

# **User Manual of KPS/KGW Series Products**

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***KYLAND***

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# 1 Product Introduction

The product name prefix of KPS/KGW indicates the product category. KPS series includes industrial serial server products and KGW series includes industrial intelligent gateway products. This document applies to the following series of products:

KPS/KGW310XA&320XA series;

KPS/KGW3224A series;

KGW3204A 4G series;

KPS/KGW320xA-232-485-422 series

## 1.1 Brief

### 1.1.1 KPS/KGW310X&320XA Series

KPS/KGW 310XA-320XA series is an industrial gateway product based on Linux system architecture and ARM9 processor, which is mainly used to connect serial devices to Ethernet, read serial device data through the network and remotely control serial devices.

This series can be divided into RS-232 and RS-485 serial communication modes. RS-485 provides 120Ω switchable terminal resistance, which is convenient to reduce signal reflection and can effectively improve the stability and reliability of RS-485 serial communication.

Series products include the following models:

- |                           |                         |
|---------------------------|-------------------------|
| ➤ KPS3101A-E-1T1D-232-L17 | KPS3101A-E-1T1D-485-L17 |
| ➤ KPS3102A-E-1T2D-232-L17 | KPS3102A-E-1T2D-485-L17 |
| ➤ KPS3204A-E-2T4D-232-L17 | KPS3204A-E-2T4D-485-L17 |
| ➤ KPS3208A-E-2T8D-232-L17 | KPS3208A-E-2T8D-485-L17 |
| ➤ KGW3101A-E-1T1D-232-L17 | KGW3101A-E-1T1D-485-L17 |
| ➤ KGW3102A-E-1T2D-232-L17 | KGW3102A-E-1T2D-485-L17 |
| ➤ KGW3204A-E-2T4D-232-L17 | KGW3204A-E-2T4D-485-L17 |
| ➤ KGW3208A-E-2T8D-232-L17 | KGW3208A-E-2T8D-485-L17 |



Figure 1: KPS/KGW 3102A, KPS/KGW3204A and KPS/KGW3208A RS-485 Physical Drawing

### 1.1.2KPS/KGW3224A Series

KPS3224A/KGW3224A series is an industrial-grade high-performance 24-port rack product based on Linux system architecture and 4-core A53 processor, which is mainly used for the conversion of communication protocols. Through data collection, storage and control, online real-time monitoring and remote control can be realized, and it can be used as the terminal equipment of industrial Internet platform. The equipment can meet the needs of communication protocol conversion in different industrial applications, and is suitable for smart cities, smart transportation, smart power and other fields.

It can be set to three serial communication modes: RS-232, RS-485 and RS422. The RS-485 serial interface of this series of equipment provides a switchable terminal resistance of  $120\Omega$ , which is convenient to reduce signal reflection and can effectively improve the stability and reliability of RS-485 serial communication.

Series products include the following models:

- KPS3224A-2T24D-HV
- KPS3224A-2T24D-HV-HV
- KGW3224A-2T24D-HV
- KGW3224A-2T24D-HV-HV



Figure 2: KPS 3224a/KGW 3224a Physical Drawing of Front Panel



Figure 3: KPS 3224a/KGW 3224a Physical Drawing of Back Panel



### 1.1.3 KGW3204A-4G Series

KGW3204A-4G wireless gateway is an industrial-grade 4G wireless gateway based on Linux system architecture, which is mainly used for the conversion of communication protocols. Through data collection, storage and control, it can realize online real-time monitoring and remote control, and can be used as the terminal equipment of industrial Internet platform.

4G wireless gateway can support RS-232, RS-485 and RS-422 serial communication modes. Two Ethernet interfaces and one 4G are provided to meet the requirements of wired and wireless communication. Providing a switchable terminal resistance of 120Ω is convenient to reduce signal reflection and can effectively improve the stability and reliability of serial communication.

Series products include the following models:

- KGW3204A-2T4D-232/485-4G-L17



Figure 4: KGW 3204a-2t4d-232/485-4g-L17 Physical Drawing

### 1.1.4 KPS3x0xAL Series

KPS3x0xAL series is an industrial gateway product based on Linux system architecture and ARM9 processor, which is mainly used to connect serial devices to Ethernet, read serial device data through the network and remotely control serial devices.

This serial server supports TCP Client, TCP Server, and UDP network communication modes, supports transparent transmission and Modbus RTU data transmission protocol, and supports SSH Mode transparent transmission mode.

Series products include the following models:

- KPS3102AL-1T4D-485-L5
- KPS3204AL-2T4D-485-L5



Figure 5: KPS3204AL-2T4D-485-L5 Physical Drawing

### 1.1.5KPS/KGW320xA-232-485-422 Series

The KPS/KGW320xA-232-485-422 series is an industrial-grade gateway product based on the Linux system architecture and ARM9 processor. It is mainly used to connect serial devices to Ethernet, and can read serial device data and remotely control serial devices through the network.

This serial server supports TCP Client, TCP Server, and UDP network communication modes, supports transparent transmission and Modbus RTU data transmission protocol, and supports SSH Mode transparent transmission mode.

This series of products uses a three-in-one serial interface, which can switch between RS-232/RS-485/RS-422 through software. It provides a switchable termination resistor of 120Ω, which helps to reduce signal reflection and effectively improve the stability and reliability of serial communication.

Series products include the following models:

- KPS3204A-2T4D-232/485/422-L17-L17
- KPS3208A-2T8D-232/485/422-L17-L17

- KGW3204A-2T4D-232/485/422-L17-L17
- KGW3208A-2T8D-232/485/422-L17-L17



Figure 6: KPS/KGW320xA -2TxD-232/485/422-L17-L17 Physical Drawing

## 1.2 Product Features

- |                        |   |
|------------------------|---|
| Data transmission:     | Support Socket operation mode, including TCP Server, TCP Client and UDP.  |
| Transmission protocol: | KPS series supports transparent transmission and Modbus RTU data transmission protocol;<br>KGW series additionally supports Modbus, OPC UA, DNP, IEC101, IEC103, IEC104, IEC61850, DL/T645-1997, DL/T645-2007 and Siemens S7 data transmission protocols, and supports advanced application-script calculation. |
| Routing:               | Support static routing.   |
| Security function:     | Support SSH, MAC address binding, user classification, AES\DES\3DES data encryption.  |
| Device management:     | Support Web management (HTTP/HTTPS)<br>Support KyCMT integrated debugging management tools (equipment search, IP address configuration and other functions)   |

Support KyPMT integrated configuration tool (EDPS protocol engineering configuration)

Support ICMP control message

Support SNMP v2c

Support SNMP Trap

Support ARP, DNS, DHCP Client.

Equipment maintenance: Support upgrading through WEB software.

Support FTP, TFTP and Syslog.

Support SMTP mail alarm

Support device alarm indicator light

Support breakpoint reconnection

Support telnet management

Clock characteristics: Support NTPv3 Client.

## 2 Specification Parameters and Pin Definition

### 2.1 Power Source Pin

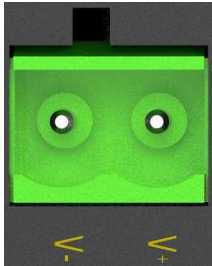
Table 1 Power Information

| Products            | Input voltage         | Access terminal     | Power consumption  | Anti-reverse connection of power supply |
|---------------------|-----------------------|---------------------|--|---|
| KPS/KGW3x0xA series | 24V DC<br>(12-48V DC) | 2-core plug-in type | KPS3101A: 1.0W<br>KGW3101A: 2.0W<br>KPS3102A: 1.0W<br>KGW3102A: 2.0W<br>KPS3204A: 1.5W<br>KGW3204A: 2.0W<br>KPS3208A: 1.6W<br>KGW3208A: 3.0W | √                                       |
| KPS/KGW3224A series | 220V AC               | 3-core plug-in type | 15.0W  | AC                                      |
| KGW3204A 4G series  | 24V DC<br>(12-48V DC) | 2-core plug-in type | 8.0W   | √                                       |
| KPS3x0xAL series    | 24V DC<br>(9-36V DC)  | 2-core plug-in type | 1.5W   | √                                       |

|                                     |                       |                        |    |   |
|-------------------------------------|-----------------------|------------------------|----|---|
| KPS/KGW320xA-<br>232-485-422 series | 24V DC<br>(12-48V DC) | 2-core plug-in<br>type | 3W | √ |
|-------------------------------------|-----------------------|------------------------|----|---|

KPS/KGW3x0xA series , KGW3204A-4G series and KPS3x0XAL series and KPS/KGW320xA-232-485-422 series use a 2-core plug-in terminal to connect to the power supply. The equipment has anti-reverse connection protection, and the line sequence is subject to the mask screen printing instructions.

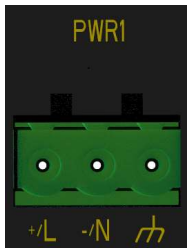
Table 2 Definition of Power Interface



| Power | Pin | Description  |
|-------|-----|--------------|
| PWR   | V+  | Power supply |
|       | V-  | Power supply |

KPS/KGW3224A series rack serial server uses two 3-core plug-in terminals to connect to the power supply.

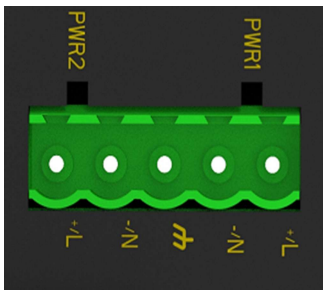
Table 3 Definition of Power Interface



| Power | Pin | Description |
|-------|-----|-------------|
| PWR   | -/N | Zero curve  |
|       | +/L | Live wire   |
|       | GND | Earth wire  |

KPS/KGW32x4A-232-485-422 series three-in- one serial port server uses a 5-core plug-in terminal to connect to the power supply.

Table 4 Definition of Power Interface



| Power | Pin | Description  |
|-------|-----|--------------|
| PWR1  | -/N | Power supply |
|       | +/L | Power supply |
|       | GND | Earth wire   |
| PWR2  | -/N | Power supply |
|       | +/L | Power supply |

## 2.2 Serial Interface

### 2.2.1 RS-485 terminal resistance

Table 5 Resistance Information

| Products                        | 120Ω terminal resistance setting mode |
|---------------------------------|---------------------------------------|
| KPS/KGW3x0xA series             | DIP switch                            |
| KPS/KGW3224A series             | WEB page configuration                |
| KGW3204A 4G series              | DIP switch                            |
| KPS3x0xAL series                | WEB page configuration                |
| KPS/KGW320xA-232-485-422 series | DIP switch                            |

When using RS-485 transmission mode in complex industrial environment, it may be necessary to increase the terminal resistance to reduce the signal interference caused by serial signal reflection;

DIP switch is set with 120Ω terminal resistance: ID n of DIP switch corresponds to serial port Sn respectively. When dip switch No. N is turned ON, the terminal resistance of Sn serial port is enabled; When dip switch No. N is turned OFF, the terminal resistance of Sn serial port is not enabled; The termination resistor is not enabled by default.

WEB page setting 120Ω terminal resistance: When the serial terminal resistance of the serial server-additional configuration page is set to ON, the terminal resistance of the serial port is enabled; When set to OFF, the terminal resistance of the serial port is not enabled; The device does not enable the termination resistor by default.

The KPS/KGW320xA-232-485-422 device DIP switch pull-up and pull-down resistor definitions: each serial port contains a set of DIP switches, and each set of DIP switches contains three sub-DIP switches, as shown in the figure below:



Figure 7 KPS/KGW3204A-2T4D-232/485/422-L17-L17 DIP switch Physical Drawing

Sub-DIP switch 1:

RS485 pull-up resistor value for A-line to isolated power supply positive pole: Pull High

ON: 500 Ω      OFF: 1K Ω

Sub-DIP switch 2:

RS485 pull-down resistor value for B-line to isolated power supply ground: Pull Low

ON: 500 Ω    OFF: 1K Ω

Sub-DIP switch 3:

RS485 matching resistor value between A and B lines: Terminator

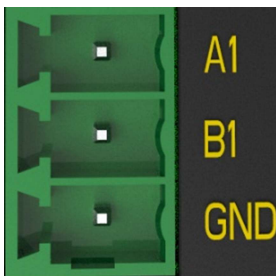
ON: 120 Ω    OFF: ---

## 2.2.2 Serial interface pin definition

### 2.2.2.1 KPS/KGW310XA&320XA

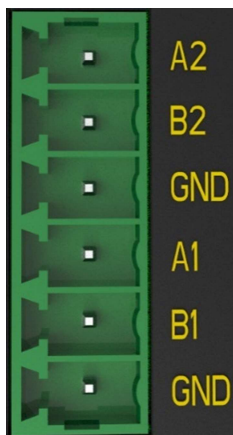
According to different product models, serial ports can be divided into RS-232 type and RS-485 type, and each type of gateway only supports one communication mode of serial interface.

Table 6 Definition of KPS/KGW 3101a Terminal



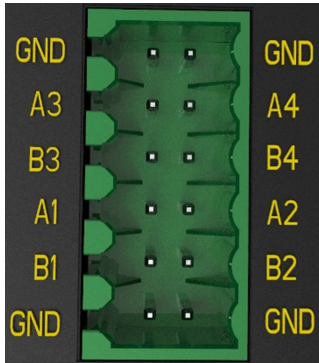
| Pin | Serial number | RS-232 | RS-485   |
|-----|---------------|--------|----------|
| GND | S1            | GND    | GND      |
| B1  |               | RxD    | Data-(B) |
| A1  |               | TxD    | Data+(A) |

Table 7 Definition of KPS/KGW 3102a Terminal



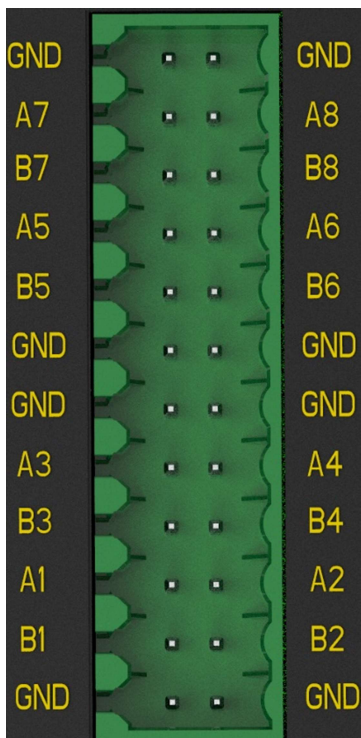
| Pin | Serial number | RS-232 | RS-485   |
|-----|---------------|--------|----------|
| GND | S1            | GND    | GND      |
| B1  |               | RxD    | Data-(B) |
| A1  |               | TxD    | Data+(A) |
| GND | S2            | GND    | GND      |
| B2  |               | RxD    | Data-(B) |
| A2  |               | TxD    | Data+(A) |

Table 8 Definition of KPS/KGW 3204a Terminal



| Pin | Serial number | RS-232 | RS-485   |
|-----|---------------|--------|----------|
| GND | S1            | GND    | GND      |
| B1  |               | RxD    | Data-(B) |
| A1  |               | TxD    | Data+(A) |
| GND | S2            | GND    | GND      |
| B2  |               | RxD    | Data-(B) |
| A2  |               | TxD    | Data+(A) |
| B3  | S3            | RxD    | Data-(B) |
| A3  |               | TxD    | Data+(A) |
| GND |               | GND    | GND      |
| B4  | S4            | RxD    | Data-(B) |
| A4  |               | TxD    | Data+(A) |
| GND |               | GND    | GND      |

Table 9 Definition of KPS/KGW 3208a Terminal



| Pin | Serial number | RS-232 | RS-485   |
|-----|---------------|--------|----------|
| GND | S1            | GND    | GND      |
| B1  |               | RxD    | Data-(B) |
| A1  |               | TxD    | Data+(A) |
| GND | S2            | GND    | GND      |
| B2  |               | RxD    | Data-(B) |
| A2  |               | TxD    | Data+(A) |
| B3  | S3            | RxD    | Data-(B) |
| A3  |               | TxD    | Data+(A) |
| GND |               | GND    | GND      |
| B4  | S4            | RxD    | Data-(B) |
| A4  |               | TxD    | Data+(A) |
| GND |               | GND    | GND      |



|     |    |     |          |
|-----|----|-----|----------|
| GND | S5 | GND | GND      |
| B5  |    | RxD | Data-(B) |
| A5  |    | TxD | Data+(A) |
| GND | S6 | GND | GND      |
| B6  |    | RxD | Data-(B) |
| A6  |    | TxD | Data+(A) |
| B7  | S7 | RxD | Data-(B) |
| A7  |    | TxD | Data+(A) |
| GND |    | GND | GND      |
| B8  | S8 | RxD | Data-(B) |
| A8  |    | TxD | Data+(A) |
| GND |    | GND | GND      |

### 2.2.2.2 KPS/KGW3224A

The serial ports of this series can be divided into RS-232 type, RS-485 type and RS-422 type, and each serial port only supports one communication mode of serial interface. According to the additional configuration of page serial port-serial port mode configuration item, RS-485 terminal can be configured as RS-422 terminal.

