

PLC data acquisition protocol conversion gateway

D225



D225

User manual

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website: www.4g-iot.com



Perface

Thank you for using the PLC data acquisition protocol conversion gateway D225 of Shenzhen King Pigeon Hi-Tech Co., Ltd. Reading this product manual will enable you to quickly grasp the functions and usage of this product.

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Revise.Record

Updated date	Version	remark	Writer
25 th ,OCT.2019	V1.0	First edition	ZYH
23 th ,OCT.2020	V1.1	Add Modbus TCP Server protocal and revised	HYQ
7 th ,DEC.2020	V1.2	Add DL/T645 protocal	HYQ



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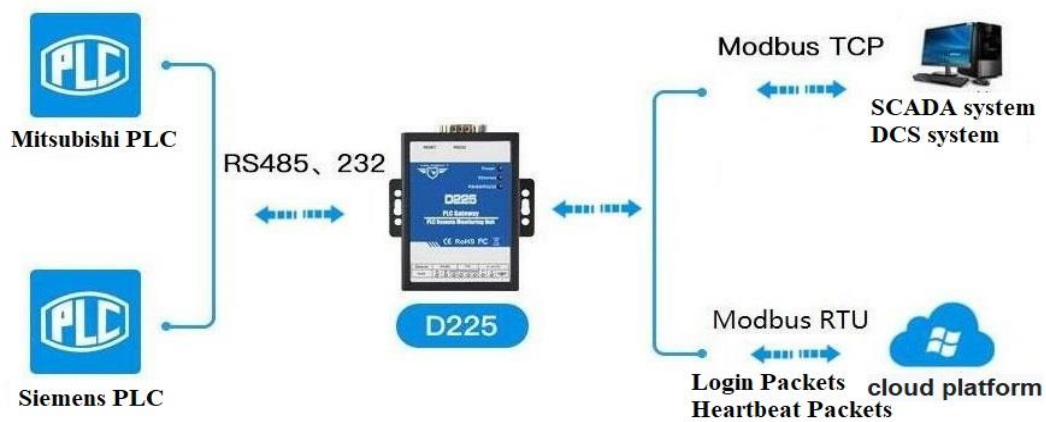
1 Product Introduction

1.1 Overview

The PLC data acquisition protocol conversion gateway D225 is a converter used to convert the main PLC data acquisition protocol on the market into Modbus TCP protocol. D225 can store the PLC I/O point data to the gateway through the RS-232 or RS-485 serial port of the PLC. The gateway transmits the data to the cloud platform through the Modbus protocol. It also allows your software to pass through the local LAN or Internet access to serial devices.

1.2 Typical Application

- Cloud configuration and data Monitoring



- PLC Remote program debugging





1.3 Packing list

Before installing and using the D225 device, please confirm whether the following materials are in the product box

- 1x D225 device



- 1x 2 bit 3.5 female connector for input power



- 1x 6 bit 3.5mm female interface used by 485 and TTL



- 1x RS-232 data cable





- 1x 0.5m network cable



- 1x Power adapter (12VDC/1A)

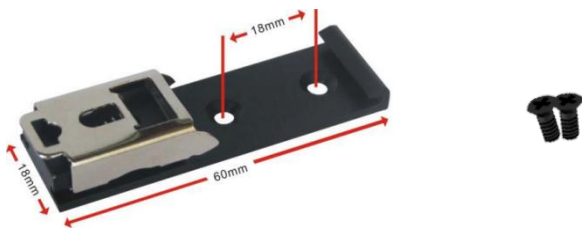


- 1 x QR code label (including User manual download and software information)

Remark: If the above items are missing or damaged, pls kindly contact sales representative of King Pigeon.

Optional accessories (must be purchased separately)

- 35mm DIN Rail installation kit





1.4 Function Features

- Wide working voltage design, support 9-36V DC power supply, the interface is DC Q2.1 jack and terminal block two ways, and with anti-reverse connection protection design;
- Built-in industrial-grade ARM®Cortex™ core, high performance, low power consumption, stable and reliable;
- Support 1 Chanel RS-232、 1 Chanel RS-485 and 1 Chanel TTL;
- Serial port Baud rate support 4800bps-128000 bps; data bits support 7, 8, 9bits, Support None, Odd, Even verification method;
- Support 1chanel RJ45 Ethernet port, with link and data indicator the network port has a build-in isolation transformer up to 12V electromagnetic isolation ;
- Support the Reset button to restore the factory function (long press for 3 seconds to restore) to prevent parameter setting errors;
- Using metal shell material, protection grade IP30, metal shell and system are safely isolated, especially suitable for industrial control field applications;
- The device is small in size, 96mm*68mm*25mm, and supports wall-mounted installation and DIN 35mm industrial rail installation.
- Use configuration software to set device parameters, support WIN XP, WIN 7, WIN 8 and WIN 10, with a friendly interface;
- Support static IP address or DHCP to automatically obtain IP address, and can query devices in the network through UDP broadcast protocol
- Built-in TCP/IP protocol stack, supports Modbus TCP Server protocol, transparent transmission protocol, Golden Pigeon 2.0 protocol, Golden Pigeon 3.0 protocol, Modbus RTU over TCP protocol, supports self-defined handshake protocol to actively connect to the server and automatically reconnect to the server after disconnection Features;
- Support remote debugging of PLC program;
- Support server domain name resolution;
- Support to upgrade the firmware through TTL, the firmware update is more convenient;

1.5 Technical Parameters

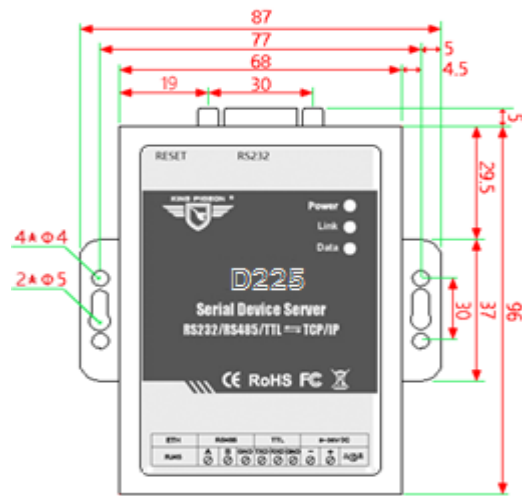
classification	Parameters	Description
Powers supply	Working volt.	9~36 V DC
	Power consumption	regular: 100mA@12V, MAX: 120mA@12V
	Power protection	Anti-reverse connect、 ESD air: 15KV, surge: 4KV
Network interface	Ethernet port specification	1 x RJ45, 10Mbps
	Ethernet protection	ESD connection: 8KV , surge: 4KV (10/1000us)
Serial Port	Serial QTY	1 x RS232、 1 x RS485、 1 x TTL
	Serial port baud rate	4800bps-128000bps
	data bit	7,8,9



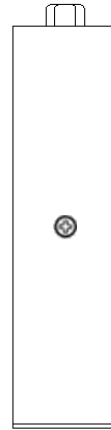
	parity bit	None, Even, Odd
	Stop bit	1, 1.5, 2
	Serial port protection	ESD connection: 8KV surge: 4KV (8/20us)
Software Parameter	Network protocol	IPV4、TCP/UDP、DHCP、DNS、Modbus RTU、Modbus TCP Server、KIPIOT 2.0、KIPIOT3.0
	IP obtaining method	Static IP/DHCP
	Transparent transmission	Support
	DNS	support
	User configuration	PC sw configuration, Support WIN XP、WIN 7、WIN 8 and WIN 10
	Network cache	transmit: 8Kbyte; receive: 8Kbyte;
	registration package	Support custom registration package
	Heart package	Support custom heart package
Certification	MTBF	≥100000 Hours
	EMC	EN 55022: 2006/A1: 2007 (CE &RE) Class B
		IEC 61000-4-2 (ESD) Level 4
		IEC 61000-4-3 (RS) Level 4
		IEC 61000-4-4 (EFT) Level 4
		IEC 61000-4-5 (Surge)Level 3
		IEC 61000-4-6 (CS)Level 4
		IEC 61000-4-8 (M/S) Level 4
other	CE、FCC、ROHS、3C	
Environment	Working Tem.&Hum.	-45~85°C, 5~95% RH
	Storage Tem.&Hum.	-45~105°C, 5~95% RH
Other	Housing	Metal materials
	Size	9.6cm×6.8cm×2.5cm(L*W*H)
	IP	IP30
	N/W	260g
	Installation Method	Wall-mounted、Rail type

2 Hardware

2.1 Dimensions unit: mm



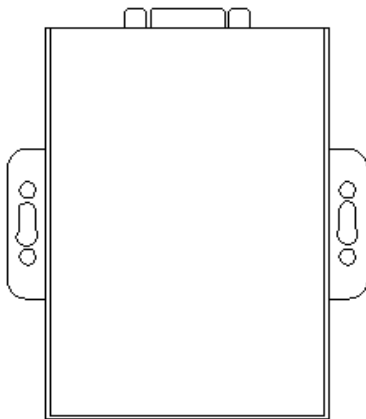
Front view



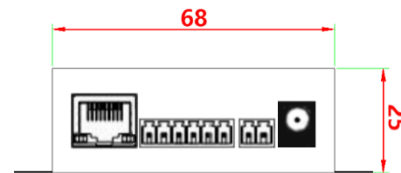
Side view left



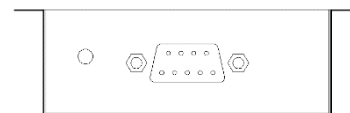
Side view right



Bottom view



Bottom view



Top view

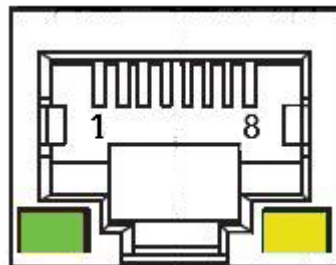
2.2 LED Indicator



LED Indicator description			
Name	Color	Status	Description
Power	red	Lighting	External power supply is normal
		No lighting	Device fault
Ethernet	red	Lighting	Data transmission through the Ethernet port
		No lighting	No data transmission via Ethernet port
RS485/RS232	red	Lighting	RS485/RS232 have data transmission
		No lighting	RS485/RS232 no data transmission

2.3 Interface definition

2.3.1 RJ45 Pin definition



Network interface Definition			
NO.	568B	Definition	Description
1	Orange white	TX+	Send positive
2	Orange	TX-	Send negative

3	Greenwhite	RX+	Receive positive
4	blue	Data+	Two-way data+
5	Blue white	Data-	Two-way data-
6	green	RX-	Receive negative
7	Brown White	Data+	Two-way data+
8	Brown	Data-	Two-way data -

2.3.2 RS-485、TTL and power supply pin connector



RS-485、TTL and power supply pin connector		
NO.	Function	Description
1	A	RS485 data+(A)
2	B	RS485 data-(B)
3	GND	Public land
4	TXD	Sender
5	RXD	Receiver
6	GND	Public land
7	-	Power input -
8	+	Power input +

2.3.3 RS232 Pin definition



RS232 Description	
DB9 NO	Function Description
1	NC
2	Receive data (RXD)
3	Send data (TXD)
4	NC
5	Signal land (GND)
6	NC
7	NC
8	NC
9	NC
RESET	Reset button

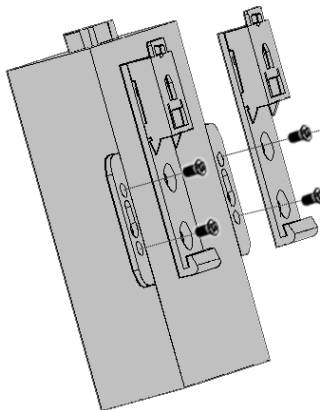
3 Device installation

D225 Support horizontal desktop placement, wall-mounted and rail installation

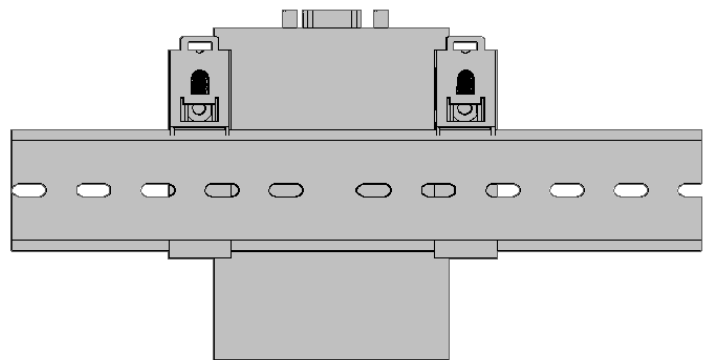
3.1 Wall-mounted



3.2 Rail installation



Snap-in installation



Rail installation

4 Configuration software parameter configuration

D225 configuration software is used for configuration, the connection method is through the RJ45 Ethernet port, and a standard cross/straight network cable is used to connect to the LAN, or a standard cross network cable can be directly connected to the computer.

Remark:If the PC is connected for the first time, because the factory IP of the D225 device is 192.168.1.250, you need to change the computer IP to 192.168.1.* to search for the device. That is the device and the computer must be in the same network segment.

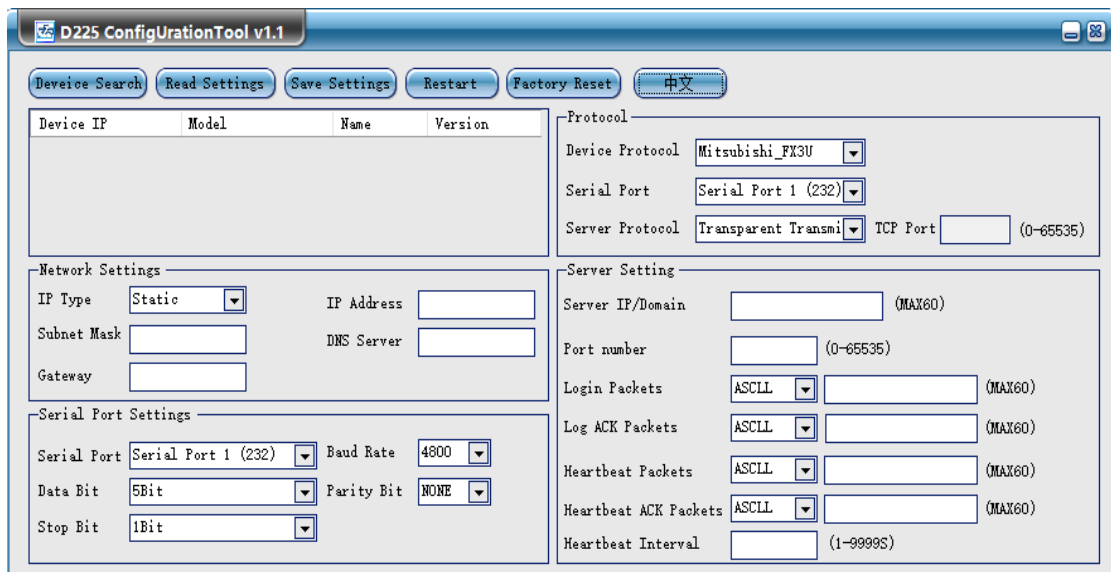
4.1 Steps to log in the configuration SW

4.1.1 Open configuration SW

Run the configuration software "D225.exe" on the computer, Click "English" to switch to English,

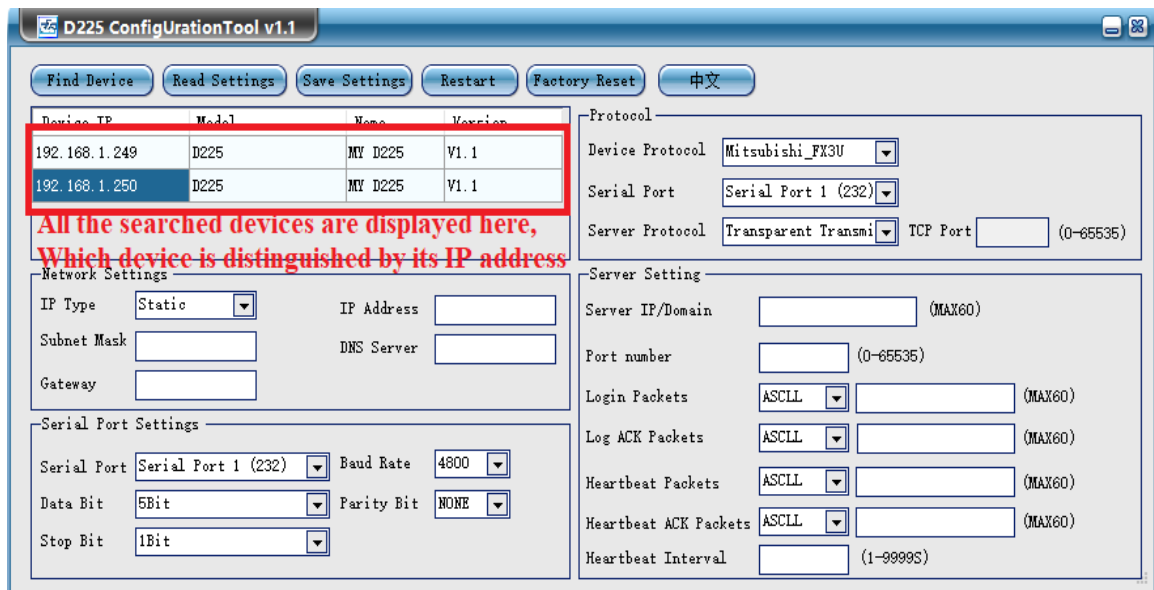


the display interface is as follows



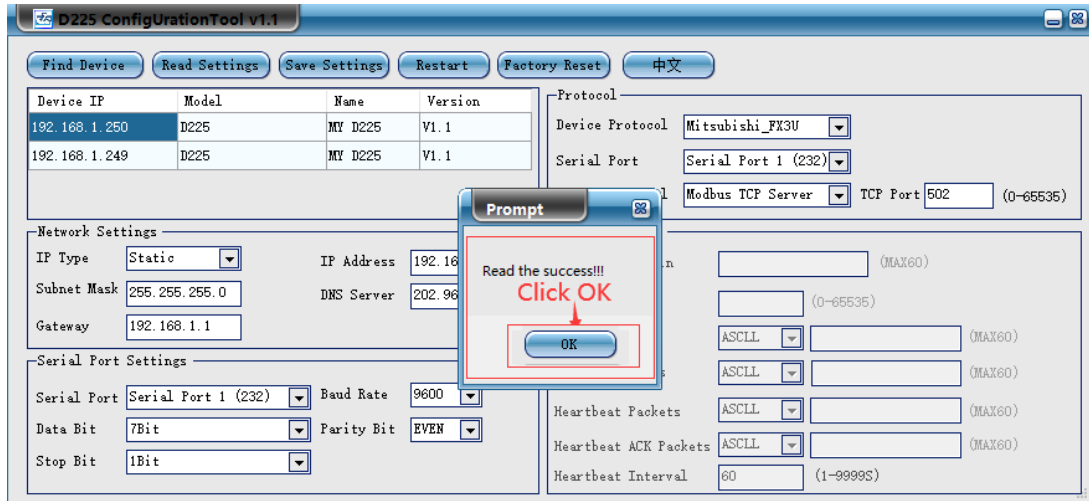
4.1.2 Search device

Clicking on "Device Search" will search for all devices in the same LAN as the computer. The first IP displayed for all devices is 192.168.1.250. Therefore, it is best to have only one device in the LAN when the device is connected for the first time.



