

# **KGW310X&320X Modbus Gateway user manual**

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***KYLAND***

## **KGW310X&320X Modbus gateway**

### **User manual**

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# 1 Product Introduction

Welcome to use the Kyland KGW310X&320X Modbus gateway, which has power redundancy, and it can realize mutual conversion between Modbus TCP and Modbus RTU/ASCII protocol. The KGW310X&320X Modbus gateway has dual power input with 2KV electromagnetic isolation protection built in the serial port.

**(Note: KGW310X&320X contains KGW3101、KGW3102 and KGW3204, the difference are explained separately in the text, no special explanation if same.)**

This chapter introduces the KGW3101, KGW3102 and KGW3204 Modbus gateway products, mainly including the following:

- Summary
- Packing list
- Product characteristics

## 1.1 Summary

KGW310X&320X Modbus gateway is a Modbus gateway with power redundancy, it can realize mutual conversion between Modbus TCP and Modbus RTU/ASCII protocols. It can access up to 16 TCP Master/Client device. Each serial port can manage up to 32 nodes. KGW310X&320X Modbus gateway device provides 2KV serial port isolation protection for each serial port, each RS-232/RS-422/RS-485 serial port can be configured separately as Modbus RTU or Modbus ASCII operating mode and different baud rates, and allows both types of networks to be integrated through one Modbus TCP of the Modbus gateway.

KGW310X&320X Modbus gateway supports two communication modes: transparent transmission mode and proxy mode. In transparent transmission mode, the gateway directly transforms the Modbus command between the Modbus TCP/ UDP / RTU. In proxy mode, the gateway proactively polls the Modbus slave device and stores the data in the gateway's memory. The Modbus master station can retrieve data from the Modbus slave device through the storage of the gateway.

## 1.2 Packing List

KGW310X&320X Modbus gateway packaging includes the following accessories:

- 1 KGW310X&320X Modbus gateway
- Installation user manual
- CD-ROM
- Qualified certificate

Description: If any of the above items are lost or damaged, please contact the sales representative.

## 1.3 Product characteristics

- Implement the mutual conversion between the Modbus TCP/UDP and the Modbus RTU/ASCII protocol
- KGW3101 Modbus has 1 100M electric port, 1 RS-232/RS-422/RS-485 serial port; KGW3102 Modbus has 1 100M electric port, 2 RS-232/RS-422/RS-485 serial ports; KGW Modbus has 2 100M electric ports, 2 RS-232/RS422/RS-485 serial ports.
- 16 TCP Master/Client device can be accessed through network port.
- Each serial port can manage 32 nodes.
- 15KV ESD protection circuit in the serial port.
- Serial port supports 2KV isolation protection

- Support HTTPS, SSH security configuration protocol
- Support redundant 12~48VDC power access
- Support one-click recovery function
- IP40 protection class
- CE, FCC, UL61010, CID2, RoHS certifications.

## 2 Learn the ABC

This chapter will provide basic operating instructions for the KGW310X&320X Modbus gateway installation, mainly including the following:

- Connect power supply
- Connect serial device
  - RS-485 terminal resistance
  - Connect to host or network
- LED indicator
- Dimension
- Pin defination
  - Network interface (RJ45)
  - Serial interface (DB9 male)
  - Power input interface
- Specifications
  - Network interface
  - Serial interface
  - Serial port communication parameter
  - Serial port signal
  - Software
  - LED INDICATOR
  - Button
  - Mechanical structure
  - Environment condition
  - Power requirment
  - Trade standard
  - Warranty

## 2.1 Connect power supply

KGW310X&320X Modbus gateway is powered by the power terminal connection to the power supply.

Connect power supply:

1. Unscrew or remove the screws on the power terminal;
2. Connect the 12-48VDC power cord to the power terminal;
3. Tighten the power cord with the screws on the power terminal.

Note: there is no power switch on the gateway device, the device operates immediately when connecting the power, and the power indicator located on the front panel of the device shines. There are two redundant DC power input on the gateway.

## 2.2 Connect serial device

The serial port of the gateway device is located on the front panel of the device. If you are trying to connect multiple devices to the network, note the following points:

1. The same protocol must be used when all devices are connected to a single serial port (Modbus RTU or Modbus ASCII)
2. Each primary device on the gateway device must be connected to its own port

Pin description of serial port refer to section 2.5: pin definition.

### 2.2.1 Set the RS-485 terminal resistance

When RS-485 transmission in more harsh environments, you may need to increase terminal resistance to prevent reflection of serial signals. KGW310X&320X Modbus Gateway serial port has the default pull-up/drop-down resistance of 100 K $\Omega$ . For each serial port, the DIP switch on the top panel of the gateway device is used to enable/disable the 120 $\Omega$  terminal resistance of the rs-485.

Set 120 $\Omega$  terminal resistance on the KGW3101 Modbus: Identification 1 of the DIP switch corresponds to the serial port S1. When the DIP is switched to the ON, the terminal resistance of the corresponding serial port is enabled; when the DIP is switched to the OFF, the terminal resistance of the corresponding serial port is disabled; the terminal resistance is disabled by default on the gateway device.

Set 120 $\Omega$  terminal resistance on the KGW3102 Modbus: Identification 1 and 2 of the DIP switch corresponds to the serial port S1 and S2. When the DIP is switched to the ON, the terminal resistance of the corresponding serial port is enabled; when the DIP is switched to the OFF, the terminal resistance of the corresponding serial port is disabled; the terminal resistance is disabled by default on the gateway device.

Set 120Ω terminal resistance on the KGW3104 Modbus: Identification 1, 2, 3 and 4 of the DIP switch corresponds to the serial port S1, S2, S3 and S4. When the DIP is switched to the ON, the terminal resistance of the corresponding serial port is enabled; when the DIP is switched to the OFF, the terminal resistance of the corresponding serial port is disabled; the terminal resistance is disabled by default on the gateway device.

### 2.2.2 Connect to host or network

KGW3101 Modbus gateway has 1 10/100Mbps network port; KGW3202 Modbus has 1 10/100Mbps network port; KGW3204 Modbus has 2 10/100Mbps network port, it is located in the front panel of the gateway. The gateway can connect to the other host or network through this network port. When working normally, the gateway can be connected to Modbus TCP network by the network cable. When initialization and fault detection are required, the gateway can be directly connected to PC by the network cable. When the gateway is running, the two green LED lamps on the network port will light to indicate whether the gateway is connected to the network and the rate of accessing the network.

KGW3101 Modbus gateway has one network port and one MAC address, the IP address can be changed by user, the MAC address can't be changed; KGW3102 Modbus gateway has one network port and one MAC address, the IP address can be changed by user, the MAC address can't be changed; KPS3204 Modbus has two network ports and two MAC address, and the IP of network port can be set to same or different network segment, IP addresses are different by default, the IP address can be changed by user, the MAC address can't be changed.

## 2.3 LED Indicator

Table 2.3 LED INDICATOR

Item	Description	
Reset Button	Long press Reset Button for more than 5 seconds, the gateway will reboot and recovery to factory default.	
LED indicator		
PWR1,PWR2	Green	ON: input power connects and runs normally
		OFF: input power disconnects or runs abnormally.
Run	Green	Flash: Main board CPU system running normal (1Hz frequency)
		ON: During start up process of the device.
		OFF: Do no power device.
E1 、 E2 (Link/ACT)	Green	ON: The port has established a valid network connection
		Flash: Port is active.
		OFF: The port has not established a valid network connection

E1 、 E2 (10/100M)	Yellow	ON: 100M working status (100Base-TX)
		OFF: 10M working status (10Mbase-TX) or no connection
Sn-T	Green	Flash: The data is being transferring on the serial port n.
		OFF: No data transmission on the serial port n.
Sn-R	Green	Flash: The data is being receiving on the serial port n.
		OFF: No data transmission on the serial port n.

Note: The value of n in Table 2.3 is the serial port ID number, such as S1 for serial port 1.  
 KGW3101 and KGW3102 only has E1 and no E2. The others are the same.

### 2.4 Dimension drawing

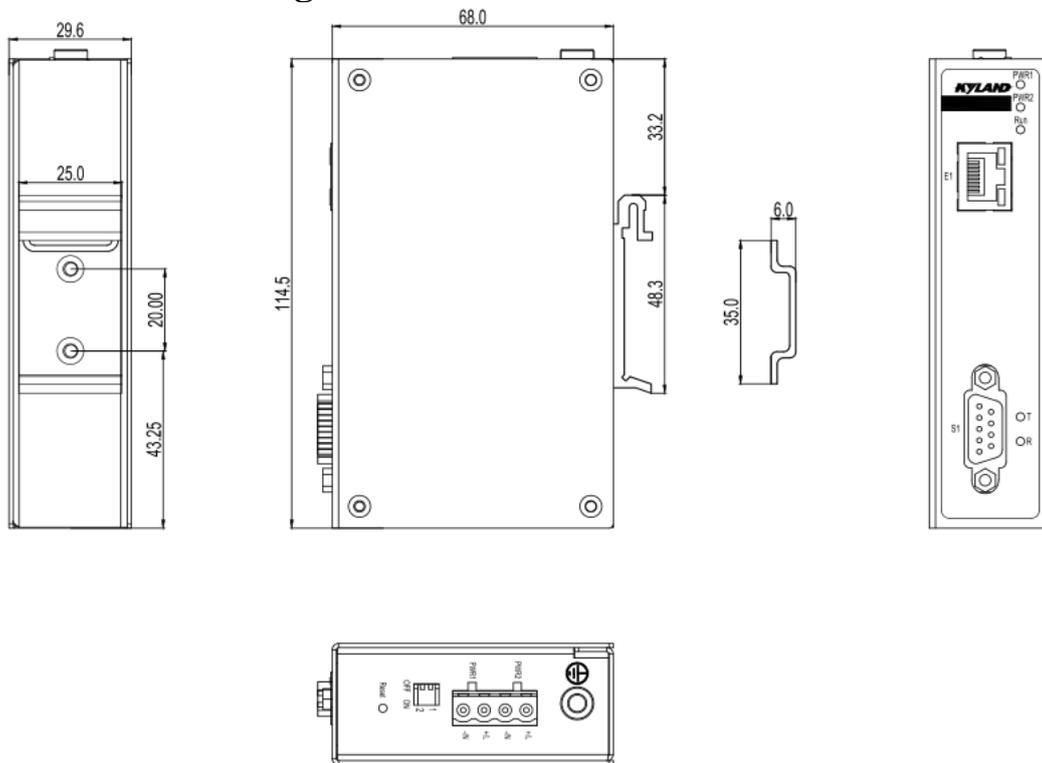


Figure 2.4.1 KGW3101 dimension drawing (mm)

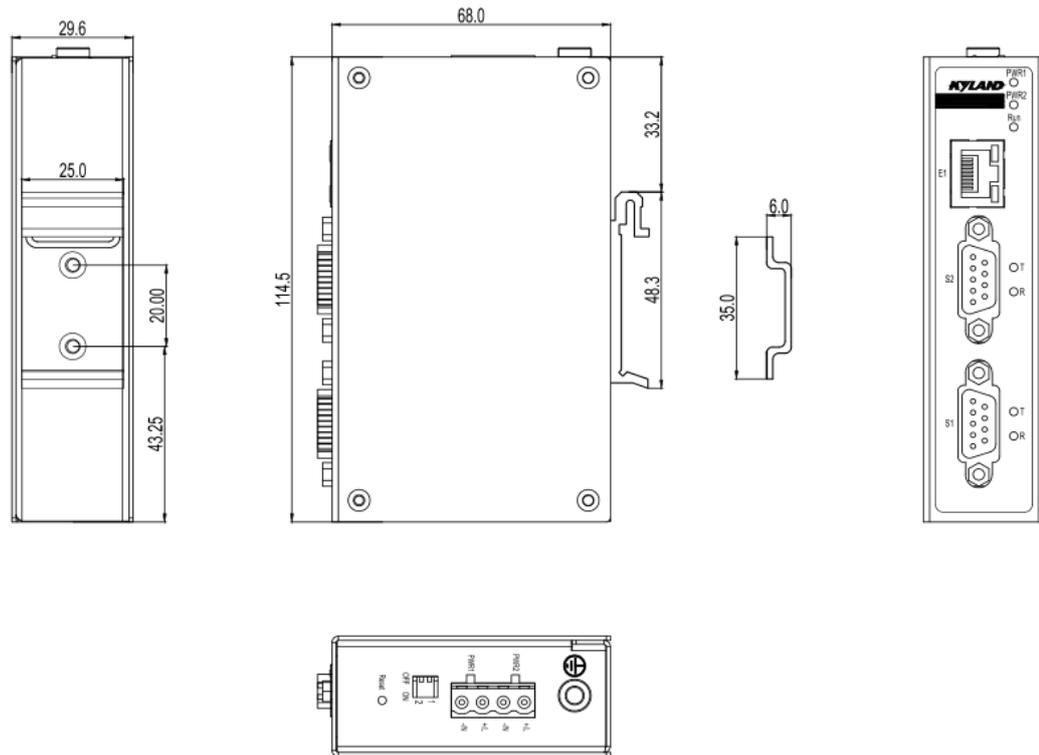


Figure 2.4.2 KGW3102 dimension drawing (mm)