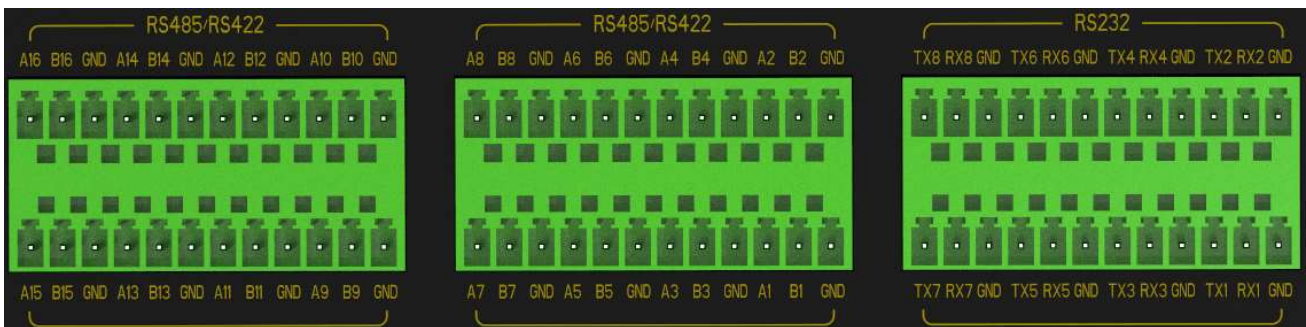


Table 10 Definition of KPS 3224a/KGW 3224a RS-485 Terminal

| Pin | Serial number | RS-232 | RS422 | RS-485 |
|-----|---------------|--------|-------|--------|
| GND | S1            | -      | GND   | GND    |
| B1  |               | -      | TxD1- | B1     |
| A1  |               | -      | TxD1+ | A1     |
| GND | S2            | -      | GND   | GND    |
| B2  |               | -      | RxD1- | B2     |
| A2  |               | -      | RxD1+ | A2     |

|     |     |   |       |     |
|-----|-----|---|-------|-----|
| GND | S3  | - | GND   | GND |
| B3  |     | - | TxD2- | B3  |
| A3  |     | - | TxD2+ | A3  |
| GND | S4  | - | GND   | GND |
| B4  |     | - | RxD2- | B4  |
| A4  |     | - | RxD2+ | A4  |
| GND | S5  | - | GND   | GND |
| B5  |     | - | RxD3- | B5  |
| A5  |     | - | RxD3+ | A5  |
| GND | S6  | - | GND   | GND |
| B6  |     | - | RxD3- | B6  |
| A6  |     | - | RxD3+ | A6  |
| GND | S7  | - | GND   | GND |
| B7  |     | - | RxD4- | B7  |
| A7  |     | - | RxD4+ | A7  |
| GND | S8  | - | GND   | GND |
| B8  |     | - | RxD4- | B8  |
| A8  |     | - | RxD4+ | A8  |
| GND | S9  | - | GND   | GND |
| B9  |     | - | TxD5- | B9  |
| A9  |     | - | TxD5+ | A9  |
| GND | S10 | - | GND   | GND |
| B10 |     | - | TxD5- | B10 |
| A10 |     | - | TxD5+ | A10 |
| GND | S11 | - | GND   | GND |
| B11 |     | - | TxD6- | B11 |
| A11 |     | - | TxD6+ | A11 |
| GND | S12 | - | GND   | GND |
| B12 |     | - | TxD6- | B12 |
| A12 |     | - | TxD6+ | A12 |
| GND | S13 | - | GND   | GND |
| B13 |     | - | RxD7- | B13 |
| A13 |     | - | RxD7+ | A13 |

|     |     |   |       |     |
|-----|-----|---|-------|-----|
| GND | S14 | - | GND   | GND |
| B14 |     | - | RxD7- | B14 |
| A14 |     | - | RxD7+ | A14 |
| GND | S15 | - | GND   | GND |
| B15 |     | - | RxD8- | B15 |
| A15 |     | - | RxD8+ | A15 |
| GND | S16 | - | GND   | GND |
| B16 |     | - | RxD8- | B16 |
| A16 |     | - | RxD8+ | A16 |

Table 11 Definition of KPS 3224a/KGW 3224a RS-232 Terminal

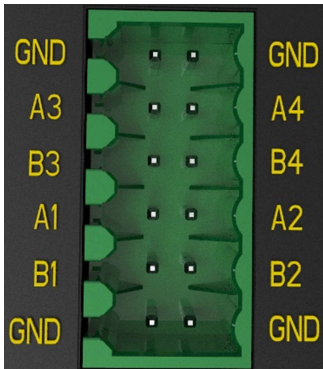
| Pin | Serial number | RS-232 | RS422 | RS-485 |
|-----|---------------|--------|-------|--------|
| GND | S1            | GND    | -     | -      |
| RX1 |               | Rx1    | -     | -      |
| TX1 |               | Tx1    | -     | -      |
| GND | S2            | GND    | -     | -      |
| RX2 |               | Rx2    | -     | -      |
| TX2 |               | Tx2    | -     | -      |
| GND | S3            | GND    | -     | -      |
| RX3 |               | Rx3    | -     | -      |
| TX3 |               | Tx3    | -     | -      |
| GND | S4            | GND    | -     | -      |
| RX4 |               | Rx4    | -     | -      |
| TX4 |               | Tx4    | -     | -      |
| GND | S5            | GND    | -     | -      |
| RX5 |               | Rx5    | -     | -      |
| TX5 |               | Tx5    | -     | -      |
| GND | S6            | GND    | -     | -      |
| RX6 |               | Rx6    | -     | -      |
| TX6 |               | Tx6    | -     | -      |
| GND | S7            | GND    | -     | -      |
| RX7 |               | Rx7    | -     | -      |
| TX7 |               | Tx7    | -     | -      |

|     |    |     |   |   |
|-----|----|-----|---|---|
| GND | S8 | GND | - | - |
| RX8 |    | Rx8 | - | - |
| TX8 |    | Tx8 | - | - |

### 2.2.2.3 KGW3204A-2T4D-232/485-4G-L17

The serial ports of this series can be divided into RS-232, RS-485 and RS-422, and each serial port only supports one of the communication modes of serial interfaces. According to the settings of serial port server-serial interface, RS-485 terminal can be configured as RS-422 terminal.

Table 12 Definition of KGW3204a-2t4d-232/485-4g-L17 Terminal

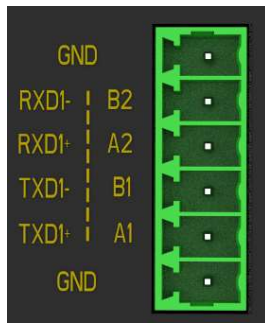


| Pin | Serial number | RS-485   | RS-232 | RS-422 |
|-----|---------------|----------|--------|--------|
| GND | S1            | GND      | -      | -      |
| A1  |               | Data+(A) | -      | -      |
| B1  |               | Data-(B) | -      | -      |
| GND | S2            | GND      | -      | -      |
| A2  |               | Data+(A) | -      | -      |
| B2  |               | Data-(B) | -      | -      |
| GND | S3            | GND      | GND    | GND    |
| A3  |               | Data+(A) | TxD    | TxD+   |
| B3  |               | Data-(B) | RxD    | TxD-   |
| GND | S4            | GND      | GND    | GND    |
| A4  |               | Data+(A) | TxD    | RxD+   |
| B4  |               | Data-(B) | RxD    | RxD-   |

### 2.2.2.4 KPS310XAL&320XAL

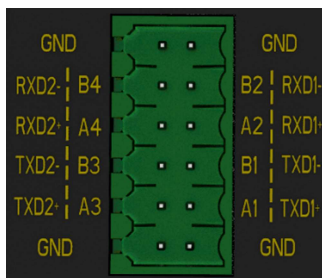
The serial port of this series is RS-485 type. According to the additional configuration of the page serial port - serial port mode configuration item, the RS-485 type terminal block can be configured for use as the RS-422 type terminal block.

Table 13 Definition of KPS3102AL Terminal



| Pin | Serial number | RS-485   | RS-422 |
|-----|---------------|----------|--------|
| GND | S1            | GND      | GND    |
| A1  |               | Data+(A) | TxD1+  |
| B1  |               | Data-(B) | TxD1-  |
| A2  | S2            | Data+(A) | RxD1+  |
| B2  |               | Data-(B) | RxD1-  |
| GND |               | GND      | GND    |

Table 14 Definition of KPS3204AL Terminal



| Pin | Serial number | RS-485   | RS-422 |
|-----|---------------|----------|--------|
| GND | S1            | GND      | GND    |
| A1  |               | Data+(A) | TxD1+  |
| B1  |               | Data-(B) | TxD1-  |
| A2  | S2            | Data+(A) | RxD1+  |
| B2  |               | Data-(B) | RxD1-  |
| GND |               | GND      | GND    |
| GND | S3            | GND      | GND    |
| A3  |               | Data+(A) | TxD2+  |
| B3  |               | Data-(B) | TxD2-  |
| A4  | S4            | Data+(A) | RxD2+  |
| B4  |               | Data-(B) | RxD2-  |
| GND |               | GND      | GND    |

### 2.2.2.5 KPS/KGW 3204A-2T4D-232/485/422-L17-L17

The serial ports of this series use standard DB9 male interface, which can be switched between

RS-232、RS-485 and RS-422 modes through software.

Table 15 Definition of KPS/KGW3204A-2T4D-232/485/422-L17-L17 Terminal



|   | Serial number | RS-485   | RS-232 | RS-422 |
|---|---------------|----------|--------|--------|
| 1 | S1/S2/S3/S4   | NC       | NC     | TxD-   |
| 2 |               | NC       | RxD    | TxD+   |
| 3 |               | Data+(A) | TxD    | RxD+   |
| 4 |               | Data-(B) | NC     | RxD-   |
| 5 |               | GND      | GND    | GND    |

## 2.3 Network Port

Table 16 Network Interface Information

| Products                        | Network interface  |
|---------------------------------|--|
| KPS/KGW3x0xA series             | KPS/KGW310XA: 1x10/100Mbps<br>KPS/KGW320XA: 2x10/100Mbps |
| KPS/KGW3224A series             | 2 x 10/100Mbps   |
| KGW3204A 4G series              | 2 x 10/100Mbps   |
| KPS3x0xAL series                | KPS3102AL: 1x10/100Mbps<br>KPS3204AL: 2x10/100Mbps       |
| KPS/KGW320xA-232-485-422 series | KPS/KGW3204A: 2x10/100Mbps<br>KPS/KGW3208A: 2x10/100Mbps |

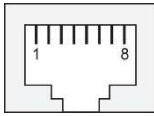
When working normally, you can directly connect the equipment to the network by using the network cable. When initialization and fault detection are needed, it can be directly connected to the PC through the network cable. When the equipment is running, the network port indicator lights up, so it can be judged whether it has been connected to the network and the rate of access to the network.

Users can change the IP address of the network port, but the MAC address cannot be changed.

If you want to connect multiple devices to the network side, the external network device must keep the same network segment as the network port of the device, and there is no IP and MAC address conflict.

The port pins are defined as follows:

Table 17 Definition of Network Ports



| Pin | MDI-X signal  | MDI signal    |
|-----|---------------|---------------|
| 1   | Rx+           | Tx+           |
| 2   | Rx-           | Tx-           |
| 3   | Tx+           | Rx+           |
| 6   | Tx-           | Rx-           |
| 4-5 | to be defined | to be defined |
| 7-8 | to be defined | to be defined |

## 2.4 Light emitting diode

Table 18 LED Indicators

| LED Indicator light | Color | Description  |
|---------------------|-------|--|
| Reset               | Green | Flashing: the Reset button is pressed for more than 3 seconds.   |
|                     |       | On: Press the Reset button for less than 3 seconds.  |
|                     |       | Off: the Reset button is not pressed.  |
| Power               | Green | Always on: the input power supply is connected normally and the equipment is running normally.                                   |
|                     |       | Off: the input power supply is not connected or abnormal.  |
| PWR1                | Green | On: power on   |
|                     |       | Off: No electricity.   |
| PWR2                | Green | On: power on   |
|                     |       | Off: No electricity.   |
| Run                 | Green | Always on: the serial server is starting.  |
|                     |       | Flash: The frequency is about once every second, and the system is running normally.   |
|                     |       | Flash (no Reset indicator):<br>When the reset key is pressed (for 3-10 seconds), the system will return to the factory settings. |
|                     |       | Off: the main state is abnormal or not powered on.   |
| 4G                  | Green | On: the port has established a valid network connection.   |
|                     |       | Flash: There is network activity on the port.  |

|                    |           |  |
|--------------------|-----------|--|
|                    |           | Off: the port has not established a valid network connection.                                |
| Alarm              | Green/Red | Flash: The frequency is about 2 times per second, and the system crashes or runs abnormally. |
|                    |           | Off: the system is normal  |
|                    |           | Always on: KGW series non-agreement project<br>KPS serial port is not started.               |
| Link/ACT           | Green     | On: the port has established a valid network connection.                                     |
|                    |           | Flash: There is network activity on the port.  |
|                    |           | Off: the port has not established a valid network connection.                                |
| Speed              | Green     | On: 100M working state (i.e. 100Base-TX).  |
|                    |           | Off: 10M working state (i.e. 10Base-TX)  |
| RJ45<br>(Link/ACT) | Green     | On: the port has established a valid network connection.                                     |
|                    |           | Flash: There is network activity on the port.  |
|                    |           | Off: the port has not established a valid network connection.                                |
| RJ45<br>(10/100M)  | Yellow    | On: 100M working state (i.e. 100Base-TX).  |
|                    |           | Off: 10M working state (i.e. 10Base-TX)  |
| Tx-n               | Green     | Flash: serial port n has data signal to send.  |
|                    |           | Off: serial port n has no data transmission.   |
| Rx-n               | Green     | Flash: serial port n has data signal reception.  |
|                    |           | Off: serial port n has no data transmission.   |

**Note:** The value of n in the above table is serial number of serial port, such as Tx1 for serial port 1.

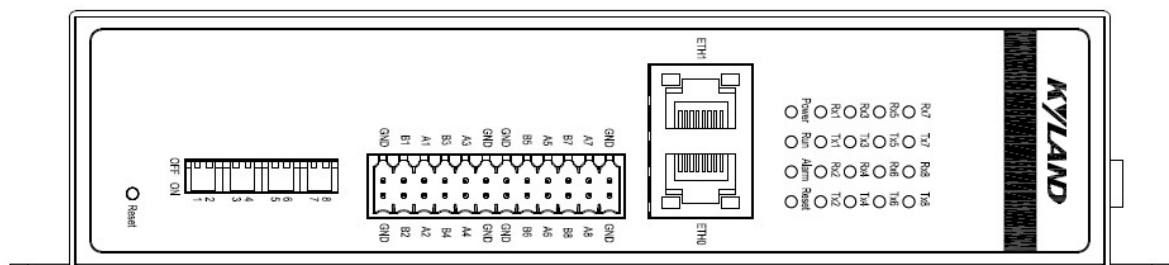


Figure 8 Line Diagram of KPS/kg w3x0xa Series Indicator Panel (taking KPS3208A as an example)



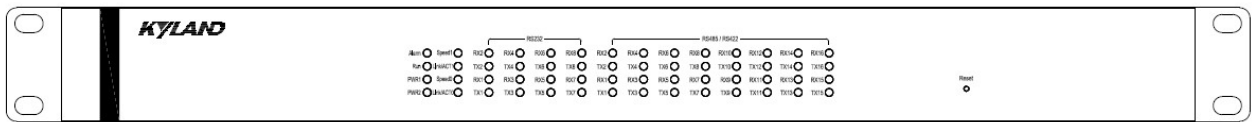


Figure 9 Line Diagram of KPS/kgw3224a Indicator Panel

**Note: KPS/KGW3224A series equipment supports configuring RS485 serial port in RS422 mode. When the RS-422 serial port N is enabled, the RX 2n indicator will always be on, indicating that the RS-422 serial port N has been turned on. At this time, RX/TX(2n-1) is the serial port indicator of RS-422 port n.**

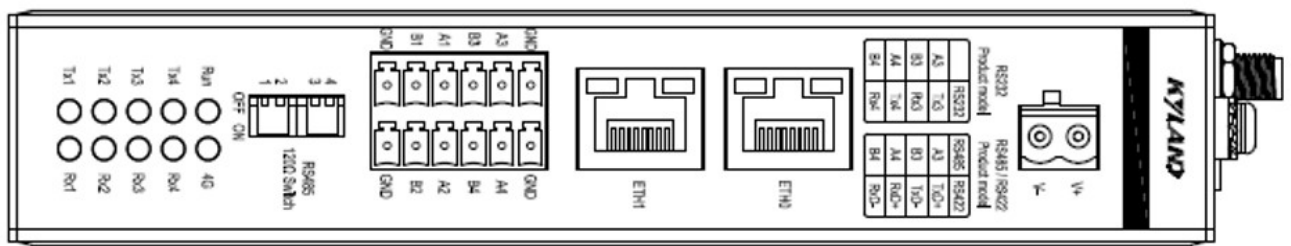


Figure 10 KGW3204A-4G Series Indicator Panel Line Diagram

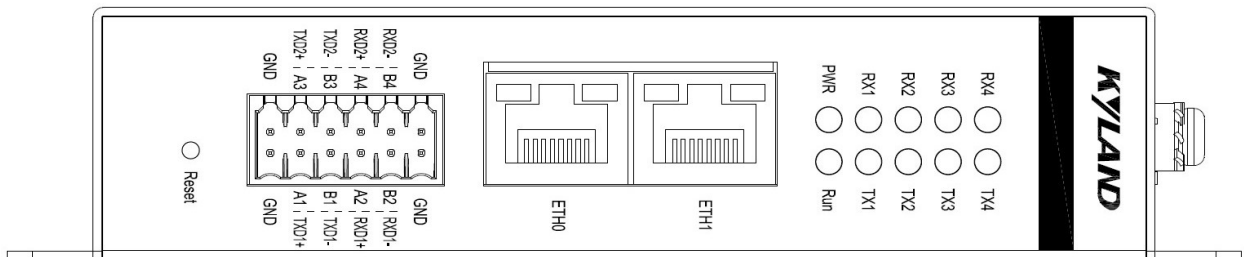


Figure 11 Line Diagram of KPS3204AL Indicator Panel

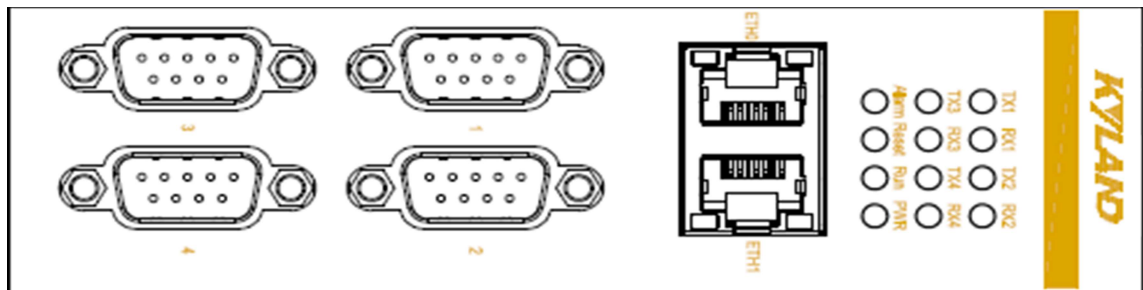
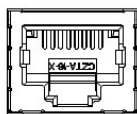