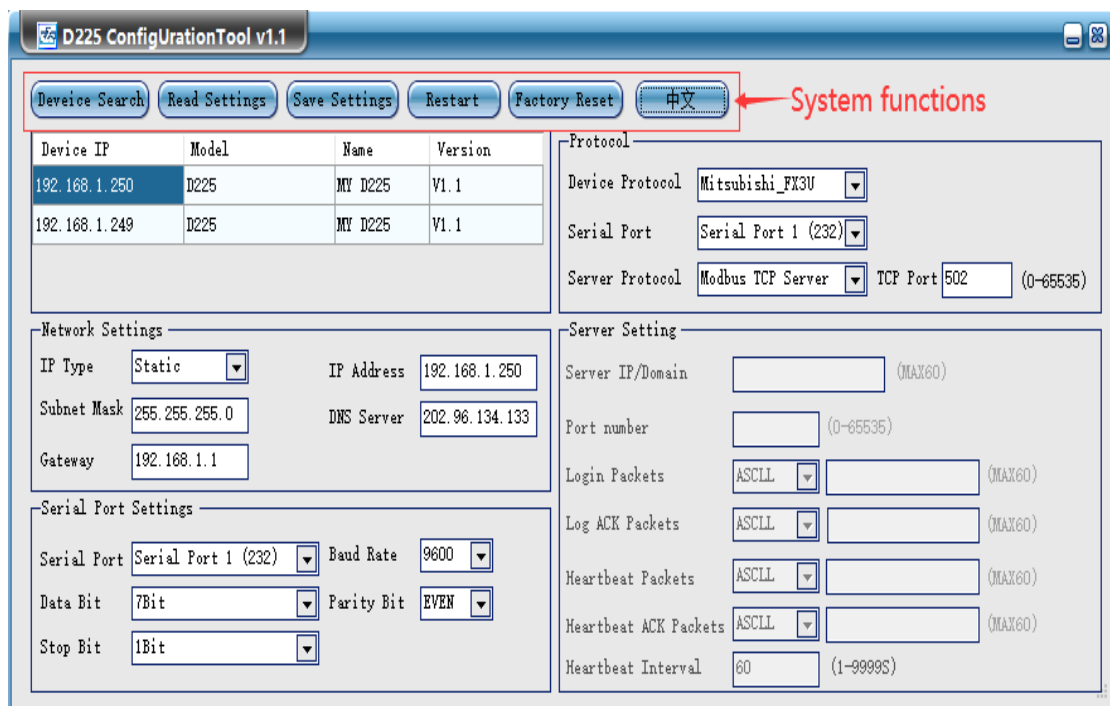
4.1.3 Connect Device

Double-click the device you want to configure, a prompt box "read successfully" appears, click OK to enter the device configuration interface



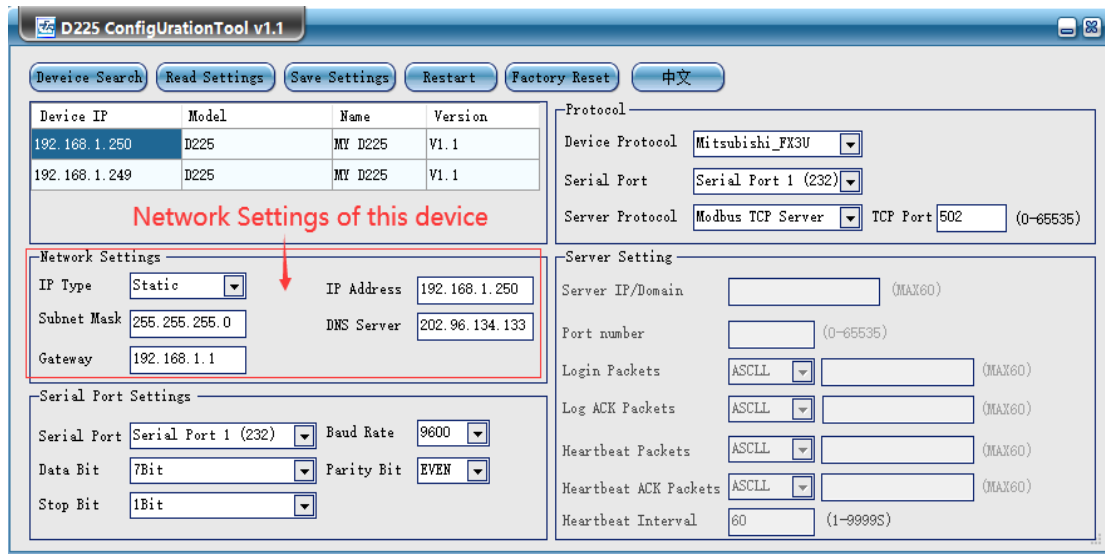
4.2 Configuration software configuration instructions

4.2.1 System functions



Items	Description
Device search	Search all D225 devices in the same LAN
Read Settings	Read the configuration parameters of the logged-in D225 device
Save Settings	Click this button to save all configuration parameters to the device. The device must be restarted for the modified configuration to take effect
Restart	Click reset button, reset device
Factory Reset	All configuration parameters are restored to factory default values, and the device needs to be restarted
中文	Click change language to Chinese

4.2.2 Description of network configuration of this device

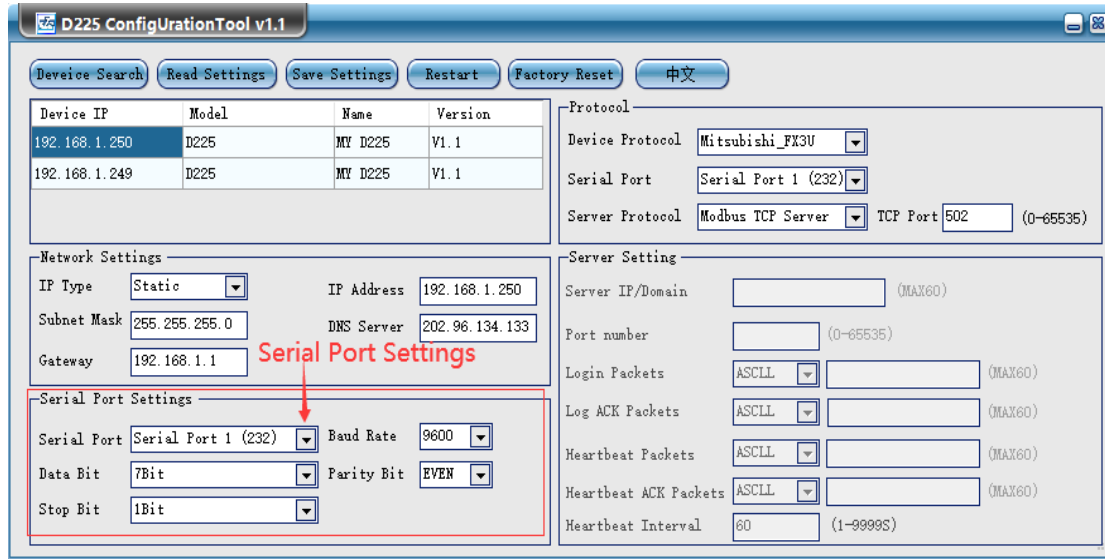


Network settings		
Items	Description (Set the IP of this device)	Default
IP Mode	Select the mode of obtaining an IP address: <ul style="list-style-type: none"> ● Dynamic: Obtain IP address automatically from DHCP server ● Static: manually configure a static IP address for the device 	Static
IP address	set device IP address	--
Subnet mask	Current Subnet mask	--
Gateway	Current gateway address	--
DNS Server	Current DNS Server	--

Note: 1. [IP Address], [Subnet Mask], [Gateway], [DNS Server] can be set after selecting "Static" in [IP Mode]. Please set the relevant parameters according to the local area network. . Please set the IP address of this device yourself according to the IP address distribution in the LAN.

2、 [IP Mode] Select "Dynamic" to automatically obtain an IP address in the LAN only when the router in the LAN allows dynamic allocation of IP addresses.

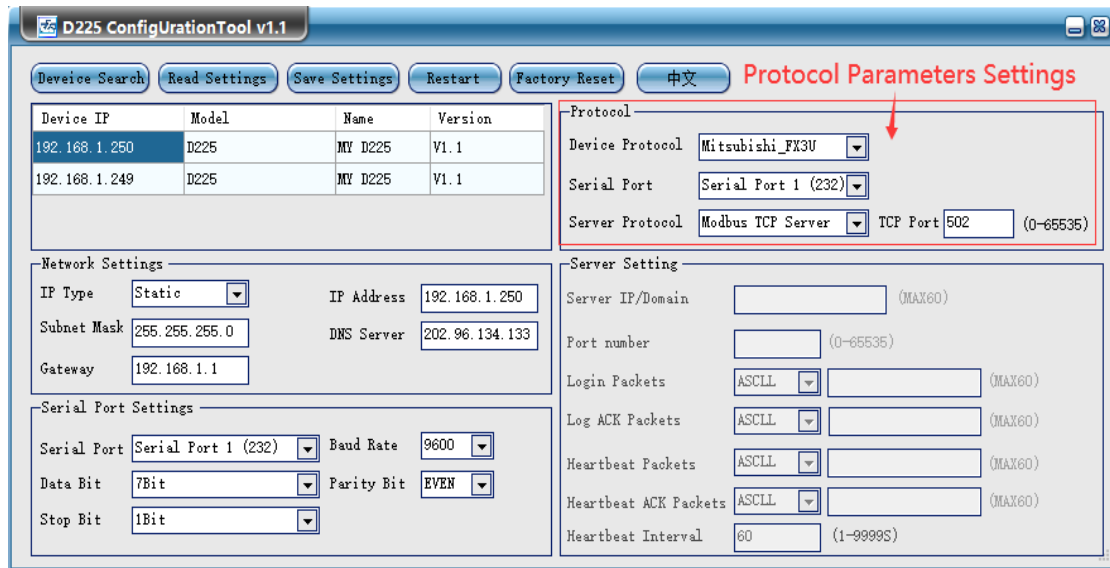
4.2.3 Serial Port Configuration



Serial Port setting		
Items	Description (mainly the connection configuration between equipment and PLC)	Default
Serial port selection	Select and show the current serial port channel , Including: RS232 and RS485	RS232
Baud rate	Choose from “ 4800 ” 、 “ 9600 ” 、 “ 14400 ” 、 “ 19200 ” 、 “ 38400 ” 、 “ 56000 ” 、 “ 57600 ” 、 “ 115200 ” 、 “ 128000 ”	9600
Data bit	Choose from “ 7Bit ” 、 “ 8 Bit ” 、 “ 9 Bit ” 。	7 Bit”
Parity bit	Choose from “ NONE ” 、 “ EVEN ” 、 “ ODD ” 。	EVEN
Stop bit	Choose from “ 1Bit ” 、 “ 1.5Bit ” 、 “ 2Bit ” 。	1Bit

Note: The parameter setting of the serial port should be consistent with the serial port parameters of the PLC, and the serial port selected by the serial port should be consistent with the selection of [Device Link] in the PLC serial port and protocol parameters

4.2.4 Protocol Parameter



Protocol Parameter		
Item	Description	Default
Device protocol	Choose From "Mitsubishi FX3U"、"Mitsubishi FX2N"、"Mitsubishi FX1S"、"Mitsubishi FX3S"、"Siemens S7-200SMART"、"DL/T645"	Mitsubishi FX3U
Device link	Selection of serial port for communication link between equipment and PLC: 1、RS232 2、RS485	RS232
Server Protocol	Communication protocol between device and server: 1、Transparent transmission、 2、KPIOT2.0、3、KPIOT3.0 4、Modbus TCP Server 5、Modbus RTU Over TCP	Modbus TCP Server
Port	When the device is used as a TCP/UDP server, the port number can be customized and modified, and the range is 0-65536.	502

Note: 1. Select the same type of PLC protocol in [Device Protocol] according to the PLC type. If you don't have the PLC type you want to choose, you can contact the sales representative of King Pigeon.

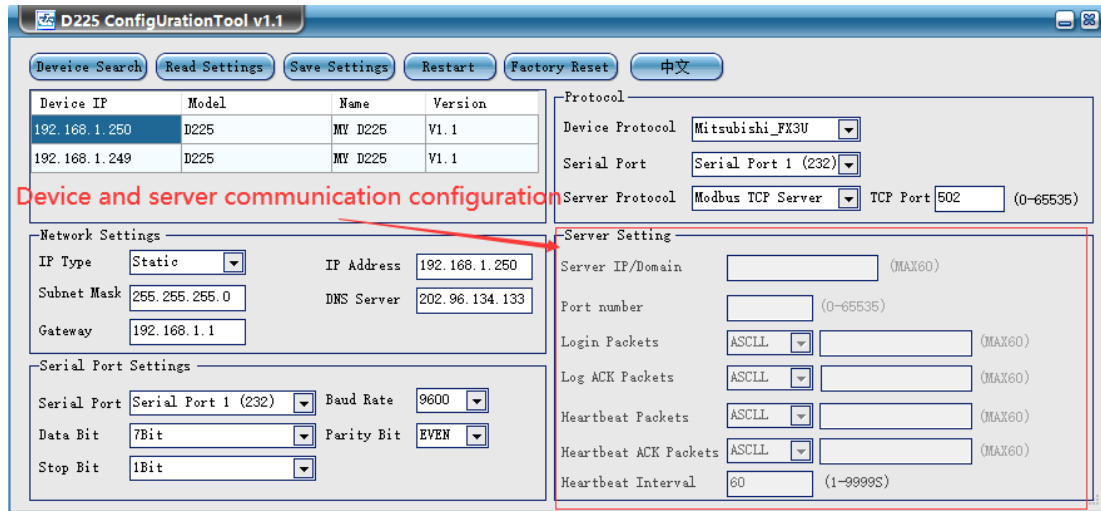
2. To modify the port number, you must select the [Modbus TCP Server] protocol in the server protocol to modify. The port number is mainly used with the [Modbus TCP Server] protocol when



the device is used as the server.

3.The serial port selection of the device link should be consistent with the PLC connection serial port and the serial port selection of the serial port setting

4.2.5 Server Configuration



Server Configuration		
Item	Description	Default
Server IP/domain name	The IP or domain name of the target server	blank
Port number	Port number of target server	blank
Register package	The registration handshake protocol package of the target server	blank
Register response package	If set after the device sends the registration package, the server needs to return a response packet to the device within 3 seconds, otherwise it will send the registration package according to the "reconnection times". If the number of sending times is reached, it will be offline, counted as one offline. Then it will reconnect immediately, continue in sequence, and then execute the time to connect to the server again in accordance with the "dropped 3 times, reconnect time".	blank
Heartbeat package	After setting, the device will send heartbeat packets at intervals according to the heartbeat packet time	Blank
Heartbeat response packet	If set, after the heartbeat packet is sent, wait for the server response time to be the set heartbeat time. If it times out, the heartbeat packet will be sent according to the "reconnection times". If the number of sending times is reached, it will be	Blank



	offline, count as one time, and then immediately Connect, continue in sequence, and then perform the time to connect to the server again in accordance with the "dropped 3 times, reconnect time".	
Heartbeat time	The interval between sending heartbeat packets, ranging from 1-9999 (seconds).	60

Note: (1) Select the transparent transmission protocol, the server configuration mainly configures the server IP/domain name and port number. Whether to fill in other options according to your needs.