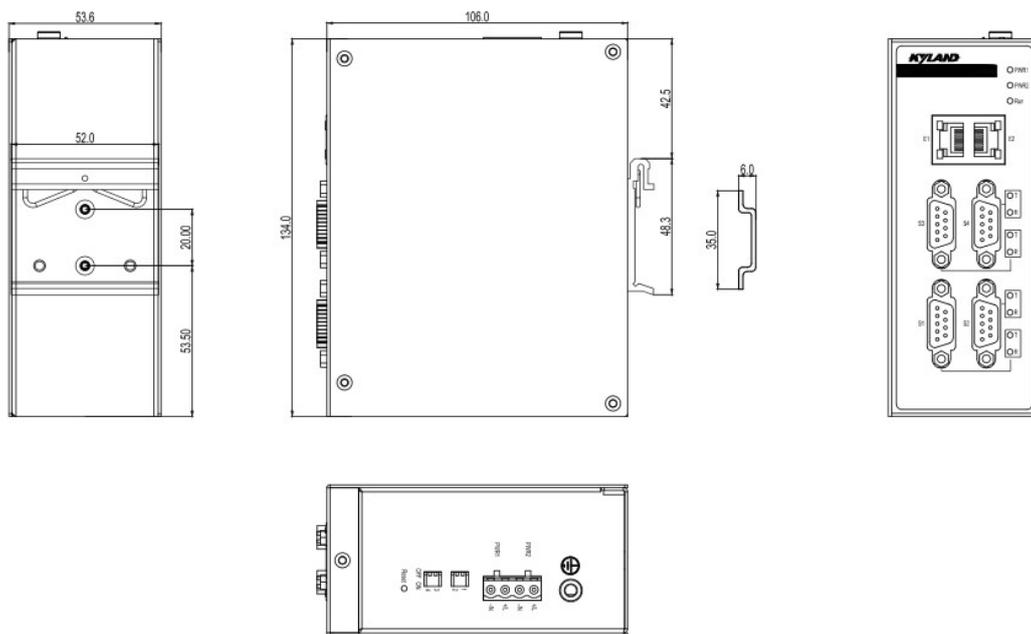
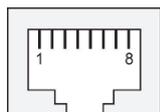


Figure 2.4.3 KGW3204 dimension drawing (mm)

## 2.5 PIN definition

### 2.5.1 Network interface (RJ45)

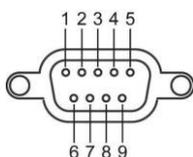


Pin	MDI-X signal	MDI signal
1	Rx+	Tx+
2	Rx-	Tx-
3	Tx+	Rx+
6	Tx-	Rx-
4, 5, 7, 8	undefinition	undefinition

Table 2.5.1 Network port definition

### 2.5.2 Serial interface (DB9 male)

KGW310X&320X Modbus gateway uses the DB9 serial port interface to connect to the Modbus RTU/ASCII device. Each serial port supports 3 serial interfaces: RS-232, RS-422, RS-485, to select the serial interface type via software.

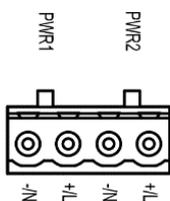


Pin	RS-232	RS-422	RS-485
1	CTS	RxD-(B)	-
2	RxD	RxD+(A)	-
3	TxD	TxD-(Z)	Data-(B)
4	RTS	TxD+(Y)	Data+(A)
5	GND	GND	GND
6	-		-
7	-		-
8	-		-
9	-	-	-

Table 2.5.2 Serial port definition

### 2.5.3 Power input interface

KGW310X&320X Modbus gateway uses a plug-in terminal with a 5.08mm spacing to connect the power supply, there is dual powers PWR1 and PWR2.



Power	PIN	Description
PWR1	+/L	PWR1 connect the positive pole
	-/N	PWR1 connect the negative pole
PWR2	+/L	PWR2 connect the positive pole
	-/N	PWR2 connect the negative pole

Table 2.5.3 Power interface definition

## 2.6 Specification

### 2.6.1 Network interface

Network interface number: KGW3101/KGW3102 one; KGW3204 two

Rate: 10/100Mbps, Auto MDI/MDIX

Connector: RJ45

Protocol: Modbus TCP/UDP

Isolation protection: Build-in 1.5KV

## 2.6.2 Serial interface

Serial interface number: KGW3101 one; KGW3102 two; KGW3204 four

Serial port type: RS-232/RS-422/RS-485, it can be selected via software

Connector: DB9 male

ESD protection: 15KV ESD

Isolation protection: Build-in 2KV

DIP switch: Enable/disable 120Ω terminal resistance of RS-485

Protocol: Modbus RTU/ASCII

## 2.6.3 Serial port communication parameter

Data bit: 7, 8

Stop bit: 1, 2

Check bit: None、Even、Odd

Baud rate: 4800bps~115200bps

## 2.6.4 Serial port signal

RS-232: TxD、RxD、RTS、CTS、GND

RS-422: Tx+、Tx-、Rx+、Rx-、GND

RS-485: Data+、Data-、GND

## 2.6.5 Software

Security configuration protocol: HTTPS、SSH2

## 2.6.6 LED indicator

System: PWR1、PWR2、Run

Serial port: KGW3101 : S1-T/R

KGW3102 : S1-T/R、S2-T/R

KGW3204 : S1-T/R、S2-T/R、S3-T/R、S4-T/R

Network: KGW3101 : SPEED, ACT/LINK (RJ45)

KGW3102 : SPEED, ACT/LINK (RJ45)

KGW3204 : ACT/LINK (RJ45)

## 2.6.7 Button

Reset: Support “recovery factory default configuration”

### 2.6.8 Mechanical structure

Enclosure: Aluminum

Weight: KGW3101 : 165g

KGW3102 : 170g

KGW3204 : 320g

Dimension: KGW3101/KGW3102 : 30×115×68 mm (1.8×5.3×7.3 in)

KGW3204 : 54mm×135mm×106mm (1.8×5.3×7.3 in)

Protection class: IP40

Mounting: DIN mount

### 2.6.9 Environment condition

Operating temperature: -40°C~75°C

Storage temperature: -40°C~85°C

Relative humidity: 5~95%, no condensation

### 2.6.10 Power requirement

Input voltage: 24VDC(12-48VDC)

Connector: 4-pin 5.08mm spacing plug terminals

Power: KGW3101/KGW3102 : 1.8W

KGW3204 : 3.2W

Overload protection: Support

Reverse protection: Support

Redundant protection: Support

### 2.6.11 Trade standard:

Certification: CE, FCC, UL61010, CID2, RoHS

EMI: EN 55032 Class A

FCC Part 15 Subpart B Class A

EMS: EN 55024

IEC61000-4-2(ESD): ±6kV(contact),±8kV(air)

IEC61000-4-3(RS): 10V/m (80MHz~2GHz)

IEC61000-4-4(EFT): Power Port:±2kV;Data Port:±1kV

IEC61000-4-5(Surge):Power Port:  $\pm 1\text{kV/DM}$ ,  $\pm 2\text{kV/CM}$ ; Data Port: $\pm 1\text{kV}$

IEC61000-4-6 (CS):  $10\text{V}(150\text{KHz}-80\text{MHz})$

Mechanical standards:

Vibration: IEC60068-2-6

Impact: IEC60068-2-27

Free drop: IEC60068-2-32

## 2.6.12 Warranty

Warranty: 5 years

## 3 Typical Application

This chapter describes a typical gateway application, the home page includes the following:

- Masters of Ethernet and Slaves of Multiple serial ports

### 3.1 Masters of Ethernet and Slaves of Multiple serial ports

Masters of Ethernet and Slaves of Multiple serial ports that is all Modbus devices are connected through the Ethernet. If the upper computer supports Modbus TCP Ethernet, then KGW310X&320X Modbus gateway can collect the data the control Modbus RTU/ASCII device. KGW310X&320X Modbus gateway supports simultaneously connect to 16 Modbus TCP Master. Serial interface supports RS-232, RS-422, RS-485 which can be set through software. Each serial port manage 32 Slave nodes.

#### A. Transparent transmission

Define Modbus TCP/UDP Master in transparent mode to Modbus RTU Slave is transparent mode, so the Ethernet port of KGW310X&320X gateway is Modbus TCP/UDP Slave mode, serial port is Modbus RTU Master mode.

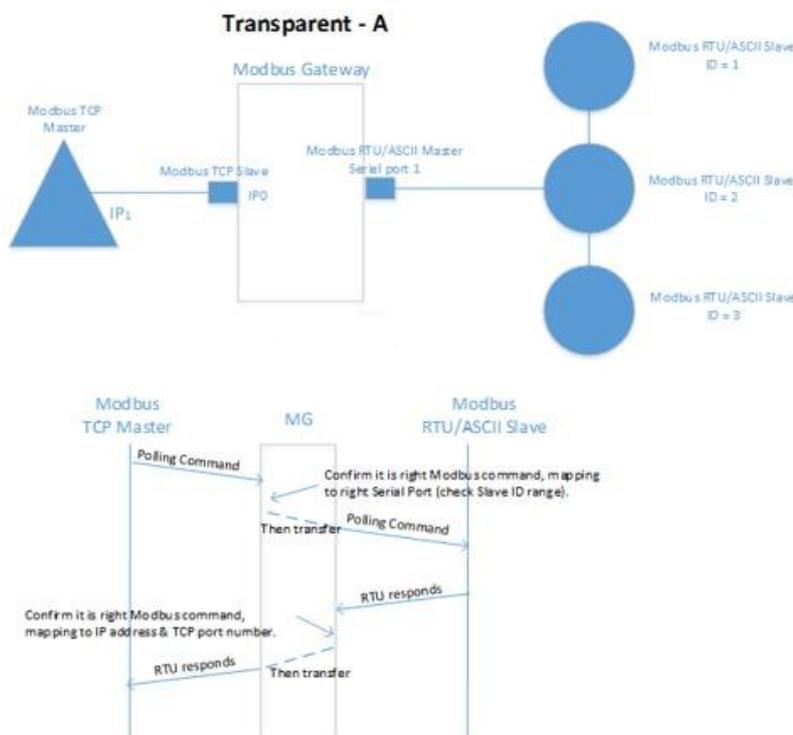


Figure 3.1.1 Transparent mode

#### B. Agent

Define Modbus TCP Master in Agent mode to Modbus RTU/ASCII Slave is Agent mode, so the Ethernet port of KGW310X&320X gateway is Modbus TCP Slave mode, serial port is Modbus RTU/ASCII Master mode.

