HV320-MTCP-V2
Modbus-TCP Communication Card
User Manual

HNC Electric Limited

1. Overview

Thank you for using our HV320-V2 series inverter and Modbus-TCP expansion card (hereinafter referred to as HV320-MTCP-V2 card). HV320-MTCP-V2 card is a Modbus-TCP fieldbus adapter card that complies with the international Modbus-TCP Ethernet standard. This card is installed on the HV320-V2 series inverter to improve communication efficiency and facilitate the inverter networking function, making the inverter a slave station of the fieldbus and accepting the control of the fieldbus master station.

This manual requires the corresponding HV320 - MTCP - V2 card software version to be 1.00 or above.

Please read this user guide carefully before using this product.

Figure 1-1 Appearance of the HV320-MTCP-V2 card

2. Installation and Setup

2.1 Installing the HV320-MTCP-V2 Card

The HV320-MTCP-V2 card is installed inside the HV320-V2 series inverter. Before installation, disconnect the power supply of the inverter and wait for about 10 minutes until the charging indicator on the inverter lights up. Then, insert the HV320-MTCP-V2 card into the inverter and tighten the screws to avoid damage caused by the tension of the external signal cable on the inter-board signal socket.

Figure 2-1 shows the hardware layout of the HV320-MTCP-V2 card. The 2* 8P bend pin socket (P1) is used to connect the inverter . The HV320-MTCP-V2 card provides two network ports J1 and J2 for communication with the master and slave stations.

For hardware details, see Table 2-1

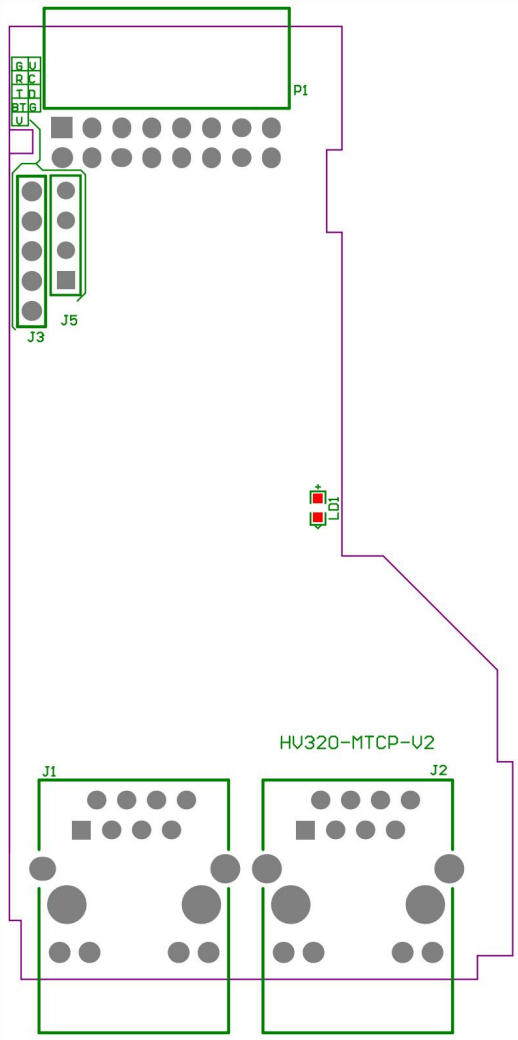

Figure 2-1 HV320-MTCP-V2 card (hardware)

Table 2-1 Hardware description of HV320-MTCP-V2 card

symbol	Hardware Name	Functional Description
P 1	Pin connector	For connecting to frequency converter
J 1 ， J 2	network port	Uses standard Ethernet RJ45 socket, no direction, uses J3 and J4 to connect to PN card or PLC for communication
LD1	Modbus-TCP communication indicator (green)	For the description of the indicator lights on the HV320-MTCP-V2 card , see Table 2-2.

Table 2-2 HV320- EIP -V2 card specification description

Indicator signal		Status description	Solution
LD1	Always green	normal	N/A
	OFF state	communication fail	Please contact technical support.

2.3 RJ45 interface

The HV320-MTCP-V2 card uses standard Ethernet to connect to the Modbus-TCP master RJ45 socket. Its pin signal definition is the same as the standard Ethernet pin. They can be connected using a crossover cable or a straight-through cable.