Figure 12 KPS3204A-2T4D-232/485/422-L17-L17 Series Indicator Panel Line Diagram

## 2.5 Console Interface

**Note: Console interface is applicable to KPS/KGW3224A, KPS/KGW320xA-232-485-422.**

**Table 19 Definition of Console Port**



| Pin | MDI-X signal  | MDI signal    |
|-----|---------------|---------------|
| 1   | to be defined | to be defined |
| 2   | Tx            | Tx            |
| 3   | Rx            | Rx            |
| 4   | to be defined | to be defined |
| 5   | GND           | GND           |
| 6-8 | to be defined | to be defined |

**Note: The KPS3204A-2T4D-232/485/422-L17-L17 device supports debugging serial port identity authentication function. The default login username is “root” and the login password is “ky.yc.18”.**

## 2.6 4G Module

**Note: 4G module is suitable for KGW3204A-4G. The domestic version uses EC200A-CN module, and the global version uses EG25-G module.**

### 2.6.1 EC200A-CN Mini Pcle

**Table 20 RF Parameters of EC 200a-CN Mini PCLE**

| Network standard | Frequency band         | Max downlink | Max uplink |
|------------------|------------------------|--------------|------------|
| LTE-FDD          | B1/ B3/ B5/ B8         | 150          | 50         |
| LTE-TDD          | B34/ B38/ B39/B40/ B41 | 130          | 30         |
| WCDMA            | B1/B5/ B8              | 384          | 384        |

**Table 21 Emission Power of EC 200a-CN Mini PCLE**

| Network standard | Maximum power value |
|------------------|---------------------|
| EGSM900          | 33dBm±2dB           |
| DCS1800          | 30dBm±2dB           |
| WCDMA            | 24dBm+1/-3db        |
| LTE-FDD          | 23dBm±2dB           |
| LTE-TDD          | 23dBm±2dB           |

### 2.6.2 EG25-G Mini PCIe

**Table 22 RF Parameters of EG25-G Mini PCLE**

| Network standard | Frequency band  | Max downlink | Max uplink |
|------------------|---|--------------|------------|
| LTE-FDD          | B1/ B2/ B3/ B4/ B5/ B7/ B8/ B12/<br>B13/ B18/ B19/ B20/ B25/ B26/ B28 | 150          | 50         |

|         |                            |     |       |
|---------|----------------------------|-----|-------|
| LTE-TDD | B38/ B39/B40/ B41          | 130 | 30    |
| WCDMA   | B1/B2/ B4/ B5/ B6/ B8/ B19 | 384 | 384   |
| GSM     | B2/ B3/ B5/ B8             | 296 | 236.8 |
|         |                            | 107 | 85.6  |

Table 23 Emission Power of EC 200a-CN Mini PCIe

| Network standard | Maximum power value |
|------------------|---------------------|
| EGSM900          | 33dBm±2dB           |
| DCS1800          | 30dBm±2dB           |
| WCDMA            | 24dBm+1/-3db        |
| LTE-FDD          | 23dBm±2dB           |
| LTE-TDD          | 23dBm±2dB           |

### 3 Hardware Characteristics

#### 3.1 Network Interface

Table 24 Network Interface Parameters

| Products                     | KPS/KGW3x0xA series                             | KPS/KGW3224 A series                             | KGW3204A 4G series                               | KPS3x0xAL series                                | KPS/KGW3 20xA-232-485-422 series               |
|------------------------------|---|--|--|---|--|
| Number of network interfaces | KPS/KGW310X A:1<br>KPS/KGW320X A:2.             | 2  | 2  | KPS3102AL: 1<br>KPS3204AL: 2.                   | KPS/KGW3 204A:2<br>KPS/KGW3 208A:2             |
| Rate                         | 10/100Mbps, adaptive                            | 10/100Mbps, adaptive                             | 10/100Mbps, adaptive                             | 10/100Mbps, adaptive                            | 10/100Mbps, adaptive                           |
| Connector                    | RJ45  | RJ45   | RJ45   | RJ45  | RJ45   |
| 4G                           | None  | None   | 1 road   | None  | None   |
| ESD protection               | Air 8 kV, contact 6 kV electrostatic protection | Air 15 kV, contact 8 kV electrostatic protection | Air 15 kV, contact 8 kV electrostatic protection | Air 8 kV, contact 6 kV electrostatic protection | Air 8 kV, contact 6kV electrostatic protection |
| Isolation protection         | Built-in 1.5KV                                  | Built-in 1.5KV                                   | Built-in 1.5KV                                   | Built-in 1.5KV                                  | Built-in 1.5KV                                 |

**Note:** it is recommended to use shielded wire for network interface wiring to improve anti-

interference ability.

### 3.2 Serial Interface

Table 25 Serial Interface Parameters

| product                     | KPS/KGW3x0xA series   | KPS/KGW3224A series   | KGW320 4A 4G series   | KPS3x0xAL series                             | KPS/KGW320x A-232-485-422 series   |
|-----------------------------|---|---|---|--|--|
| Number of serial interfaces | KPS/KGW 3101a: 1<br>KPS/KGW 3202a: 2<br>KPS/KGW 3204a: 4<br>KPS/KGW 3208a: 8. | 24  | 4   | KPS3102AL: 2<br>KPS3204AL: 4.                | KPS/KGW3204 A:4<br>KPS/KGW3208 A:8   |
| Serial port type            | RS-232/RS-485 product models are available.                                   | 8 RS-232 models and 16 RS-485 models (8 RS-422 models can be configured). | 2 RS485, 2 RS232/RS485 or 1 RS422.                              | The RS-485 model can be configured as RS-422 | Switching between RS-232、RS-485 and RS-422 through software                  |
| Connector                   | Terminal  | Terminal  | Terminal  | Terminal                                     | Terminal   |
| DIP switch                  | Enable/disable the 120Ω terminal resistance of RS-485 equipment.              | No DIP switch, controlled by software                                     | Enable/disable the 120Ω terminal resistance of RS-485 equipment | No DIP switch, controlled by software        | DIP switch, Enable/disable the 120Ω terminal resistance of RS-485 equipment. |
| EMC                         | Emc level 3 b   | Emc level 4 b   | Emc level 4 b   | Emc level 3 b                                | Emc level 3 b  |
| Isolation protection        | Built-in 3KV  | Built-in 3KV  | Built-in 3KV  | None   | Built-in 2KV   |

**Note: Shielded wires are recommended for serial interface wiring to improve anti-interference ability.**

### 3.3 Serial Communication Parameters

Table 26 Serial Communication Parameters

| Products      | KPS/KG<br>W3x0xA<br>series   | KPS3x0xAL<br>series | KGW3204A<br>4G series | KPS/KG<br>W3224A<br>series | KPS/KGW320xA-232-<br>485-422 series |
|---------------|--|---------------------|-----------------------|----------------------------|-------------------------------------|
| data bit      | 5、6、7、8  |                     |                       |                            |                                     |
| Stop position | 1、2  |                     |                       |                            |                                     |
| Check Digit   | None、Even、Odd  |                     |                       |                            |                                     |
| Baud rate     | 50, 75, 110, 134, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, Customize (nonstandard baud rate)<br><b>Note: The KPS/KGW3224A series does not support baud rates of 50、75、134、150 or 200.A baud rate of 230400 is only applicable to RS-485 13-16 and RS-422 7-8</b> |                     |                       |                            |                                     |

### 3.4 Button

Reset: Within 3S of short press, the equipment will be restarted without restoring the factory settings; Long press 3S-10S to restore the factory settings; For more than 10S, do nothing.

### 3.5 Environmental Conditions

Working temperature:-40°C ~ 75°C

Storage temperature:-40°C ~ 85°C

Relative humidity: 5 ~ 95% without condensation.

Cooling mode: natural cooling, no fan.

### 3.6 Micro SD

KPS\KGW3224A and KGW3204A-2T4D-232/485-4G-L17 series support Micro SD card expansion.

Support SDIO3.0 standard

### 3.7 SIM card

KGW3204A-2T4D-232/485-4G-L17 series supports SIM cards.

Micro card: Size 12mm\*15mm

Domestic version support: Mobile, Telecom and Unicom.

Global version:

Operator certification: Deutsche Telekom (Europe), Verizon/AT&T/U.S. Cellular (USA),  
Telus/Rogers\* (Canada)

Compulsory/conformity certification: GCF (global), CE (Europe), UKCA (United Kingdom), PTCRB (North America), FCC (United States), IC (Canada), Anatel (Brazil), IFETEL (Mexico), KC (Korea), NCC (China), JATE/TELEC (Japan), RCM (Australia & New Zealand), ICASA (South Africa).

## 4 Software Function

The device has a Web management configuration page, which can be opened by browsers such as Chrome and Firefox to set the device.

**Note: The following general functional modules are exemplified by KGW3204A, and the specific functional modules are illustrated by corresponding models.**

### 4.1 WEB Login and Password

Connect to the Web console: open a browser and enter the IP address of the device. Default IP address: network port-eth0: 192.168.0.249; Network port-eth1: 192.168.1.249.

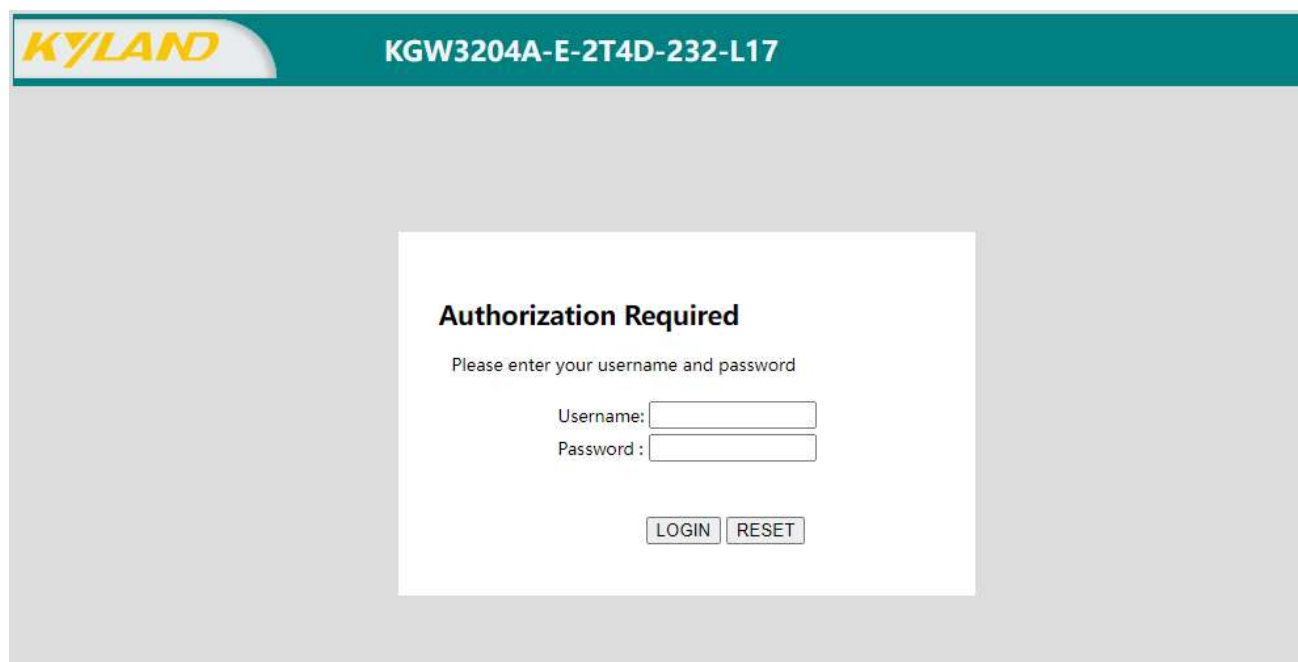


Figure 13 Login Page

Default login user name: admin and login password: pwd\$4\$Kyland. Enter the user name and password and click "Login" to enter the Web console. After logging in to the homepage, you can choose the page display language, and the page text can be switched between English and Simplified Chinese.

## 4.2 Home Page

The homepage interface is used to display equipment information, including serial number, host name, software version, hardware version and equipment time.



Figure 14 Home Page

## 4.3 Network

### 4.3.1 Interface

The network-interface page is used to display the relevant network parameters of the serial server device, including the running time of the device, MAC address, data received/sent, IP address, etc.

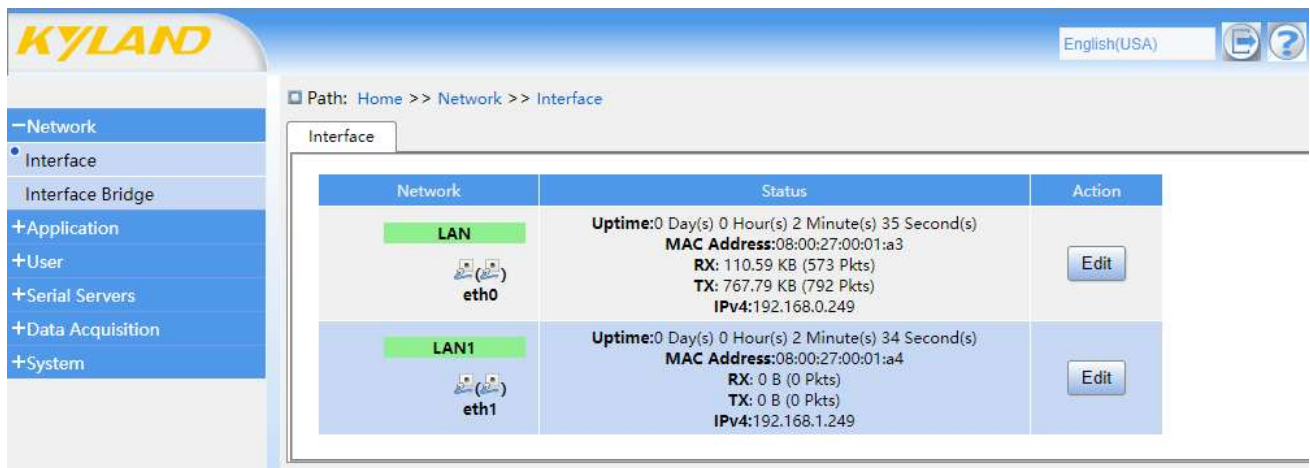


Figure 15 Network Page

After clicking the Network-Interface menu, the "Edit" button appears on the network interface page. Click the "Edit" button to enter the network interface editing interface, where the user can set the IP address, subnet mask, gateway, customized DNS and multi-IP address of the gateway -LAN (eth0) and gateway -LAN1 (eth1). When all parameters are set, click "Apply" and the network function will take effect after automatic restart.