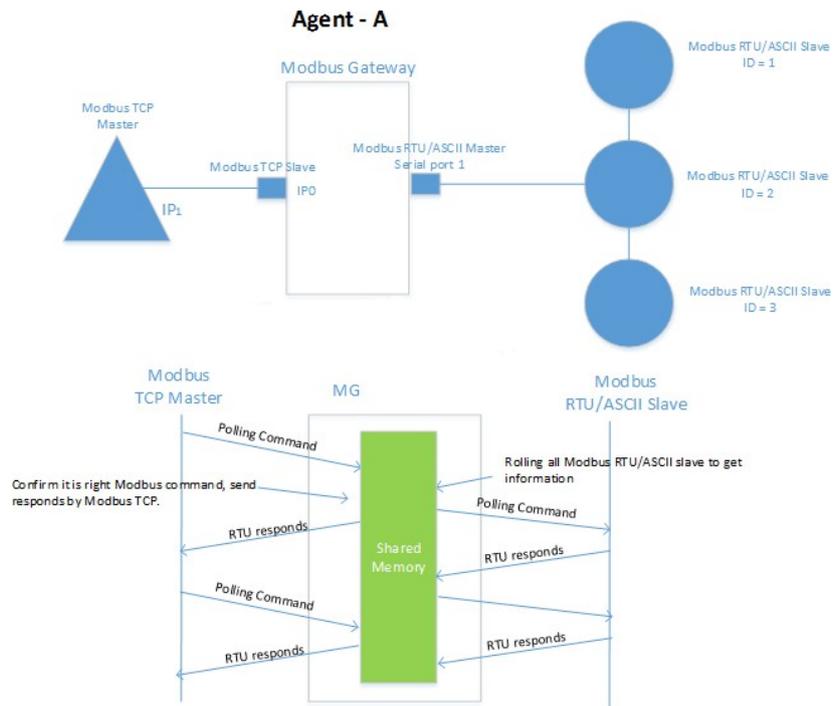


Figure 3.1.2 agent mode

## 4 Web Console Setting

KGW310X&320X Modbus gateway has Web page, the gateway device can be set in the webpage by browser such as Firefox, IE. In this chapter, we will introduce the web Console feature groups and feature definitions.

This chapter includes the following:

- Login
- Home page
- System
  - Backup/upgrade
  - Reboot
  - User management
- Network
- Data acquisition
  - Gateway device
  - Advance configuration
  - View acquisition value
  - Transparent transimssion device
  - Profile upload/download
- Help
- Exit

**Description:** Take KGW3204 as examples in the following, KGW3101 and KGW3102 operations like KGW3204, so no further described in this article.

## 4.1 Login

Connect to KGW3204 Modbus gateway Web console: Open browser, then enter IP address of gateway. The default IP address of gateway: E1:192.168.0.249 , E2: 192.168.1.249

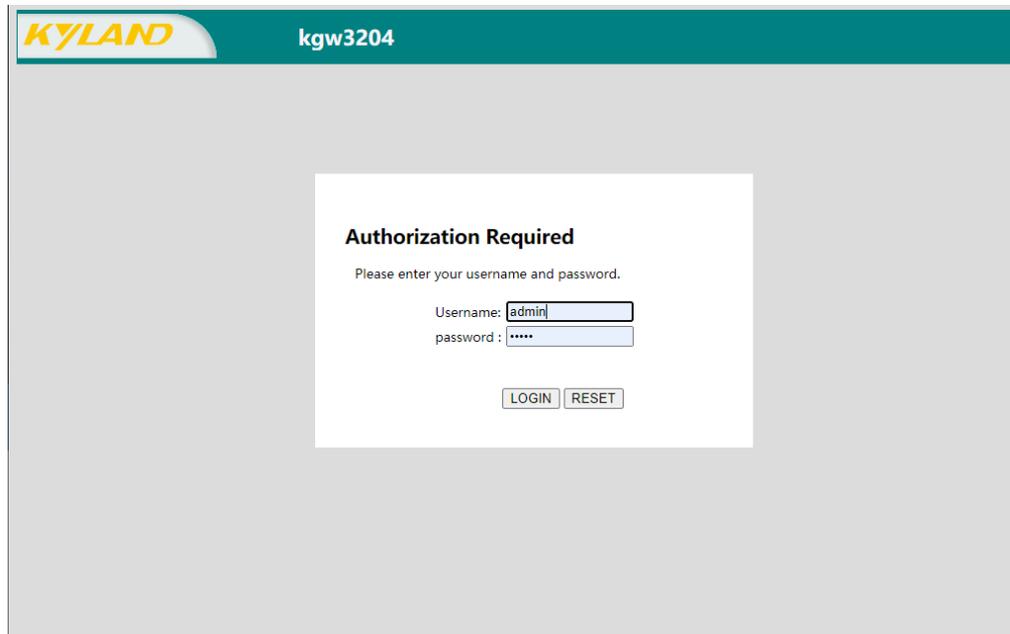


Figure 4.1 Login page

Default login username: admin, login password: admin. Enter username and password then click “login”, then enter into Web console of gateway. The language English and Chinese can be selected.

## 4.2 Home page

The home page interface displays the current device information of the KGW3204 Modbus Gateway, mainly including: hostname, software version, hardware version, and local time

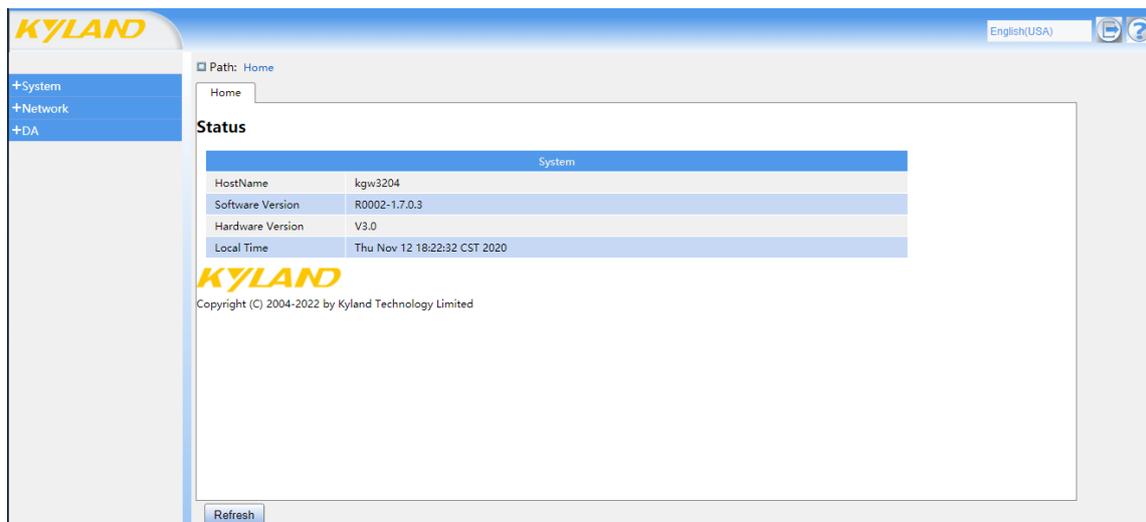


Figure 4.2 Home page

### 4.3 System

#### 4.3.1 Backup/upgrade

The gateway firmware can be upgraded in the upgrade page. Click “select file” button to select the upgrade file, then click “upgrade” button to upgrade firmware. After the upgrade is successful, reboot the system manually and the system will start with a new firmware. Check “reserve configuration” button, configuration is reserved after upgrade; configuration is not reserved after upgrade if uncheck.

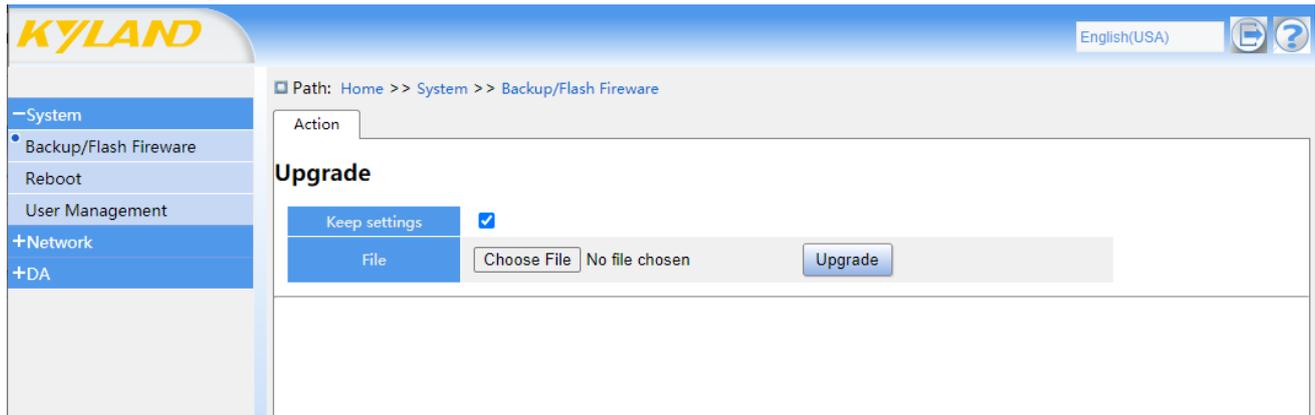


Figure 4.3.1 Upgrade page

#### 4.3.2 Reboot

Except firmware upgrade, no need to reboot the device after modifying other parameters of gateway, the parameters take effect immediately after click “save” button. If need to reboot, click “reboot” button in the reboot page to reboot the device.



Figure 4.3.2 Reboot page

#### 4.3.3 User management

The password of account management can be modified, default username is admin and password is admin. Modify password: enter current password then enter new password twice, click “save” to submit the new password.

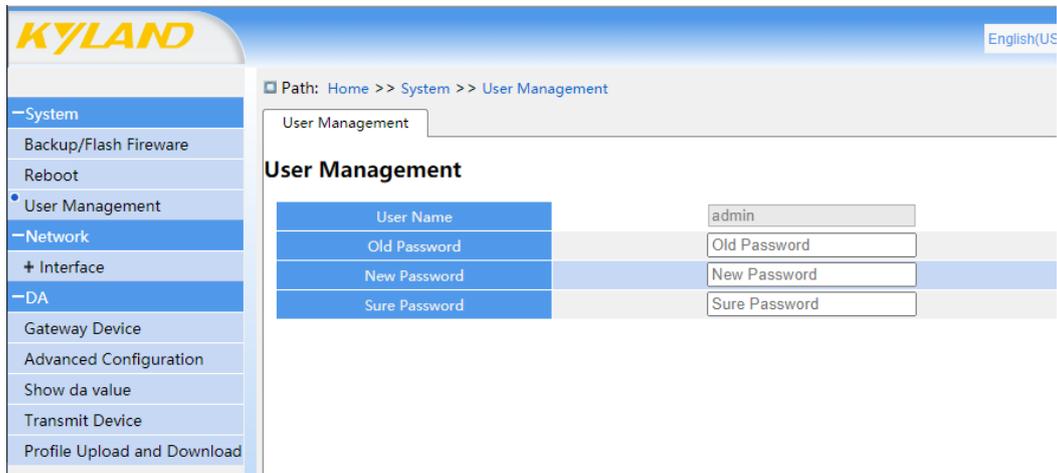


Figure 4.3.3 User management

## 4.4 Network

The network setting page displays the relevant network parameters of the gateway device, including running time, mac address, number of received/sent packets, IP address, etc. Click the “Connect” button, network reconnects. Click "Close" button, the whole network will be closed, the network port cannot be used, operate carefully. Click "Delete" button, the network port is deleted, cannot recover, operate carefully.



Figure 4.4.1 Network page

Click “Edit” button, to enter the network port editing interface and the IP address, subnet mask and gateway can be set. When all parameters are set, click “Apply” and the parameters take effect immediately.

