RD11 Modbus option TCP/IP +24V Expansion Card Operating Instructions

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RD11 Modbus TCP/IP +24V Expansion Card Operating Instructions

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Thank you for using the network communication extension card of VEDA-in DRIVES. This card can be used on RD11 inverter to make RD11 inverter a server of ModbusTCP Industrial Ethernet and available for ModbusTCP Industrial Ethernet client control.

Before using this card, please read this manual carefully.

1. Function Introduction

Switch networking supported;

DHCP IP addresses allocation via DHCP not supported;

Maximum number of function codes read in a single session: 100;

Up to 4 ModbusTCP client connections supported;

Abnormal status indication supported.

2. Hardware Appearance and Fault Indication Description

This card looks as follows:

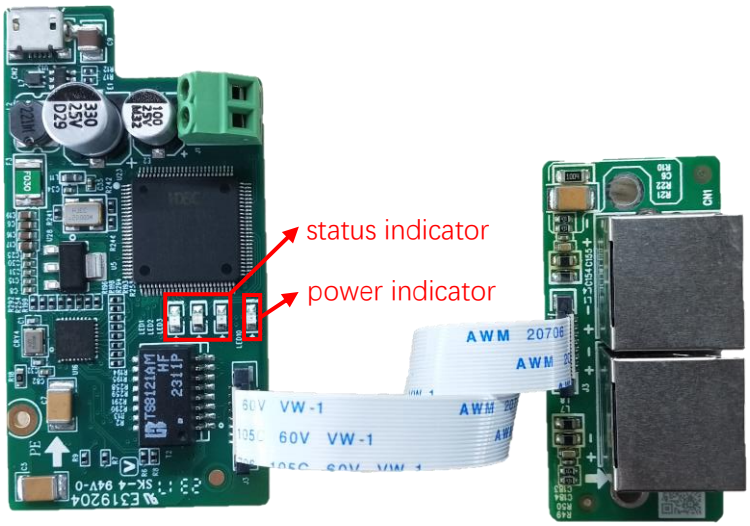


Figure 1

As shown above, this card has 1 power indicator and 3 status indicators; the power indicator is always on after power on, and the status indicator is described in the table below.

No.	LED1 RED	LED2 GREEN	LED3 YELLOW	Status/fault type	Troubleshooting measure
1	flash	off	off	Handshaking to the inverters	Check if the extension card is correctly inserted into the card slot
2	on	on	flash	The network cable is disconnected; the protocol stack is starting up	Check network cable connection; Power up and restart
3	flash	off	flash	MAC address error	Power up and restart
4	flash	flash	flash	Stack initialization timeout	Power up and restart
5	off	flash	on	Communication parameter	Power up and restart

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				setting error (IP obtaining failure)	
6	off	on	off	Hand-shaked successfully, no client accesses	
7	off	flash	off	Client access without data interaction	
8	off	flash	flash	With data interaction	
9	off	on	on	Receive buffer is full	Reduce the number of function codes accessed in a command; Increase the access period of periodic commands.
10	off	on	flash	Inverter reply to abnormal command	
11	off	off	flash	Inverter reply timeout	

Table 1

3. Wiring Description

Connection to a single client:

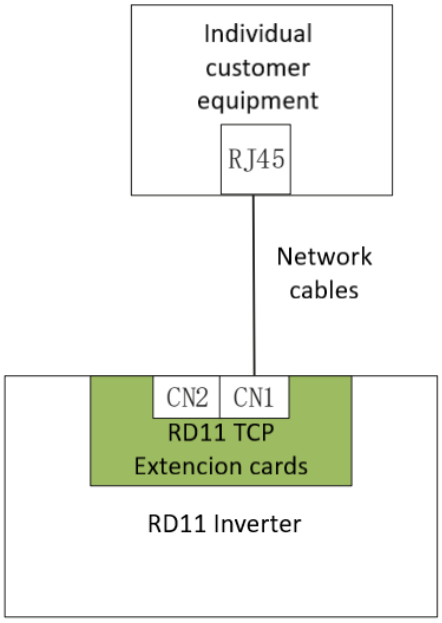


Figure 2

Connection to multiple clients:

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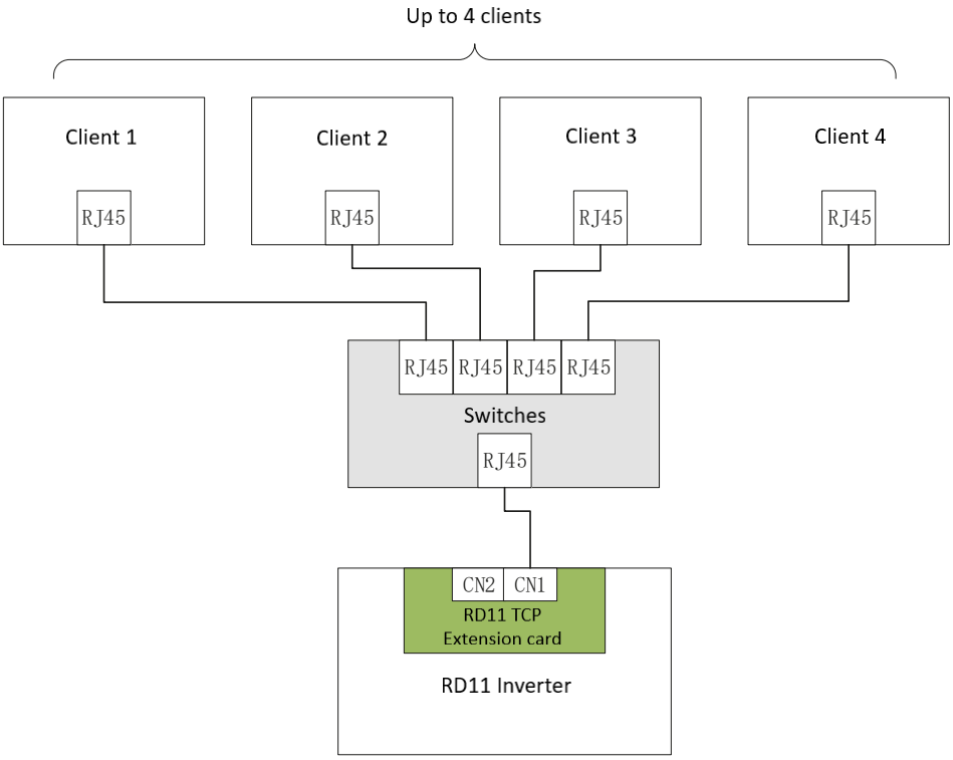


Figure 3

Multi-inverter networking:

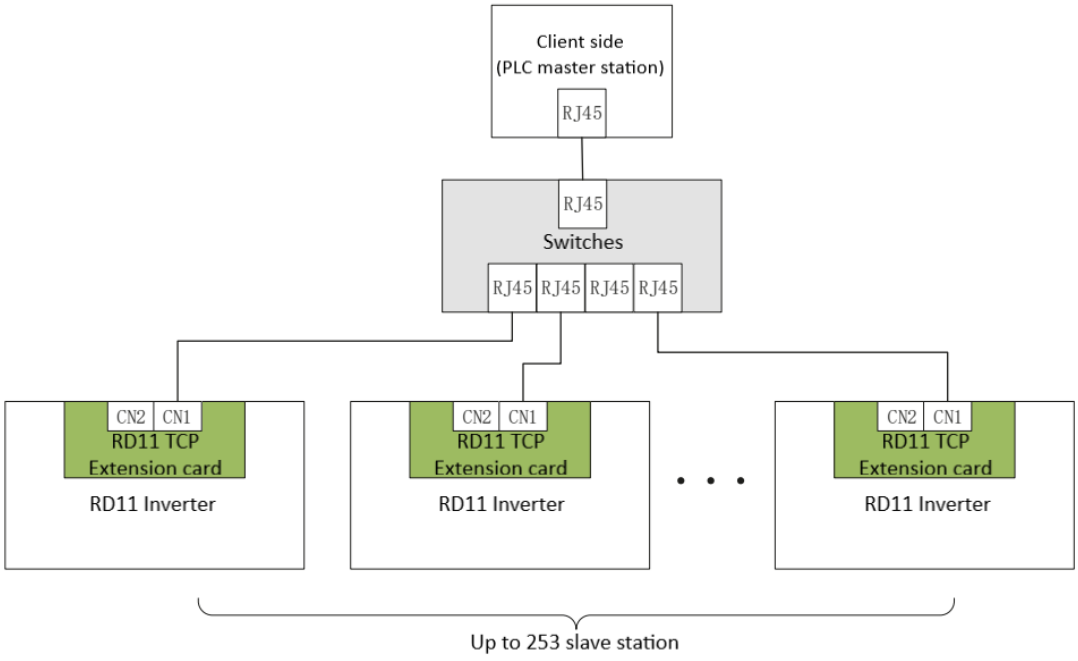


Figure 4

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4.RD11 Inverter-related Function Code Configuration Description

The function codes about this card in RD11 inverter are shown in the following table.

No.	Code	Address	Function	Defa ult	Value range	Description
1	F19.00	0x5300	IP address 0	192	0-255	The default value is 192.168.1.20
2	F19.01	0x5301	IP address 1	168	0-255	
3	F19.02	0x5302	IP address 2	1	0-255	
4	F19.03	0x5303	IP address 3	20	0-255	
5	F19.04	0x5304	Subnet mask 0	255	0-255	The default value is 255.255.255.0
6	F19.05	0x5305	Subnet mask 1	255	0-255	
7	F19.06	0x5306	Subnet mask 2	255	0-255	
8	F19.07	0x5307	Subnet mask 3	0	0-255	
9	F19.08	0x5308	Gateway 0	192	0-255	The default value is 192.168.1.1
10	F19.09	0x5309	Gateway 1	168	0-255	
11	F19.10	0x530A	Gateway 2	1	0-255	
12	F19.11	0x530B	Gateway 3	1	0-255	
13	F19.12	0x530C	MAC address 0	2	0-255	The default value is 02:00:00:00:00:00
14	F19.13	0x530D	MAC address 1	0	0-255	
15	F19.14	0x530E	MAC address 2	0	0-255	
16	F19.15	0x530F	MAC address 3	0	0-255	
17	F19.16	0x5310	MAC address 4	0	0-255	
18	F19.17	0x5311	MAC address 5	0	0-255	
19	F19.18	0x5312	Client 1 receive timeout	100	10-65535	100 by default, unit ms. 65535: timeout check off
20	F19.19	0x5313	Client 2 receive timeout	100	10-65535	100 by default, unit ms. 65535: timeout check off
21	F19.20	0x5314	Client 3 receive timeout	100	10-65535	100 by default, unit ms. 65535: timeout check off
22	F19.21	0x5315	Client 4 receive timeout	100	10-65535	100 by default, unit ms. 65535: timeout check off

Table 2

Note 1: The latest version of the inverter software will default to configure the above function code parameters, if it's not the latest version of the software, please set manually;

Note 2: If multiple extension modules are included under the same network segment, different MAC addresses and IP addresses need to be set for each module;

Note 3: F19.18-F19.21 are used to set the timeout time for each client, and in the case of multiple clients, it is not recommended to set it to 65535 (i.e. it is not recommended to turn off the timeout check), since the client will continue to occupy communication resources if access timeout occurs with the check is off, resulting in affecting the normal access of other clients;

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Note 4: If multiple clients accessed have periodic commands, the access period of these commands needs to be increased, otherwise the extension card is prone to enter the cache full state, resulting in fault codes sent to each client.

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5. Operation Examples

5.1 Parameter Configuration Process

When using with the inverter for the first time or changing the inverter network parameters, the following procedure should be followed.