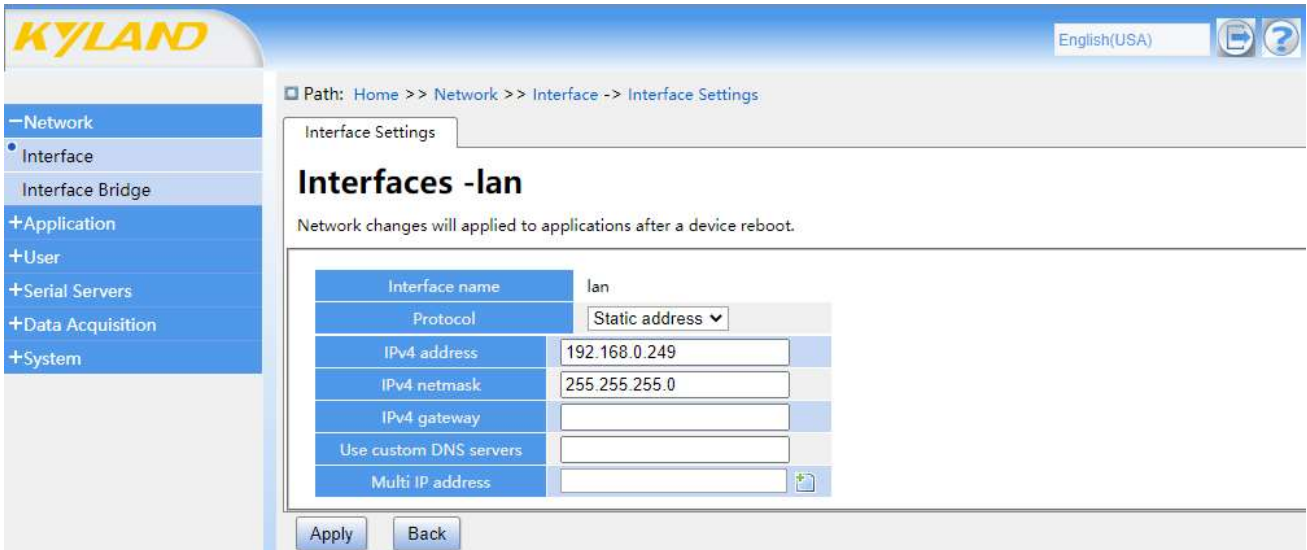


Figure 16 Website Editing Page

Table 27 Editing Parameters of Network Port

| Parameter             | Value                                    | Description  |
|-----------------------|--|--|
| Protocol              | Static address, DHCP client              | Select static IP or DHCP.  |
| Ip address            | eth0:192.168.0.249<br>eth1:192.168.1.249 | Ip address   |
| Subnet mask           | 255.255.255.0                            | Identifies whether the server belongs to a, b or c network.  |
| Default gateway       | 0.0.0.0                                  | The IP address of the router that provides network access outside the LAN of the device.   |
| Custom DNS            | IP address                               | domain name system   |
| Multiple IP addresses | IP address                               | You must be in the same network segment as the current network port to add successfully, and you can access the device through the added multi-IP address. |

#### 4.3.2 Network port bridging

The network-gateway bridge page is used to display the network parameters related to gateway bridge, including enabling bridge, IPv4 address, IPv4 subnet mask, using customized DNS server, multiple IP addresses, etc.

Network interface bridging is divided into LAN-LAN and LAN-WAN.

LAN-LAN bridging mode. Tick Enable Bridging, tick "Ethernet Adapter eth1", turn on the



bridging function, set the IP address and subnet mask, and click "Apply". The bridge function between the network port -LAN(eth0) and the network port -LAN1(eth1) has been successfully enabled, and both networks can access this equipment or transmit data with this equipment with the set IPv4 address.

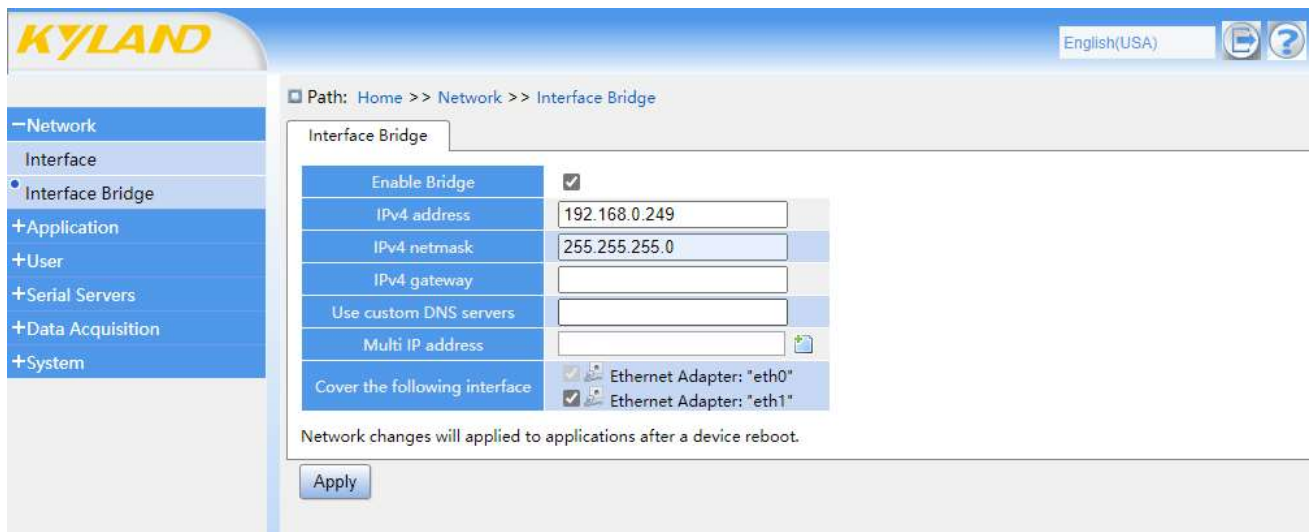


Figure 17 LAN-LAN Gateway Bridge Page

Table 28 LAN-LAN Interface Bridging Parameters

| Parameter               | Value         | Description  |
|-------------------------|---------------|--|
| IPv4 address            | IP address    | Ip address   |
| IPv4 subnet mask        | 255.255.255.0 | Identifies that the server belongs to a class, b or c network.   |
| Use a custom DNS server | IP address    | Domain name system   |
| Multiple IP addresses   | IP address    | You must be in the same network segment as the current network port to add successfully, and you can access the device through the added multi-IP address. |

Bridge mode of LAN-WAN. Check Enable Bridging, uncheck “Ethernet Adapter eth1”, select the protocol (WAN), set the IP address and subnet mask of the gateway -LAN(eth0) and gateway -WAN (eth1) respectively, and click Apply. The routing function is enabled, and the IP of different network segments can be accessed through the WAN port of this device.

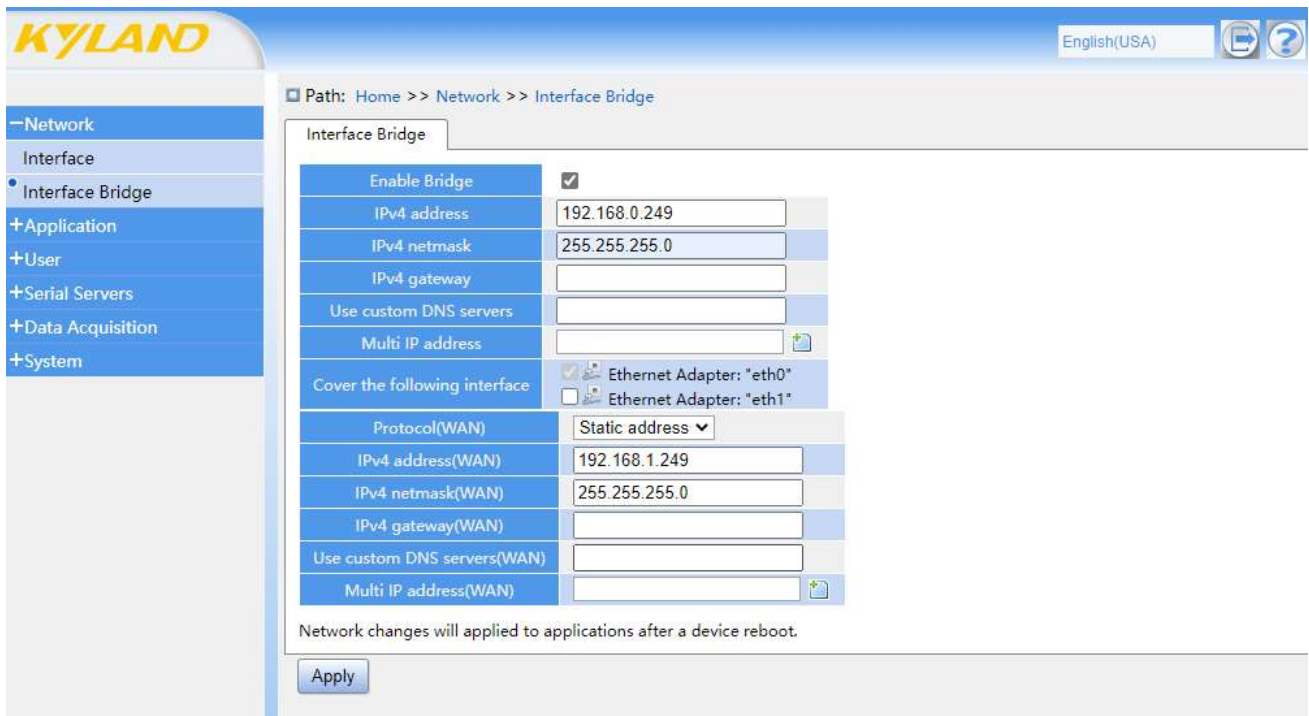


Figure 18 LAN-WAN Interface Bridge Page

Table 29 LAN-WAN Interface Bridging Parameters

| Parameter               | Value                       | Description   |
|-------------------------|-----------------------------|---|
| Protocol                | Static address, DHCP client | Select static IP or DHCP.   |
| IPv4 address            | IP address                  | Ip address  |
| IPv4 subnet mask        | 255.255.255.0               | Identifies that the server belongs to a class, b or c network.  |
| IPv4 gateway            | IP address                  | Default gateway   |
| Use a custom DNS server | IP address                  | Domain name system  |
| Multiple IP addresses   | IP address                  | The LAN port has multiple IPS, and it must be in the same network segment as the current network port to be added successfully, and the device can be accessed through the added multiple IP addresses. |
| Multi-IP address (WAN)  | IP address                  | WAN port has multiple IPS, and it must be in the same network segment as the current network port to be added successfully, and the device can be accessed through the added multiple IP addresses.     |

**Note: A single network port device does not support bridging.**

## 4.4 Mobile Network Settings

**Note: KGW3204A-2T4D-232/485-4G-L17 unique function module.**

### 4.4.1 Mobile network enabling

The mobile network enabling page is used to display and set relevant parameters of mobile network settings, including enabling mobile network, access point name, user name, password and Ping address.

When the mobile network function is enabled, the device will communicate with the 4G network to realize the function of wireless communication. When the access point name, user name and password are correctly filled in, the system will register with the correct access point name, user name and password. When the access point name, user name and password are not filled in, the system will register with the default access point name, user name and password.

**Note: APN is not required for non-private network.**

Figure 19 Mobile Network Enabling Page

Table 30 Enabling Parameters of Mobile Network

| Parameter         | Value                      | Description   |
|-------------------|----------------------------|---|
| Access point name | Access point name or empty | APN   |
| User name         | User name or empty.        | User name   |
| Password          | Password or empty.         | Password  |
| Ping address      | Ping address               | Ping address is used to judge whether the current network communication is normal. If the address filled in cannot be pinged, the 4G module |

|  |  |  |
|--|--|--|
|  |  | will be restarted. If this function is not enabled, fill in 127.0.0.1. |
|--|--|--|

#### 4.4.2 IMSI

The IMSI page is used to display basic information of IMSI, including IMEI, IMSI and firmware information.

When the mobile network function is enabled, IMEI information, IMSI information and firmware information will be displayed on the IMSI page. Turn off the mobile network function, and the basic information of IMSI page will not be displayed. When the mobile network function is enabled but the SIM card is not inserted, IMSI page displays IMEI information and firmware information, and IMSI is displayed as no sim card.

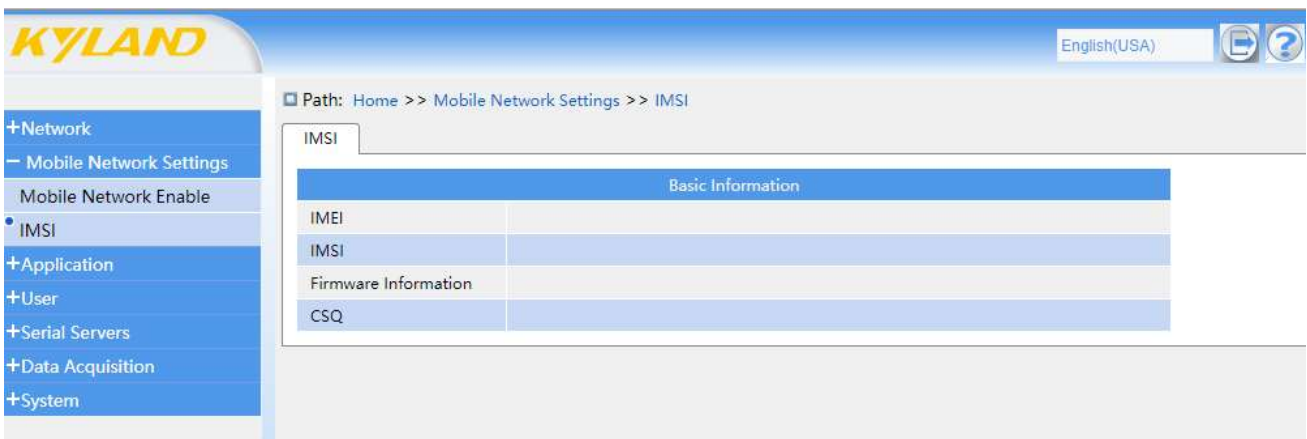


Figure 20 IMSI Page

Table 31 IMSI Parameters

| Parameter            | Value  | Description  |
|----------------------|--|--|
| IMEI                 | IMEI information is empty.                       | Information of 4G module   |
| IMSI                 | IMSI information is either empty or no sim card. | SIM card information   |
| Firmware information | Firmware information is empty.                   | 4G module firmware   |
| Signal strength      | Signal strength and bit error rate               | 4G signal strength in **, ##<br>** It should be between 0 and 31 (99 indicates no signal), and the larger the value, the better the signal quality.<br>## is the error rate, and the value is between 0 and 99.<br>Otherwise, check whether the antenna or SIM card is installed |

|  |  |            |
|--|--|------------|
|  |  | correctly. |
|--|--|------------|

## 4.5 Application

### 4.5.1 Time synchronization

The time synchronization page is used to display and set time, including enabling time zone selection application, device time synchronization and setting time application.

Time zone setting: Select the corresponding time zone from the drop-down box and click Apply.

Device time: manually synchronize the local time to the device, and the synchronized gateway device time is consistent with the local time.

Setting time: manually set the time parameter by year, month, day, hour and minute, and the time of gateway equipment after application is the set time.

Relevant parameters of time synchronization, including NTP client, calibration interval and candidate NTP servers. When the time synchronization function is enabled, the equipment will regularly check the time with NTP server with the time checking interval as the time checking cycle. When multiple NTP servers are set up, if the device fails to correct the time with the first candidate NTP server, the device will automatically correct the time with the second candidate NTP server, and so on.

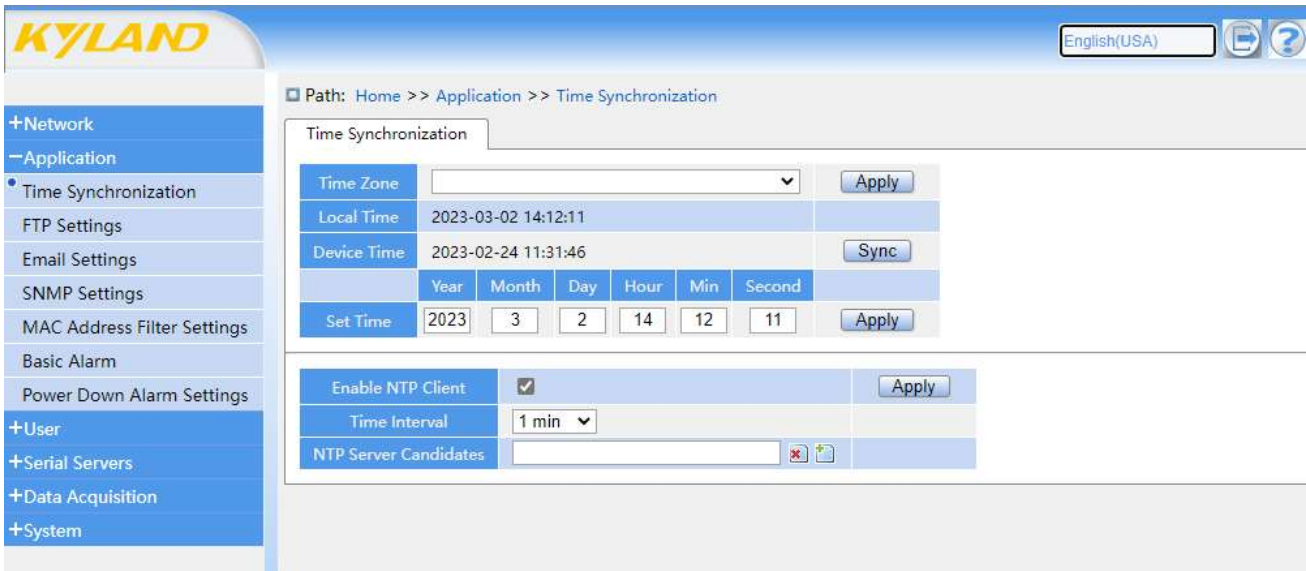


Figure 21 Time Synchronization Page

Table 32 Time Synchronization Parameters

| Parameter     | Value             | Description                      |
|---------------|-------------------|----------------------------------|
| Time interval | 1min, 5min, 20min | Time correction request interval |

|                      |   |   |
|----------------------|---|---|
| Candidate NTP server | Target NTP server   | The device sends a time correction request to the NTP server.             |
| Time zone            | UTC-12:00~UTC+12:00   | World time zone time  |
| Equipment time       | Local time  | After synchronization, the device time is consistent with the local time. |
| Set-up time          | Month: 1-12, day: 1-31, hour: 0-23, minute: 0-59, and second: 0-59. | Set the time manually   |

#### 4.5.2 FTP settings

The FTP Settings page is used to display the relevant parameters of this device as an FTP server, including enabling FTP server, FTP account and FTP account password.