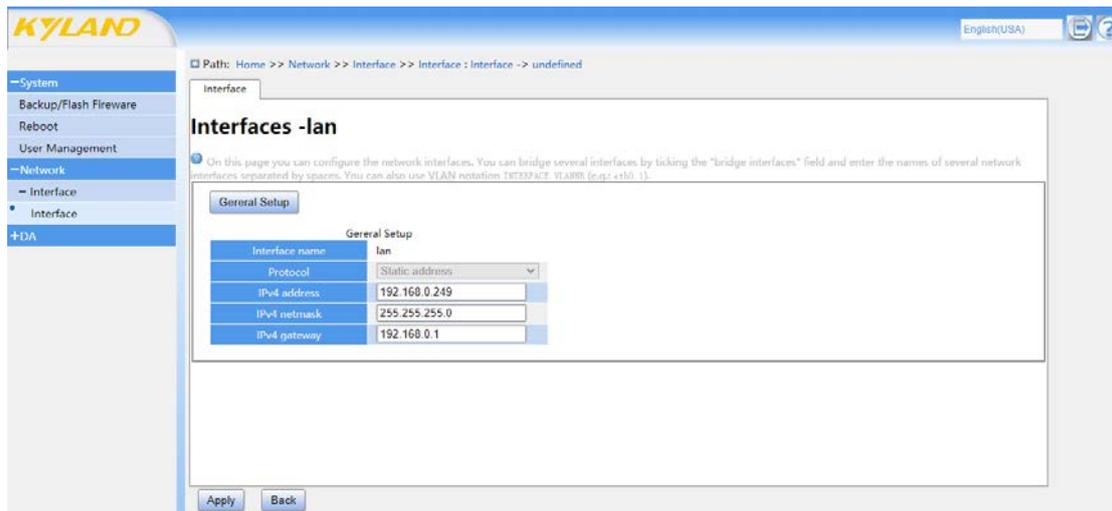


Figure 4.4.2 Network port edit

Parameter	Value	Description
IP address	E1:192.168.0.249 E2:192.168.1.249 (or other 32 bits number)	The address of the gateway device on the TCP/IP network. Two networks of the KGW3204 Modbus gateway devices can be set to two different or the same IP addresses.
Subnet mask	255.255.255.0 ( or other 32 bits number )	Identifies that the server belongs to the A, B or C class network.
Default gateway	0.0.0.0 ( or other 32 bits number )	Provides the IP address of the router that for network access outside of the server's LAN.

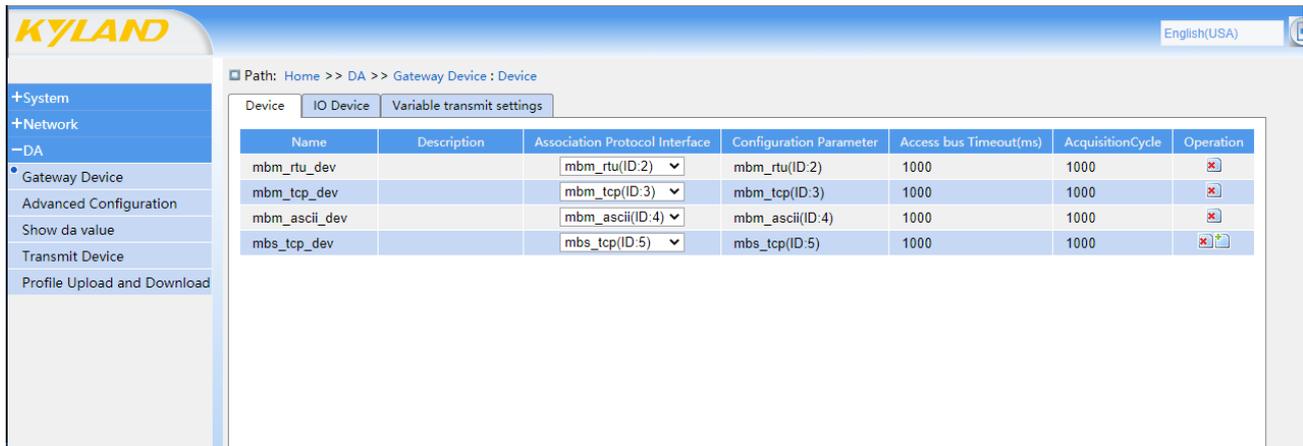
Table 4.4.1 Network port edit parameter

## 4.5 Data acquisition

### 4.5.1 Gateway device

KGW3204 Modbus gateway has two working modes: Transparent transmission mode and proxy mode. Gateway device is an item configured in proxy mode, including device, IO, and variable transfer settings. Before configuring the gateway device, the advanced configuration must be configured first, add the corresponding protocol interface, See Section 4.5.2 for advanced configuration.

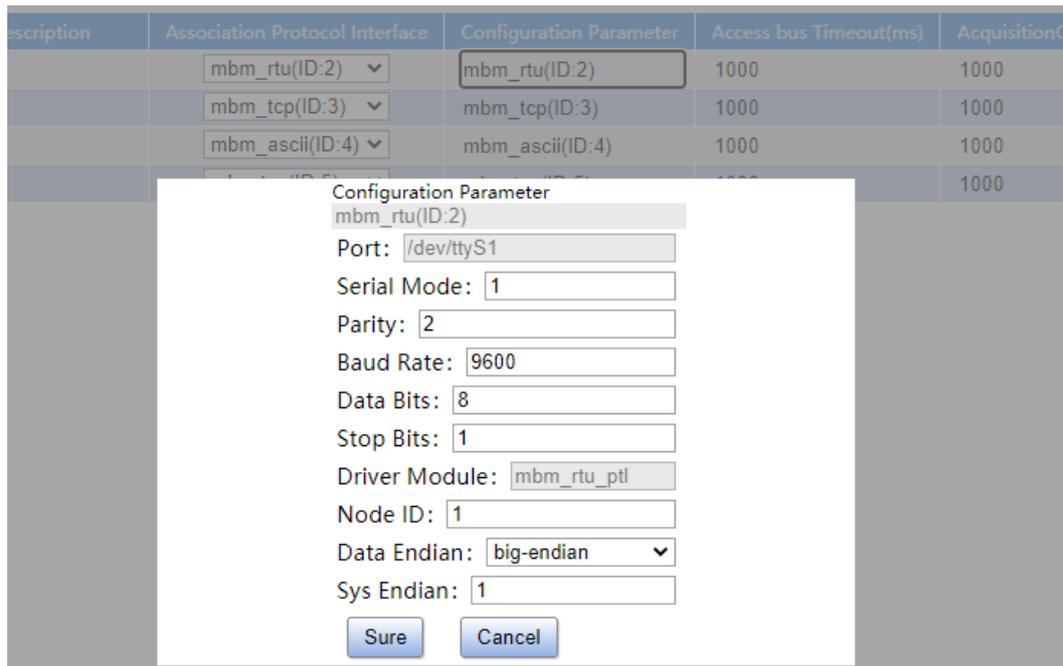
#### (1) Device configuration



Parameter	Value	Description
Name	User-defined	User-defined name, the system automatically adds _dev
Description	User-defined	User-defined description
Associated protocol interface	mbm_rtu、 mbm_tcp、 mbm_ascii、 mbs_tcp	mbm_rtu: Use the rtu protocol for serial ports mbm_tcp: Use the tcp protocol for network ports, select this protocol when server network port connects slave (Unavailable temporarily) mbm_ascii: Use ascii protocol for serial ports. mbs_tcp: Use tcp protocol for network ports, select this protocol when server network port connects master (Unavailable temporarily)
Access bus timeout time	User-defined	When the device which is connected to server over this time and no response, the bus timeout is determined
acquisition cycle	User-defined	The server sends an acquisition request to the slave at every other acquisition cycle

Table 4.5.1.1 Device configuration parameter

Serial port protocol configuration:

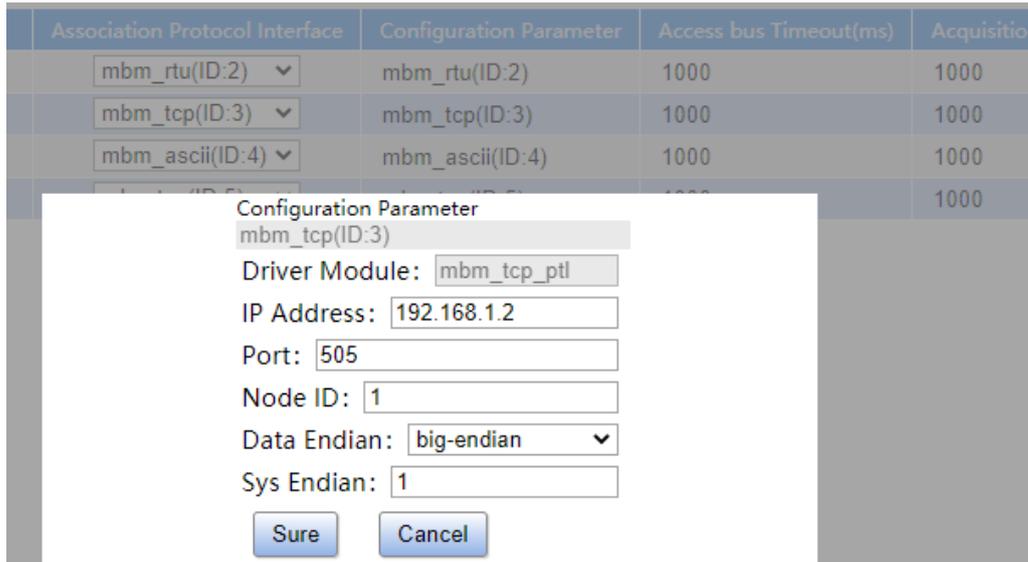


Parameter	Value	Description
Serial port type	0、 1、 2	The system fills automatically and select 232 to display 0, 485 display 1, 422 to display 2 in the advanced configuration
Check bit	0、 1、 2	The system fills automatically, 0 means parity check, 1 means odd check, and 2 means no check bit
Band rate	Value in the advanced configuration	The system fills automatically, the band rate configured in the advanced configuration.
Data bit	7、 8	The system fills automatically, the data bit configured in the advanced configuration.
Stop bit	1、 2	The system fills automatically, the stop bit configured in the advanced configuration.
Site ID	0-255	Device ID
Big little end	Big end, little end	Data type 32-bit, float Big end: High 16-bit data high bit storage, low 16-bit data low bit storage Little end: High 16-bit low bit storage, low 16-bit data high bit storage.

System end	1、0	Data type 16-bit, 32-bit, float 1: Every 2 bytes, high 8-bit data high bit storage, low 8-bit data low bit storage 0: Every 2 bytes, high 8-bit data low bit storage, low 8-bit data high bit storage
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Table 4.5.1.2 Serial port configuration parameter

Network port protocol configuration:

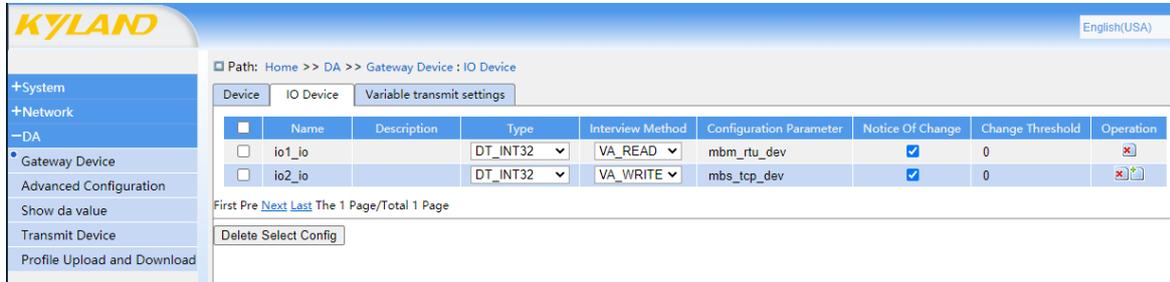


Parameter	Value	Description
IP address	Serial port server IP	Serial server as the tcp server, the protocol is mbs_tcp, fill IP of serial server here.
Port number	Serial server port	Serial server as the tcp server, the protocol is mbs_tcp, fill port of serial server here.
Site number	User-defined	Keep same with connected device
Big little end	Big end, little end	Data type 32-bit, float Big end: High 16-bit data high bit storage, low 16-bit data low bit storage Little end: High 16-bit low bit storage, low 16-bit data high bit storage.
System end	1、0	Data type 16-bit, 32-bit, float 1: Every 2 bytes, high 8-bit data high bit storage, low 8 bit data low bit storage

		0: Every 2 bytes, high 8-bit data low bit storage, low 8-bit data high bit storage
--	--	--