Table 2-3 Modbus-TCP communication interface description

Terminal Symbols	Terminal Name	Describe
J 1	Modbus-TCP interface 1	Modbus-TCP network interface.
J 2	Modbus-TCP Interface 2	

● When facing the RJ45 interface. Both interfaces must be connected correctly.
● Cat5e shielded twisted pair (STP) network cable must be used to ensure stability.

3. Communication Configuration

3.1 Communication configuration between HV320-MTCP-V2 card and HV320-V2 series inverter After installing HV320 - MTCP - V2 card on HV320-V2 series inverter , complete the communication configuration to realize the communication between them.

■ Communication card settings for the inverter

Inverter software version: L 8.00

The following parameters must be set to enable the HV320-MTCP-V2 card to communicate with the HV320-V2 series inverter and connect the HV320-MTCP-V2 card to the Modbus-TCP fieldbus network.

Function code	Name	Content	Settings	Describe
P0-02	Run command source	0: Operation panel running command channel (LED off) 1: Terminal command channel (LED on) 2: Communication command channel (LED flashes)	2	Run command issued via communication
P0-03	Main frequency source X selection	0: Digital setting (preset frequency P0-08, UP/ DOWN can be modified, no memory is stored after power failure) 1: Digital setting (preset frequency P0-08, UP/ DOWN can be modified, power-off memory) 2: AI 1 3: AI2 4: AI 3 5: PULSE setting (DI 5) 6: Multi-segment instructions 7: Simple PLC 8: PID 9: Communication setting	9	Given a target frequency By communication
P0-28	Serial communication protocol	0: Modbus protocol 1: Communication card bridge protocol	1	Select special item communication card for communication

■ Communication control related function codes

function code	name	Predetermined area		Decimal address
U3-16	Frequency setting	-Maximum frequency~Maximum frequency 0.01Hz		29456
U3-17	control commands	0001: Forward operation 0002: Reverse operation 0003: Forward jog 0004: Reverse jog	0005: Free stop 0006: Deceleration and stop 0007: Fault reset	29457
U3-18	DO control	BIT 0: DO 1 output control BIT 1: DO 2 output control BIT 2: RELAY 1 lose Out of control BIT 3: RELAY 2 lose Out of control BIT 4: FMR output control	BIT 5: VDO 1 BIT 6: VDO 2 BIT 7: VDO 3 BIT 8: VDO 4 BIT 9: VDO 5	29458
U3-19	AO 1 control	0～7 FFF means 0 %～ 100%		29459
U3-20	AO 2 control	0～7 FFF means 0 %～ 100%		29460
U3-21	FMP Control	0～7 FFF means 0 %～ 100%		29461
U3-22	reserve	reserve		
U3-23	Speed control	Signed data, 1 rpm		29463

■ **Communication monitoring related function codes**

Function code	Name	Unit	Decimal address
U 0-00	Operating frequency (Hz)	0.01 Hz	28672
U0-01	Set frequency (Hz)	0.01 Hz	28673
U0-02	Bus voltage (V)	0.1V	28674
U0-03	Output voltage(V)	1V	28675
U0-04	Output current(A)	0.01A	28676
U0-05	Output power (kW)	0.1kW	28677
U0-06	Output torque(%)	0.10%	28678
U0-07	DI input status	1	28679
U0-08	DO output status	1	28680
U0-09	AI 1 voltage (V)	0.01V	28681
U0-10	AI 2 voltage (V)	0.01V	28682
U0-11	AI 3 voltage (V)	0.01V	28683
U0-12	Count value	1	28684
U0-13	Length value	1	28685
U0-14	Load speed display	100.00%	2868600.00%
U0-15	PID Setting	1	28687