(2) Choosing the King Pigeon (KPIOT)2.0 protocol and the King Pigeon 3.0 protocol is to connect to the company's cloud platform, server IP/domain name and port number, heartbeat packet and heartbeat response packet. The configuration software has been filled in by default, so be careful not to modify it. Only need to fill in the configuration item of [Registration Package], please contact our sales representative for [Registration Code] to fill in the content of [Registration Package]

(3) Select Modbus TCP Server protocol, the server configuration does not need to be configured, so the server configuration items have been forbidden to fill in. Modbus TCP Server protocol is used with the port number of this device

(4) The Modbus RTU Over TCP protocol is the Modbus RTU protocol of the independent platform or other platforms. Please configure it according to the relevant configuration of the platform. [Server IP/domain name] and [Slogan] are required

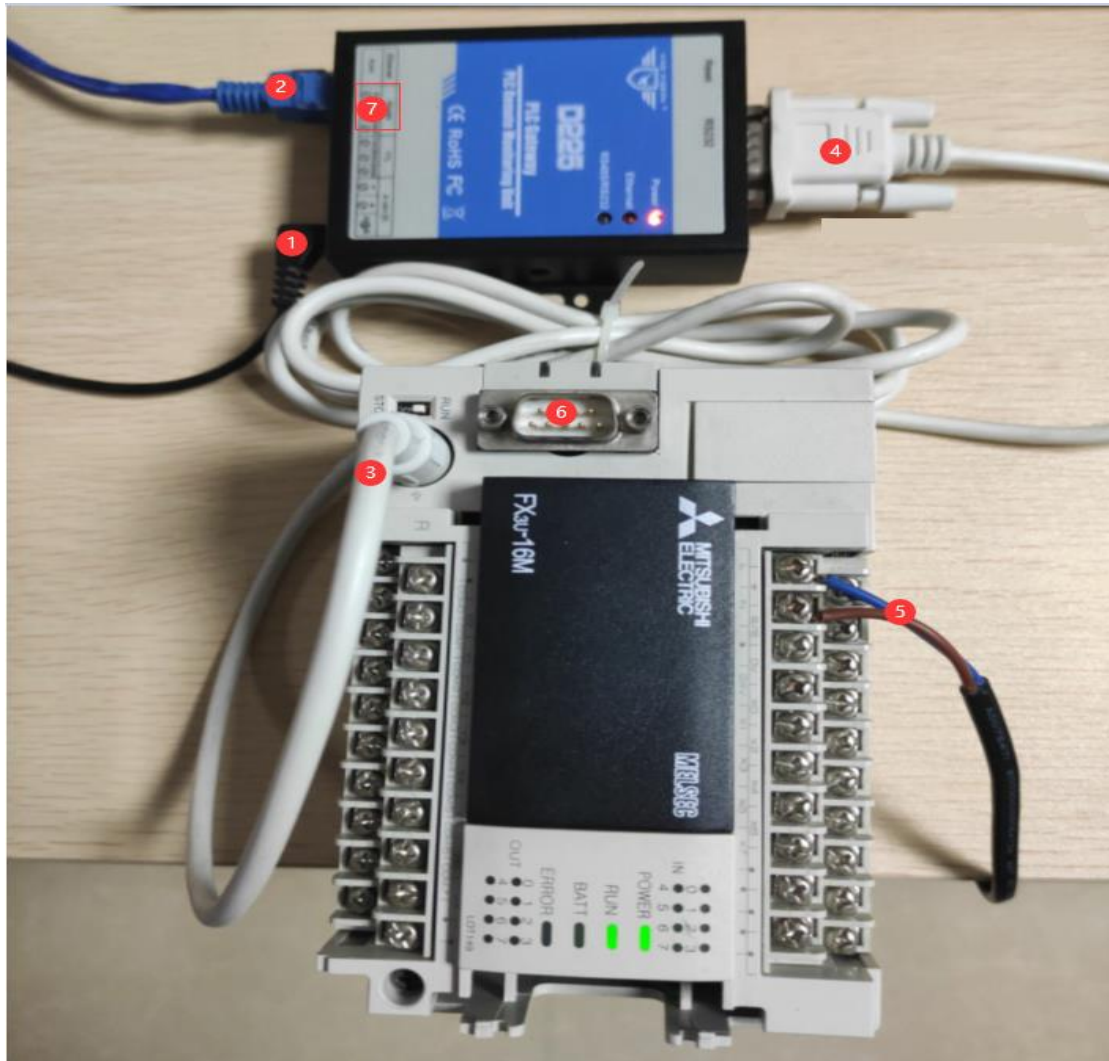
5 D225 Application case

The address of various PLC registers corresponds to the mapping address of D225 and what function code is used to collect PLC register data. For details, see [Appendix Mapping address of PLC register](#)

5.1 Data acquisition of Mitsubishi PLC

Take Mitsubishi FX3U as an example, choose the server protocol as: Modbus TCP Server, and collect the output Y and register D of FX3U. Mitsubishi FX3U and D225 equipment are connected through RS422 to RS232 line.

5.1.1 FX3Uand D225 device connection



Note: 1. The example in the figure is to connect D225 equipment with RS422 to RS232 line, and also introduces the connection method with communication expansion module

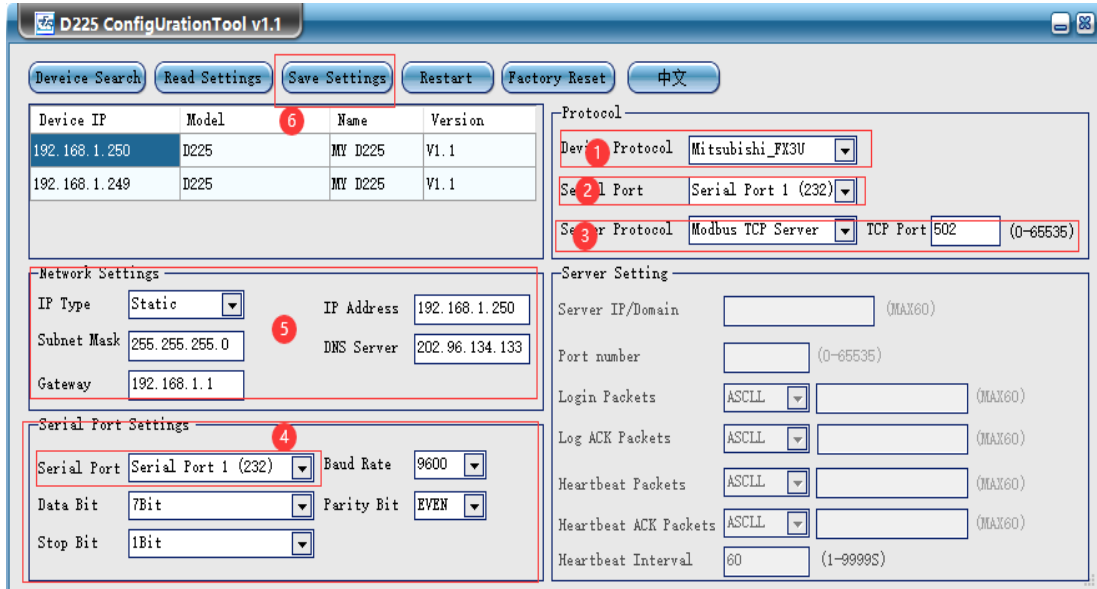
2.Plug the 12V/1A power adapter directly into the power hole of the D225 device, or plug the 12V power cord connector into the power terminal hole next to the power hole, pay attention to the positive and negative.

3.The network cable in the example in the picture is connected to the router, and the same LAN as the computer

Connection instructions: (1) D225 device power cord (12V/1A), (2) D225 device network cable connected to the router, (3) and (4) connected via RS422 to RS232 cable, the RS422 interface of the PLC is connected to the D225 device RS232 interface, (5) PLC power cord, (6) If the D225 device is not connected to the PLC RS422 interface, it can also be connected to the D225 device through the PLC expansion communication module, and the RS232 expansion communication module is directly connected to the D225 device through the RS232 line The RS485 expansion communication module is directly connected to the RS485 port of the D225 device through the RS485 line, (7) the RS485 port of the D225 device

5.1.2 Configuration Software Configuration

After modifying the configuration, you need to click [Save Parameters]. After the save is successful, click the "Restart" button to restart the device or the D225 device is powered off, power on and restart, and the modified configuration can take effect



ote: 1. To modify the configuration, you need to log in to the configuration software, and then configure it after selecting the device to be configured.

2.The serial port configuration is based on the FX3U serial port RS422 parameter configuration, baud rate: 9600, data bit: 7, stop bit: 1, parity bit: EVEN

3.IP The network configuration can be modified according to your needs. When the IP mode is static, you can specify the specific IP of the device, and when the IP mode is dynamic, the device automatically obtains the IP

4.After the configuration is complete, you need to click [Save Parameters]. After prompting that the save is successful, click the "Restart" button to restart the device or the D225 device is powered off and powered on again to make the modified configuration take effect. After clicking [Save Parameters], you can click [Read Parameters] to check whether each configuration is the modified configuration content.

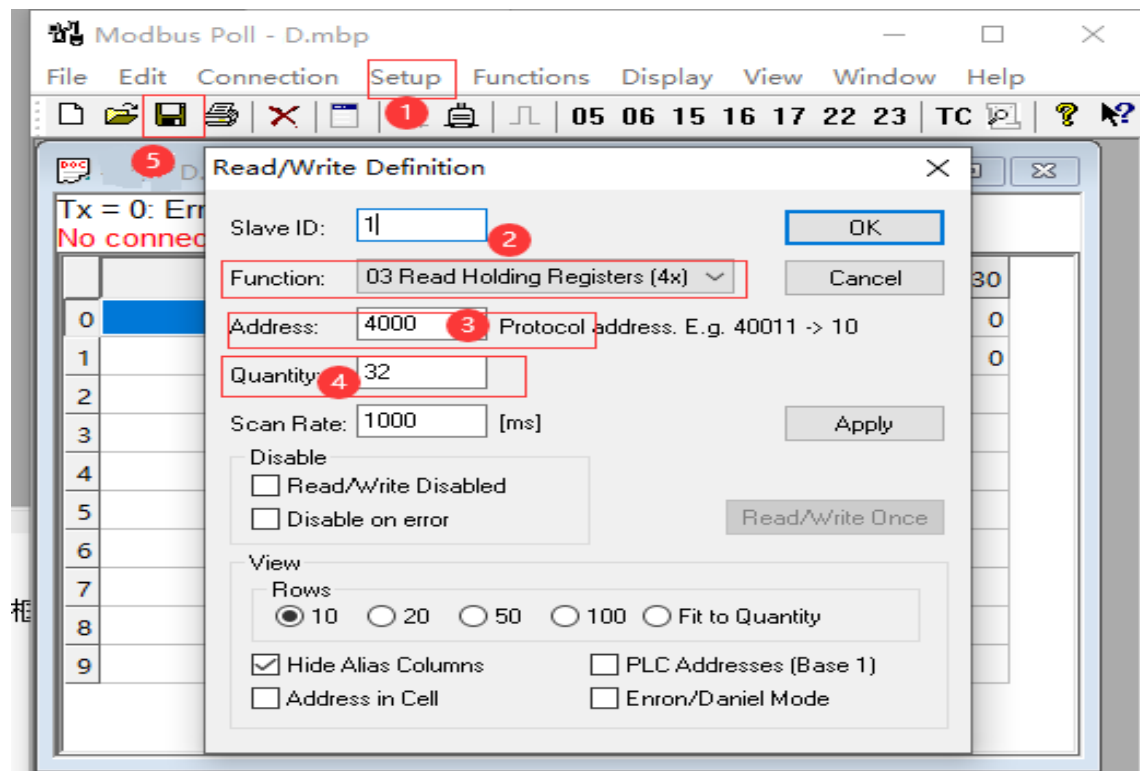
Operation steps description: (1) After logging in by selecting the device to be configured (in this example, double-click the IP address: 192.168.1.250 to log in), select the same PLC protocol according to the PLC connected to D225, (2) According to the connection method between PLC and D225 , Select the link protocol, this example is that FX3U and D225 are connected through RS422 to RS232 line, so select serial port 1 (232), (3) this example selects Modbus TCP Server server protocol, the port number can be modified or defaulted, according to According to your own needs, (4) The serial port selection is consistent with the device link selection. The configuration of the serial port is configured according to the parameters of the PLC serial port. (5) The device network IP address can be modified according to your needs. (6) Click after configuration "Save parameters", after prompting that the save is successful, you need to click the "Restart" button or the D225 device is powered off and powered on again to make the modified configuration take effect

N

5.1.3 Use Modbus Poll tool to simulate the system to collect PLC data

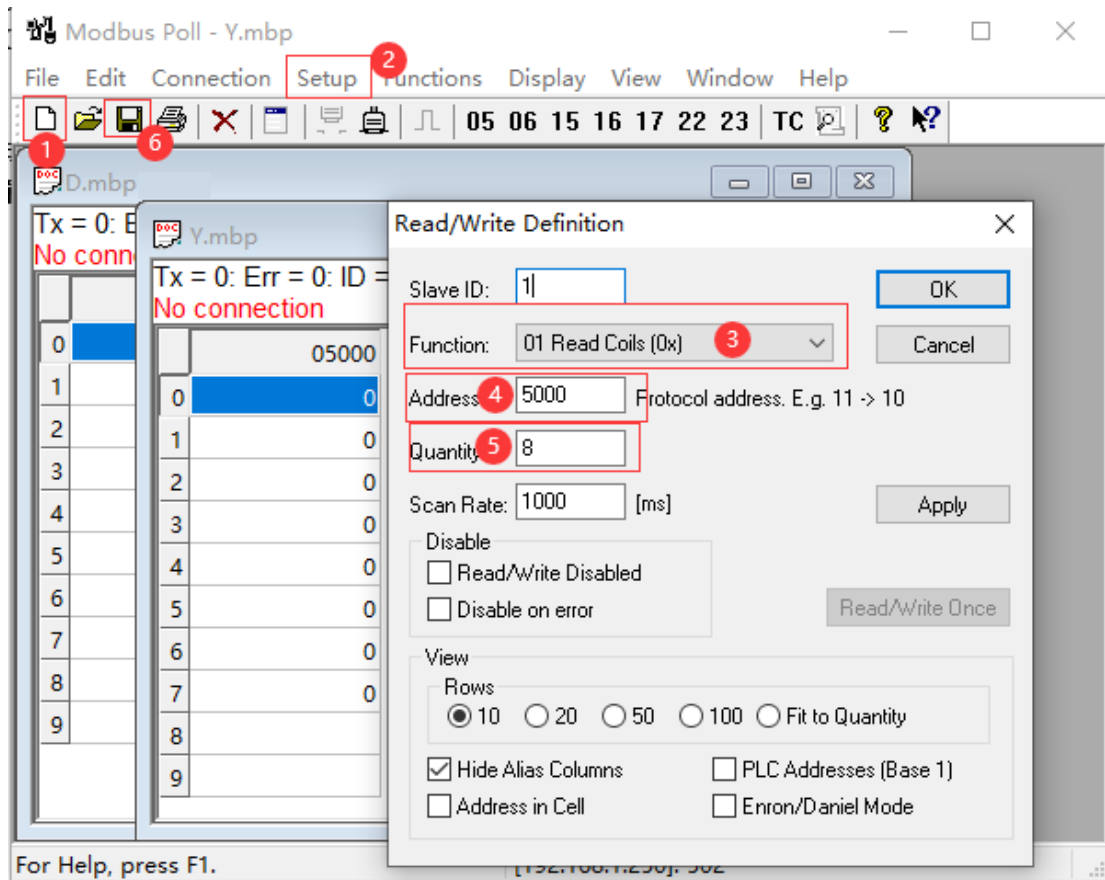
Modbus Poll tool is a very useful Modbus debugging tool, which can be downloaded from the Internet.

5.1.3.1 The data configuration of collecting PLC register D is as follows: collecting data of D0-D31



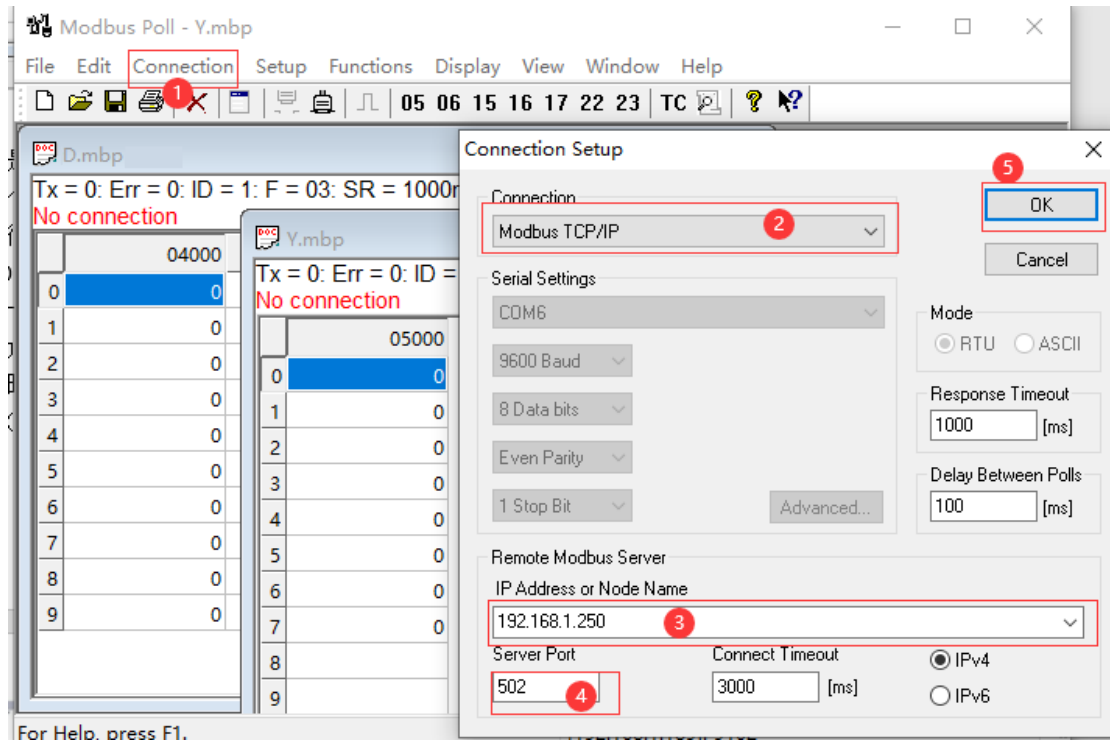
Operation instructions: (1) Open the "Modbus Poll" software, click "Setup" to pop up the configuration box, (2) "Slave ID" defaults to "1", because the register D is a numerical value, so select the function code as "03" (For details about the function codes used to collect PLC registers, please refer to [Appendix Mapping address of PLC register](#)), (3) The mapping address of Mitsubishi FX3U register D in the D225 device is 4000-11999, so the address cannot exceed 11999. This example collects D0- D31, so fill in 4000. (For the mapping address of PLC register corresponding to D225, see [Appendix Mapping address of PLC register](#)) (4) Collect the number of D225 mapping addresses, because D0-D31, there are 32 registers in total, so the number is "32", (5) Other setting items are default, you can also modify the configuration according to the requirements, click "OK" after configuration, and click the "Save" button to modify the file name

5.1.3.2 The data configuration of collecting FX3U output Y is as follows: collecting Y0-Y7



Operation instructions: (1) Because the data of Y is collected at the same time in the same project, click the New File button (same as ideal for collecting multiple registers in the same project to create as many files as you want, click on that file is right (2) Click on the newly created file, click "Setup" to pop up the configuration box, (3) "Slave ID" defaults to "1", because the data of Y is Boolean, so the function code It is "01", (for details of the function code used to collect the PLC register, please refer to [Appendix Mapping address of PLC register](#)) (4) The mapping address corresponding to the collection Y0-Y7 is 5000-5007, so the starting address is filled in "5000", (PLC The mapping address of the register corresponding to D225 is detailed in the [Appendix Mapping address of PLC register](#)) (5) Y0-Y7, there are 8 in total, so the number is filled in: "8" (6) Other setting items are default, and you can also modify the configuration according to requirements , Click "OK" after the configuration is complete, so that the collected data of Y is configured, click "Save" to modify the file name