Table 4.5.1.3 Network port configuration parameter

(2) IO point configuration



Parameter	Value	Description
Name	User-defined	User-defined name, the system automatically adds _io
Description	User-defined	User-defined description
Type	The drop-down list	Data type of data stored in the register
Interview method	The drop-down list	Read data/write data
Notice of change	Check	Notification when the threshold is exceeded. Unavailable temporarily
Change threshold Value	User-defined	Maximum change range of value of IO point

Table 4.5.1.4 IO configuration parameter

mbm\_rtu/ascii configuration:

Type	Interview Method	Configuration Parameter	Notice Of Change	Change
DT_INT32	VA_READ	mbm_rtu_dev	<input checked="" type="checkbox"/>	0
DT_INT32	VA_WRITE	mbs_tcp_dev	<input checked="" type="checkbox"/>	0

Device:

Driver Module:

Register Type:

Function:

Start Address:

Block:

Parameter	Value	Description
Device	Configuration finished and applied device	Configuration finished and applied device
Driver module	Automatic change	Drive corresponding to the selected device
Register type	0、1、3、4	1 represents discrete input, 0 represents coil, 3 represents input register and 4 represents hold register
Function code	8-bit data and the highest bit is not 1	Function code in Modbus protocol
Start address	16-bit data	Register start address in Modbus protocol
Block	16-bit data	Register number, unavailable temporarily

Table 4.5.1.5 mbm\_rtu/ascii configuration parameter

mbs\_tcp configuratiaon:

Type	Interview Method	Configuration Parameter	Notice Of Change	Change
DT_INT32	VA_READ	mbm_rtu_dev	<input checked="" type="checkbox"/>	0
DT_INT32	VA_WRITE	mbs_tcp_dev	<input checked="" type="checkbox"/>	0

Device:

Driver Module:

Register Type:

Register Address:

Parameter	Value	Description
Register type	0、1、3、4	1 represents discrete input, 0 represents coil, 3 represents input register and 4 represents hold register
Register address	0-65535	Register start address in Modbus data frame

Table 4.5.1.6 mbs\_tcp configuration parameter

(3) Variable transmit settings

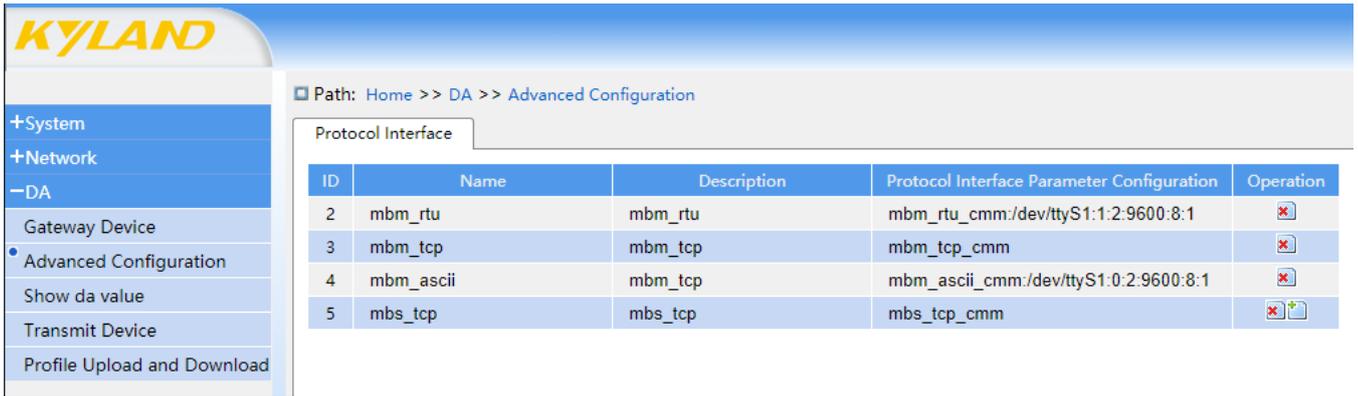


Parameter	Value	Description
Name	User-defined	User-defined name
Description	User-defined	User-defined description
Original IO name	The drop-down list	IO point in the IO configuration, data resource operation.
Target IO name	The drop-down list	IO point in the IO configuration, data target operation.
Enable	Check	Whether using the configured transmit mode
Variable range	User-defined	Variable range of IO data

Table 4.5.1.7 Variable transmit settings parameter

4.5.2 Advanced configuration

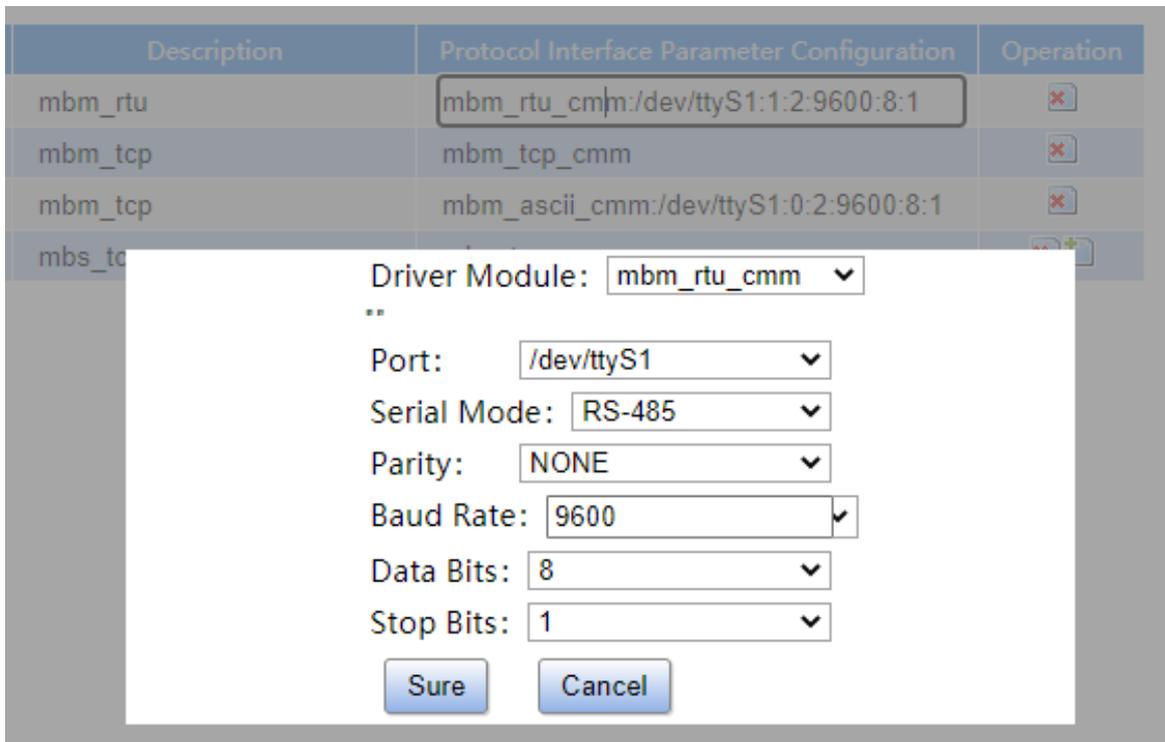
Advanced configuration, configure it only the device use proxy mode. Add the protocol the device needs to use to the protocol interface and supports to configure the protocol interface parameter of the serial port



Parameter	Value	Description
Name	User-defined	User-defined name
Description	User-defined	User-defined description
Protocol interface parameter configuration	protocol configuration of interface	Detailed configuration items are shown in Table 4.5.2.2

Table 4.5.2.1 Advanced configuration parameter

Serial port protocol parameter configuration:



Parameter	Value	Description
Driver module	Configure modbus transmit mode and	mbm is modbus_master that is modbus master mode,

	master/slave mode.	mbs is modbus_salve that is modbus slave mode there is three transmit mode as rtu, tcp and ascii
Port	ttyS1、ttyS2、ttyS3、 ttyS4	Specifies the serial port that uses the protocol
Serial type	RS422、RS485、RS232	Configuration of serial type
Check bit	NONE、ODD、EVEN	Configuration of serial check bit
Band rate	The drop-down list	Serial port band rate configuration
Data bit	7、8	Serial port data bit configuration
Stop bit	1、2	Serial port stop bit configuration

Table 4.5.2.2 Serial port protocol configuration parameter

### 4.5.3 Show data value

You can use show data value function to read the data of current register of gateway. Each IO data value is shown in the page.

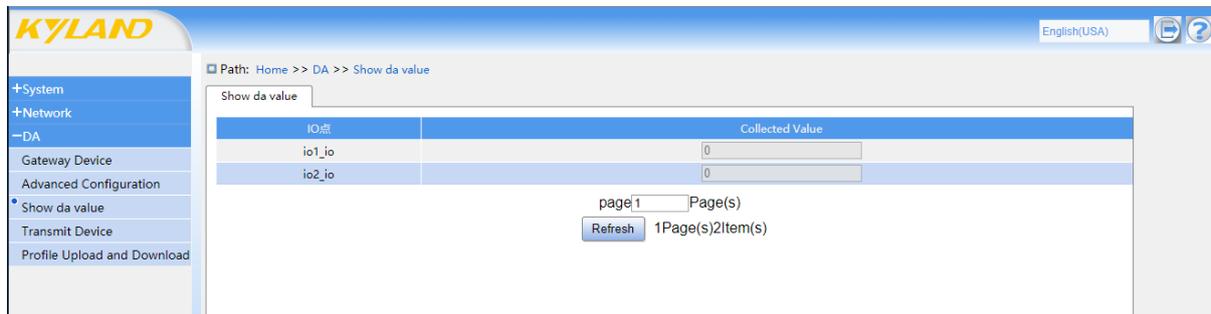
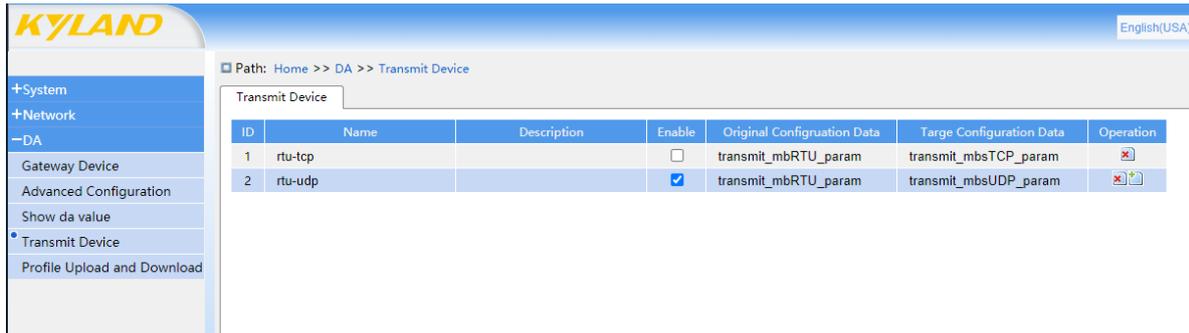


Figure 4.5.3 Data value

### 4.5.4 Transparent transmit device

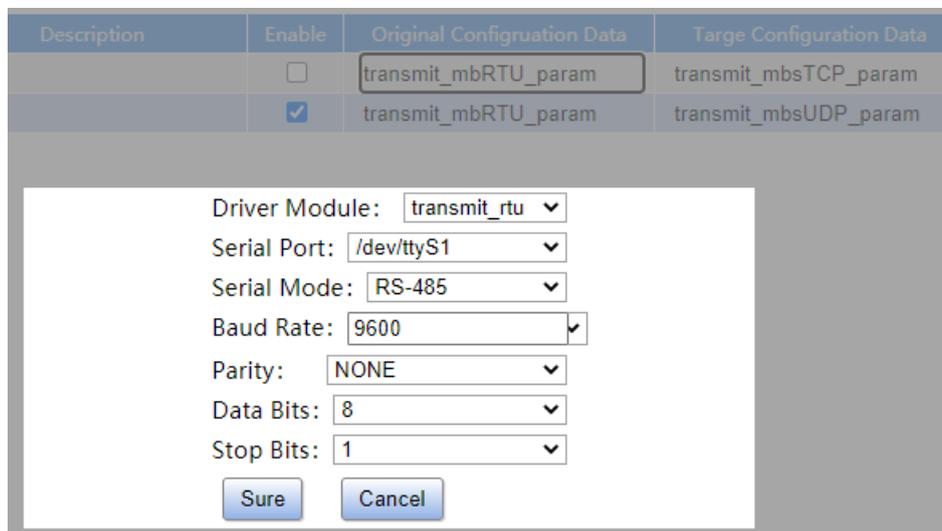
If you need to use the transparent transmit mode, you need to configure the transparent transmit device data. It should be noted that when using the transparent transmit mode, all the proxy configuration in the gateway device page and the advanced configuration page needs to be deleted. The current transparent transmit mode only supports the lower computer connect to serial port and the upper computer connect to network port.