Enable the FTP server function, and you can use the device as an FTP server to store and download files.

**Note: The file storage space of FTP function of KPS\KGW3224A and KGW3204A-2T4D-232/485-4G-L17 models is the built-in SD card of the device, and the FTP function is not available when the SD card is not inserted. The KPS\KGW3204A-2T4D-232/485/422-L17-L17 does not have a built-in SD card.**

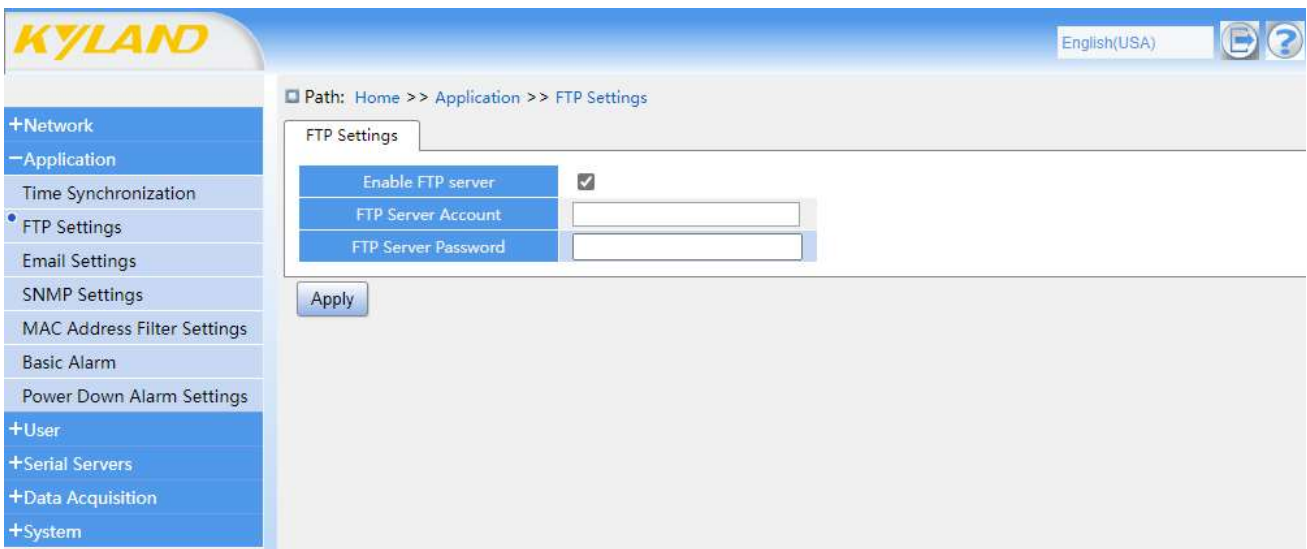


Figure 22 FTP Settings Page

Table 33 FTP Settings Parameters

| Parameter   | Value             | Description                   |
|-------------|-------------------|-------------------------------|
| FTP account | Custom (non-root) | User login FTP server account |

|                      |           |                                   |
|----------------------|-----------|-----------------------------------|
| FTP account password | Customize | Password of user login FTP server |
|----------------------|-----------|-----------------------------------|

### 4.5.3 Mail alert settings

The e-mail alarm setting page is used to display the relevant parameters of e-mail alarm setting, including enabling e-mail alarm client, address of e-mail sending server, e-mail account and password of e-mail account, etc.

E-mail alarm setting can regularly send alarm information to the mailbox designated by the user, and the alarm content includes equipment IP, CPU and memory information.

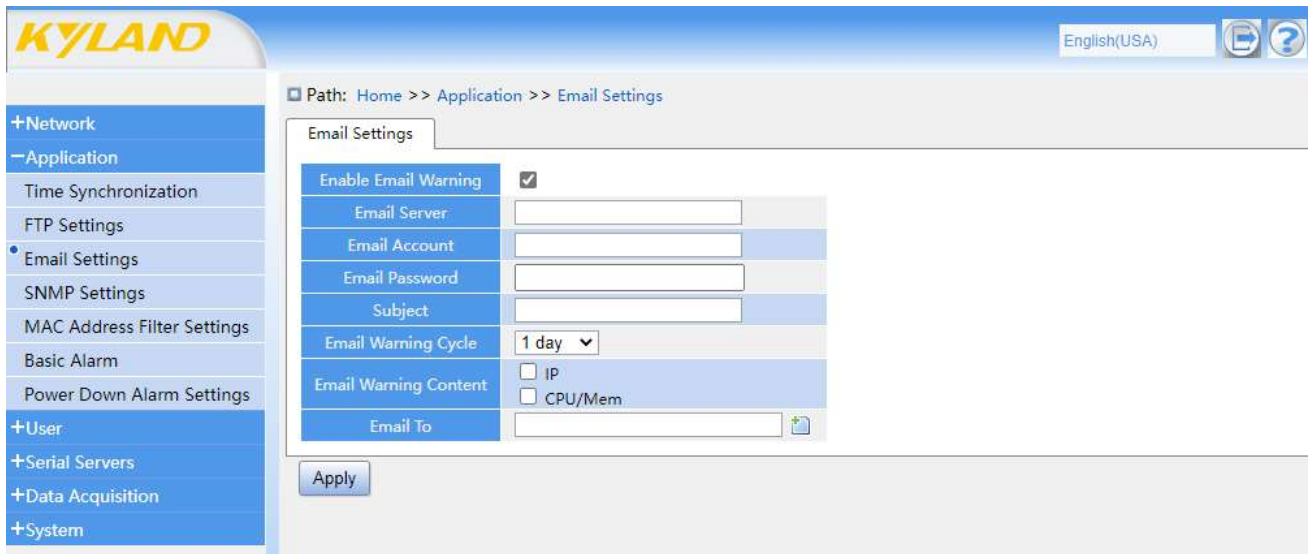


Figure 23 Email Alarm Settings

Table 34 Email Alarm Settings

| Parameter             | Value                           | Description  |
|-----------------------|---------------------------------|--|
| Mail delivery address | Server IP address               | Mail alert server address                            |
| Mail account          | Mailbox account                 | The login account of the sender of the mail.         |
| Mail account password | Email password                  | Password of the login account of the mail sender.    |
| Mail theme            | Customize                       | Mail theme   |
| E-mail alert period   | 1day, 20hour, 20min, 5min, 1min | The interval between mail sending.                   |
| Email alert content   | Checked/Unchecked               | Email alarm content can be checked with IP, CPU/Mem. |
| Alarm mail receiver   | Mailbox account                 | Mail recipient's mailbox account                     |

#### 4.5.4 SNMP settings

**Note: The KPS/KGW3204A-2T4D-232/485/422-L17-L17 model device does support SNMP Trap function.**

The SNMP Settings page is used to display the related parameters of SNMP settings, including enabling SNMP, service port, community, Trap IP and Trap port.

After successful SNMP setting, you can get the device information, including device time, network information, memory information, etc. At the same time, the device can regularly specify the IP to upload the device information to the user.

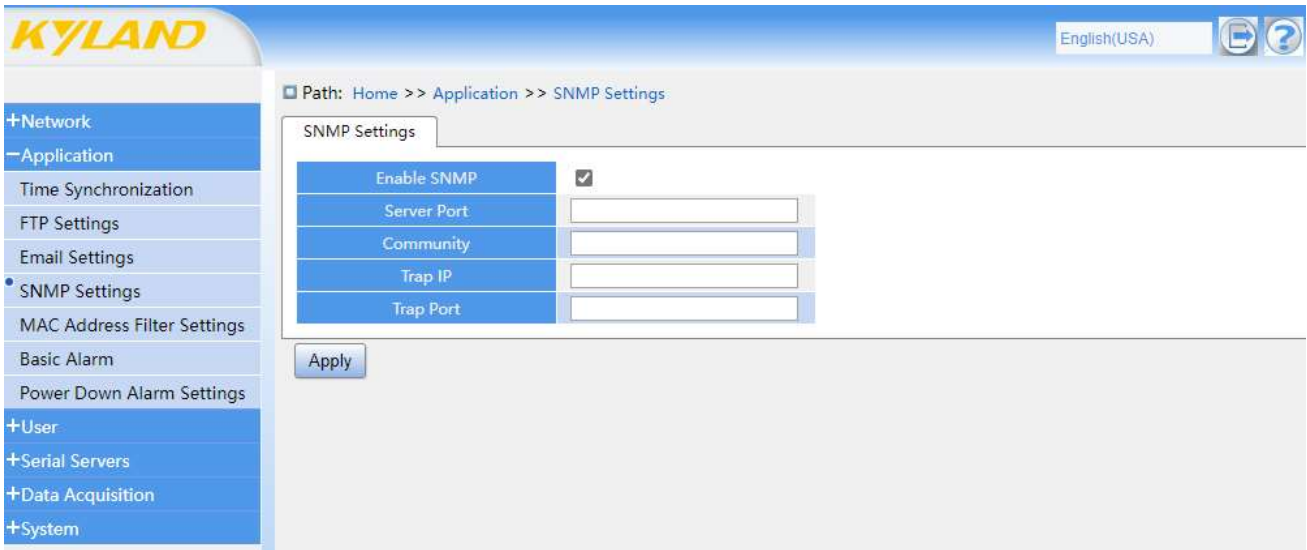


Figure 24 SNMP Settings

Table 35 SNMP Settings

| Parameter    | Value       | Description   |
|--------------|-------------|---|
| Service port | Port number | Port number of the SNMP service of the device.                        |
| community    | Customize   | Community of communication between devices and SNMP protocol          |
| Trap IP      | Ip address  | The destination IP address of the information uploaded by the device. |
| Trap port    | Port number | The destination port number of information uploaded by the device.    |

#### 4.5.5 Address filtering settings

The MAC address setting page is used to display relevant parameters of MAC address filtering settings, including enabling MAC address filtering, MAC address filtering mode and MAC address.

The MAC address filtering setting function is used to set the firewall. By setting the white list, only MAC addresses added to the white list are allowed to access this device. By setting the blacklist,



the MAC address added to the blacklist will not be able to access this device.

**Note: Please use black/white list carefully. When the wrong setting of black/white list makes it impossible to access this device, press and hold the Reset button to restore the factory settings to reset the black/white list.**

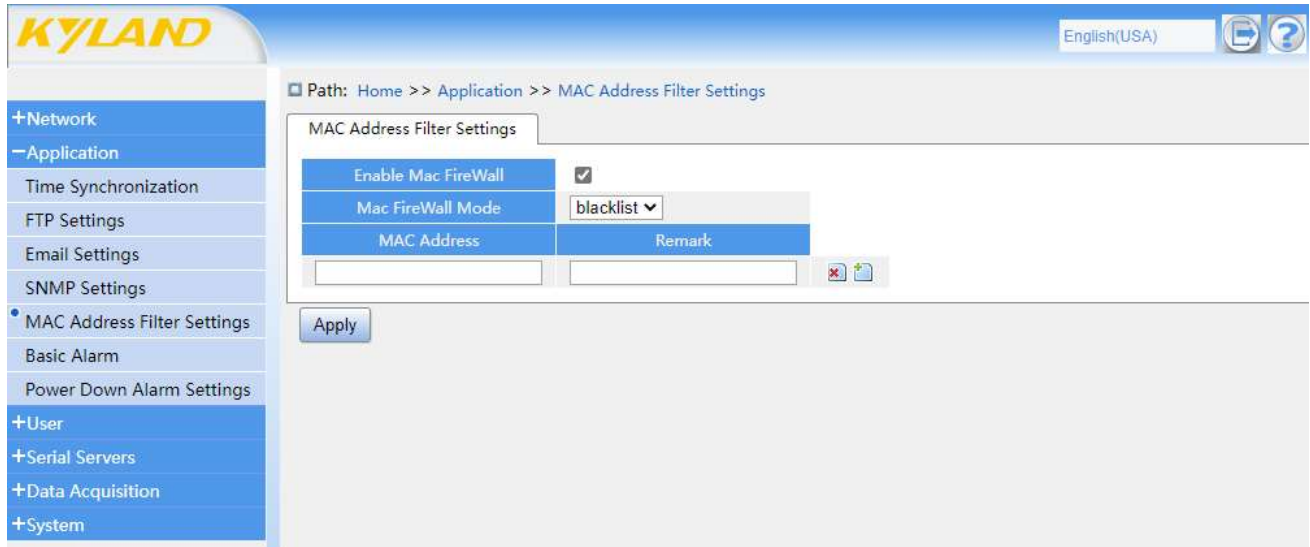


Figure 25 MAC Address Filtering Settings Page

Table 36 MAC Address Filtering Setting Parameters

| Parameter                  | Value                 | Description   |
|----------------------------|-----------------------|---|
| Mac address filtering mode | White list, blacklist | Select white list or black list for filtering mode. |
| Mac address                | Mac address           | MAC address to add to the list.                     |

#### 4.5.6 Basic alarm

The basic alarm page is used to display relevant parameters of basic alarm, including enabling basic alarm, external alarm server and port, external alarm server protocol, alarm threshold, etc.

The basic alarm function can be used for users to manage equipment, monitor equipment status and set alarm conditions. When the utilization rate of CPU or memory is higher than the threshold set by users, alarm information will be sent to the designated external server.

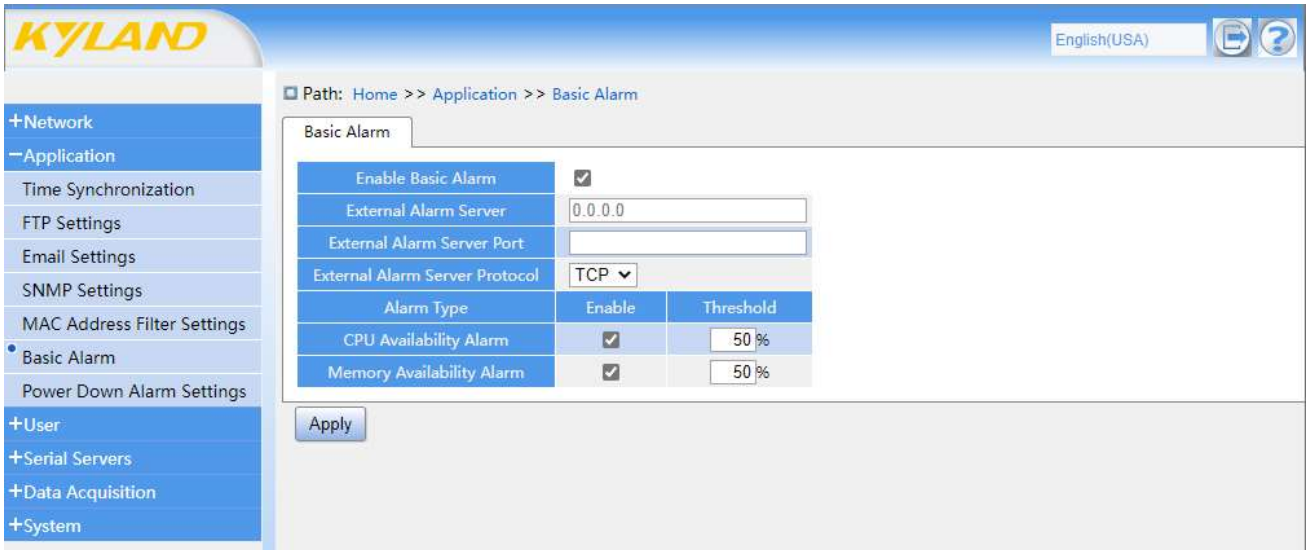


Figure 26 Basic Alarm Settings Page

Table 37 Basic Alarm Setting Parameters

| Parameter                      | Value             | Description                                  |
|--------------------------------|-------------------|--|
| External alarm server          | Ip address        | External server IP address                   |
| External alarm server port     | Port number       | External address port number                 |
| External alarm server protocol | TCP, UDP          | The receiver uses the protocols TCP and UDP. |
| Alarm type                     | Checked/Unchecked | Alarm trigger content and conditions         |

#### 4.5.7 Power failure alarm setting

The power failure alarm page is used to display the relevant parameters of power failure alarm, including enabling power failure alarm, external alarm protocol, external alarm server and port, and alarm content.

Power failure alarm is used to send the prompt information of power failure to the designated external server when the equipment is powered down.