U0-16	PID Feedback	1	28688
U0-17	PLC stage	1	28689
U0-18	PULSE input pulse frequency (Hz)	0.01 kHz	28690
U0-19	Feedback speed (Hz)	0.01 Hz	28691
U0-20	Remaining running time	0.1Min	28692
U0-21	AI 1 voltage before correction	0.001V	2869300.00%
U0-22	AI 2 voltage before correction	0.001V	28694
U0-23	AI 3 voltage before correction	0.001V	28695
U0-24	Line speed	1m/ Min	28696
U0-25	Current power-on time	1 Min	28697
U0-26	Current running time	0.1 Min	28698
U0-27	PULSE input pulse frequency	1Hz	28699
U0-28	Communication setting value	0.01%	28700
U0-29	Encoder feedback speed	0.01 Hz	28701
U0-30	Main frequency X display	0.01 Hz	28702
U0-31	Auxiliary frequency Y display	0.01 Hz	28703
U0-32	View the value of any memory address	1	28704
U0-33	Synchronous machine rotor position	0.1°	2870500.00%
U0-34	Motor temperature value	1℃	2870600.00%
U0-35	Target torque(%)	0.10%	28707
U0-36	Resolver position	1	28708
U0-37	Power factor perspective	0.1°	28709
U0-38	ABZ position	1	28710
U0-39	VF separation target voltage	1V	28711
U0-40	VF separation output voltage	1V	28712
U0-41	DI input status intuitive display	1	28713
U0-42	DO input status intuitive display	1	28714
U0-43	DI input status intuitive display 1	1	28715
U0-44	DI input status intuitive display 2	1	28716
U0-45	accident details	1	28717
U0-58	Z signal counter	1	28730
U0-59	Setting frequency(%)	0.01%	28731
U0-60	Operating frequency(%)	0.01%	28732
U0-61	Inverter status	1	28733
U0-62	Current fault code	1	28734
U0-63	Operating frequency after droop control	0.01 Hz	38375
U0-64	Current Back EMF	0.1V	28736
U0-65	Reserve	-	-
U0-66	Expansion card model	100: CANopen 200: Profibus - DP 300: CANlink 400: Profinet 500: EtherCAT	28738

U0-67	Expansion card version number	0.01	28739
U0-68	Inverter status	1	28740
U0-69	Operating frequency (Hz)	0.01 Hz	28741
U0-70	Motor speed	1 rpm	28742
U0-71	Output current	0.1A	28743

3.2 Modbus-TCP communication

3.2.1 Modbus-TCP topology

Modbus-TCP include bus, star, tree, etc. Through the reasonable use of switches, a variety of networking can be achieved.