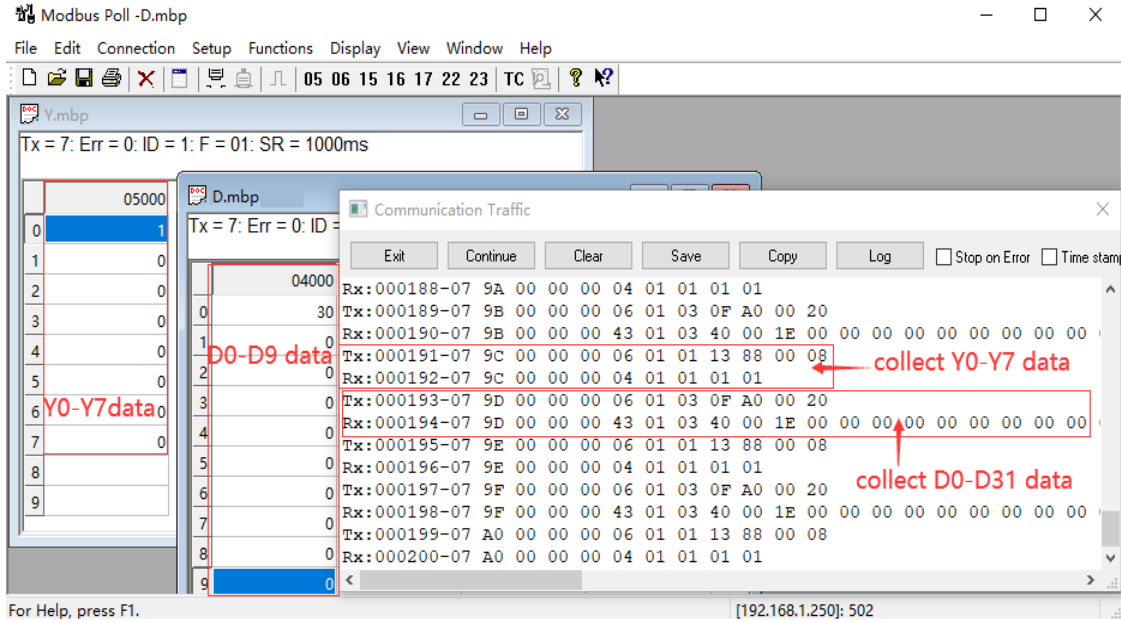
5.1.3.3 The communication connection configuration with D225 is as follows



Operation instructions: (1) Click "Connect..." of "Connection" to pop up the connection configuration box, (2) The communication protocol with D225 is: Modbus TCP, (3) Fill in the address of the D225 device, note: the address should be the same as [on the D225 configuration software The [IP address] configuration of the network settings is the same, (4) fill in the port number of the D225 device, note: the port number must be consistent with the [port] configuration of the [protocol parameter] on the configuration software, the port number here is not [service settings] [Port Number], (5) Other options can be defaulted or modified according to your own needs. Click "OK" to communicate with D225 to collect data on FX3U

5.1.3.4 Comparison of the data collected by Modbus Poll and the data checked by the programming software

The data collected by Modbus Poll is as follows (click "Communication" of "Display" to view the detailed data communication information)



From the Mitsubishi programming software query to compare the data of D0 and Y0 with the data collected by Modbus Poll, it is found that the data is consistent and there is no problem.

5.1.3.5 Description of the message format for collecting Mitsubishi FX3U data

Take the data of Y0-Y7 as an example, the mapping address of D225 device: 5000-5007, the number of collection: 8

Modbus Poll: Data sent TX: 07 9C 00 00 00 06 01 01 13 88 00 08

- 07 High bit of transaction identifier
- 9C transaction processing identifier low
- 00 High bit of protocol identifier
- 00 low bit of protocol identifier
- 00 High byte of the length of the byte following
- 06 Low byte of the length of the following byte

- 01 D225 device address
- 01 Read the function code of the register
- 13 High bit of start address
- 88 Low bit of start address
- 00 The high number of acquisitions
- 08 The low number of acquisitions

D225 device returns data RX: 07 9C 00 00 00 04 01 01 01 01

- 07 High bit of transaction identifier
- 9C transaction processing identifier low
- 00 High bit of protocol identifier

5.2 Data acquisition of Siemens PLC

Take Siemens S7-200SMART as an example, communicate with D225 equipment through RS485, server protocol selection: Modbus TCP Server, acquisition output Q and variable register VW.

5.2.1 S7-200 SMART And D225 device connection

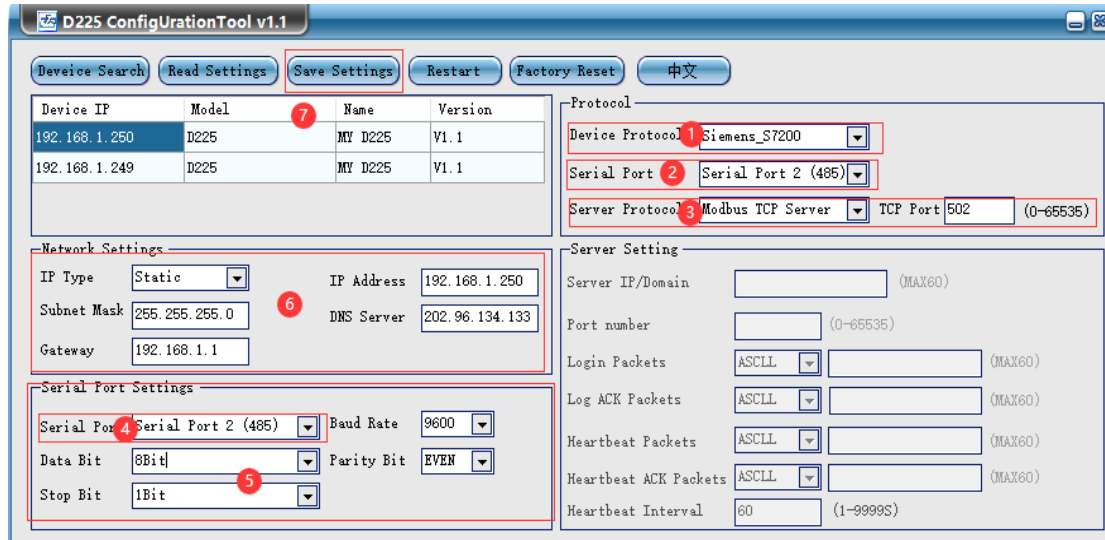


Note: 1. The example in the figure is directly connected to the D225 device through the RS485 line. Note that the data A and B of the PLC RS485 port should correspond to the A and B of the RS485 interface of the D225

2. The network cable of D225 in the example shown in the figure is connected to the router and in the same local area network as the computer.

Connection instructions: (1) D225 equipment power cord (12V/1A), (2) D225 equipment network cable connected to the router, (3) and (4) connected via RS485 line, Siemens PLC RS485 interface connected to D225 equipment RS485 Interface, (5) Siemens PLC power cord

5.2.2 D225 Configuration SW configuration



The screenshot shows the 'D225 ConfigurationTool v1.1' interface. At the top, there are buttons for 'Device Search', 'Read Settings', 'Save Settings', 'Restart', 'Factory Reset', and '中文'. Below these is a table with columns 'Device IP', 'Model', 'Name', and 'Version'. The first row is selected, showing IP 192.168.1.250, Model D225, Name MY D225, and Version V1.1. To the right of the table is a 'Protocol' section with dropdown menus for 'Device Protocol' (Siemens_S7200), 'Serial Port' (Serial Port 2 (485)), and 'Server Protocol' (Modbus TCP Server). Below the table are three sections: 'Network Settings' with fields for IP Type (Static), IP Address (192.168.1.250), Subnet Mask (255.255.255.0), Gateway (192.168.1.1), and DNS Server (202.96.134.133); 'Serial Port Settings' with fields for Serial Port (Serial Port 2 (485)), Baud Rate (9600), Data Bit (8Bit), Parity Bit (EVEN), and Stop Bit (1Bit); and 'Server Setting' with fields for Server IP/Domain, Port number, Login Packets, Log ACK Packets, Heartbeat Packets, Heartbeat ACK Packets, and Heartbeat Interval (60).

Note: 1. To modify the configuration, you need to log in to the configuration software, and only configure after selecting the device to be configured

2. After modifying the configuration information, you need to click "Save parameters". After prompting that the save is successful, click the "Restart" button to restart the device or the D225 device is powered off, restarted, and the modified configuration can take effect

Operation instructions: (1) After selecting the device to be configured and logging in (in this example, double-click the IP address: 192.168.1.250 to log in), select the same PLC protocol according to the PLC connected to D225. Because the data of Siemens S7-200SMART is collected, the device protocol selects Siemens S7-200SMART protocol (2) Selects RS485 connection with D225 device (3) Server protocol selection: Modbus TCP Server (4) Because PLC passes RS485 Connect with D225, so the serial port selection must be RS485 (5) Configure RS485 parameters to be consistent with Siemens S7-200SMART's RS485 serial port parameters, baud rate: 9600, data bits: 8 bits, parity bit: EVEN, stop bit: 1 bit (6) Whether to modify the IP configuration according to your own needs, you can specify the IP or automatically obtain the IP (7) After modifying the configuration information, click to save the parameters, and click Read parameters to read the configuration information to see if it is what you need Configure, after clicking to save the parameters, click the "Restart" button to restart the device or the device is powered off, power on again, and the modified configuration information can take effect.

5.2.3 Use Modbus Poll tool to simulate the system to collect PLC

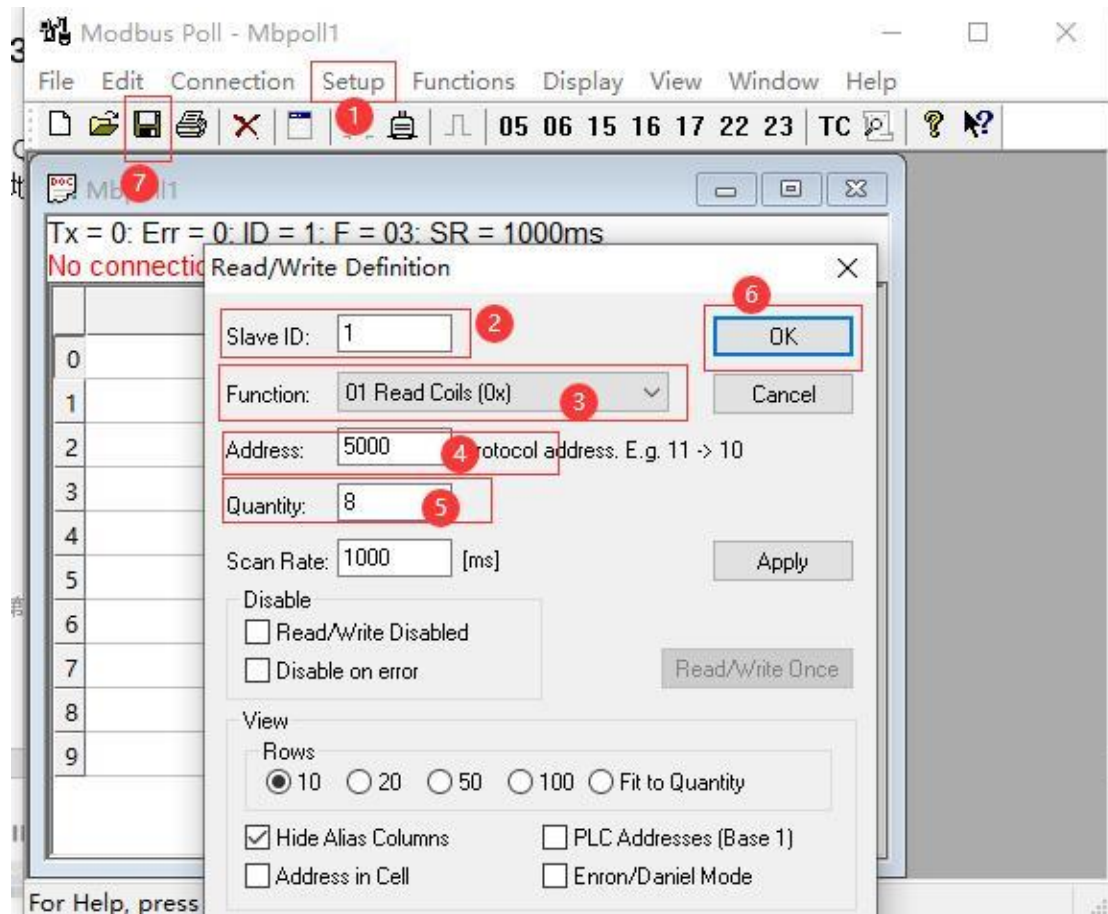
data

Modbus Poll tool is a very useful Modbus debugging tool, which can be downloaded from the Internet.

5.2.3.1 Data configuration of acquisition output Q

Collect the data of Q0.0-Q0.7, the corresponding D225 mapping address is: 5000-5007, (the

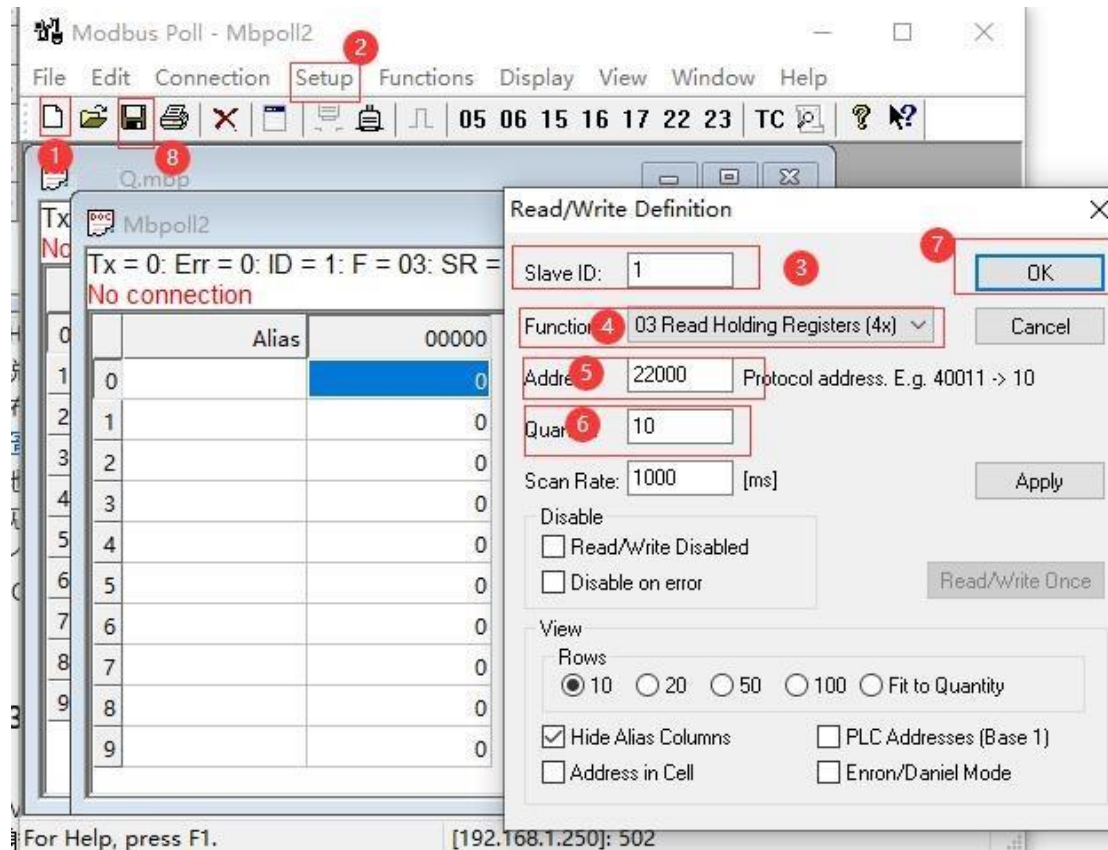
mapping address of PLC register corresponding to D225 is detailed in the Appendix Mapping address of PLC register) configuration is as follows:



Operating instructions: (1) Open the "Modbus Poll" software, open and click "Setup" to pop up the configuration box, (2) "Slave ID" defaults to "1", (3) Because the output Q is Boolean data, select the function code It is "01" (see [Appendix Mapping address of PLC register](#) for details about the function code used to collect the PLC register), (4) Siemens S7-200 SMART output point Q0.0-Q0.7 data, corresponding to D225 mapping address: 5000-5007, so fill in the starting address as: 5000, (For details about the mapping address of PLC register corresponding to D225, please refer to the [Appendix Mapping address of PLC register](#)) (5) Collect the number of D225 mapping addresses, because Q0.0-Q0.7, a total of 8 Therefore, fill in the number as "8", (6) Other setting items are default, you can also modify the configuration according to the requirements, click "OK" after configuration, (7) Click the "Save" button to modify the file name

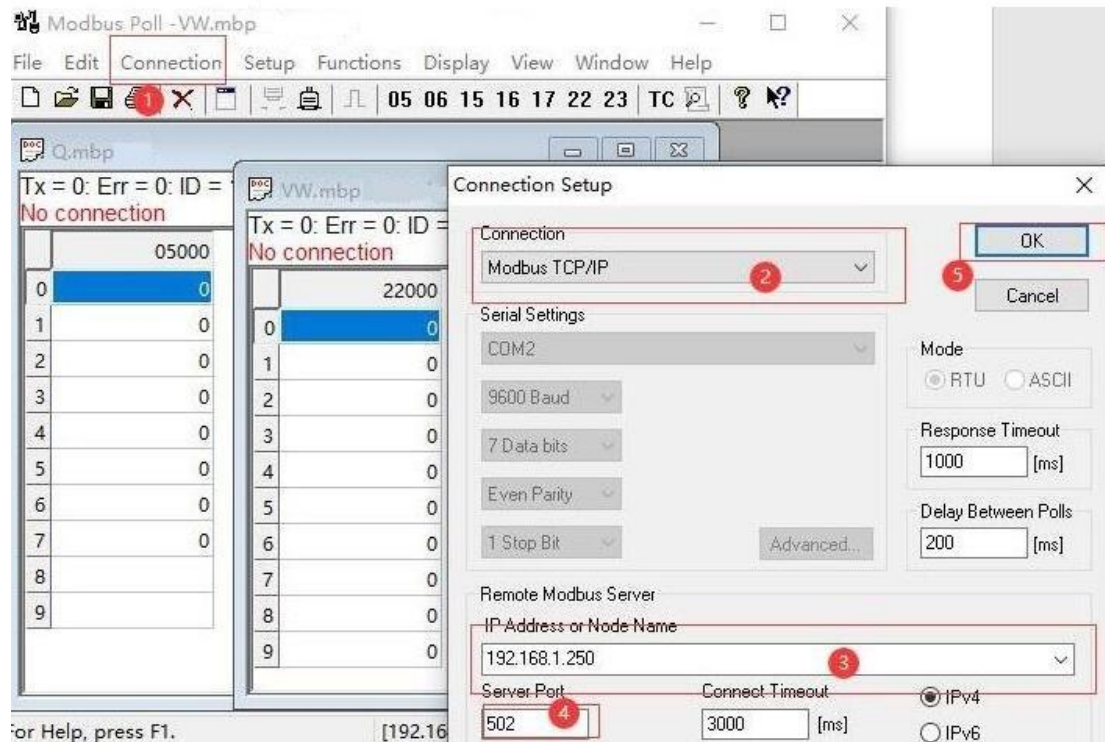
5.2.3.2 Data configuration of acquisition variable register VW