**Note: Power failure alarm needs to be correctly connected to the power supply.**

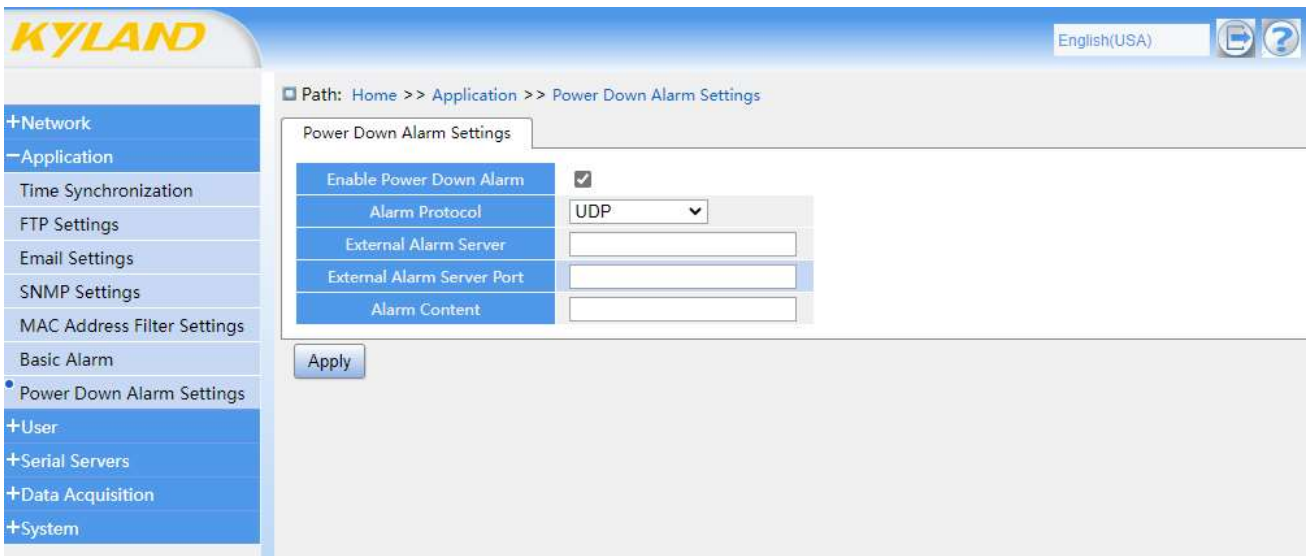


Figure 27 Power Failure Alarm Settings

Table 38 Power Failure Alarm Settings

| Parameter                  | Value       | Description                 |
|----------------------------|-------------|-----------------------------|
| Alarm protocol             | UDP, SNMP   | Alarm protocol UDP or SNMP  |
| External alarm server      | Ip address  | External server IP address  |
| External alarm server port | Port number | External server port number |
| Alarm content              | Customize   | Alarm information content   |

## 4.6 User

### 4.6.1 User management

The user management page is used to display and manage related parameters of user accounts, including user name, password, permission level, etc.

Using the admin user login page, you can add or delete users, modify user passwords, and modify users' read and write permissions on the user management page. Read-only users can only browse Web page information, and cannot modify device configuration parameters and manage users. Read-write users can browse and modify the device configuration parameters of Web pages, but they cannot manage users.

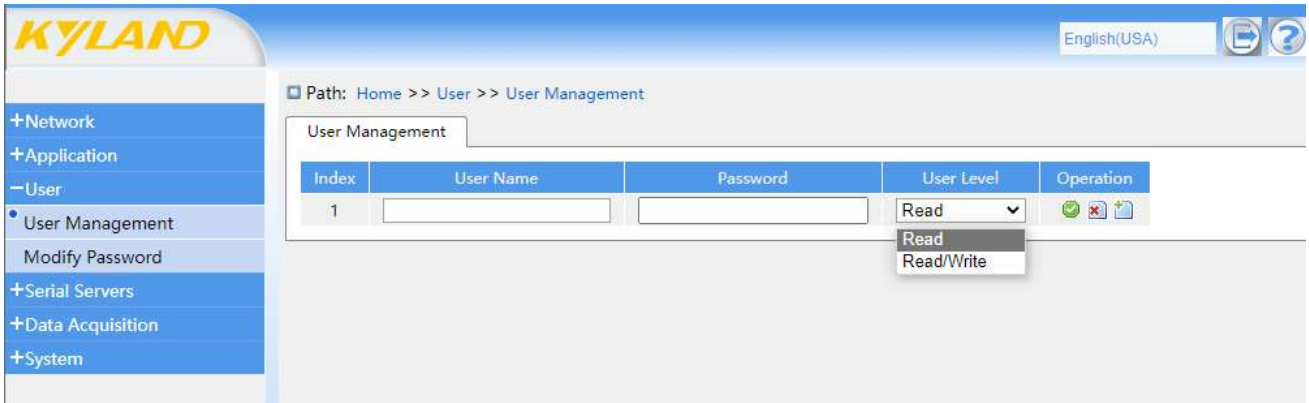


Figure 28 User Management Page

## 4.6.2 Modify password

User-Modify Password page is used to display relevant parameters of user password, including user name, current password, new password, etc.

On the User-Modify Password page, you can modify the user password. The default user name is admin and the password is pwd\$4\$Kyland.

Modify password: enter the current password, enter the new password, enter the new password again for confirmation, and click "Apply" to show that the password is successfully modified. If you forget the administrator password, press and hold the Reset button to restore the factory settings, you can log in to the page with the initial user name admin and password pwd\$4\$Kyland.

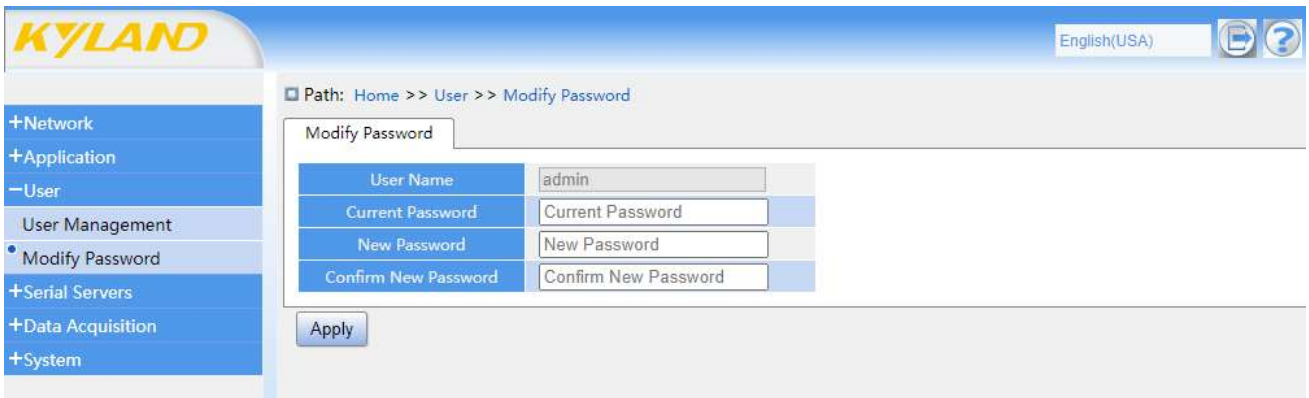


Figure 29 Modify Password Page

## 4.7 Serial server

### 4.7.1 Serial interface settings

The serial port setting page can set the relevant parameters of the device, which is used to set baud rate, data bit, parity bit, stop bit, serial port mode, etc. Standard and nonstandard baud rates are supported. Select the existing standard baud rate from the Baud Rate drop-down box. If you need to Customize the nonstandard baud rate, select Customize from the drop-down box or double-click the baud rate input box, and then manually enter the required baud rate. Transparent transmission mode

supports encrypted transmission, and the modes are DES, 3DES and AES. Select the mode to be encrypted in the drop-down box corresponding to Encrypted Transmission, or select Disabled without encryption.

When the parameters are set, click "Apply" and the parameters will take effect immediately. The configuration of serial communication parameters needs to be consistent with the lower computer; The serial port mode can be selected from four modes: TCP Server, TCP Client, UDP Server and UDP Client. Refer to Chapter 4 for the specific configuration method of serial port parameters.

The local port should be configured above 1024 as far as possible to avoid occupying the system port. If the local port number is not filled in in TCP Client and UDP Client modes, the system will automatically assign the port number. The maximum number of sessions represents the maximum number of allowed upper computers to connect to the serial server. Only 8 links are allowed to be established in TCP Server mode, and only 8 newly established session connections are maintained in UDP Server mode.

**Note: Serial interface page and protocol project cannot use the same Serial number at the same time. For example, if serial port 1 is set to TCP Server mode, it is necessary to avoid using COM1 port in protocol project.**

Transmission modes are Transparent and Modbus RTU.

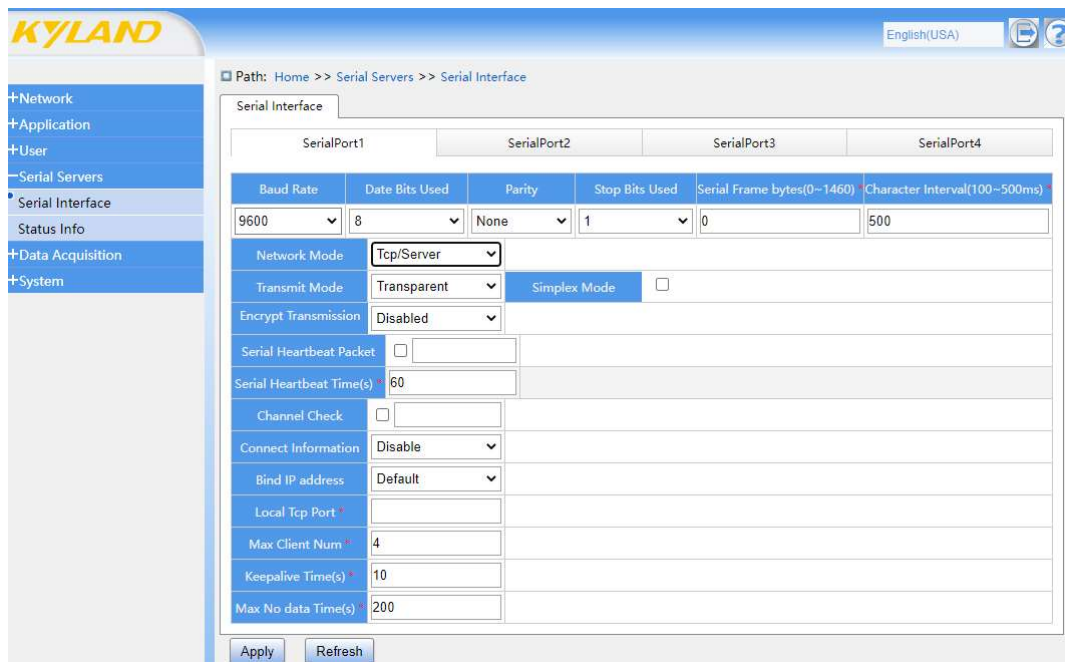


Figure 30 Transparent Transmission Mode TCP Server mode

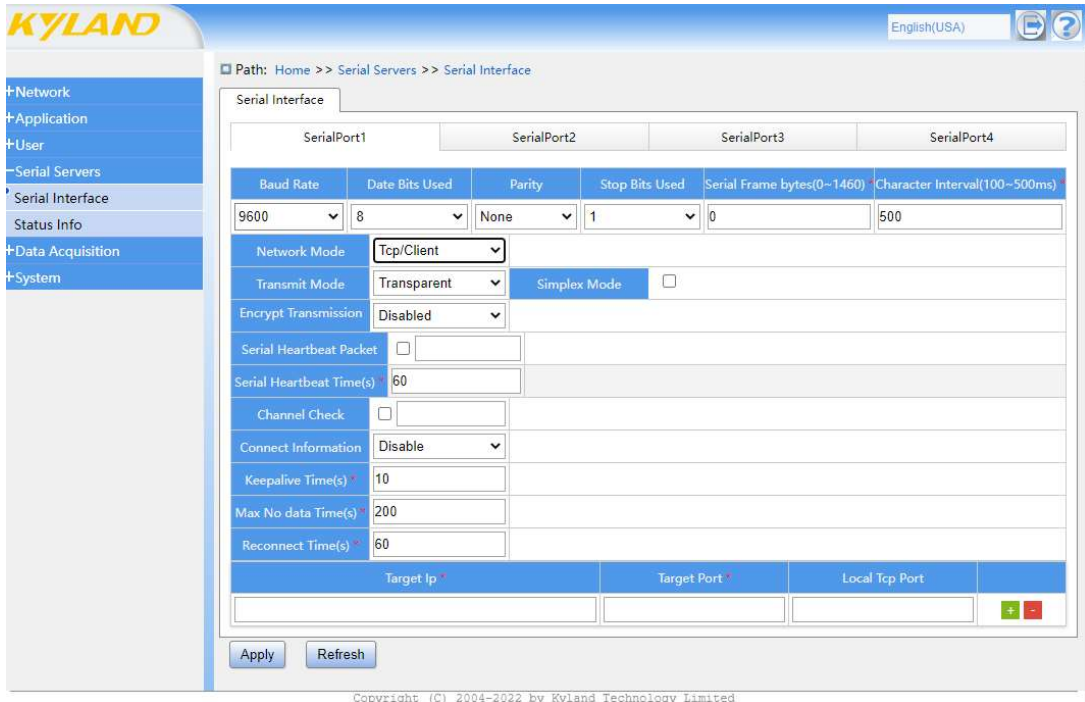


Figure 31 Transparent Transmission Mode TCP Client Mode

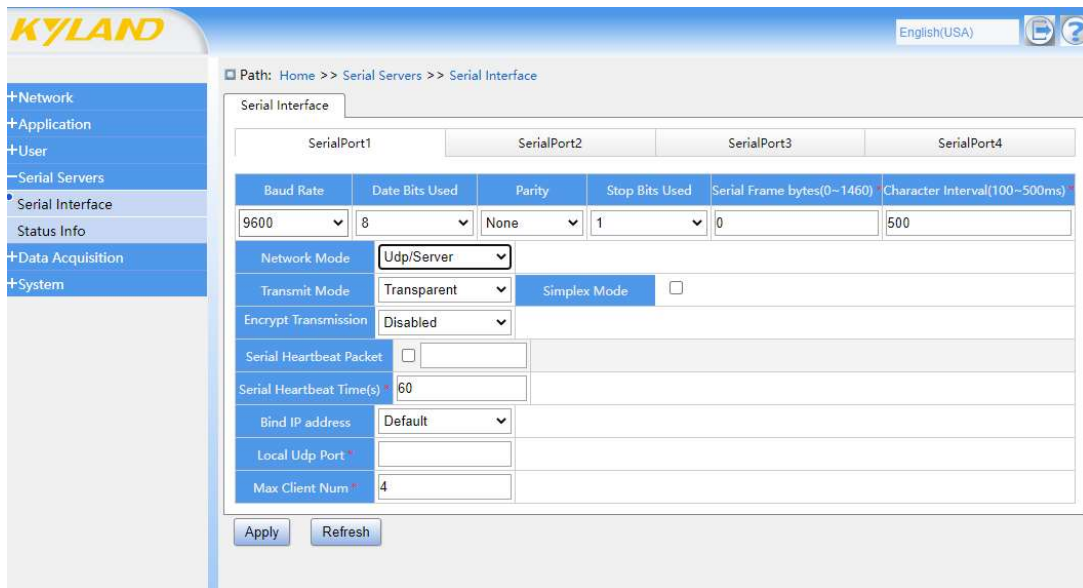


Figure 32 Transparent Transmission Mode UDP Server Mode

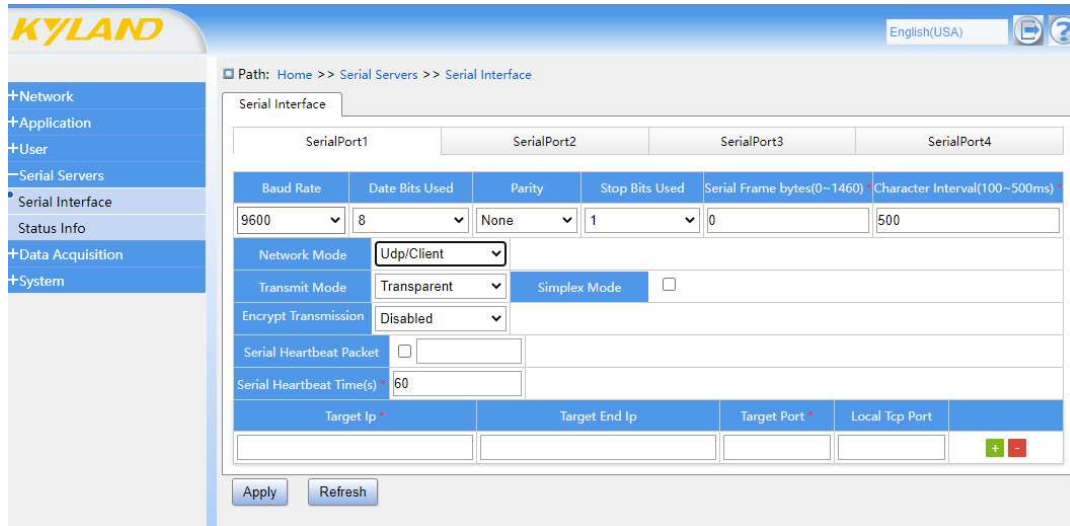


Figure 33 Transparent Transmission Mode UDP Client Mode

Table 39 Transparent Setting Parameters

| Parameter     | Value  | Description  |
|---------------|--|--|
| Baud rate     | 50, 75, 110, 134, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, Customize(nonstandard baud rate)<br><b>Note: KPS/KGW3224A model does not support 50, 75, 134, 200 and 1800, and only RS-485 13-16 port supports 230400.</b> | Configuration of baud rate of serial port:<br>After selecting Customize, manually enter the baud rate in the input box, ranging from 50 to 250000.<br><b>Note: When KPS/KGW3224A and KGW3204A-4G models are configured with nonstandard baud rate, use the following calculation formula to check the error rate. If the error rate is less than 0.003, configuration is allowed.</b><br>Calculation formula:<br>If the baud rate is n, the error rate error is:<br>$M = \text{INT}(33333333/16/n)$<br>$N = \text{INT}(33333333/M/16)$<br>$\text{error} = \text{abs}((N-n)/n)$ |
| Data bit      | 5, 6, 7, 8   | Configuration of serial data bits  |
| Check Digit   | None, Odd, Even  | Configuration of serial port parity bit  |
| Stop position | 1, 2   | Configuration of serial port stop bit  |