Parameter	Value	Description
Name	User-defined	User-defined name
Description	User-defined	User-defined description
Enable	Check, uncheck	Whether enable the communication link
Original configuration data	Serial port	Detailed configuration items are shown in table 4.5.4.2
Target configuration data	Network port	Detailed configuration items are shown in table 4.5.4.3

Table 4.5.4.1 Transparent transmit device parameter

Original configuration data:



Parameter	Value	Description
Driver module	transmit_rtu	Select transmit_rtu
Serial port number	ttyS1、 ttyS2、 ttyS3、 ttyS4	Select the used serial port

Band rate	4800、9600、14400、19200、38400、57600、115200	Serial port band rate configuration
Check bit	NONE、ODD、EVEN	Serial port check bit configuration
Data bit	7、8	Serial port data bit configuration
Stop bit	1、2	Serial port stop bit configuration

Table 4.5.4.2 Original configuration data parameter

Target configuration data:

Description	Enable	Original Configuration Data	Target Configuration Data
	<input type="checkbox"/>	transmit_mbRTU_param	transmit_mbsTCP_param
	<input checked="" type="checkbox"/>	transmit_mbRTU_param	transmit_mbsUDP_param

Driver Module:

IP Address:

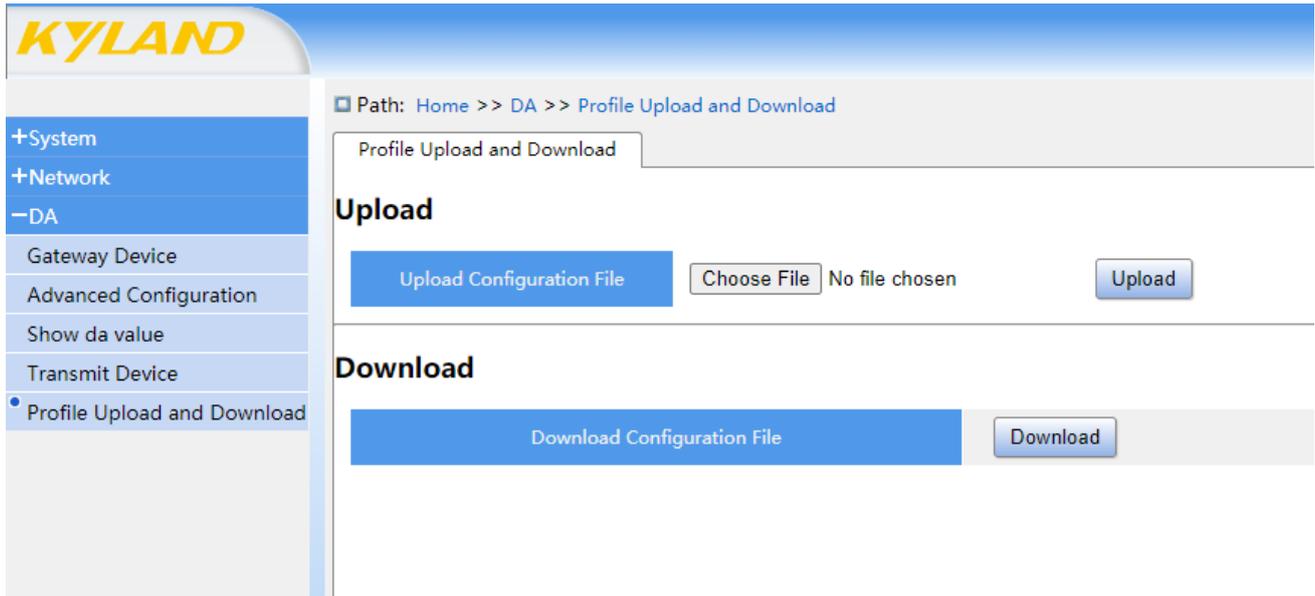
Port:

Parameter	Value	Description
Driver module	transmit_tcp/udp	Select transmit_tcp or udp, select it according to the actual situation
IP address	Local IP address	As the IP address of the tcp or udp services side, for the client connection
Port	Local port	As the port of the tcp or udp services side, for the client connection

Table 4.5.4.3 Target configuration data parameter

### 4.5.5 Profile upload and download

The profile can be uploaded and downloaded in the profile upload and download page, also can be modified the data configuration of gateway through import profile.



Parameter	Describe
Download	Click “download” button, export gateway current configuration information data.
Upload	Click “upload” button, import backup or modified profile to gateway.

Table 4.5.5 Profile upload and download

## 4.6 Help

Help button in the upper right corner of each setting page in the Web console, click “Help” button jump to official website. When you have questions during using, you can click “Help” button to view the help information.



Figure 4.6 Help page

## 4.7 Exit

For security, exit the Web program after using the web console to prevent those who have no access to the gateway device to operate the gateway device. The “Exit” button is located in the top right corner of the page.



Figure 4.7 Exit page

## 5 Operation example

In this chapter, we mainly describe the operation methods and steps of the gateway devices in two working modes.

This chapter includes the following:

- Transparent operation example
- Agent operation example

## 5.1 Transparent operation example

In Transparent mode, use one KGW3204 Modbus gateway and one computer, gateway interface type is RS-484. The network port of gateway as Modbus TCP Slave, USB port of computer use the USB to DB9 converter to connect serial port S1 of gateway, S1 as Modbus RTU Master.

Note: This operation example is the communication mode of the RTU protocol at serial port, the RS485 connection cable, and the TCP protocol at network port. If the serial port uses the RS232 connection cable or the UDP protocol at network port, the configuration item can be changed to the corresponding mode, and the operation method is similar

### A. Configure Web console

Startup KGW3204 Modbus gateway, enter gateway IP address on the browser, login the Web console. Confirm the current working mode. In the transparent mode, need to delete all configuration items in the proxy mode. Then click “DA”-“Transmit device”, select original configuration data, select driver module transmit\_rtu, select serial port ttyS1, type is RS-485, set band rate etc., and click “Save”.

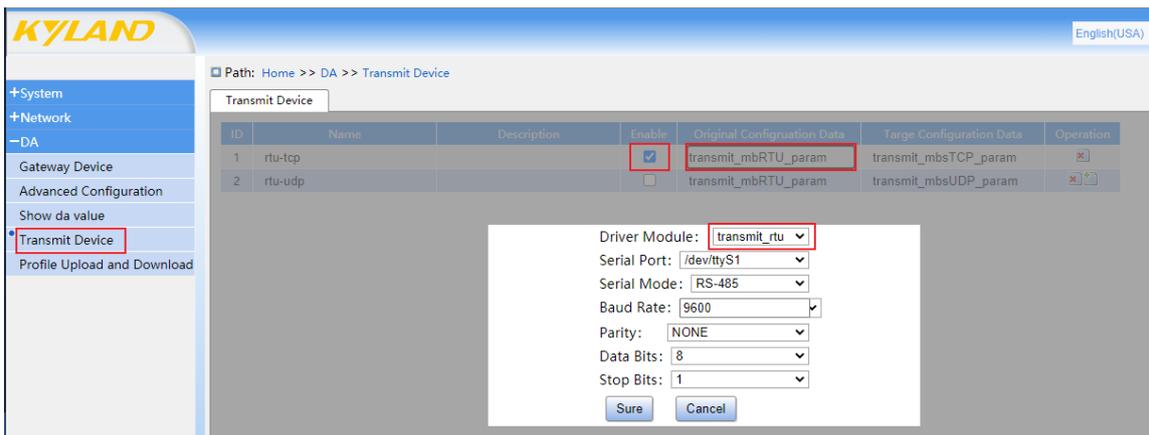


Figure 5.1.1 Source data configuration

Select target data configuration, driver module select transmit\_tcp, fill serial server IP, port is user-defined.

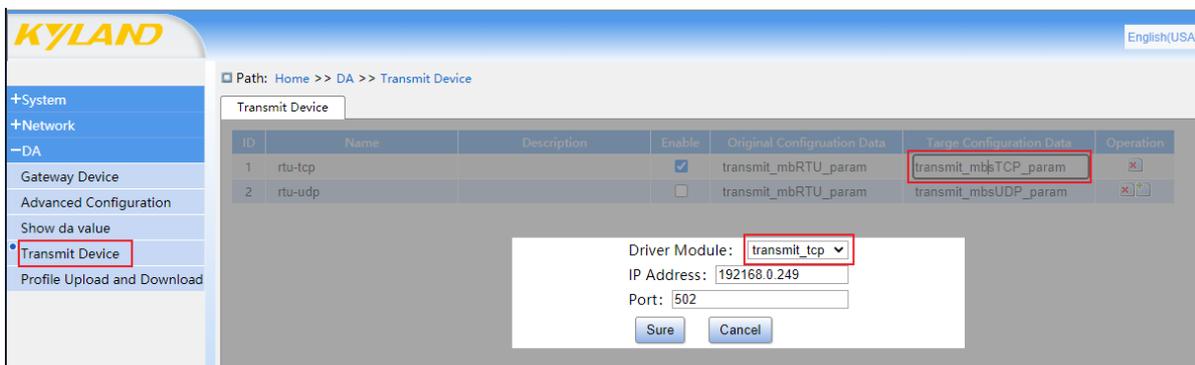


Figure 5.1.2 Target data configuration

**B. Configure PC parameter**

Serial port of PC as slave, still need to configure its relevant parameters. Connect the PC to the serial port S1 of gateway device using the USB to the DB9 female socket connection cable, then open “Modbus Slave” software, configure as serial port connection mode, the serial port related parameters are configured to be the same parameters as the gateway device serial port S1, Mode select RTU mode. Click OK after completing configuration to enter main interface.

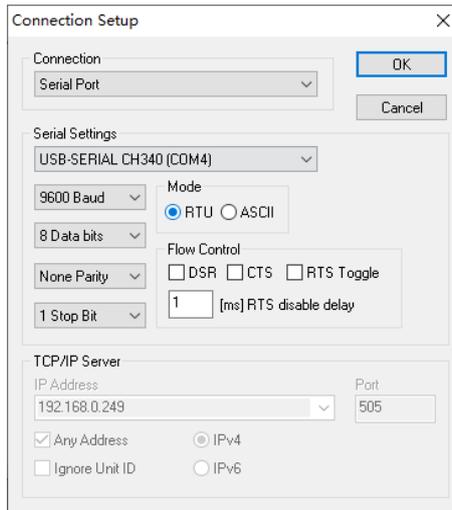


Figure 5.1.3 Configure PC parameter

Open “Modbus Poll” Software on PC, configure connection mode as Modbus TCP/IP, set IP as 192.168.0.249 (E1 is connected), serial port 1 set as port number 502 of gateway serial port 1. Click OK after completing configuration to enter main interface.

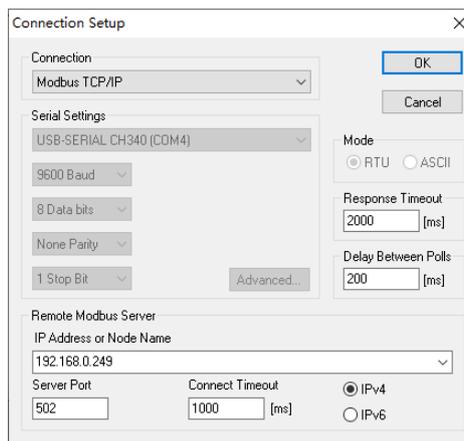


Figure 5.1.4 Set IP

After completing configuration, enter the IP on the address1 and address 2 of Modbus Slave, It can be seen that corresponding data can be received, as shown in Figure 5.1.5.