Collect the data of VW0-VW9, the mapping address corresponding to D225 is: 22000-22009, (the mapping address of PLC register corresponding to D225 is detailed in the [Appendix Mapping address of PLC register](#)) The configuration is as follows



Operation instructions: (1) Click the New File button, because the data of the variable register VW is collected at the same time under the same project, so click the New File button (similarly, if you want to collect multiple registers in the same project, you can create as many (2) Click the newly created file (which is the Mbpoll2 file in the figure), click "Setup" to pop up the configuration box, (3) "Slave ID" defaults "1", (4) Because the VW data is a 16-bit data type, the function code is "03". (For details on the function code used to collect PLC registers, please refer to the [Appendix Mapping address of PLC register](#)) (5) Collect VW0 -The mapping address corresponding to VW9 is 22000-22009, so fill in "22000" in the starting address, (for the mapping address of PLC register corresponding to D225, please refer to the [Appendix Mapping address of PLC register](#)) (6) VW0-VW9, there are 10 in total, so fill in the number "10" (7) Other configuration defaults, click "OK", so that the collected VW data is configured, (8) click "Save" to modify the file name

5.2.3.3 Communication connection configuration with D225



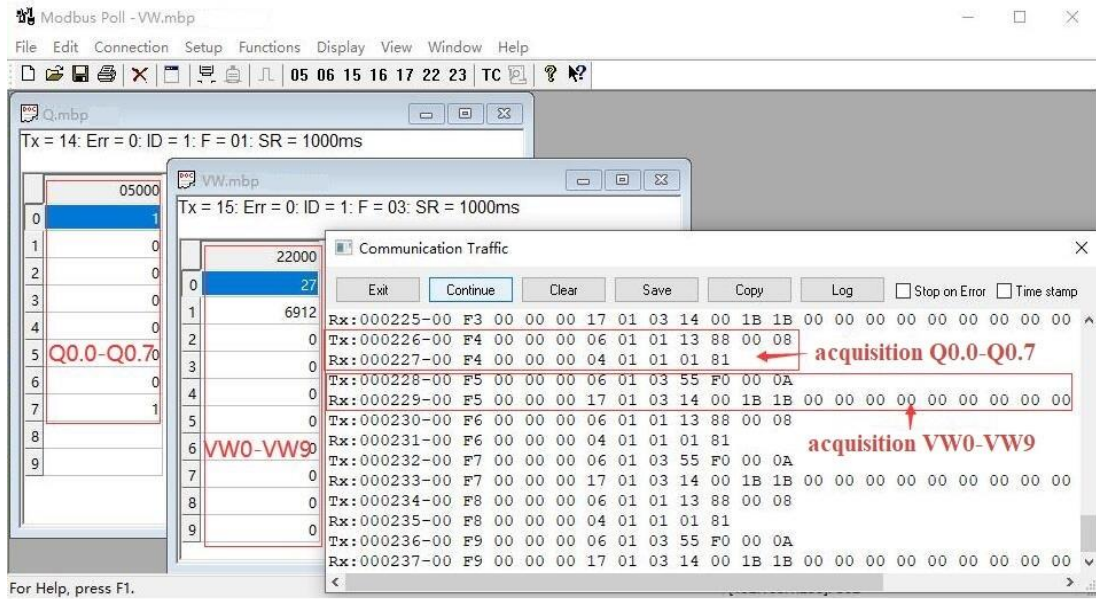
Operation instructions: (1) Click "Connect..." of "Connection" to pop up the connection configuration box, (2) The communication protocol with D225 is: Modbus TCP, (3) fill in the address of the D225 device, **note: the address should be the same as the [on the D225 configuration software The [IP address] configuration of the network settings is the same,** (4) fill in the port number of the D225 device, **note: the port number must be consistent with the [port] configuration of the [protocol parameter] on the configuration software, the port number here is not [service settings] [Port Number],** (5) Other options can be defaulted or modified according to your own needs. Click "OK" to communicate with D225 and collect data on S7-200 SMART

5.2.3.4 Comparison of the data collected by Modbus Poll and the data checked by the programming software

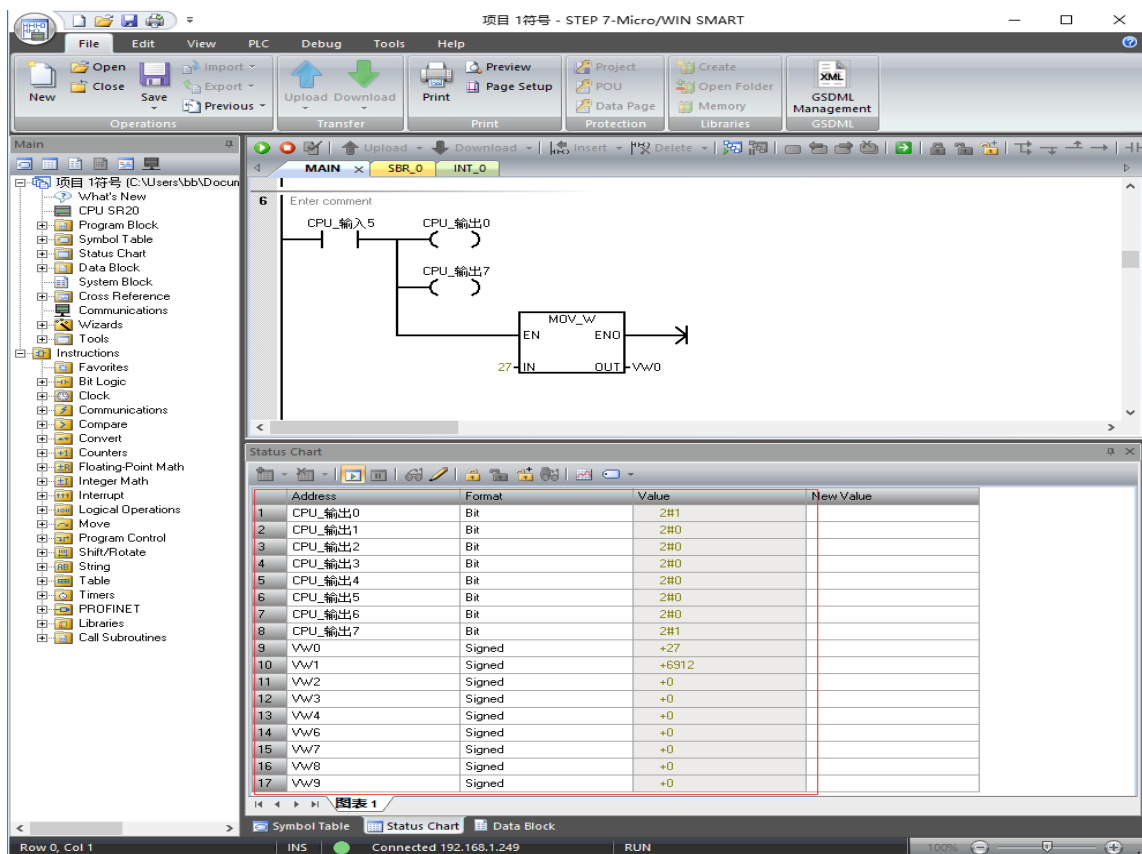
The data collected by Modbus Poll is as follows (click "Communication" of "Display" to view the detailed data communication information)



PLC Data acquisition protocol conversion gateway -D225



Programming software query data as follows



The data collected by Modbus Poll is exactly the same as the data seen on the programming software



5.2.3.5 The description of data message format for collecting

Siemens S7-200 SMART

Take the data of Q0.0-Q0.7 as an example, the mapping address of the D225 device: 5000-5007, the number of collections: 8

Modbus Poll: Data sent TX: 00 F4 00 00 00 06 01 01 13 88 00 08

00 transaction processing identifier high bit

0F transaction processing identifier low

00 High bit of protocol identifier

00 low bit of protocol identifier

00 High byte of the length of the byte following

06 Low byte of the length of the following byte

01 D225 device address

01 Read the function code of the register

13 High bit of start address

88 Low bit of start address

00 The high number of acquisitions

08 The low number of acquisitions

D225 device returns data RX: 00 F4 00 00 00 04 01 01 01 81

00 high bit of transaction identifier

F4 transaction processing identifier low bit

00 High bit of protocol identifier

00 low bit of protocol identifier

00 High byte of the length of the byte following

04 Low byte of the length of the following byte

01 D225 device address

01 Read the function code of the register

01 Number of data bytes behind

81 data (Q0.0-Q0.7 data)

Take the data of VW0-VW9 as an example, the mapping address of D225 device: 22000-22009, the number of collections: 10

Modbus Poll: Data sent TX: 00 F5 00 00 00 06 01 03 55 F0 00 0A

00 high bit of transaction identifier

F5 transaction processing identifier low bit

00 High bit of protocol identifier

00 low bit of protocol identifier

00 High byte of the length of the byte following

06 Low byte of the length of the following byte

01 D225 device address

03 Read the function code of the register

55 High bit of start address



F0 start address low
00 The high number of acquisitions
0A Low order of acquisition quantity

D225 device returns data RX: 00 F5 00 00 00 17 01 03 14 00 1B 1B 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 high bit of transaction identifier
F5 transaction processing identifier low bit
00 High bit of protocol identifier
00 low bit of protocol identifier
00 High byte of the length of the byte following
17 Low byte of the length of the following byte
01 D225 device address
03 Read the function code of the register
14 Number of data bytes behind
00 VW0 data high bit
1B Low bit of VW0 data
1B VW1 data high bit
00 Low bit of VW1 data
.....
00 VW9 High bit of data
00 VW9 Low bit of data

5.3 Three-phase multi-function meter data collection

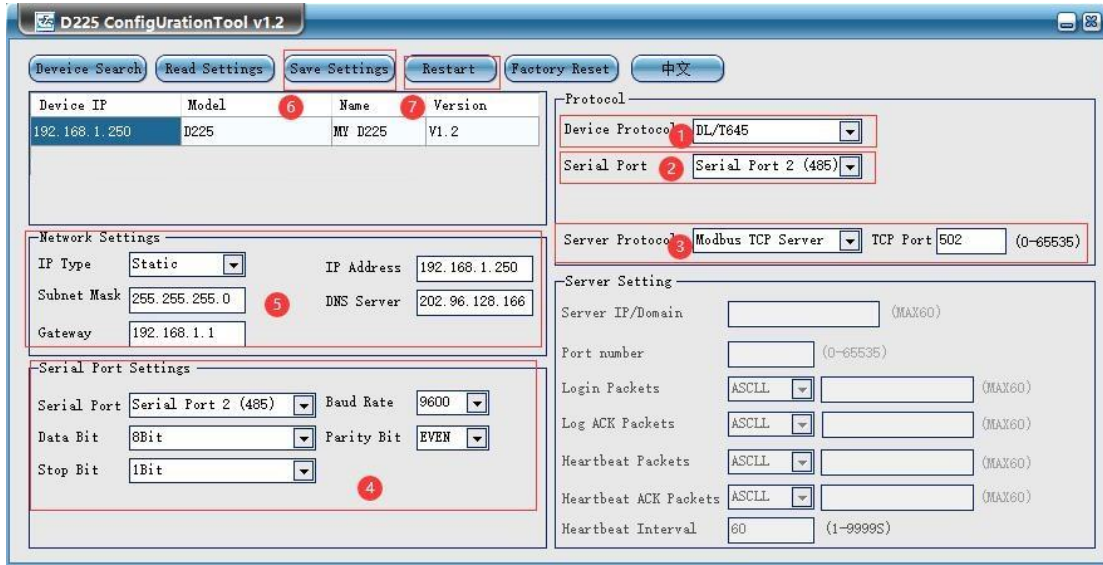
D225 equipment supports DL/T645-1997 and DL/T645-2007 protocol to Modbus protocol, and supports up to 100 DL/T645-1997 or 100 DL/T645-2007 protocol international electric meter devices, and only supports the meter address 000000000000-000000000099 The meter is connected to the RS485 port of the D225 device to convert the data collected by the meter into Modbus TCP protocol, which is convenient for docking with PLC, DCS system, SCADA system and other upper computers, and can also be converted to Modbus RTU protocol. Data is transferred to the cloud platform.

5.3.1 D225 Configuration SW of configuration

Take the DL/T645-2007 protocol electric meter, the server protocol Modbus TCP Server as an example, the D225 configuration software configuration is as follows:

To modify the configuration of the configuration software, you need to log in to the configuration software, select the device to be configured and log in before configuring

After modifying the configuration, you need to click [Save Parameters]. After saving successfully, click the "Restart" button to restart the device or the D225 device is powered off, power on and restart, and the modified configuration can take effect.



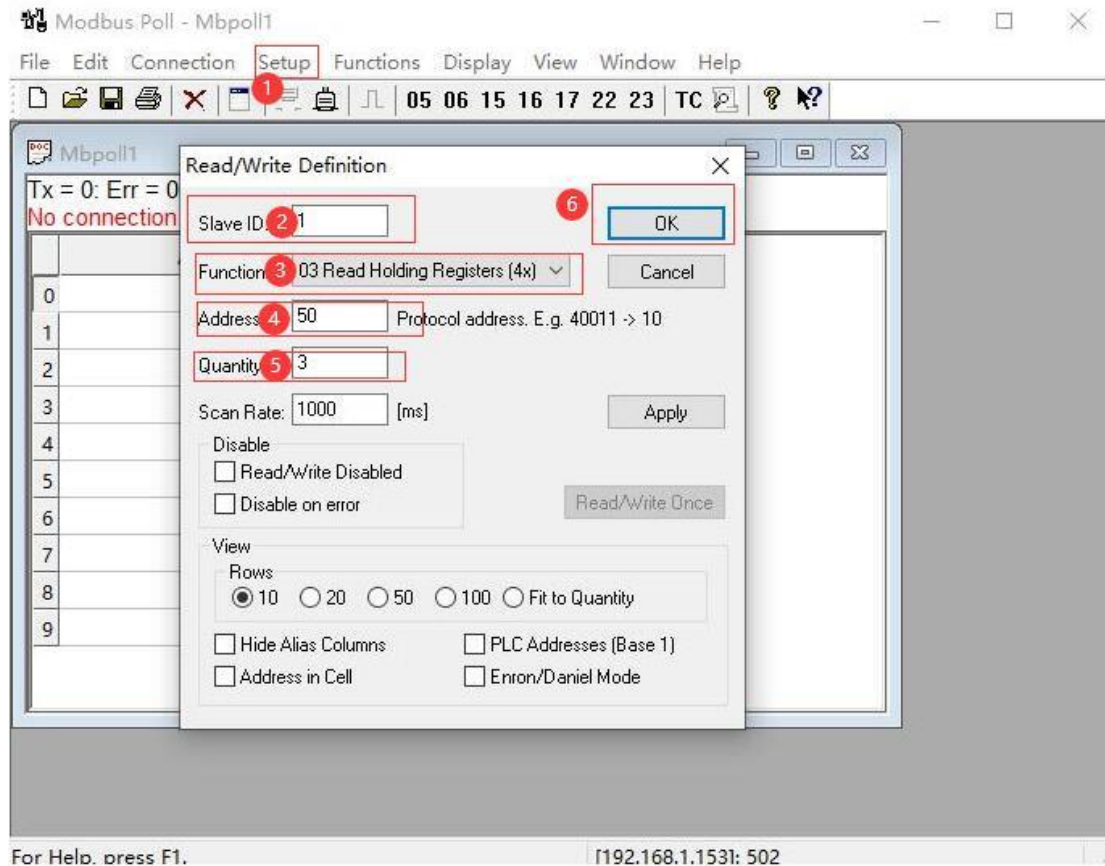
Operation instructions: (1) After logging in to the device that needs to be configured (in this example, double-click the IP address: 192.168.1.250 to log in), select the device protocol, whether it is an electricity meter with DL/T645-1997 or DL/T645-2007 protocol, select The device protocol is DL/T645 protocol, (2) Because the D225 device and the meter are connected through RS485, so choose the serial port 2 (485), (3) This example takes Modbus TCP Server protocol as an example, so choose Modbus TCP Server The default number is "502" or you can modify it according to your needs. If you want to send data to the cloud platform, you can choose our company's Jin Geyun 2.0 or Jin Geyun 3.0 or Modbus RTU Over TCP. (4) Select RS485 for the serial port. The configuration information is configured according to the meter RS485 port parameters. (5) D225 device You can choose to automatically obtain the IP address settings or specify the IP address according to your own needs. (6) After configuring the configuration information, click "Save parameters", (7) Click "Save parameters", and click "Restart" or The D225 device is powered off, power on and restarted, and the modified configuration can take effect.

5.3.2 Use Modbus Poll tool to simulate the system to collect data from three-phase multi-function meters

Modbus Poll tool is a very useful Modbus debugging tool, which can be downloaded from the Internet.