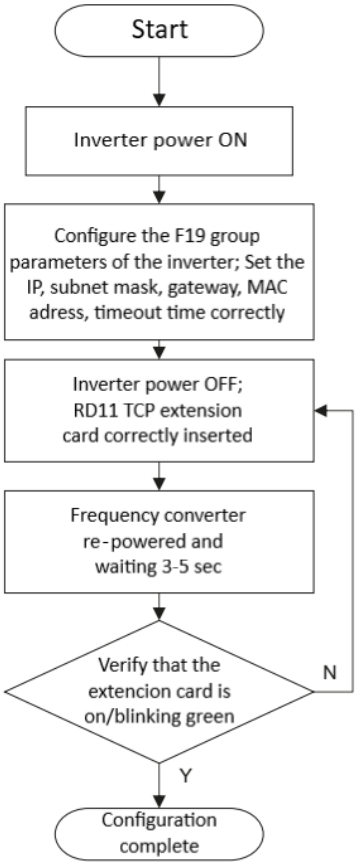


Figure 5

5.2 Setting up communication between RD11 frequency converter and PLC VC5

5.2.1 Master-Slave Configuration

Slave configuration:

Configure the slave inverter communication parameters according to the parameter configuration process of 5.1: set the IP address to 192.168.1.30, subnet mask to 255.255.255.0, gateway to 192.168.1.1, MAC address to 02:00:00:00:00:01, and client timeout time to 100ms through the keyboard.

In addition, this example is to realize the control of inverter start/stop through the extension

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card, so we need to select the source of the operation command as "given by the optional card", that is, set the F01.01 function code to 3; in actual cases, if the start/stop command is given by other ways, set it according to other definitions of the function code.

Function code	Designation	Setting range	Setting value	Meaning
F01.01	Command selection for running	0：Keyboard setting 1：Terminal setting 2：RS485 setting 3：Optional card setting 4：Terminal switch command setting	3	Run the commands given via optional cards

Table 3

Master configuration:

Open Auto Studio software, select "File->New Project", and select VC5 for PLC type.

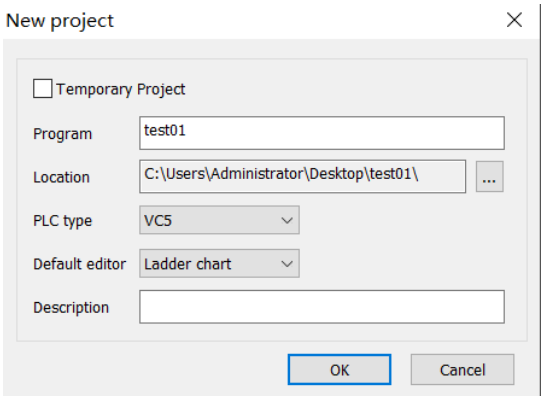


Figure 6

Double click "EtherNet" to open the "Ethernet Configuration" window, this example uses the default network parameters, configure VC5 as the master, click OK

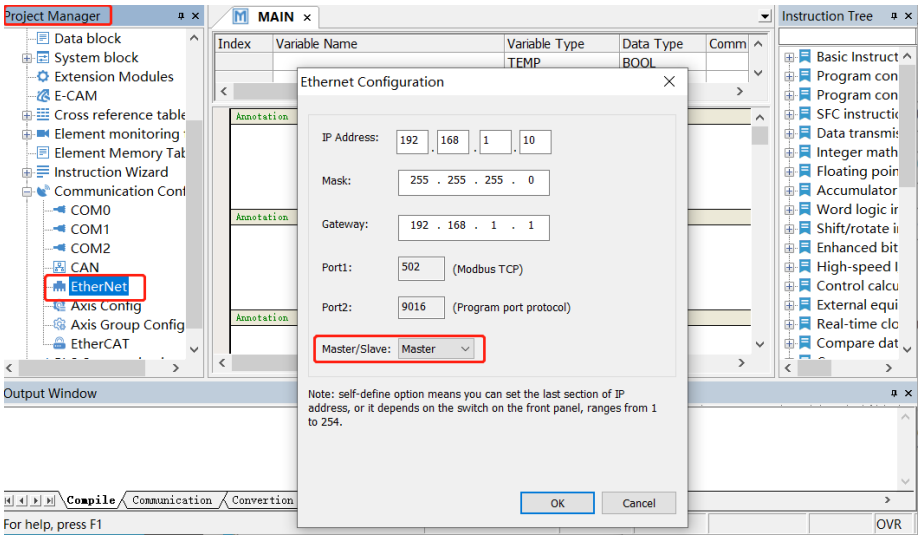


Figure 7

Right-click "EtherNet", select "Add Configuration", and then double-click "Ethernet

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Configuration" to open the "Modbus Tcp Configuration" window.