The following diagram shows the bus topology

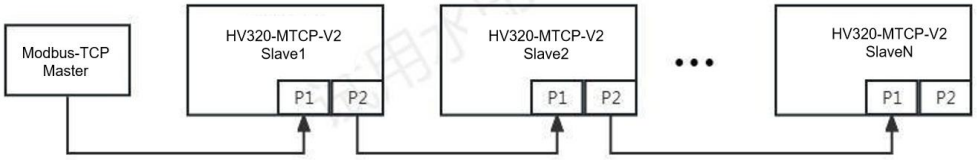

Figure 3-1 Bus connection topology

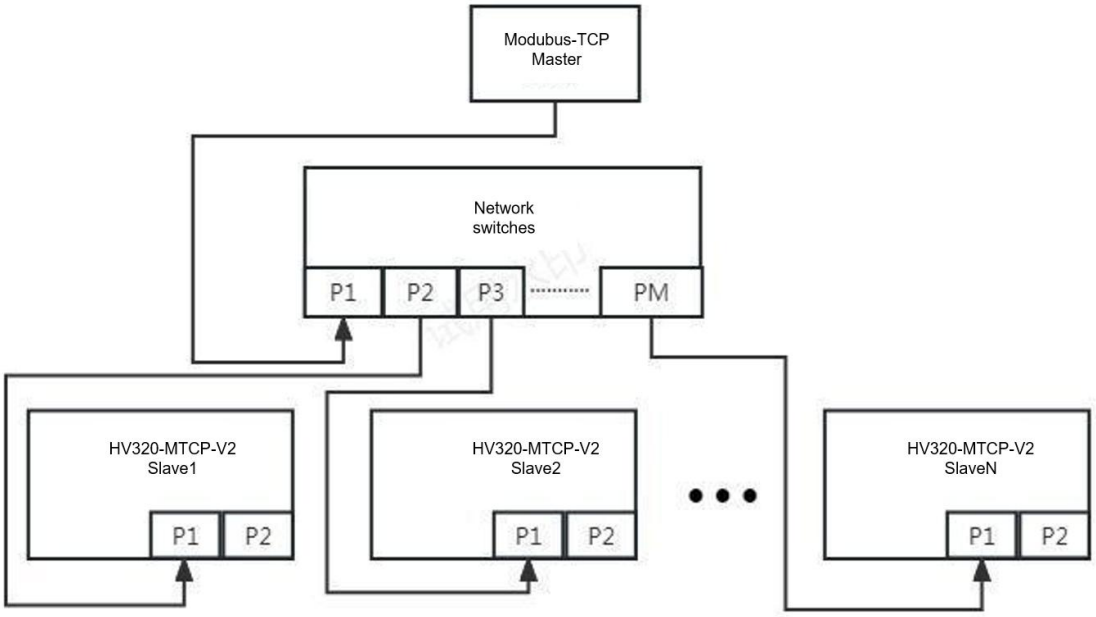

Figure 3-2 Star connection topology

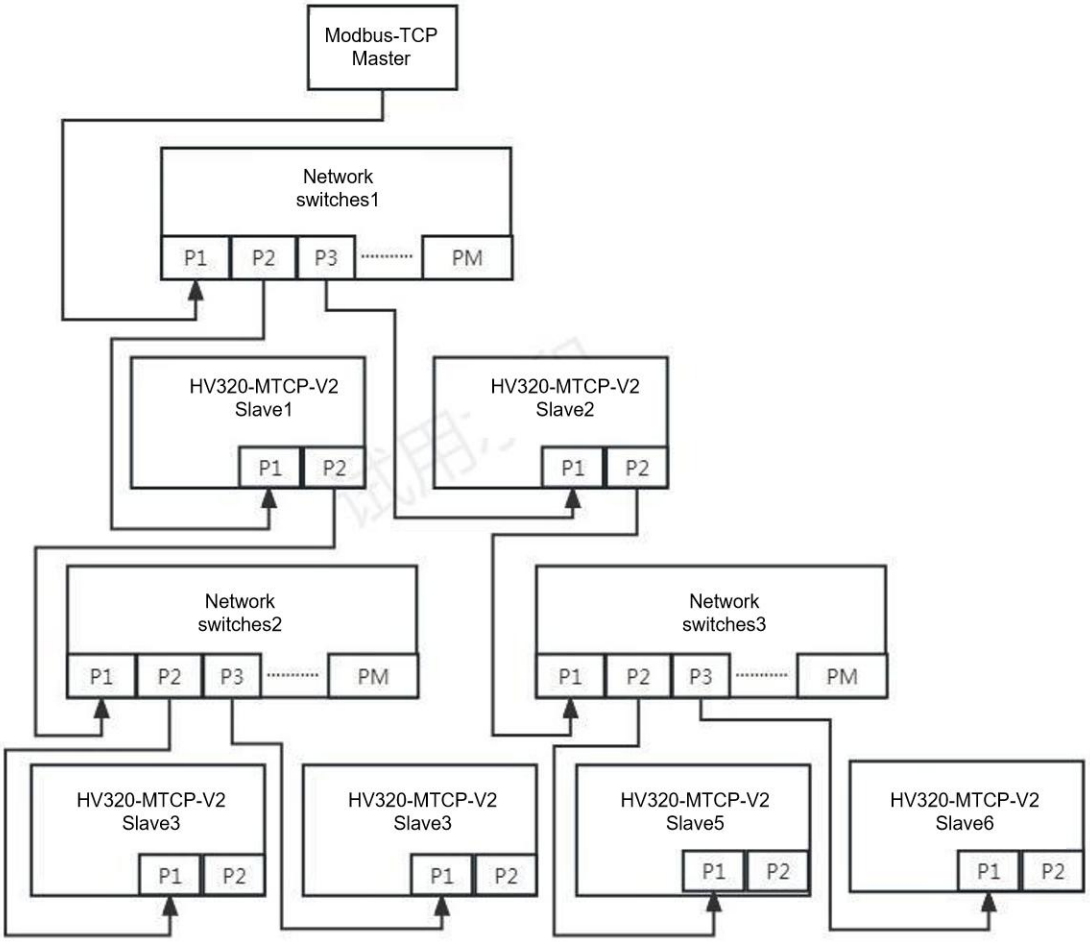

Figure 3-3 Tree connection topology

3.3.3 Communication address definition