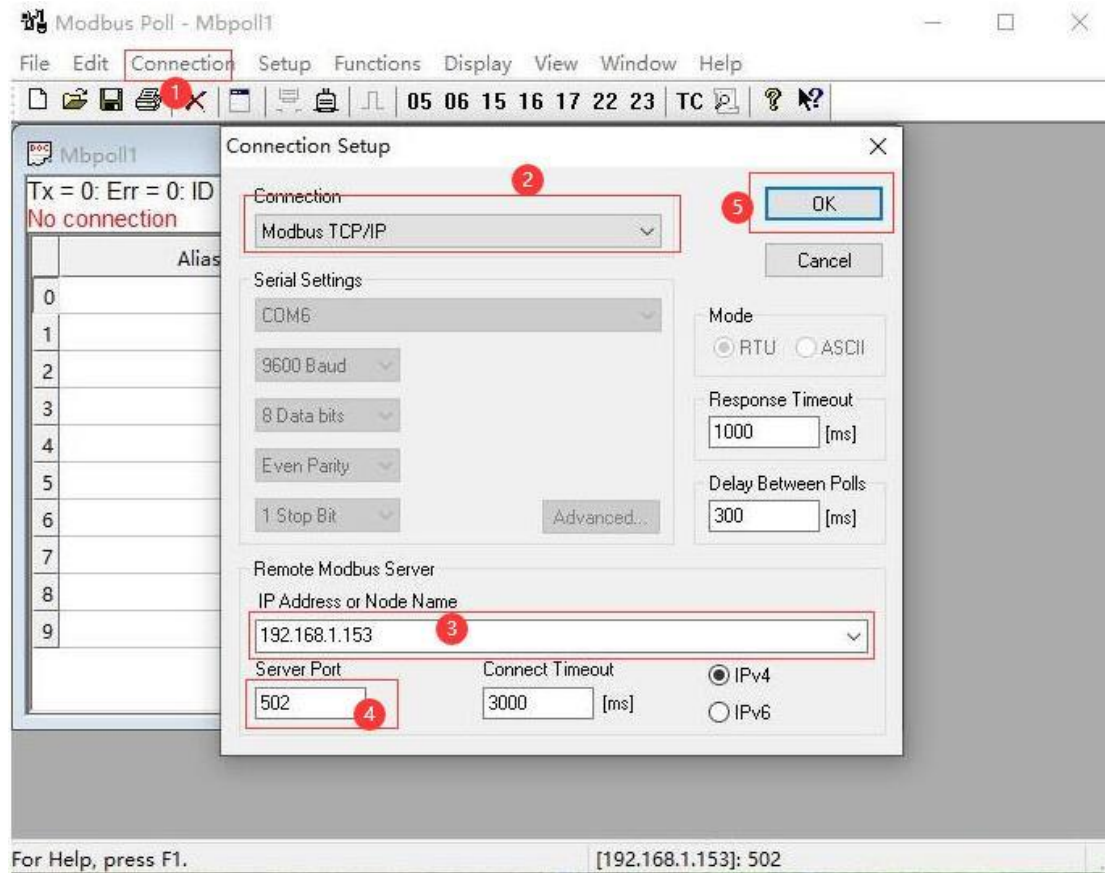
Take the A-phase, B-phase, and C-phase voltage of the electric meter, the communication address of the electric meter is "000000000000" as an example, the corresponding D225 mapping address is: 50-52, and the specific mapping address corresponding to D225 is shown in [Appendix Mapping address corresponding to three-phase multi-function meter](#)

✧ The Modbus Poll tool data point configuration is as follows



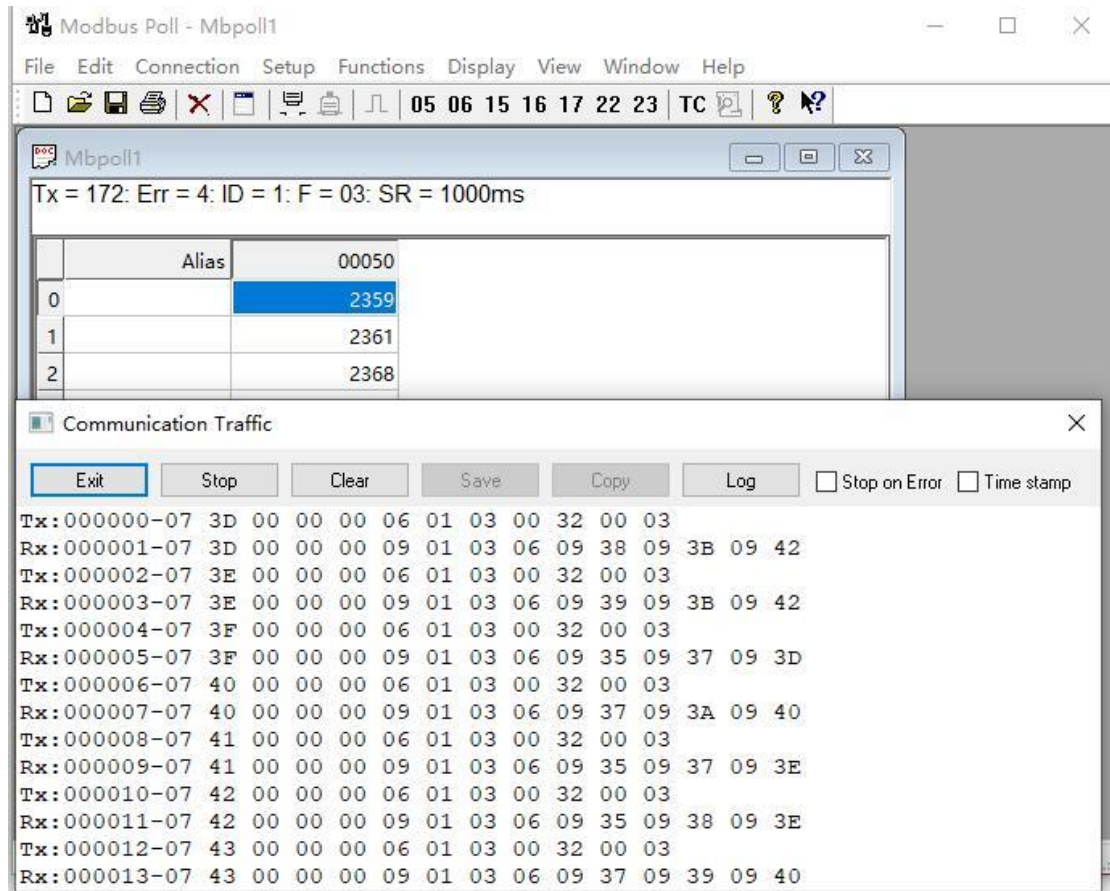
Operation instructions: (1) Open the "Modbus Poll" software, click "Setup" to pop up the configuration box, (2) "Slave ID" is filled in according to the meter number, the meter number of the DL/T645-2007 protocol meter in this example is "1" (3) Select the function code to be "03" (the function codes for collecting the data of the electric meter are all "03"), (4) The address of the electric meter in this example is "000000000000", the protocol of the electric meter is DL/T645-2007, Therefore, the corresponding D225 mapping address for phase A, B, and C voltage of the meter is: 50-52, so the starting address is filled in: 50, (for the mapping address of the meter corresponding to D225, please refer to [Appendix Mapping address corresponding to three-phase multi-function meter](#)), (5) Collect the number of D225 mapping addresses, because 50-52, there are 3 in total, so the number is filled in as "3", (6) Other setting items are default, you can also modify the configuration according to the requirements, click "OK" after configuration Can

✧ The Modbus Poll tool connection configuration is as follows



Operation instructions: (1) Click the "Connect..." of "Connection" to pop up the connection configuration box, (2) The communication protocol with D225 is: Modbus TCP, (3) Fill in the address of the D225 device, note: the address should be the same as D225 The [IP address] configuration of [Network Settings] on the configuration software is the same. (4) Fill in the port number of the D225 device. Note: The port number must be consistent with the [Port] configuration of the [protocol parameter] on the configuration software. The port here No. is not the [port number] of [Service Settings], (5) Other options can be defaulted or modified according to your needs. Click "OK" to communicate with D225 to collect data on the three-phase meter

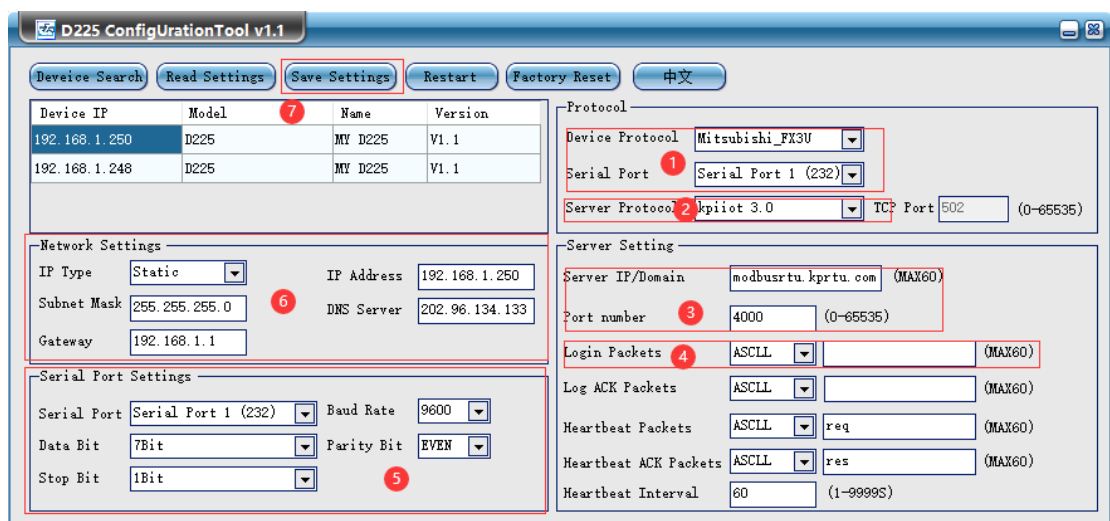
- ✧ The data collected by Modbus Poll is as follows (click "Communication" of "Display" to view the detailed data communication information)



5.4 Connect to the cloud platform application instructions

Take the connection to the King Pigeon (KPIOT) 3.0 platform as an example, the PLC selection is Mitsubishi FX3U, which is connected through the RS232 interface of the D225 device

5.4.1 D225 Configuration SW of configuration





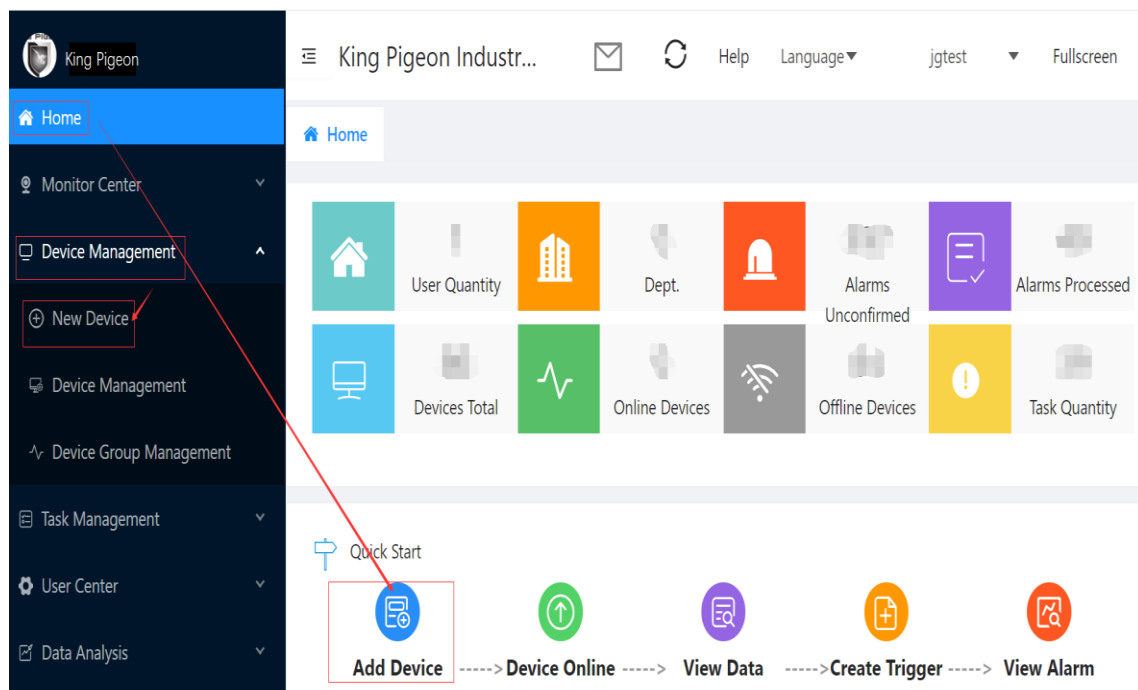
Note: To modify the configuration, you need to log in to the configuration software, select the device to be configured before configuring

Operation instructions: (1) After logging in by selecting the device to be configured (in this example, double-click the IP address: 192.168.1.250 to log in), PLC selection is FX3U, so choose Mitsubishi FX3U for device protocol, serial port 1 (232) for device link, (2) choose Jingeyun 3.0 for server protocol, (3) choose Jingeyun 3.0 for server protocol The system defaults and does not need to be modified. (4) For the registration code, please contact the sales representative of King Pigeon. The heartbeat packet and heartbeat response can be left blank or filled. According to your own needs, the company's Jin Ge 3.0 platform is fixed The heartbeat packet and the heartbeat response packet are respectively: "req" and "res", (5) The serial port configuration is filled in according to the serial port parameters of FX3U, (6) The IP address is modified according to your own needs, (7) After the configuration, click "Save parameters" ", after the save is successful, click the "Restart" button to restart or the D225 device is powered off, power on again, and restart.

5.4.2 King Pigeon (KPIOT 3.0) Platform configuration

5.4.2.1 New device

For the login user name and password of the company' s KPIOT 3.0 platform, please contact the sales representative of Golden Pigeon Technology. After logging in to the Golden Pigeon 3.0 platform, click the "Add Device" icon for quick access on the "Homepage" or click "Device Management". New equipment" to configure some information of D225 equipment and set up D225 equipment to collect PLC data points, as shown below






King Pigeon Industrial IOT V3.0

Home x New Device x

* Device Id: 1

Product Name: 2 Protocol:

* Device Name: 3

Icon:  4 5

* Overtime Time: 4 Seconds

* Device Address: 5

Overtime Time Must Exceed The Collection Time, Otherwise Device Will Offline Frequently.

Operation steps description: (1) Fill in the registration code (the registration code obtained from the sales representative of King Pigeon), (2) After filling in the registration code, the server communication protocol and product name will be automatically displayed here, (3) The device name is filled in according to your needs, The icon can also be modified, click "modify" to select the icon, (4) fill in the timeout time according to the collection period and your own needs, (5) fill in the address of the D225 device, select from the map below

Establish and collect PLC data points, as follows

Some data points will be automatically generated when filling in the registration code, you can add new data points or delete the generated data points yourself



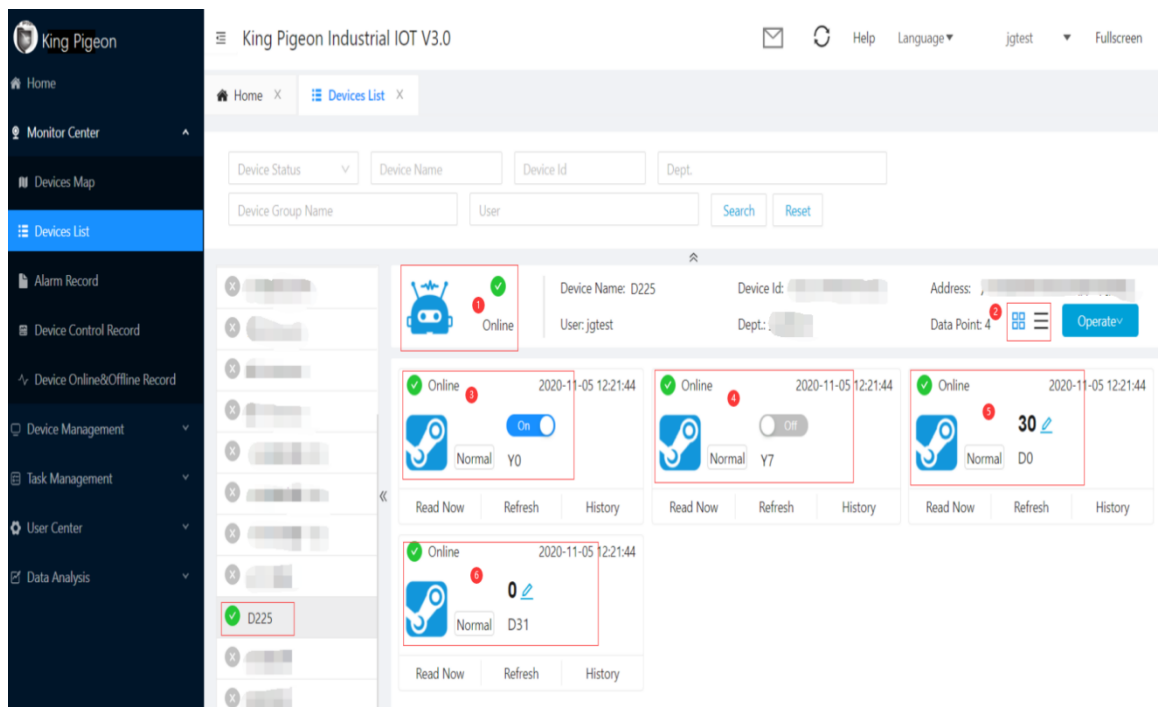
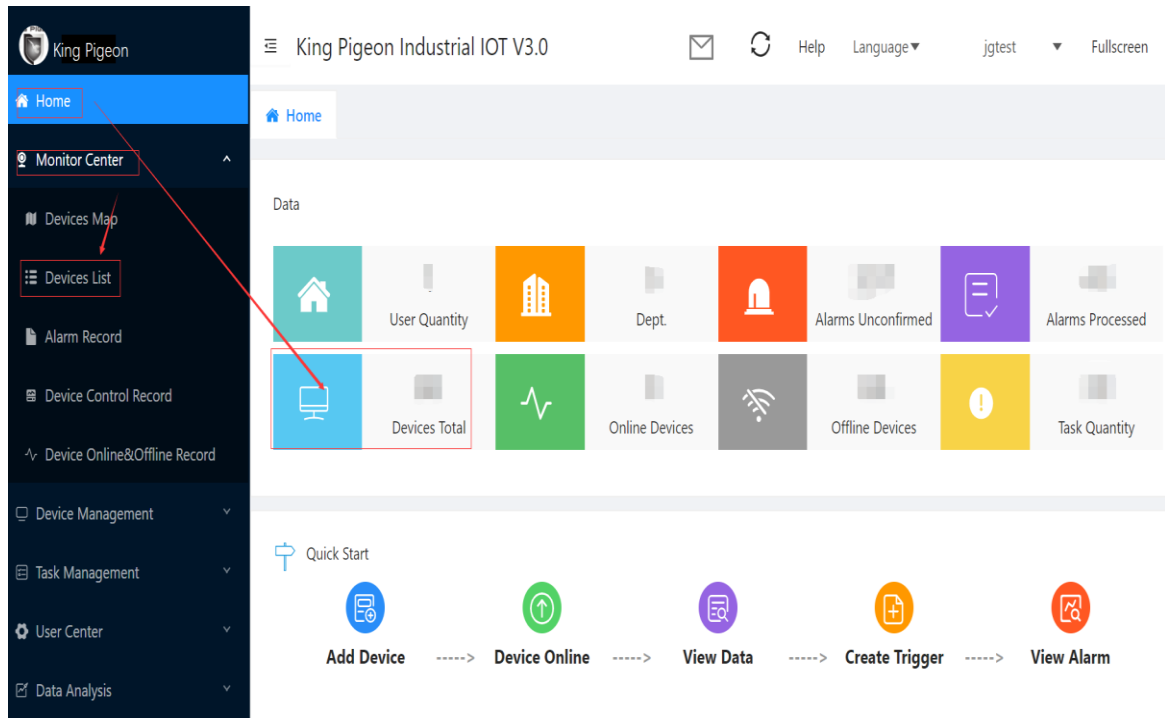
PLC Data acquisition protocol conversion gateway -D225