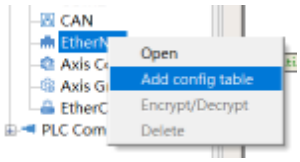


Figure 8

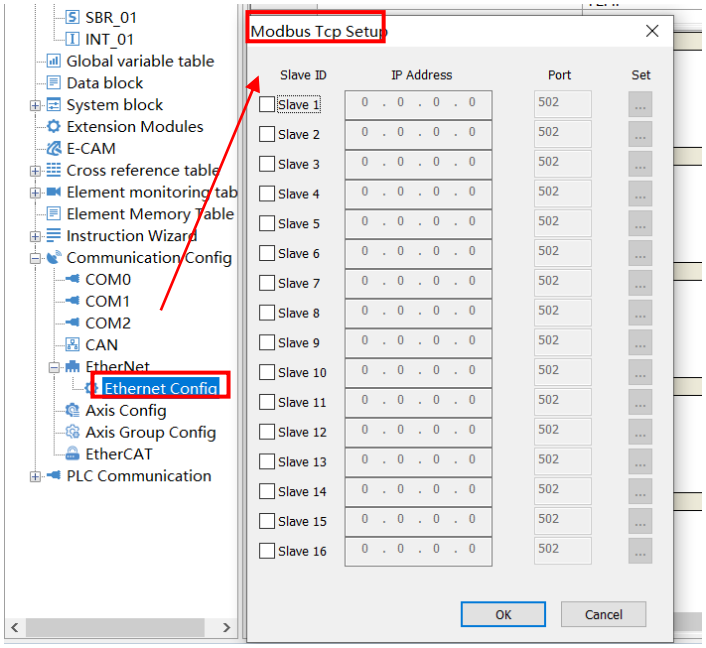


Figure 9

Enter the configured slave IP address 192.168.1.30, using port number 502.

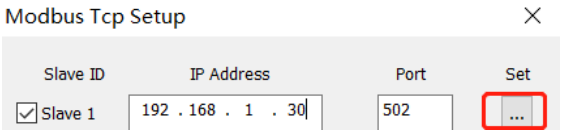


Figure 10

Click Settings to open the "MODBUSTCP Configuration" window. According to the RD11 inverter manual, the command given address of the optional card communication control is 0x3101, so the command shown in the "MODBUSTCP Configuration" window is added to trigger the write access function code 0x3101.

Address	Function description	Data description	R/W characteristics
0x3100	Given communication frequency	Unit 0.01Hz, so 5000 corresponds to 50.00Hz	R/W
0x3101	Communication command setting	0: No command 1：Forward running 2：Reverse running 3：Forward jogging 4：Reverse jogging 5：Deceleration stop 6：Free stop	R/W

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		7：Fault reset 8：Run-prohibited command 9：Run-allowed command	