Refer to the Modbus protocol in the inverter manual

4. Configure the slave station in LAEconfig software

1) Install the configuration software on your computer 

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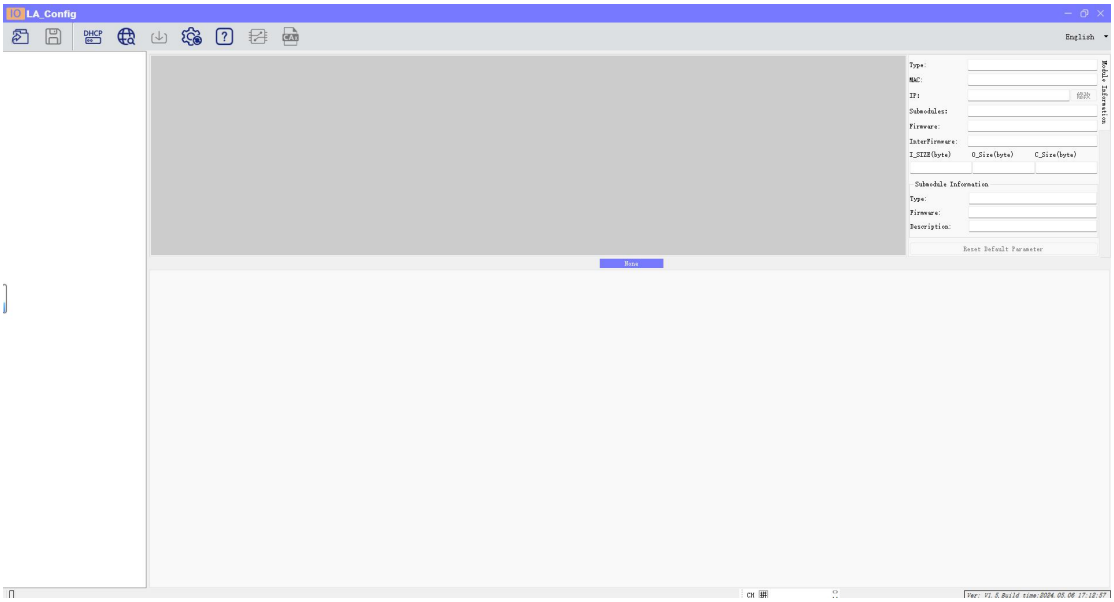
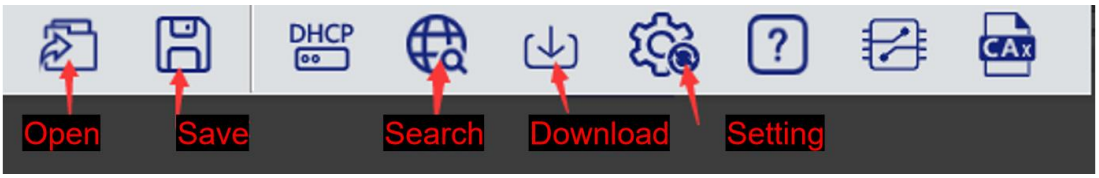
2) After the installation is complete, click 

Open the software.