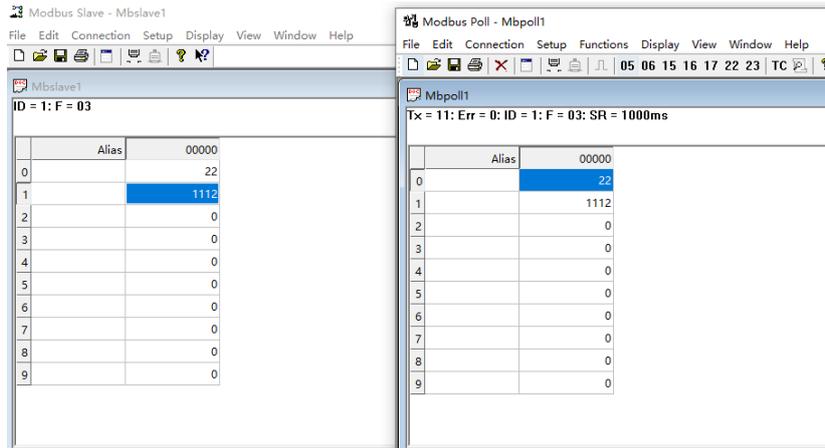


Figure 5.1.5 Receive and transmitter data successfully

## 5.2 Agent operation example

In Agent mode, use one KGW3204 Modbus gateway and one computer, gateway interface type is RS-484. The network port of gateway as Modbus TCP Slave, USB port of computer use the USB to DB9 converter to connect serial port S1 of gateway, S1 as Modbus RTU/ASCII Master.

Note: This operation example is the communication mode of the RTU protocol at serial port, the RS485 connection cable, and the TCP protocol at network port. If the serial port uses the RS232 connection cable or the ASCII protocol (ASCII protocol data bit is 7) at network port, the configuration item can be changed to the corresponding mode, and the operation method is similar

### A. Configure Web console

Startup KGW3204 Modbus gateway, enter gateway IP address on the browser, login the Web console. Enter “DA”, select “advanced configuration”, add Modbus RTU Master, select driver module mbm\_rtu\_cmm, select serial port ttyS1, type is RS-485. And click “Save”.

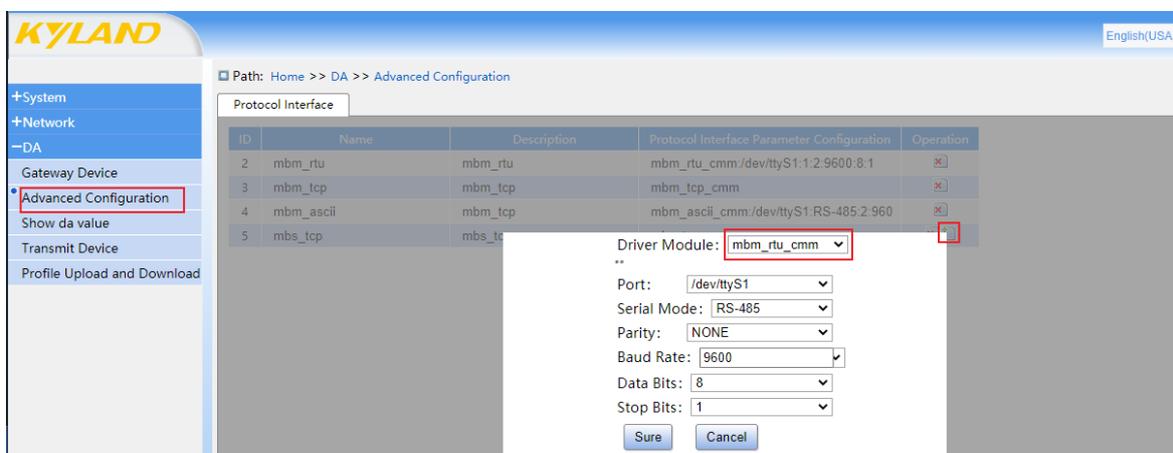


Figure 5.2.1 Advanced configuration

Then, add Modbus TCP Slave, select protocol interface parameter mbs\_tcp\_cmm, click “save” to apply.

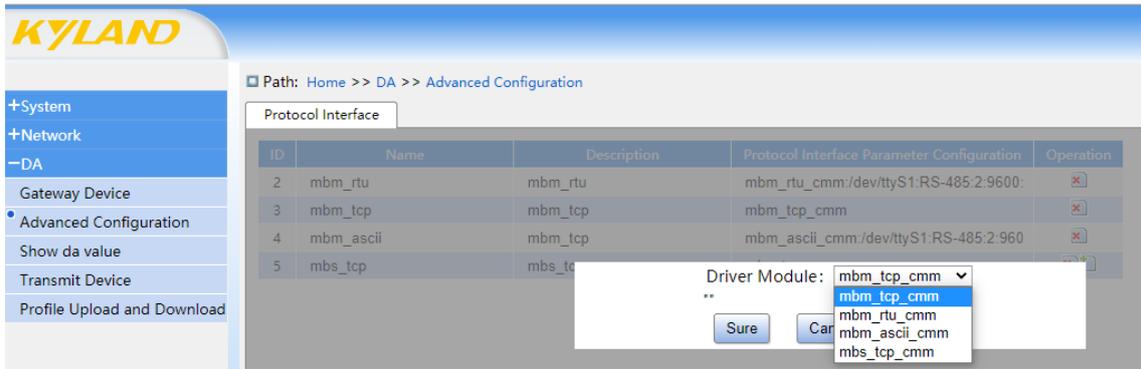


Figure 5.2.2 Protocol interface parameter

After completing adding protocol, add protocol to gateway device, click “gateway device”-“devcie” to add, add rtu protocol as shown in figure 5.2.3:

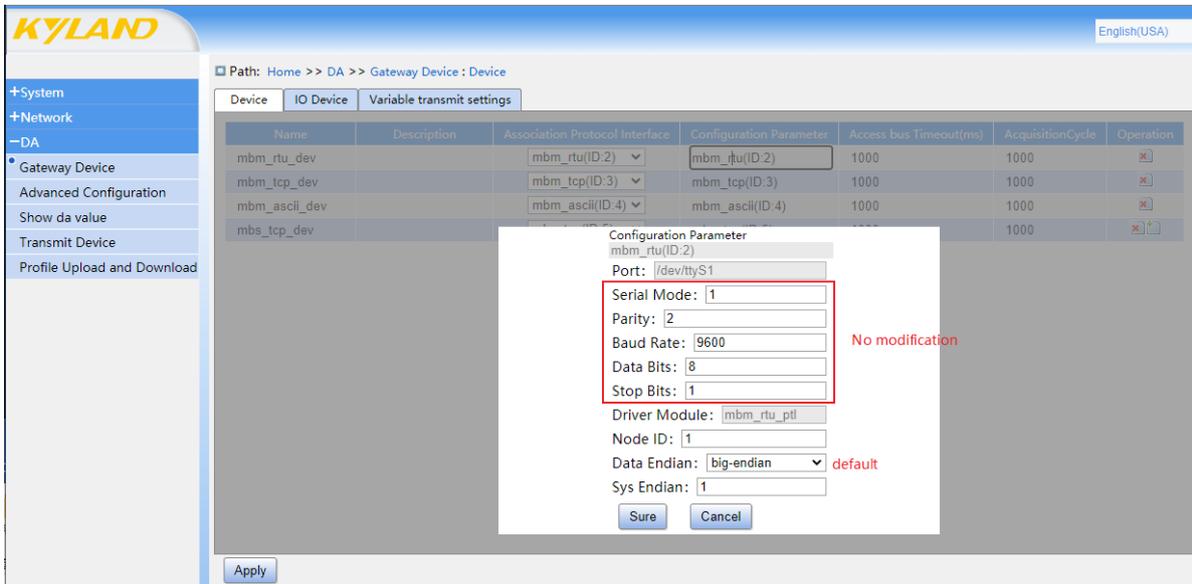


Figure 5.2.3 Add rtu protocol

Add tcp protocol is shown in figure 5.2.4:

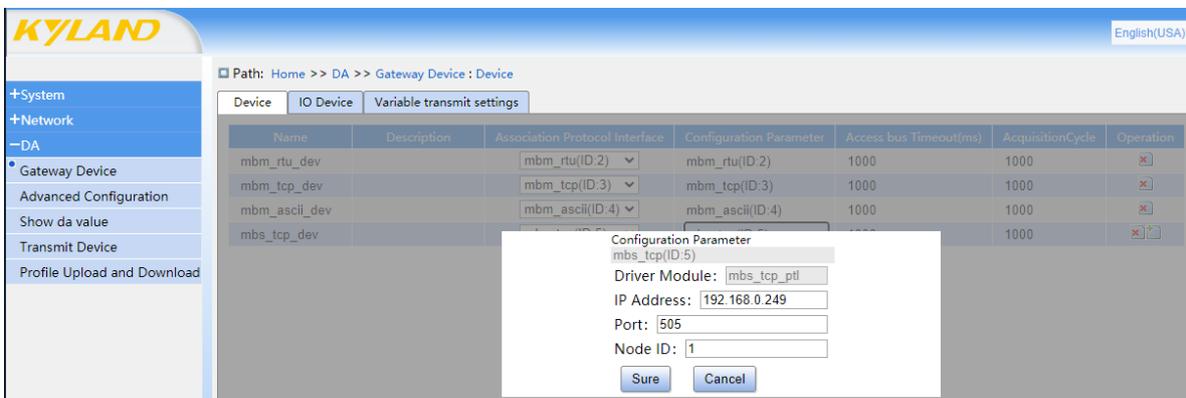
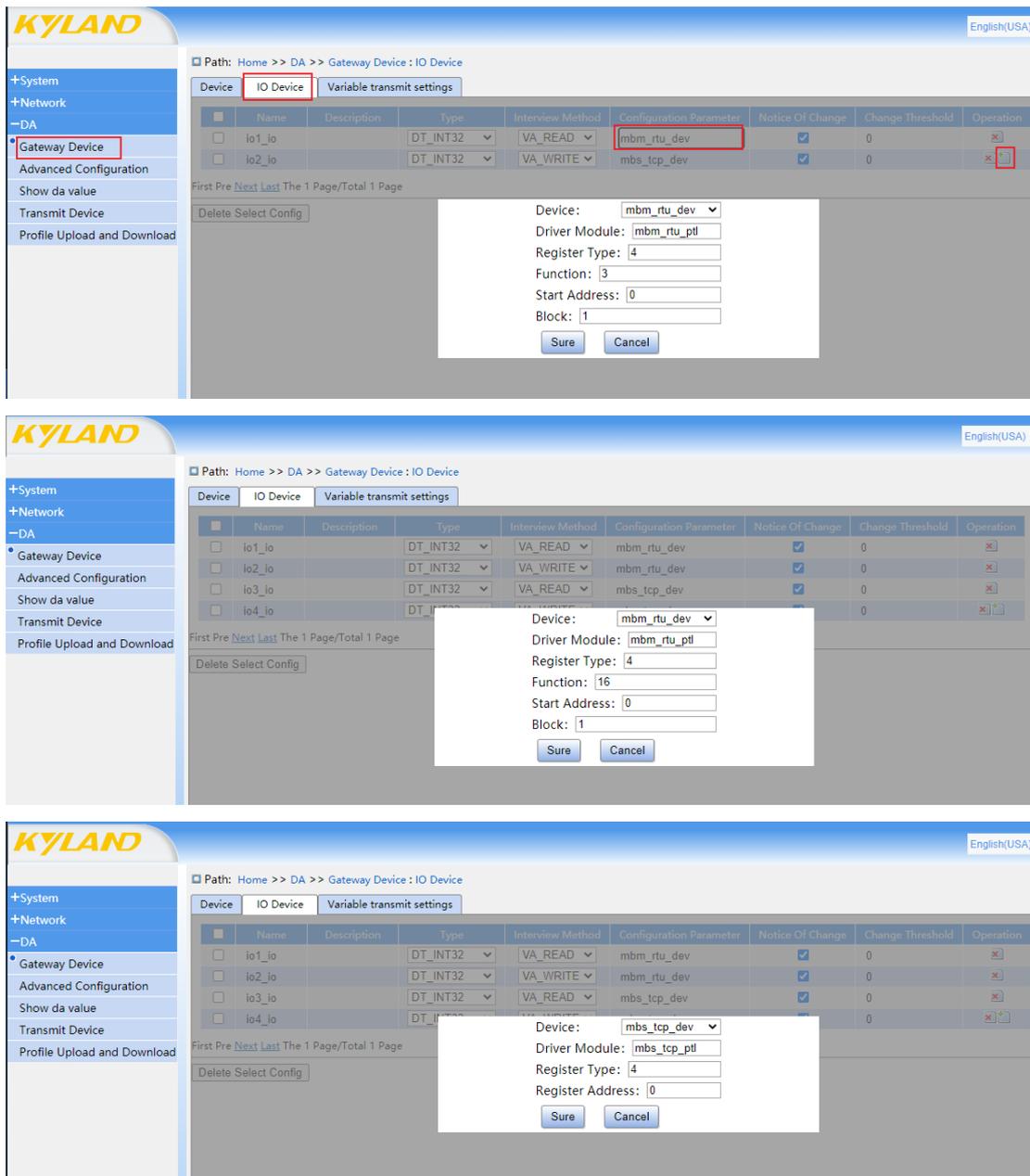