|                                  |   |  |
|----------------------------------|---|--|
| Serial data frame                | Unit bytes, the default is 0.<br>Setting range 0-1460 bytes | Not enabled when set to 0; When the setting value is not 0, the maximum length of data sent by the serial port at a time, and when the data received by the network port of the equipment does not exceed this length, wait for the character interval time until the serial port data frame length is reached or exceeds the waiting character interval, and directly send the data; When it exceeds this length, the serial port will split the data and send it in packets. |
| Character spacing                | Unit ms, the default is 500.<br>Setting range is 100-500ms. | When the serial port data frame is not 0, if the data length received by the network port at one time is less than the set value of the serial port data frame, the device waits for the character interval until the serial port data frame length is reached or exceeds the waiting character interval, and the serial port sends data to the outside.   |
| Network mode                     | TCP/Server, TCP/Client,<br>UDP/Server, UDP/Client           | Select the network mode of serial port operation.  |
| Transmission mode                | Transparent   | Communication mode and transparent transmission mode of serial port data.  |
| Unidirectional data transmission | Checked/Unchecked   | Checked: Only the serial port is allowed to send data to the network port.<br>Unchecked: the data of serial port and network port can be transmitted in both directions.   |
| Encrypted transmission           | DES, 3DES, AES  | Select the encryption method for encrypted transmission.   |
| Encryption mode                  | ECB, CBC  | Select the encryption mode for   |



|  |  |   |
|--|--|---|
|  |  | encrypted transmission.   |
| Encrypted filling                        | PKCS7, Zero  | Select the filling form of encrypted transmission.  |
| Key length                               | 128, 192, 256  | AES encryption method can choose the key length.  |
| Encryption key                           | Custom fill-in key   | The key length is between 1 and 32 characters.  |
| Encrypted IV                             | Custom filling   | Encryption IV requires input only when encryption mode is CBC.  |
| Serial port heartbeat packet             | Checked/Unchecked<br>Customizable information content                        | Enable the serial port heartbeat packet, and the serial port will regularly send customized information content.  |
| Heartbeat packet interval of serial port | Unit s, the default is 60.   | Enable serial port heartbeat packet and send the time period of serial port heartbeat packet.   |
| Channel check (optional)                 | Not enabled by default<br>Information content is empty.                      | Before the device communicates, the network side needs to check the information once. Establish communication connection when receiving correct check information; Disconnect as soon as you receive the error check information. |
| Connection information (optional)        | The default is empty.<br>IP information and Device information are optional. | After the communication connection is established, the device network actively sends the device IP address or device name.  |
| Local port (optional)                    | Port number  | Local port numbers of TCP and UDP Client mode can be automatically assigned by the system by default.   |
| Maximum number of sessions               | 1~8  | Maximum number of sessions in Server mode.  |
| Keep-alive interval                      | Unit: S, the default is 10 s.  | When the device has no data communication, the network sends Keep Alive information frames regularly until the device judges that there is no data  |

|                               |                            |  |
|-------------------------------|----------------------------|--|
|                               |                            | disconnection.   |
| No data disconnection         | Unit: S, 200 s by default. | If the set time is exceeded, the communication connection will be disconnected actively when the device has no data communication.   |
| Reconnection time             | Unit: S, default is 60s.   | In TCP Client mode, the time period for reconnecting devices can reduce the network connection time of TCP Client. If channel check is set, it needs to be checked again after reconnection. |
| Target IP                     | Ip address                 | Target IP address  |
| Destination end IP (optional) | Ip address                 | In UDP Client mode, the set destination end IP address of the destination IP segment can be used to send serial port information to multiple consecutive UDP Server servers.                 |
| Target port                   | Port number                | Target port number   |
| Local port (optional)         | Port number                | When setting the local port, a fixed port number will be used for communication; When the port is empty, the system will allocate an idle port number for communication.                     |
| Binding network port          | eth0, eth1                 | Select the bound network port (effective only when two network ports belong to the same network segment and have different IP).  |
| Bind an IP address            | Primary IP, multi-IP       | Select the IP to bind, and multiple different IPs can bind the same port (only in Tcp/Server and Udp/Server modes).  |

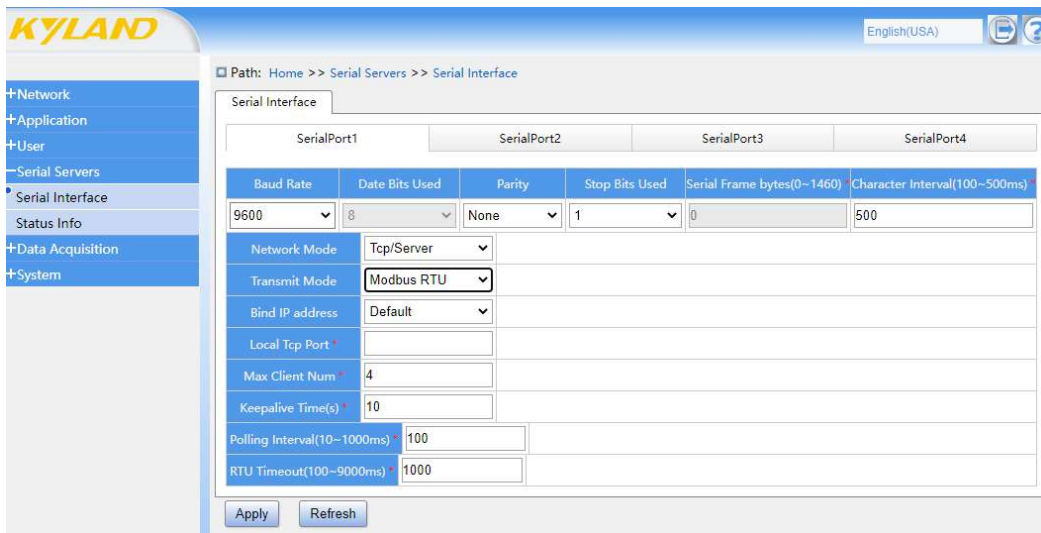


Figure 34 Modbus RTU Transmission Mode TCP Server Mode

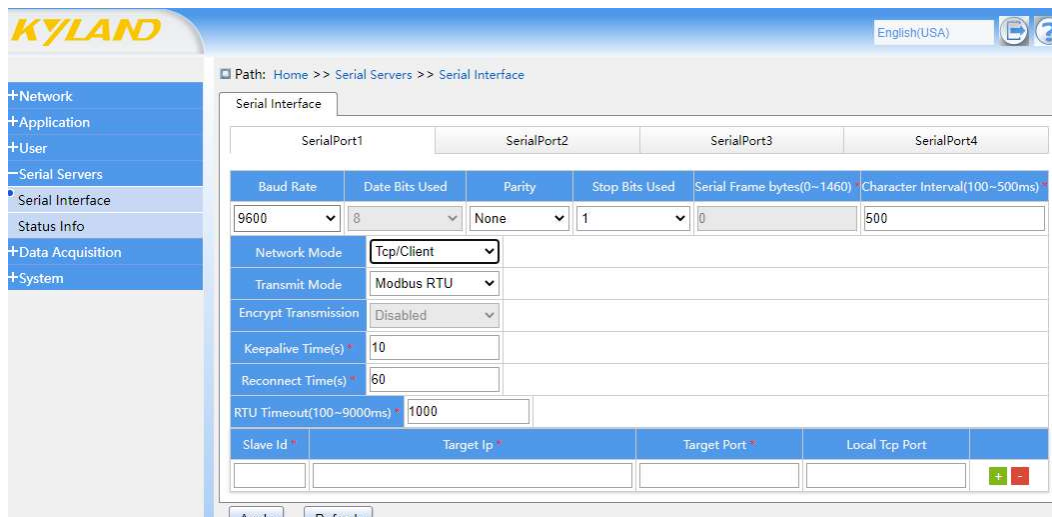


Figure 35 Modbus RTU Transmission Mode TCP Client Mode

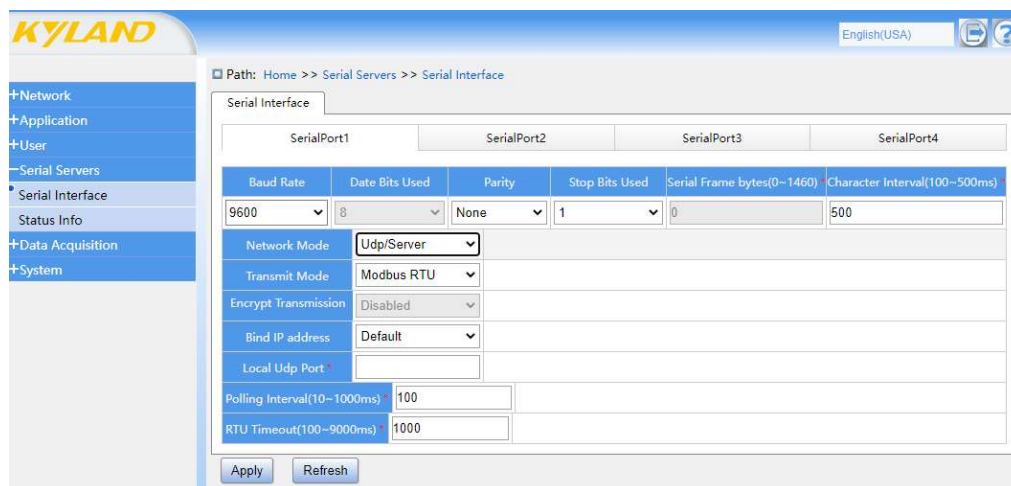


Figure 36 Modbus RTU Transmission Mode UDP Server Mode

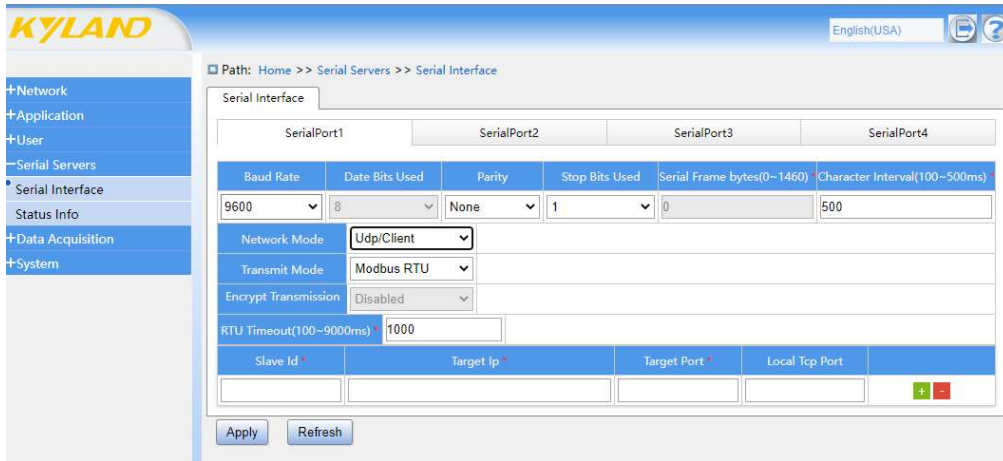


Figure 37 Modbus RTU Transmission Mode UDP Client Mode

Table 40 Modbus RTU Setting Parameters

| Parameter         | Value  | Description   |
|-------------------|--|---|
| Baud rate         | 50, 75, 110, 134, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, Customize (nonstandard baud rate) | <p>Configuration of baud rate of serial port: After selecting Customize, manually enter the baud rate in the input box, ranging from 50 to 250000.</p> <p><b>Note: When KPS/KGW3224A and KGW3204A-4G models are configured with nonstandard baud rate, use the following calculation formula to check the error rate. If the error rate is less than 0.003, configuration is allowed.</b></p> <p>Calculation formula:<br/>           If the baud rate is n, the error rate error is:<br/> <math>M = \text{INT}(33333333/16/n)</math><br/> <math>N = \text{INT}(33333333/M/16)</math><br/> <math>\text{error} = \text{abs}((N-n)/n)</math></p> |
| Data bit          | 8  | Not configurable  |
| Check Digit       | None, Odd, Even  | Configuration of serial port parity bit   |
| Stop position     | 1, 2   | Configuration of serial port stop bit   |
| Serial data frame | Unit bytes, the default is 0.  | Not configurable  |

|                            |   |  |
|----------------------------|---|--|
| Character spacing          | Unit ms, the default is 500.<br>Setting range is 100-500ms. | Not effective  |
| Network mode               | TCP/Server, TCP/Client,<br>UDP/Server, UDP/Client           | Select the network mode of serial port operation.  |
| Transmission mode          | Modbus RTU  | Communication mode of serial port data, Modbus RTU mode.   |
| Local port (optional)      | Port number   | Local port numbers of TCP and UDP Client mode can be automatically assigned by the system by default.  |
| Maximum number of sessions | 1~8   | Maximum number of sessions in Server mode.   |
| Keep-alive interval        | Unit: S, the default is 10 s.                               | When the device has no data communication, the network sends Keep Alive information frames regularly until the device judges that there is no data disconnection.                            |
| Reconnection time          | Unit: S, default is 60s.                                    | In TCP Client mode, the time period for reconnecting devices can reduce the network connection time of TCP Client. If channel check is set, it needs to be checked again after reconnection. |
| Target IP                  | Ip address  | Target IP address  |
| Target port                | Port number   | Target port number   |
| Local port (optional)      | Port number   | When setting the local port, a fixed port number will be used for communication; When the port is empty, the system will allocate an idle port number for communication.                     |
| Binding network port       | eth0, eth1  | Select the bound network port (effective only when two network ports belong to the same network segment and have   |

|                    |                      |   |
|--------------------|----------------------|---|
|                    |                      | different IP).  |
| Slave Id           | 1-255                | Slave Id value of TCP and UDP Client, that is, slave station address.   |
| Polling interval   | 10-1000ms            | TCP/UDP Server network mode, when the request time of the upper computer is less than the set value, the time interval for the device to send continuous requests to the lower computer is the sum of the set value and the request processing time; When the time requested by the upper computer is greater than the set value, the value setting is invalid. |
| RTU timeout        | 100-9000ms           | The upper computer sends a request message, and if the lower computer fails to reply after the set time, the serial server will send a timeout message to the upper computer. This value needs to be less than the timeout set by the upper computer.   |
| Bind an IP address | Primary IP, multi-IP | Select the IP to bind, and multiple different IPS can bind the same port (only in Tcp/Server and Udp/Server modes).   |

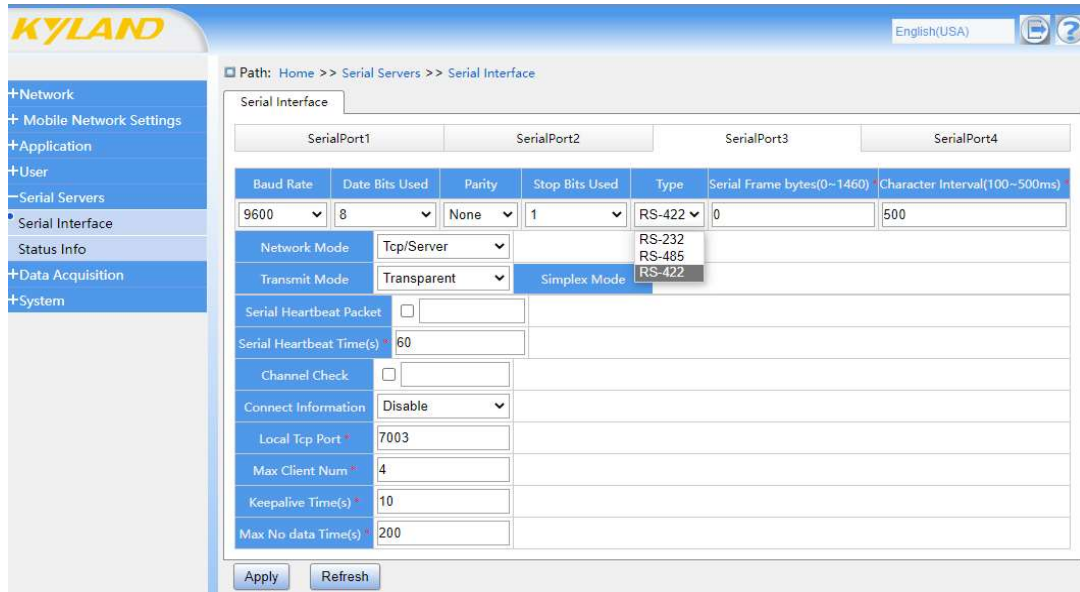


Figure 38 KGW3204A-2T4D-232/485-4G-L17 serial Ports 3 and 4 Configured as RS-422.

**Note:** Serial ports 1-2 of KGW3204A-2T4D-232/485-4G-L17 series products are fixed as RS-485, and serial ports 3-4 are fixed as RS-232 or RS-485 when they leave the factory, and cannot be changed after leaving the factory. If the serial port 3-4 is set as RS-485 in the factory, two RS-485s can be configured as one RS-422 on the serial port server-serial interface setting page.