3) Software interface introduction

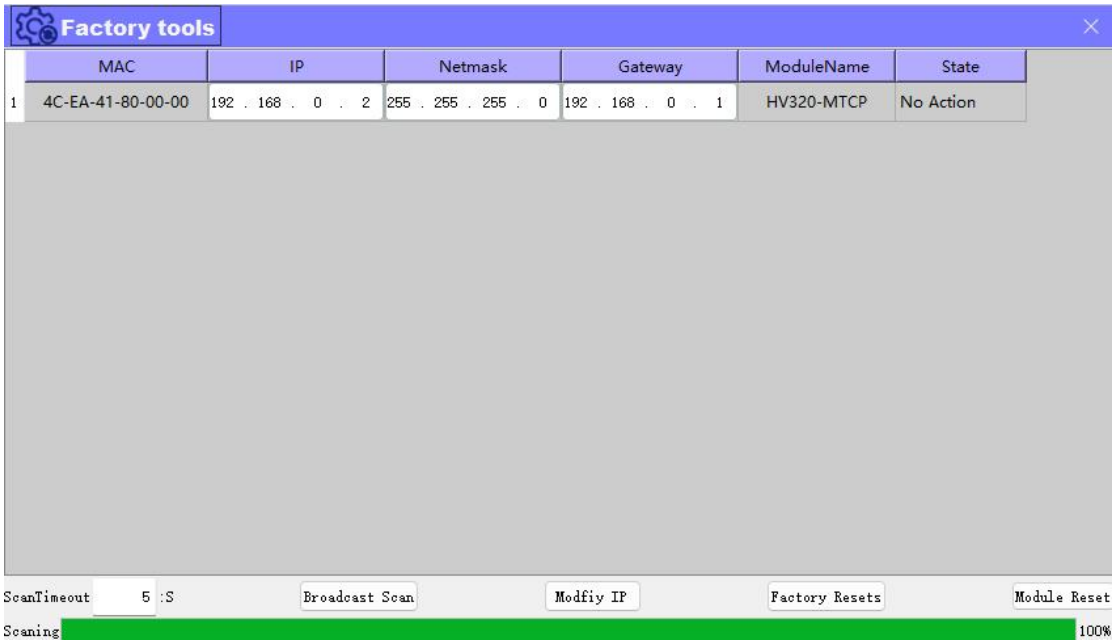


The software interface includes: toolbar, module information tree directory, parameter setting area, module information display area, etc.

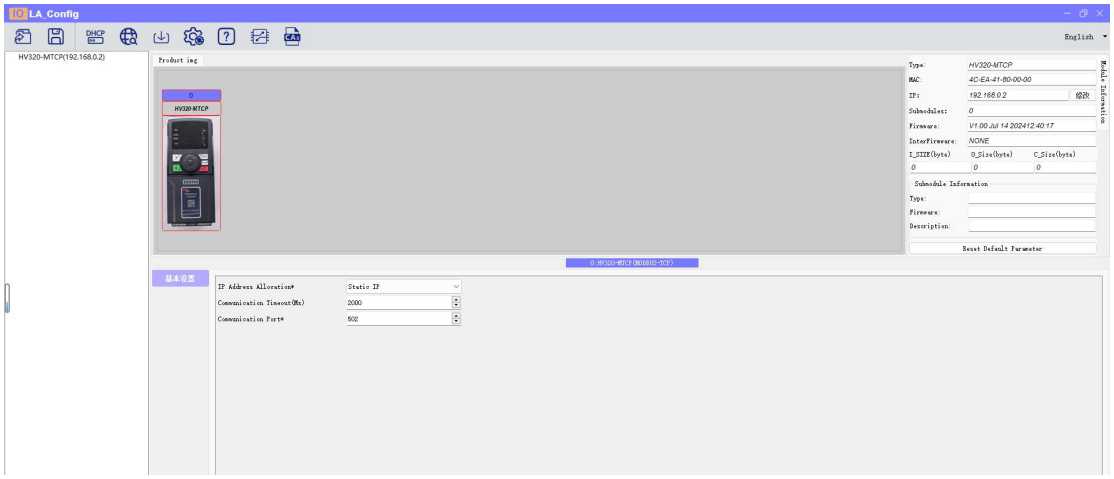


4) Modify the IP address of the inverter

Click the button in the toolbar  , click Global Scan, select the IP address to be modified, and click Modify IP Address. The IP address allocation process begins, and whether the allocation is successful can be displayed in the status column at the back.



5) Modify the inverter parameters



6) After modifying the parameters, download the inverter parameters

Set the module parameters in the parameter setting area. After setting, click  to download the module parameters.

At this point, the inverter parameter setting is completed.

Next is the Modbus-TCP master station settings, and configure the relevant parameters according to the configuration software of different master stations

Note: All addresses of the inverter are stored in the holding register of area 4!

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