Figure 5.2.4 Add tcp protocol

Next step to add io point, for serial port server, input channel, read data from serial port, write to network port, so we need to configure a rtu read point and a tcp write point; output channel, master site send command, serial port server read data from network port, write to serial port, so we need to configure one tcp read point and one rtu write point. if you only need to read value of register, for each value of register address, need to configure 2 io points and 1 read channel. If you need to read and write, for each value of register address, need to configure 4 io points and 2 channels, one read channel and one write channel.

Take the analog read and write as an example, the io point configuration is shown in Figure 5.2.5:



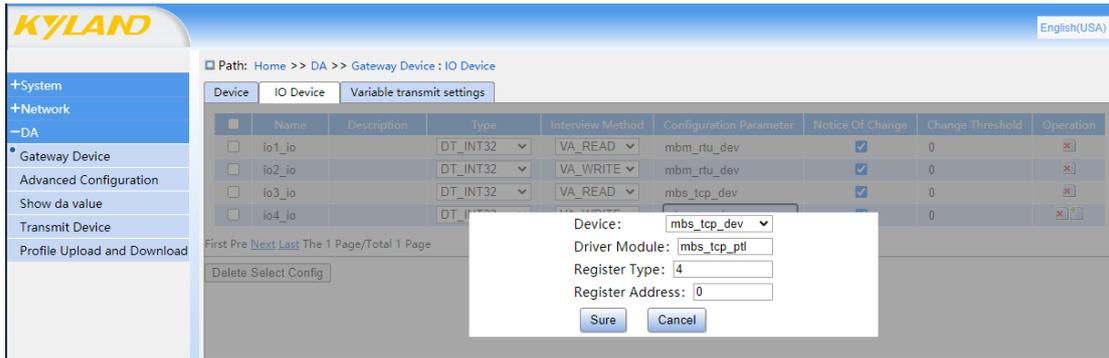


Figure 5.2.5 io point configuration parameter

Variable transmission configuration, we need to configure two channels, read from rtu, write to data input channel of tcp and read from tcp, write to data output channel of rtu, the specific configuration is shown in Figure 5.2.6:

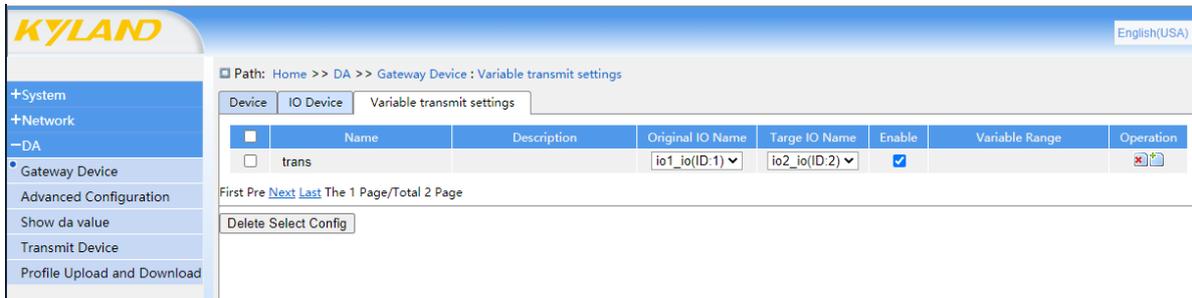


Figure 5.2.6 Variable transmission configuration

**B. Configure PC parameter**

PC serial port is Modbus RTU Slave, open “Modbus Slave” software, select RTU mode, The serial port parameter is configured to be the parameters of the serial port S1 in the serial port settings.

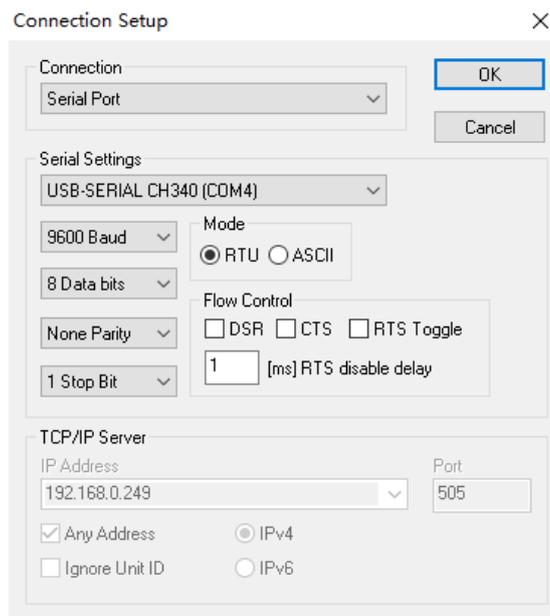


Figure 5.2.7 Configure PC parameter

After completing configuration then click OK, enter the main interface, add the same Modbus rtu slave device as the added Modbus slave terminal device

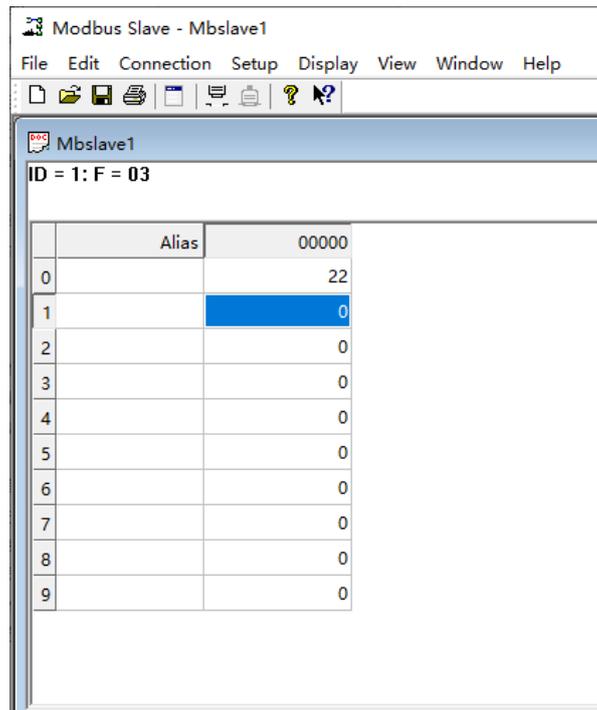


Figure 5.2.8 Add slave device

Open “Modbus Poll” software on PC, configure to Modbus TCP/IP connection, IP is gateway IP, port is 503, as shown in Figure 5.2.9.

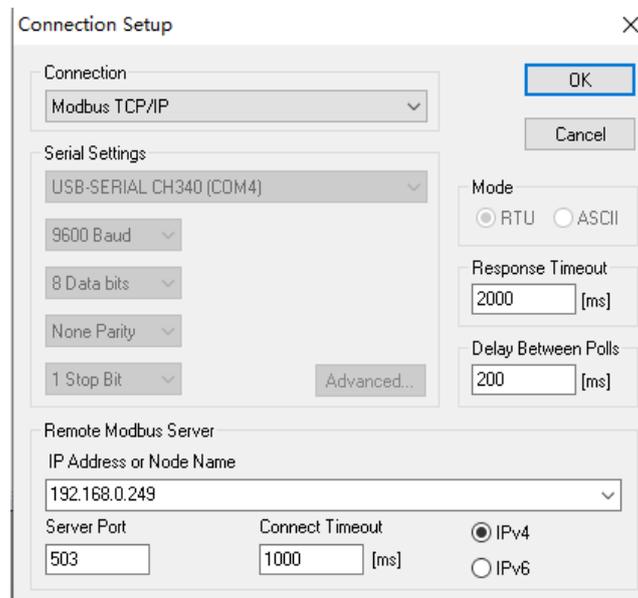


Figure 5.2.9 Set IP

After completing configuration then click OK, enter the main interface, Slave ID in Setup—>Read/Write Definition is same with gateway Modbus ID in “gateway configuration”, add a

Modbus TCP master device that matches the Modbus Slave terminal device.

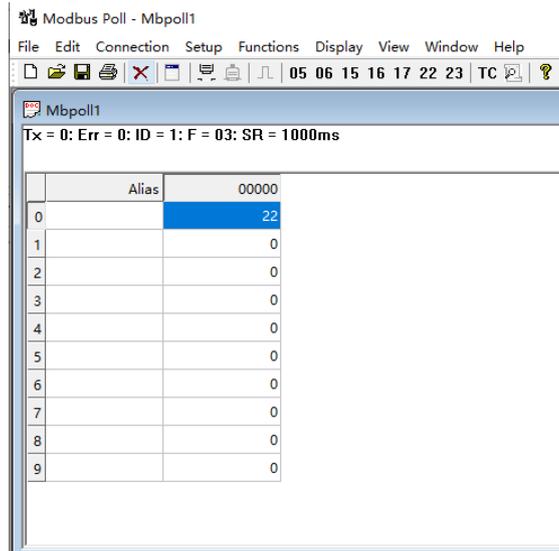


Figure 5.2.10 Add master device

After completing configuration, enter the IP on the address 1 of Modbus Slave, enter the IP on the address1 and address 2 of Modbus Slave, it can be seen that corresponding data can be received at Modbus Poll relevant position, as shown in Figure 5.1.5. Modify value from Modbus Poll, also can write to Modbus Slave.

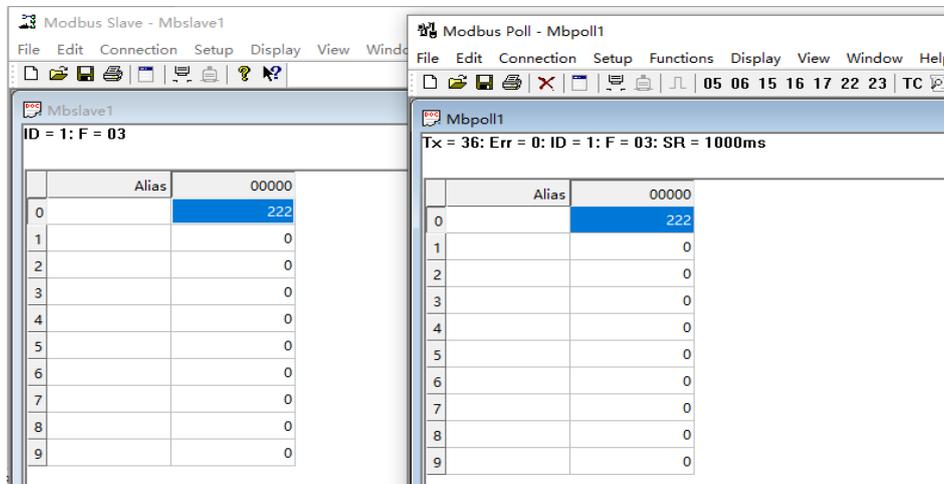


Figure 5.2.11 Receive and transmitter data successfully