Icon	Data Name	Unit	Slave Address	Function Code	Register Address	Data Format	Data Bit	Byte Order	Decimal Digits	Minimum Value	Maximum Value	Minimum Original Value	Maximum Original Value	Collect Or Not	Collection Cycle	Operate
	Y0		1	R&W Switch (01/05)	5000	Bool								Yes	30	Delete
	Y7		1	R&W Switch (01/05)	5007	Bool								Yes	30	Delete
	D0		1	R&W Registers (03/06)	4000	16-Bit Signed Integer		AB	0	0	0	0	0	Yes	30	Delete
	D7		1	R&W Registers (03/06)	4031	16-Bit Signed Integer		AB	0	0	0	0	0	Yes	30	Delete

Operation instructions: (1) Add new collected data points, which can be added single or multiple, (2) Name the collected data points, (3) The slave address is the ID of the D225 device, the defaults to "1" , (4) Select the register type according to the value type of the data point to be collected. For details, [see Appendix Mapping address of PLC register](#). (5) The register address is to fill in the mapping address of D225. For details, [see Appendix Mapping address of PLC register](#). (6) According to Fill in the data format of the data to be collected. (7) The storage order of 16-bit data bytes processed by the D225 device is AB, and the byte order of 32-bit data is ABCD. Choose the byte order according to how many bits of data are collected. (8) You can freely choose whether To collect this data point, (9) fill in the collection period according to your needs, (10) if you don't need this collected data point, you can click Delete to delete this collected data point, (11) The decimal point is based on the data type and how many decimal places you need to fill in. The data unit is filled in according to your own needs. The data bit is the data that is read and written by bit. The minimum, maximum, minimum original value and maximum original value are used for sensor data amplification or Zoom out, configure the configuration of the data points you want to collect, and click "confirm".

5.4.2.2 Monitor D225 equipment to collect PLC data points

Click the "Device List" in the "Monitoring Center" or click the "Total Device Icon" in the "Homepage" to check whether the D225 device is connected to the Golden Pigeon 3.0 platform, as shown below



Explanation: (1) You can see whether the device D225 is online, (2) You can choose the arrangement of the collected data points, (3) Collect the data of FX3U output Y0, from the figure you can see that Y0 is closed, (4) Collect the data of FX3U output Y7, (5) Collect the data of FX3U register D0, (6) Collect the data of FX3U register D31

5.4.2.3 Modify the collection point

If you want to add or modify the collected points again, the operation is as follows



PLC Data acquisition protocol conversion gateway -D225

King Pigeon Industrial IOT V3.0

Home | Devices List | Device Management

Device Status | Device Name | Device Id | Dept. | User

Create Time | Search | Reset | New

Status	Device Name/Address	Device Id	Dept.	User	Protocol	Create Time	Expire Date	Operate
⊗	[blurred]	[blurred]	[blurred]	jgtest	MODBUS RTU	2020-11-03 14:3...	2025-11-02	Details Edit Delete
⊗	[blurred]	[blurred]	[blurred]	jgtest	MODBUS RTU	2020-10-23 14:2...	2025-08-26	Details Edit Delete
⊙	D225	[blurred]	[blurred]	jgtest	MODBUS RTU	2020-10-21 19:4...	2025-10-22	Details Edit Delete
⊗	[blurred]	[blurred]	[blurred]	jgtest	MODBUS RTU	2020-10-16 14:5...	2020-12-15	Details Edit Delete

Hidden Map:

Add Batch Add

Note: Eg: The sensor output is 10 times the real value, here the minimum, maximum, minimum original value, maximum original value need to be filled in 0-1-0-10 in this order.

Icon	Data Name	Unit	Slave Address	Function Code	Register Address	Data Format	Data Bit	Byte Order	Decimal Digits	Minimum Value	Maximum Value	Minimum Original Value	Maximum Original Value	Collect Or Not	Collection Cycle	Operate
	Y0		1	R&W Switch (01/05)	5000	Bool								Yes	30	Delete
	Y7		1	R&W Switch (01/05)	5007	Bool								Yes	30	Delete
	D0		1	R&W Registers (03/06)	4000	16-Bit Signed Integer		AB	0	0	0	0	0	Yes	30	Delete
	D31		1	R&W Registers (03/06)	4031	16-Bit Signed Integer		AB	0	0	0	0	0	Yes	30	Delete

Total 4 Records < 1 >

Cancel Ok

Operation instructions: (1) Click "Device Management" of "Device Management", (2) Find the corresponding device according to the device name/address and device serial number, click "Edit" on the right, (3) pop up the edit box, click Add Data points or batch addition can add new collected data points or modify previous data points. The procedure for adding a new data point is the same as the method of establishing a data point when creating a new device. After adding or modifying the previous data point, click "OK".

5.5 Remote debugging of Mitsubishi PLC program

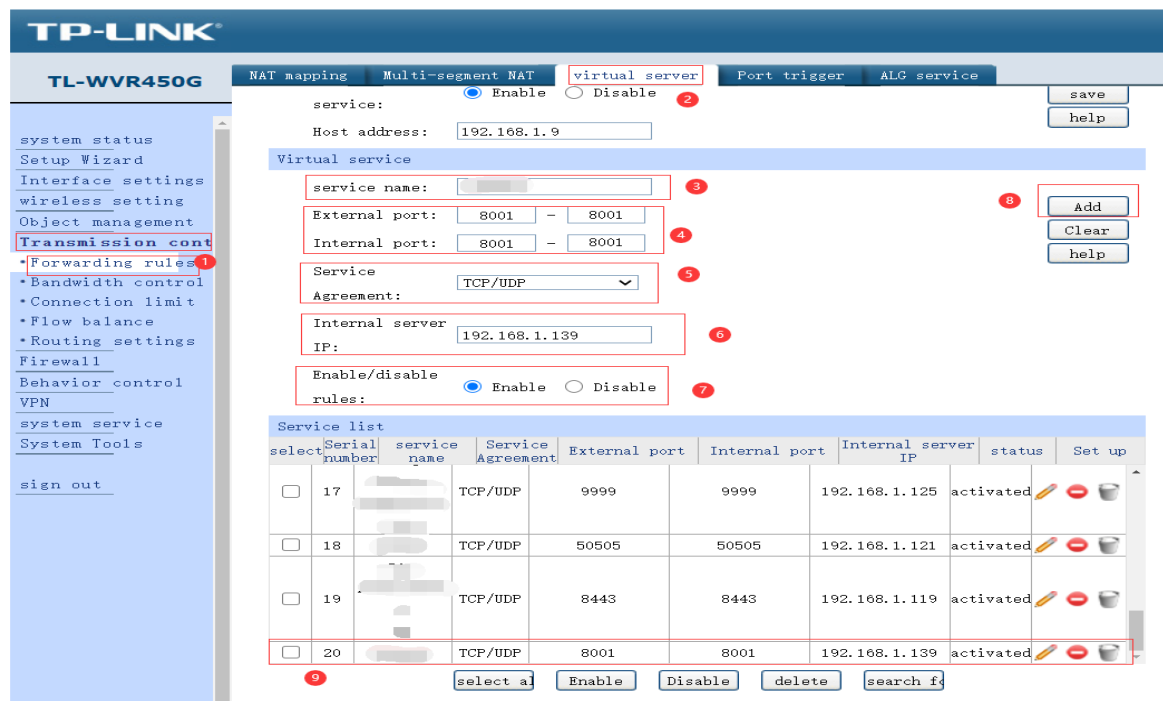
The main purpose is to realize remote debugging of Mitsubishi PLC program functions through the transparent server protocol, which can reduce a large number of travel and time costs. Use the transparent server protocol to be used in conjunction with the company's virtual serial port software. D225 configuration software configuration selects the transparent transmission server protocol, the server IP address configuration is to open the Mitsubishi programming software computer to map the IP address of the external network, the port number is the port number of the external network to map, use the company's virtual serial software to create a virtual COM port For the computer that opens the Mitsubishi programming software, the Mitsubishi PLC programming software communicates through the created virtual COM port to realize remote debugging of the Mitsubishi PLC program

Take remote debugging of Mitsubishi FX3U as an example:

✧ Mapping the port number setting of external network

Use the port forwarding of the router to map the computer that needs to open the Mitsubishi programming software debugging program into a server, which can be connected to by the device.

Take the TP-LINK router as an example.



The screenshot shows the TP-LINK router's web interface for configuring a virtual server. The 'virtual server' tab is selected. The configuration form includes the following fields and values:

- service: Enable Disable
- Host address: 192.168.1.9
- Virtual service:
 - service name: [redacted]
 - External port: 8001 - 8001
 - Internal port: 8001 - 8001
 - Service: TCP/UDP
 - Agreement: [redacted]
 - Internal server IP: 192.168.1.139
 - Enable/disable: Enable Disable

Below the form is a 'Service list' table:

select	Serial number	service name	Service Agreement	External port	Internal port	Internal server IP	status	Set up
<input type="checkbox"/>	17	[redacted]	TCP/UDP	9999	9999	192.168.1.125	activated	[edit] [delete] [trash]
<input type="checkbox"/>	18	[redacted]	TCP/UDP	50505	50505	192.168.1.121	activated	[edit] [delete] [trash]
<input type="checkbox"/>	19	[redacted]	TCP/UDP	8443	8443	192.168.1.119	activated	[edit] [delete] [trash]
<input type="checkbox"/>	20	[redacted]	TCP/UDP	8001	8001	192.168.1.139	activated	[edit] [delete] [trash]

Operation steps description: (1) Log in to the router, click on the "forwarding rules" of "Transmission Control", (2) click on "Virtual Server", (3) fill in the service name according to your needs, (4) use the external port for device connection, The internal port is used as the external port to forward data to the local computer, (5) the service protocol selects "TCP/UDP", (6) the internal server IP fills in the computer's internal network IP, (7) selects "Enable", (8) Click "Add" to complete the mapping of external network port settings. (9) Newly added configurations are displayed in the service list, such as the newly added ones are displayed in "20"

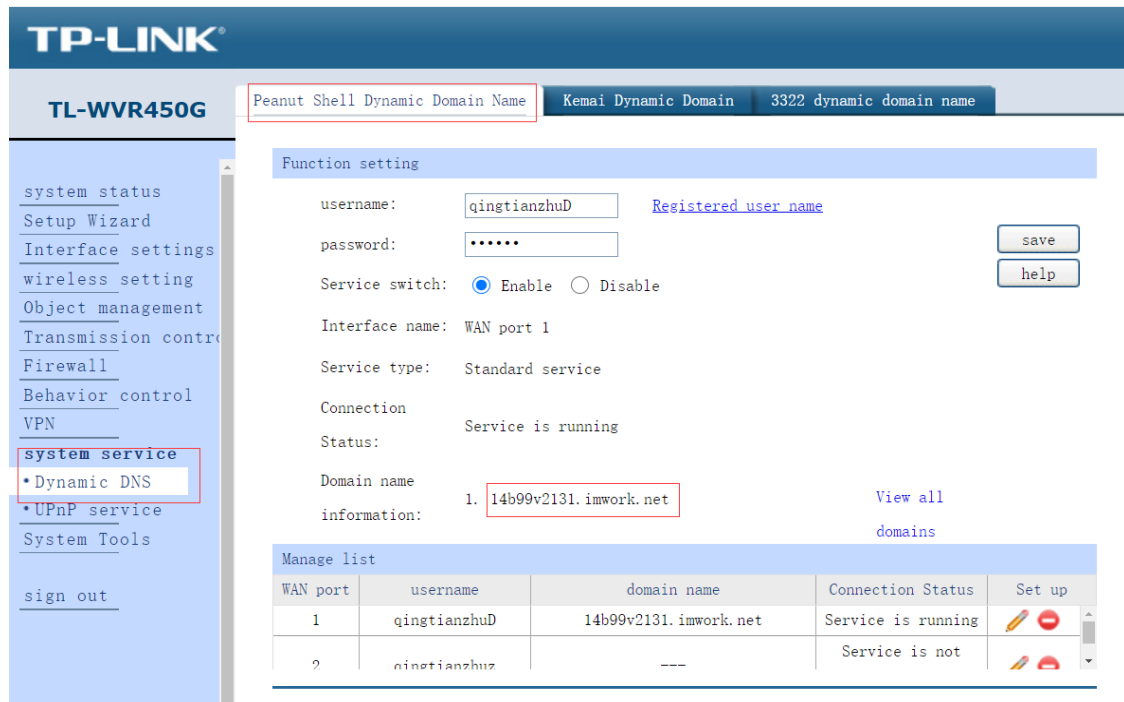
✧ Find the domain name corresponding to the external network IP on the router

Because the IP address of the external network is a dynamic address and changes, in order to facilitate the D225 device to maintain communication with the server using a dynamic domain

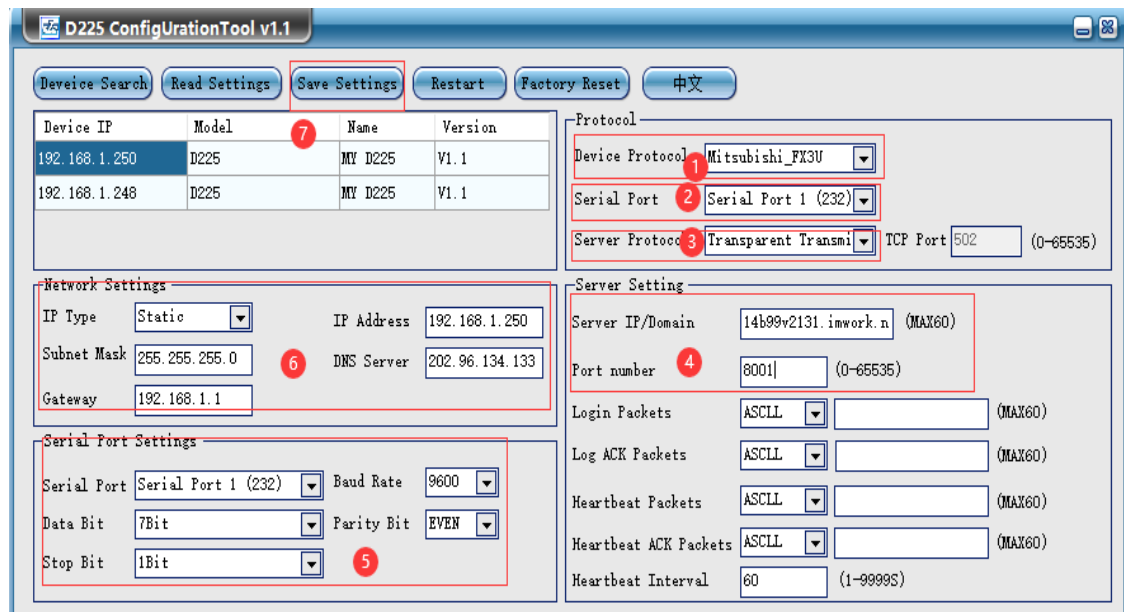


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name, the changed external network IP address has only one fixed domain name. The domain name can be a peanut shell dynamic domain name, a Kemai dynamic domain name or a 3322 dynamic domain name, which can be registered according to the needs of customers.