Table 4

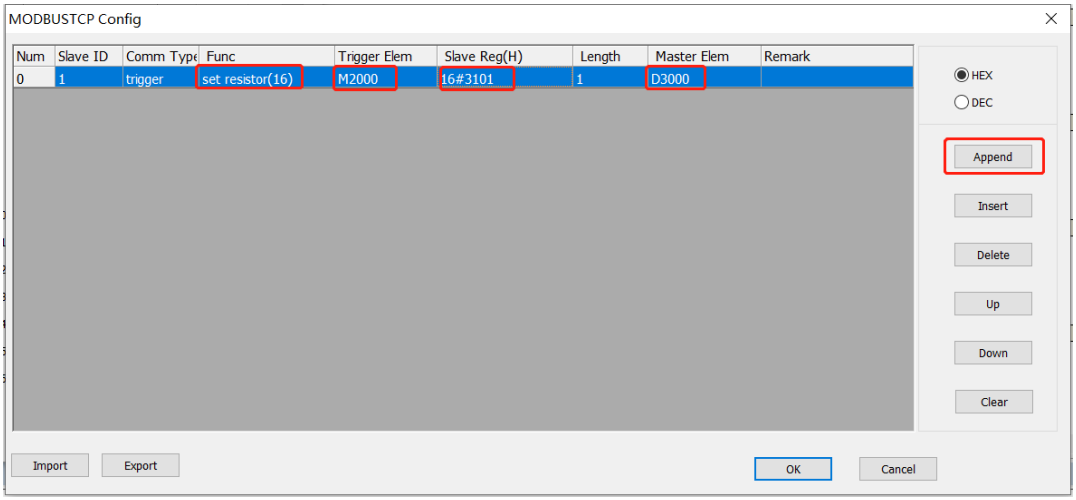


Figure 11

Once connected to the PLC, click on Compile , execution download , open monitoring window , add the variables M2000, D3000.

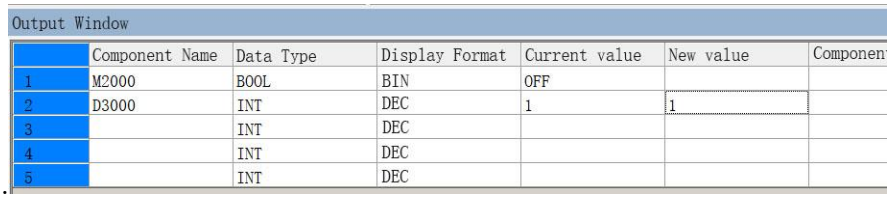


Figure 12

5.2.2 Start/stop frequency converters

Setting D3000 to 1 to trigger M2000 to start the inverter;

Reset D3000 to 6 and trigger M2000 to stop the inverter freely.

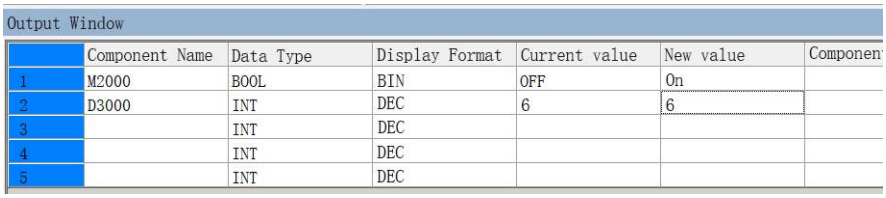


Figure 13

6. 8

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The extension card supports connecting external 24V power supply to power the control board when the power supply of the frequency converter is turned off. Maximum current consumption 200 mA.

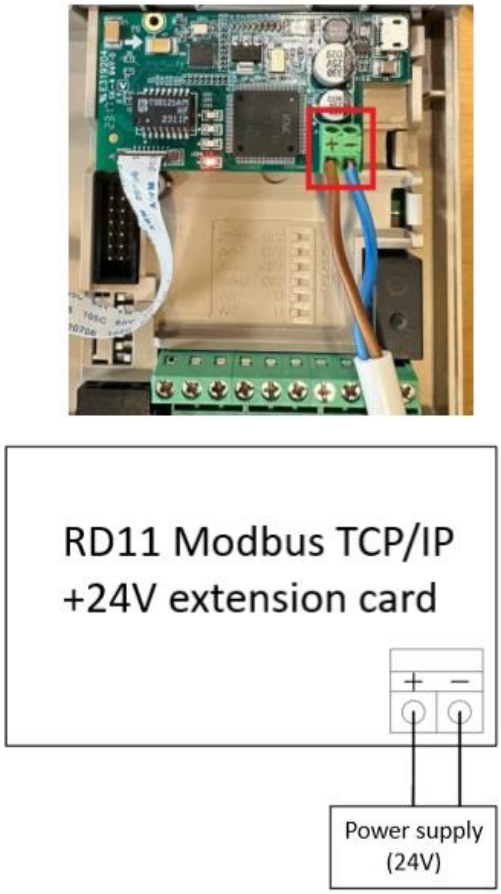


Figure 14

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