hz, acceleration 9.8m/s ² . Scan in the rate of one multiplication frequency per minute and 10 times in each direction of X, Y and Z.
Impact (shock)	147m/s ² 3 times in each direction of X, Y and Z.
Anti-pollution level	Pollution degree 2
Protective class	IP20
Cooling mode	Natural air cooling
Installation level	Guide rail installation 35mm

3.2 Performance Specifications

Item	Specifications		
Rated voltage	DC24V		
Allowable voltage range	DC16.8~28.8V		
Allowable instantaneous power-failure time	Will continue working when instantaneous outage time is under 5ms		
No. of control axes	8 axes		
Pulse output type	Transistor		
Max frequency	200KHz Pulse 200KHz		
Positioning	Pulse output mode	PULSE/SIGN mode	
	Positioning range	Control unit	Pulse
		Positioning range	-2147483648 ~ +2147483647
	Speed command	Speed command unit	pps
		Basement velocity	0 ~ 200Kpps
		Max speed	1pps ~ 200Kpps
		Origin return speed	1pps ~ 200Kpps
		Creeping speed	1pps ~ 200Kpps
		Acceleration time	0 ~ 32767ms
	Deceleration time	0 ~ 32767ms	
Acceleration and deceleration mode	Trapezoid acceleration and deceleration		
Interpolation function	N/A		

3.3 Input and Output Specifications

Input specifications

Item	Specification	
Input points	16 points	
Input form	Sink/source	
Input signal voltage	All inputs DC24V±10%	
Input impedance	All inputs 2.7kΩ	
Input signal current	All inputs 8.5mA/DC24V	
Input sensitive currency	Input ON current	All inputs Above 4.03mA
	Input OFF current	All inputs Below 3.06mA
Input response time	ON mode	All inputs Below 2.5μs
	OFF mode	All inputs Below 2.5μs
Input signal form	All inputs Non-voltage contact input NPN/PNP Open collector transistor	
Loop isolation	All inputs optocoupler isolation	
Input action display	- LED lights up at ON mode of input	

Output specifications

Item	Specification	
Output points	16 points	
Output form	Transistor/Sink type	
External voltage	All outputs DC5 ~ 30V	
Max load	Resistive load	All outputs 0.5A/1 point Please keep total load current of each common terminal under the following values - 1 Output point /common terminal:0.5A - 4 Output points /common terminal:0.8A - 8 Output points/common terminal:1.6A
	Inductive load	All outputs 12W/DC24V
Open circuit leakage current	All outputs Below 0.1mA/DC30V	
Voltage drop at ON mode	All outputs Below 1.5V	
Response time	OFF → ON	Y000 ~ Y007 Above Y0010 Below 0.2ms/Above 200mA (DC24V)
	ON → OFF	Y000 ~ Y007 Above Y010 Below 0.2ms/Above 200mA (DC24V)
Circuit isolation	All output Optocoupler isolation	
Output operation display	- LCD lights up at optical drive mode	

3.4 Distribution of Output Points

Axis no	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7
Axis 1	PLS							
Axis 2		PLS						
Axis 3			PLS					
Axis 4				PLS				
Axis 5					PLS			
Axis 6						PLS		
Axis 7							PLS	
Axis 8								PLS

3.5 Ethernet Specifications

Item	Specification
Interface type	RJ45 connector
Data transmission speed	100/10Mbps
Communication mode	Full duplex/Half duplex
Interface	RJ45 connector
Max segment code length (Length between hub and node)	100m
Support protocol	Download monitor protocol Modbus TCP/IP slave station
Cable	Support cable of Ethernet, Category 5 or higher

3.6 RS485 Specifications

Item	Specification
Interface type	RS485
Data transmission speed	115200bps
Communication mode	Half duplex
Max transmission length	100m (at specified baud rate)
Support protocol	Modbus RTU Master and slave station// Download monitoring protocol//Free communication protocol
Isolation status	Digital isolation
Terminal resistance	Not built-in