◇ D225 Configuration SW as below

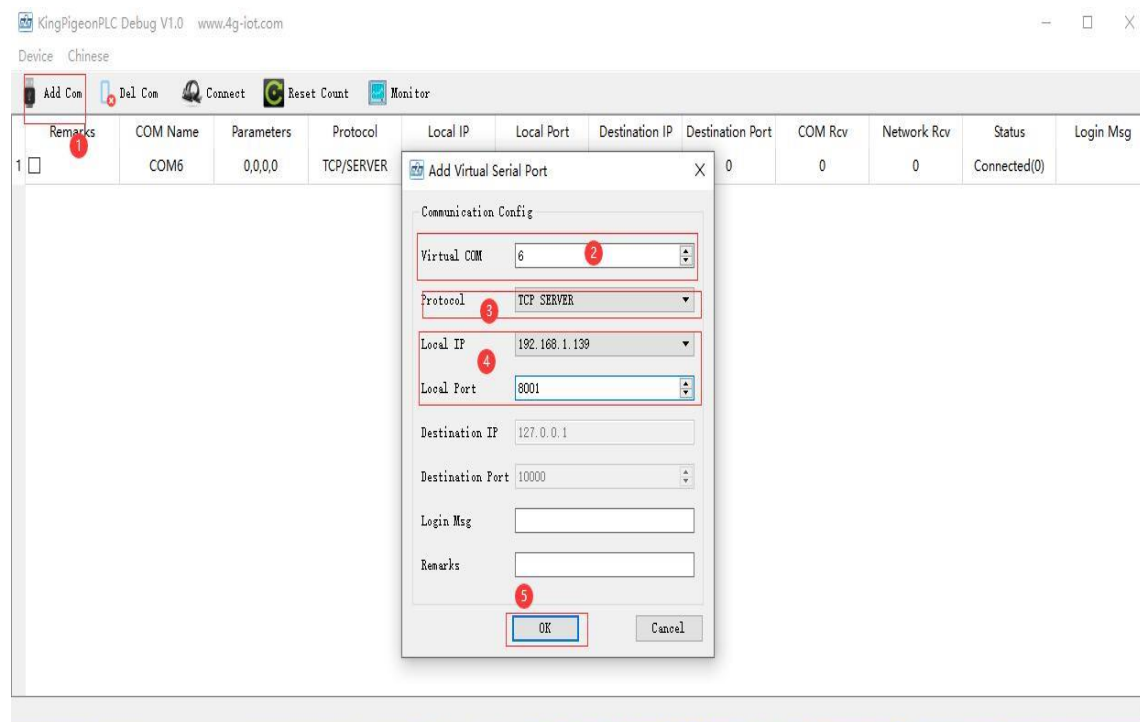


Note: To modify the configuration, you need to log in to the configuration software, select the device to be configured before configuring

Operating instructions: (1) After logging in to the device that needs to be configured (in this example, double-click the IP address: 192.168.1.250 to log in), according to the PLC type, select the device protocol. Because Mitsubishi FX3U is used as an example, choose Mitsubishi FX3U, (2) choose 232 for serial port connection, (3) choose transparent transmission for server protocol, (4) server IP/domain name is the IP address corresponding to the computer that opened the

Mitsubishi programming software The domain name of the Internet IP address (as shown in the figure is the peanut shell dynamic domain name of the router system service), the port number is the port number of the internal port mapped to the external port when configuring the router virtual server (the external port number), (5) serial port configuration Fill in the parameters according to the parameters of the serial port connected to Mitsubishi FX3U, (6) IP address configuration, according to your own needs, whether to modify it, (7) **After configuration, you need to click save parameters, and click the "restart" button to restart the device or D225 device after the save is successful Power off, power on and restart, the modified configuration will take effect**

✧ The company's virtual serial port software configuration is as follows



Operating instructions: (1) Open the virtual serial port software,click the"English", click the "Add" button, (2) According to the computer that opened the Mitsubishi programming software, and the unused COM port, fill in by yourself, (3) Select TCP SERVER for the communication protocol, (4) Configure the internal IP address and port number of the router virtual server when the IP address and port number are used, (5) Click "Apply" to do it

✧ After configuring the configuration of D225 configuration software and virtual serial port software, remote debugging can be realized.

Mitsubishi programming software realizes remote debugging operation steps as follows:

Operation instructions: (1) Open the Mitsubishi programming software, create a project, click the connection target, and select the COM port configured by the virtual software as the COM port. (2) Click "Communication Test", (3) If remote debugging is possible, the "CPU Model" will be displayed, and communication is not possible, and communication failure will be prompted.

6 Restore factory setting

When D225 needs to be restored to the factory, there are two methods:

1. Through the configuration SW settings

Click "Restore Factory" → "Save Parameters" → click "Restart" button or "Restart device after power off".

2. Via the reset button

Under normal operating conditions, use a slender thimble to keep pressing RESET for more than 3 seconds until all 3 LEDs are on and then release. Need to power off and restart.



7 Firmware upgrade

This device supports the function of directly upgrading the firmware through the TTL port. If you have any new requirements to upgrade the firmware, please contact us.

8 Warranty

- 1) This device will be repaired free of charge for any material or quality problems within one year from the date of purchase.
- 2) This one-year warranty does not cover any product malfunctions caused by man-made damage or improper operation.

9 Technical Support

Shenzhen King Pigeon Hi-tech Co.,Ltd.

Tele: 0755-29451836

Webiste: <http://www.4g-iot.com>



Appendix Mapping address of PLC register

This device supports Mitsubishi PLC and Siemens PLC protocol conversion to Modbus protocol function, and can collect and map PLC data to the device through RS485/RS232. The following is a table of various PLC mapping registers;

Modbus address mapped by Mitsubishi FX-3U register

PLC Register type	PLC data range	Type of data	Device Mapping address	Support function code
Input contact X	X0~X377	On-off type	0~255	01
Output contact Y	Y0~Y377	On-off type	5000~5255	01、 05
Timer contact TS	T0~T511	On-off type	10000~10511	01、 05
Counter contact CS	C0~C255	On-off type	12000~12255	01、 05
State relay S	S0~S4095	On-off type	14000~18095	01、 05
auxiliary relay M	M0~M7679	On-off type	34000~41679	01、 05
Special Relay SM	M8000~M8511	On-off type	54000~54511	01
Timing register T	T0~T511	numeric type	0-511	03、 06
Counter register C	C0~C199	numeric type	2000-2199	03、 06
Counter register (32 bit)	C200~C255	numeric type	52000~52111	03、 06
Register D	D0~D7999	numeric type	4000-11999	03、 06
Special register SD	D8000-D8511	numeric type	16000-16511	03
Extension register R	R0~R32767	numeric type	18000~50767	03、 06
Regsiter D(for 32 bit use)	D0-D7999	numeric type	54000-61999	03、 06

Note: In order to be compatible with all PLC types of Mitsubishi, a maximum of 32 mapping addresses can be collected at a time for various registers

Modbus address mapped by Mitsubishi Fx-2N register:

PLC Register type	Type of data	Type of data	Device Mapping address	Support function code
Input contact X	X0~X377	On-off type	0~255	01



Output contact Y	Y0~Y377	On-off type	5000~5255	01、05
Timer contact TS	T0~T255	On-off type	10000~10255	01、05
Counter contact CS	C0~C255	On-off type	12000~12255	01、05
State relay S	S0~S999	On-off type	14000~14999	01、05
Auxiliary relay M	M0~M3071	On-off type	34000~37071	01、05
Special relay SM	M8000~M8255	On-off type	54000~54255	01
Timer register T	T0~T255	numeric type	0-255	03、06
Counter register C	C0~C199	numeric type	2000-2199	03、06
Counter register (32bit)	C200~C255	numeric type	52000~52111	03、06
Register D	D0~D7999	numeric type	4000-11999	03、06
Special Register SD	D8000-D8255	numeric type	16000-16255	03
Register D(for 32 bit use)	D0~D7999	numeric type	54000-61999	03、06

Note: In order to be compatible with all PLC types of Mitsubishi, a maximum of 32 mapping addresses can be collected at a time for various registers

Modbus address mapped by Mitsubishi Fx-1S register:

PLC Register type	Type of data	Type of data	Device Mapping address	Support function code
Input contact X	X0~X17	On-off type	0~15	01
Output contact Y	Y0~Y15	On-off type	5000~5013	01、05
Timer contact TS	T0~T63	On-off type	10000~10063	01、05
Counter contact CS	C0~C31	On-off type	12000~12031	01、05
State relay S	S0~S127	On-off type	14000~14127	01、05
Auxiliary relay M	M0~M511	On-off	34000~34511	01、05



		type		
Special relay SM	M8000~M8255	On-off type	54000~54255	01
Timing register T	T0~T63	numeric type	0-63	03、06
Counter register C	C0~C31	numeric type	2000-2031	03、06
Counter register (32 bit)	C235-C255	numeric type	52070-52111	03、06
Register D	D0~D255	numeric type	4000-4255	03、06
Special Register SD	D8000-D8255	numeric type	16000-16255	03
Register D(for 32 bit use)	D0~D255	numeric type	54000-54255	03、06

Note: In order to be compatible with all PLC types of Mitsubishi, a maximum of 32 mapping addresses for each register collection at a time

Modbus address mapped by Mitsubishi Fx-3S register:

PLC Register type	Type of data	Type of data	Device Mapping address	Support function code
Input contact X	X0~X17	On-off type	0~15	01
Output contact Y	Y0~Y15	On-off type	5000~5013	01、05
Timer contact TS	T0~T137	On-off type	10000~10137	01、05
Counter contact CS	C0~C31	On-off type	12000~12031	01、05
State relay S	S0~S255	On-off type	14000~14255	01、05
Auxiliary relay M	M0~M1535	On-off type	34000~35535	01、05
Special relay SM	M8000~M8511	On-off type	54000~54511	01
Timing register T	T0~T137	numeric type	0-137	03、06
Counter register C	C0~C31	numeric type	2000-2031	03、06
Counter register (32 bit)	C200-C255	numeric type	52000-52111	03、06



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Register D	D0~D2999	numeric type	4000-6999	03、06
Special Register SD	D8000-D8511	numeric type	16000-16511	03
Register D(for 32 bit use)	D0~D2999	numeric type	54000-56999	03、06

Note: In order to be compatible with all PLC types of Mitsubishi, a maximum of 32 mapping addresses for each register collection at a time

Modbus address mapped by Siemens S7-200SMART register:

PLC Register type	Type of data	Type of data	Device Mapping address	Support function code
Input contact I	I0.0~I31.7	On-off type	0~255	01
Output contact Q	Q0.0~Q31.7	On-off type	5000~5255	01、05
Timer contact TS	T0~T255	On-off type	10000~10255	01
Counter contact CS	C0~C255	On-off type	12000~12255	01
State relay S	S0.0~S31.7	On-off type	14000~14255	01、05
auxiliary relay M	M0.0~M31.7	On-off type	20000~20255	01、05
Special relay SM	SM0.0~SM2047.7	On-off type	30000~46383	01
Timing register T	T0~T255	numeric type	20000-20255	03、06
Counter register C	C0~C255	numeric type	21000-21255	03、06
Temp registers VW	VW0~VW8190	numeric type	22000-30190	03、06
Analog input AIW	AIW0~AIW110	numeric type	42000-42055	03
Analog output AQW	AQW0~AQW110	numeric type	43000-43055	06
Variable register VD	VD0~VD8188	numeric type	44000-60377	03、06

Note: In order to be compatible with all PLC types of Siemens, various registers can collect at most 32 mapping addresses at a time.



Appendix Mapping address corresponding to three-phase multi-function meter

Mapping address corresponding to DL/T645-1997 protocol meter

Y: true value

X: The value stored in the register

"Y=X/100" means: "true value=value stored in the current register/100"

The function codes are all "03" instructions, register storage data format: big endian(ABCD)

DL/T645 meter address	Device mapping address	Data item name	type of data	unit	Description
000000000000	10000	Total positive power	32bit int	kWh	Y=X/100
000000000000	10002	Positive active power point	32bit int	kWh	Y=X/100
000000000000	10004	Positive peak active power	32bit int	kWh	Y=X/100
000000000000	10006	Positive active power level	32bit int	kWh	Y=X/100
000000000000	10008	Positive active valley power	32bit int	kWh	Y=X/100
000000000000	10010	Total reverse active power	32bit int	kWh	Y=X/100
000000000000	10012	Reverse active power point	32bit int	kWh	Y=X/100
000000000000	10014	Reverse active peak power	32bit int	kWh	Y=X/100
000000000000	10016	Reverse active power level	32bit int	kWh	Y=X/100
000000000000	10018	Reverse active valley power	32bit int	kWh	Y=X/100
000000000000	10020	Total forward reactive power	32bit int	kVarh	Y=X/100
000000000000	10022	Positive reactive power point	32bit int	kVarh	Y=X/100
000000000000	10024	Forward peak reactive power	32bit int	kVarh	Y=X/100
000000000000	10026	Positive reactive power level	32bit int	kVarh	Y=X/100
000000000000	10028	Positive reactive valley electricity	32bit int	kVarh	Y=X/100
000000000000	10030	Reverse total reactive power	32bit int	kVarh	Y=X/100
000000000000	10032	Reverse reactive power point	32bit int	kVarh	Y=X/100
000000000000	10034	Reverse peak reactive power	32bit int	kVarh	Y=X/100
000000000000	10036	Reverse reactive power level	32bit int	kVarh	Y=X/100
000000000000	10038	Reverse reactive valley power	32bit int	kVarh	Y=X/100
000000000000	10040	Phase A voltage	16bit int	V	true value
000000000000	10041	Phase B voltage	16bit int	V	true value
000000000000	10042	Phase C voltage	16bit int	V	true value
000000000000	10043	Phase A current	16bit int	A	Y=X/100
000000000000	10044	Phase B current	16bit int	A	Y=X/100



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000000000000	10045	Phase C current	16bit int	A	Y=X/100
000000000000	10046	Instantaneous total active power	32bit int	KW	Y=X/10000
000000000000	10048	Instantaneous A-phase active power	32bit int	KW	Y=X/10000
000000000000	10050	Instantaneous B-phase active power	32bit int	KW	Y=X/10000
000000000000	10052	Instantaneous C-phase active power	32bit int	KW	Y=X/10000
000000000000	10054	Instantaneous total reactive power	16bit int	KW	Y=X/1000
000000000000	10055	Instantaneous phase A reactive power	16bit int	KW	Y=X/1000
000000000000	10056	Instantaneous B-phase reactive power	16bit int	KW	Y=X/1000
000000000000	10057	Instantaneous phase C reactive power	16bit int	KW	Y=X/1000
000000000000	10058	Total power factor	16bit int	—	Y=X/1000
000000000000	10059	A phase power factor	16bit int	—	Y=X/1000
000000000000	10060	B-phase power factor	16bit int	—	Y=X/1000
000000000000	10061	C-phase power factor	16bit int	—	Y=X/1000
000000000000	10062	Current total maximum demand for positive active power	32bit int	KW	Y=X/10000
000000000000	10064	Current total maximum demand for reverse active power	32bit int	KW	Y=X/10000
000000000000	10065-10099	Reserved address	—	—	—
000000000001	10100	Total positive power	32bit int	kWh	Y=X/100
....
000000000002	10200	Total positive power	32bit int	kWh	Y=X/100
....
000000000099	19900	Total positive power	32bit int	kWh	Y=X/100



Mapping address corresponding to DL/T645-2007 protocol meter

Y: true value

X: The value stored in the register

"Y=X/100" means: "true value=value stored in the current register/100"

The function codes are all "03" instructions, register storage data format: big endian(ABCD)

DL/T645 meter address	Device mapping address	Data item name	type of data	unit	Description
000000000000	0	Combination 1 total active power	32bit int	kWh	Y=X/100
000000000000	2	Combination 1 active tip power	32bit int	kWh	Y=X/100
000000000000	4	Combination 1 active peak power	32bit int	kWh	Y=X/100
000000000000	6	Combination 1 active power level	32bit int	kWh	Y=X/100
000000000000	8	Combination 1 active valley power	32bit int	kWh	Y=X/100
000000000000	10	Total positive power	32bit int	kWh	Y=X/100
000000000000	12	Positive active power point	32bit int	kWh	Y=X/100
000000000000	14	Positive peak active power	32bit int	kWh	Y=X/100
000000000000	16	Positive active power level	32bit int	kWh	Y=X/100
000000000000	18	Positive active valley power	32bit int	kWh	Y=X/100
000000000000	20	Total Reverse Active Power	32bit int	kWh	Y=X/100
000000000000	22	Reverse active power point	32bit int	kWh	Y=X/100
000000000000	24	Reverse active peak power	32bit int	kWh	Y=X/100
000000000000	26	Reverse active power level	32bit int	kWh	Y=X/100
000000000000	28	Reverse active valley power	32bit int	kWh	Y=X/100
000000000000	30	Total forward reactive power	32bit int	kWh	Y=X/100
000000000000	32	Positive reactive power point	32bit int	kVarh	Y=X/100
000000000000	34	Forward peak reactive power	32bit int	kVarh	Y=X/100
000000000000	36	Positive reactive power level	32bit int	kVarh	Y=X/100
000000000000	38	Positive reactive valley electricity	32bit int	kVarh	Y=X/100
000000000000	40	Reverse total reactive power	32bit int	kVarh	Y=X/100
000000000000	42	Reverse reactive power point	32bit int	kVarh	Y=X/100
000000000000	44	Reverse peak reactive power	32bit int	kVarh	Y=X/100



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000000000000	46	Reverse reactive power level	32bit int	kVarh	Y=X/100
000000000000	48	Reverse reactive valley power	32bit int	kVarh	Y=X/100
000000000000	50	Phase A voltage	16bit int	V	Y=X/10
000000000000	51	Phase B voltage	16bit int	V	Y=X/10
000000000000	52	Phase C voltage	16bit int	V	Y=X/10
000000000000	53	Phase A current	32bit int	A	Y=X/1000
000000000000	55	Phase B current	32bit int	A	Y=X/1000
000000000000	57	Phase C current	32bit int	A	Y=X/1000
000000000000	59	Instantaneous total active power	32bit int	KW	Y=X/10000
000000000000	61	Instantaneous A-phase active power	32bit int	KW	Y=X/10000
000000000000	63	Instantaneous B-phase active power	32bit int	KW	Y=X/10000
000000000000	65	Instantaneous C-phase active power	32bit int	KW	Y=X/10000
000000000000	67	Instantaneous total reactive power	32bit int	KW	Y=X/10000
000000000000	69	Instantaneous phase A reactive power	32bit int	KW	Y=X/10000
000000000000	71	Instantaneous B-phase reactive power	32bit int	KW	Y=X/10000
000000000000	73	Instantaneous phase C reactive power	32bit int	KW	Y=X/10000
000000000000	75	Instantaneous total apparent power	32bit int	KW	Y=X/10000
000000000000	77	Instantaneous phase A apparent power	32bit int	KW	Y=X/10000
000000000000	79	Instantaneous B-phase apparent power	32bit int	KW	Y=X/10000
000000000000	81	Instantaneous C-phase apparent power	32bit int	KW	Y=X/10000
000000000000	83	Total power factor	16bit int	—	Y=X/1000
000000000000	84	A phase power factor	16bit int	—	Y=X/1000
000000000000	85	B-phase power factor	16bit int	—	Y=X/1000
000000000000	86	C-phase power factor	16bit int	—	Y=X/1000
000000000000	87	Grid frequency	16bit int	Hz	Y=X/100



000000000000	88	Current total maximum demand for positive active power	32bit int	KW	$Y=X/10000$
000000000000	90	Current total maximum demand for reverse active power	32bit int	KW	$Y=X/10000$
000000000000	92-99	Reserved address	—	—	—
000000000001	100	Combination 1 total active power	32bit int	kWh	$Y=X/100$
....
000000000002	200	Combination 1 total active power	32bit int	kWh	$Y=X/100$
....
000000000099	9900	Combination 1 total active power	32bit int	kWh	$Y=X/100$