3.7 RS232 Specifications

Item	Specification
Interface type	RS232
Data transmission speed	115200bps
Communication mode	Full duplex
Max transmission length	5m
Support protocol	Download monitoring protocol Free communication protocol
Isolation status	Digital isolation
Terminal resistance	Not built-in

3.8 CAN Specifications

Item	Specification
Interface type	CAN
Data transmission speed	Max 1Mbps
Communication mode	Full duplex
Max transmission length	2.5km (Related to actual baud rate)
Support protocol	CANopen
Isolation status	Digital isolation

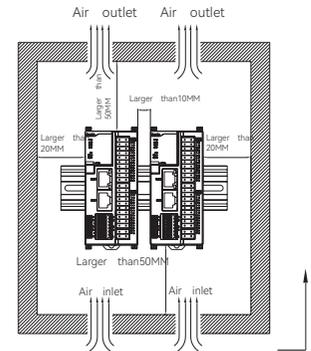
4 Installation

4.1 Installation

4.1.1 Installation of control cabinet

Pay attention to the following points when installing the control cabinet:

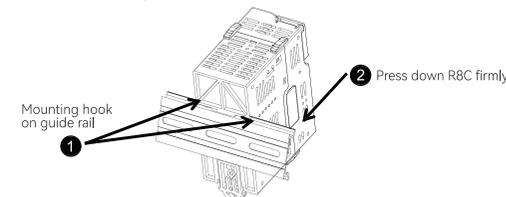
- (Method) Keep the installation direction perpendicular to the wall. Cooling the PLC control unit with natural convection or fan. Install the controller firmly on the 35mm international guide rail with the snap-fit.
- (Cooling) Enough reserved space around the PLC controller is needed to ensure the cooling from natural convection or fan. Please refer to the picture. To avoid high partial environment temperature of the PLC controller, temperature inside the electric cabinet should be kept equalized.
- (Side by side installation) During side by side installation, recommend space between each equipment is above 10mm (Leaving no space is optional if the installation space is limited).



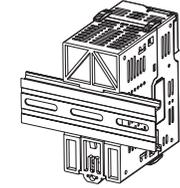
4.1.2 Installation of the guide rail

Installation of the guide rail

- (1) Align the guide rail groove of R8C to the 35mm international guide rail and the mounting hook on the guide rail, then press down R8C. After hearing the clear click sound, it indicates that bottom of the snap has been well connected with the guide rail and R8C installation is finished (All mounting hooks should be kept in contraction state before installation, or it may cause installation fault).

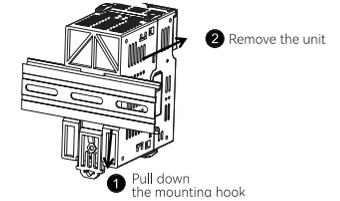


(2) Installation diagram of a successful installation:



Disassembling of the guide rail

When disassembling, pull down the mounting hook at around 6.2MM (when pull up, you can hear the clear click sound), then the unit can be removed and disassembling is finished (Tools like a screwdriver can be used to help pull the mounting hook).



4.2 Wiring description

4.2.1 Wiring description

Input wiring diagram

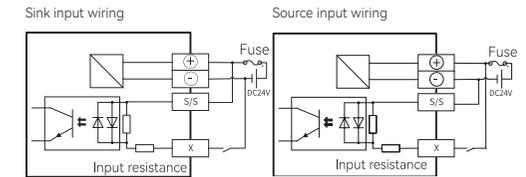


Figure 7 HCR8C-32MT-D Input wiring diagram

Output wiring diagram

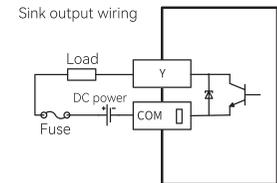


Figure 8 HCR8C-32MT-D output wiring diagram