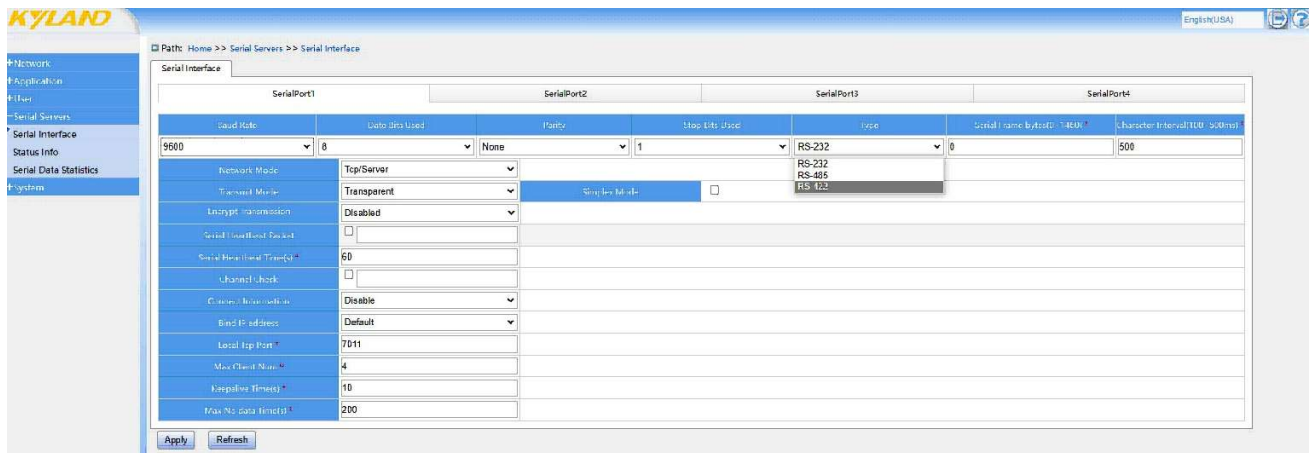


Figure 39 Switch configuration to RS232/RS485/RS422 for KPS/KGW3204A-2T4D-232/485/422-L17-L17

**Note:** The KPS/KGW3204A-2T4D-232/485/422-L17-L17 series products can switch between RS232/RS485/RS422 configuration on the Serial Interface Settings page of the serial port server.

Table 41 Serial Port Type Parameters

| Parameter | Value                | Description  |
|-----------|----------------------|--|
| Type      | RS-232\RS-485\RS-422 | If the hardware is set to RS-232, the type should be RS-232, and the other two options |

|  |  |   |
|--|--|---|
|  |  | <p>will not take effect;</p> <p>If the hardware is set to RS-485, the serial port mode is 485 when the type is RS-485, 422 when the type is RS-422, and it will not take effect when the type is RS-232.</p> <p>KPS/KGW3204A-2T4D-232/485/422-L17-L17 series products:configure RS-232、RS-485、RS-422 on the page.</p> |
|--|--|---|

### 4.7.2 Status messages

The status information page is used to record the running information of the serial port of the equipment, including the sending and receiving information of the serial port and the connection information of the TCP transmission mode, and can be used to observe the connection status of the serial port of the equipment.



Figure 40 Status Information Mode

### 4.7.3 Extra configuration

**Note: KPS/KGW3224A、KPS3x0xAL unique function module.**

The additional configuration page is used to set the running configuration of the device serial port, including enabling/disabling the 120Ω resistor in RS-485 mode and enabling/disabling the configuration of the RS422 port, which can be used to set additional configuration items of the device serial port.

#### **RS-485 120Ω configuration**

By default, the 120Ω resistor is not enabled for RS-485 serial port. When port N and port n+1 are set to on on the page, the 120Ω resistor is enabled for two consecutive 485 ports. When the page setting port n and port n+1 are off, the 120Ω resistor is disabled for two consecutive 485 ports.



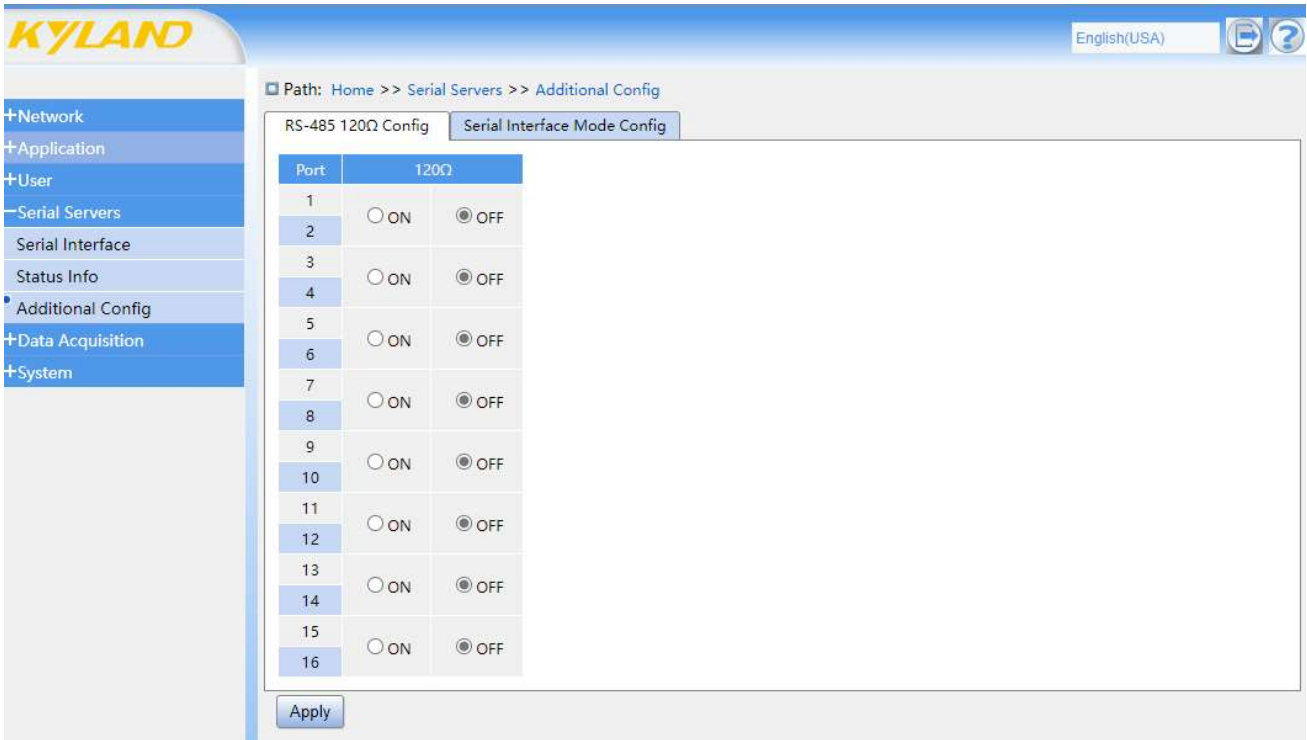


Figure 41 RS-485 120Ω Configuration

### Serial port mode configuration

By default, the RS-485 serial port is RS485 mode. When the page sets port n as enabled, two consecutive RS485 ports 2n-1 and 2n are enabled as RS422 mode. When the page setting port n is not enabled, two consecutive ports 2n-1 and 2n are in RS485 mode.

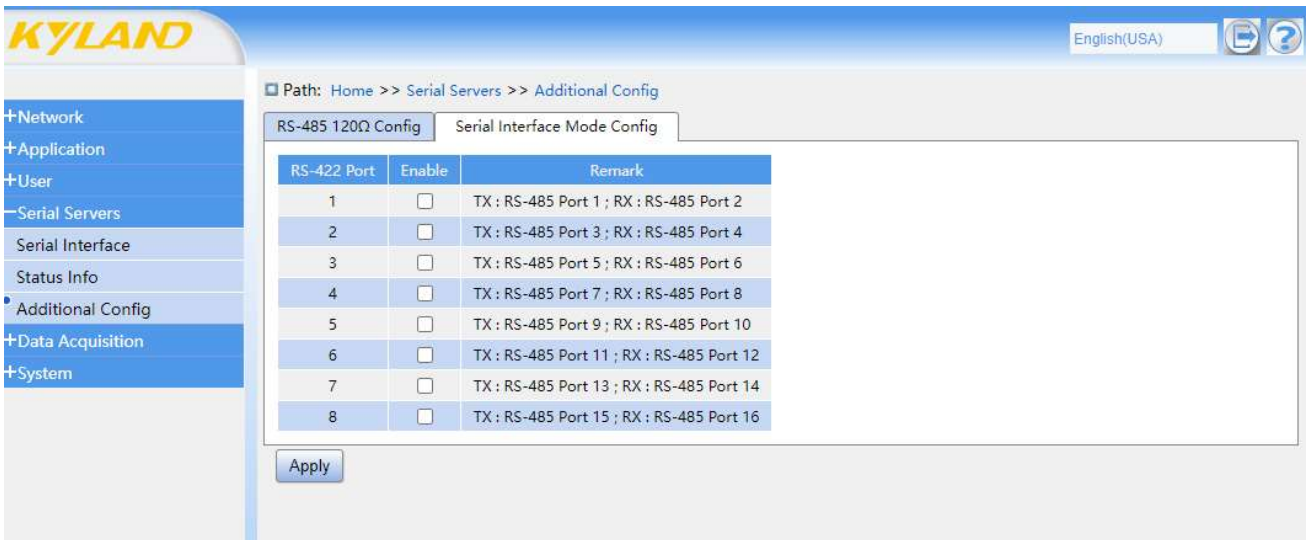


Figure 42 Serial Port Mode Configuration

#### 4.7.4 Serial port data statistics

**Note: KPS/KGW320xA-232-485-422 unique function module.**

The serial data statistics page is used to view the receiving and transmitting data of the device's serial ports. Taking /dev/ttyS1 as an example: Rx is the data received by serial port 1. Tx is the data

sent out by serial port 1; AllRx is all the data received by serial port 1, and AllTx is all the data sent out by serial port 1.

The difference between AllRx and Rx/AllTx and Tx : After clicking “Apply” in the web serial port settings, the data of Rx/Tx will be cleared, while the data of AllRx/AllTx will not be cleared. The “Reset” button next to Rx, Tx, AllRx, and AllTx will clear the corresponding data. Clicking the “Reset” button at the bottom will clear the data of all serial ports. After restarting the device, all serial port data will be cleared.

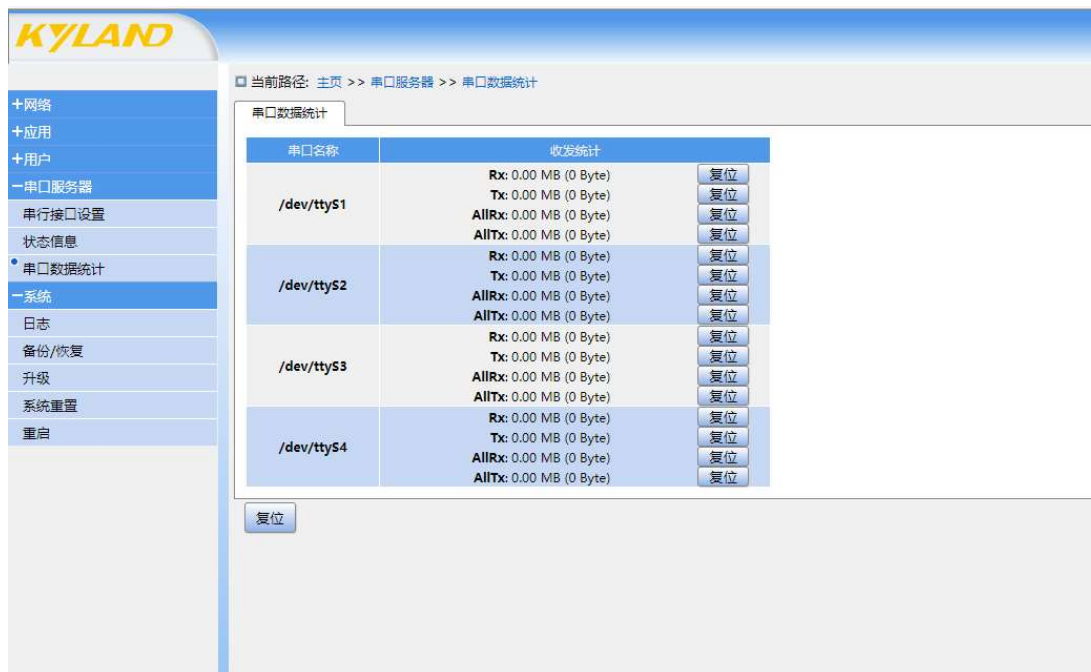


Figure 43 Serial port data statistics

## 4.8 Data acquisition

The data collection page is used to display and set the relevant configuration information of the protocol gateway. You can view the general situation of the protocol configuration through the Web page, enable, delete, download and import the protocol project, and upgrade the EDPS file and authorize the EDPS.

**Note: this page will only be displayed for KGW310XA, KGW320XA, KGW3224A , KGW3204A-4G and KGW320xA-232-485-422 series products.**

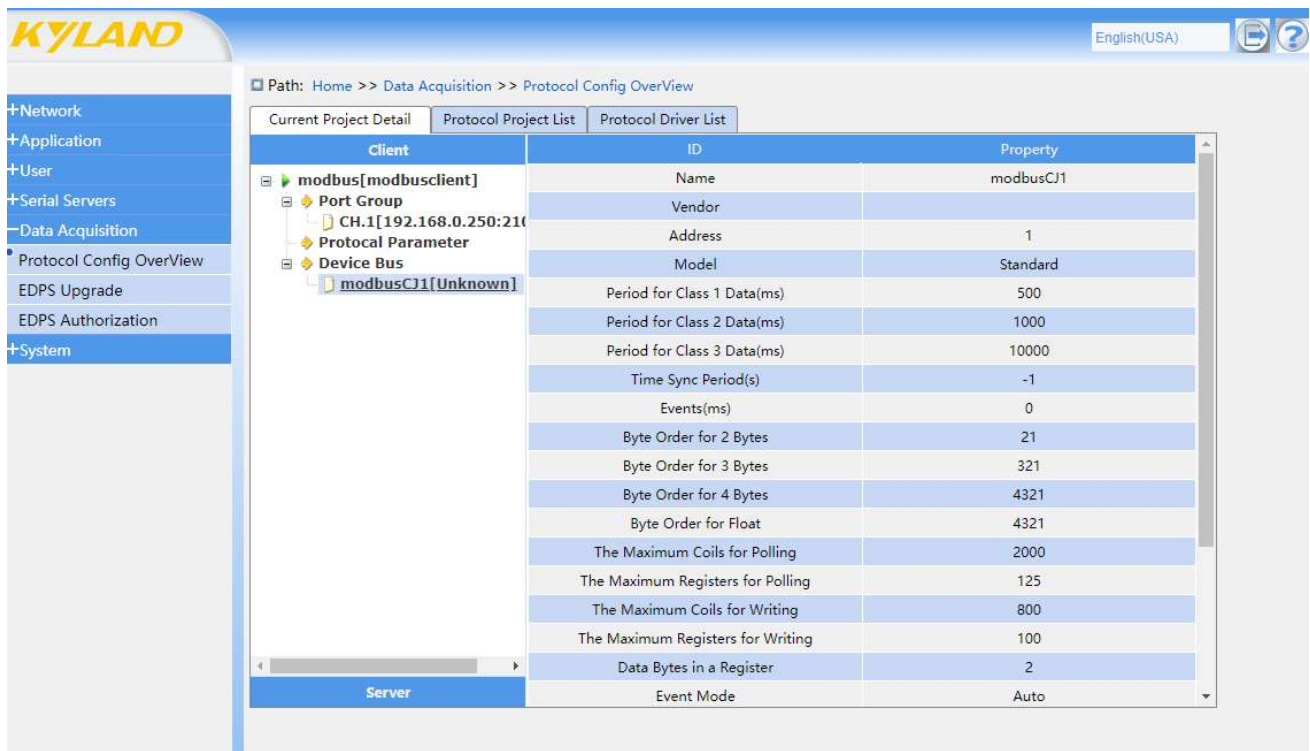
### 4.8.1 Overview of protocol configuration

The protocol configuration overview page is mainly used to display and set the configuration information related to device communication protocols, including three parts: running project configuration, protocol engineering list and protocol driver list.

#### Run project configuration

In the running project configuration, click the configuration items of collection service and

forwarding service to view the project configuration parameters of equipment currently running, including port information, protocol parameters and equipment information of engineering configuration.



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Figure 44 Running Project Configuration

### Protocol engineering list

In the list of protocol projects, you can view and manage protocol projects, and enable, download, delete and import them.

The project displayed in the protocol project list is called the downloaded protocol project in the equipment.

After downloading the protocol project, click the "Enable" button, and the page shows that the operation is successful. The enabling box of the protocol project is in a checked state, and the current protocol project is activated and immediately runs. Only one protocol project can be enabled, and multiple protocol projects cannot be enabled at the same time.

In the protocol project list, click the "Download" button of the protocol project, and the protocol project will be saved to the local computer.

In the list of protocol projects, click the "Delete" button of the inactive protocol project, and click "Confirm" to delete the project. The page shows that the operation is successful and the protocol project will be deleted from the equipment. In order to ensure the normal operation of equipment functions, it is not allowed to delete the enabled protocol projects in the equipment.

Click "Browse" button, select the path of the protocol project file stored in the local computer,

and then click "Import" button to import the selected protocol project into the protocol gateway and start running immediately.

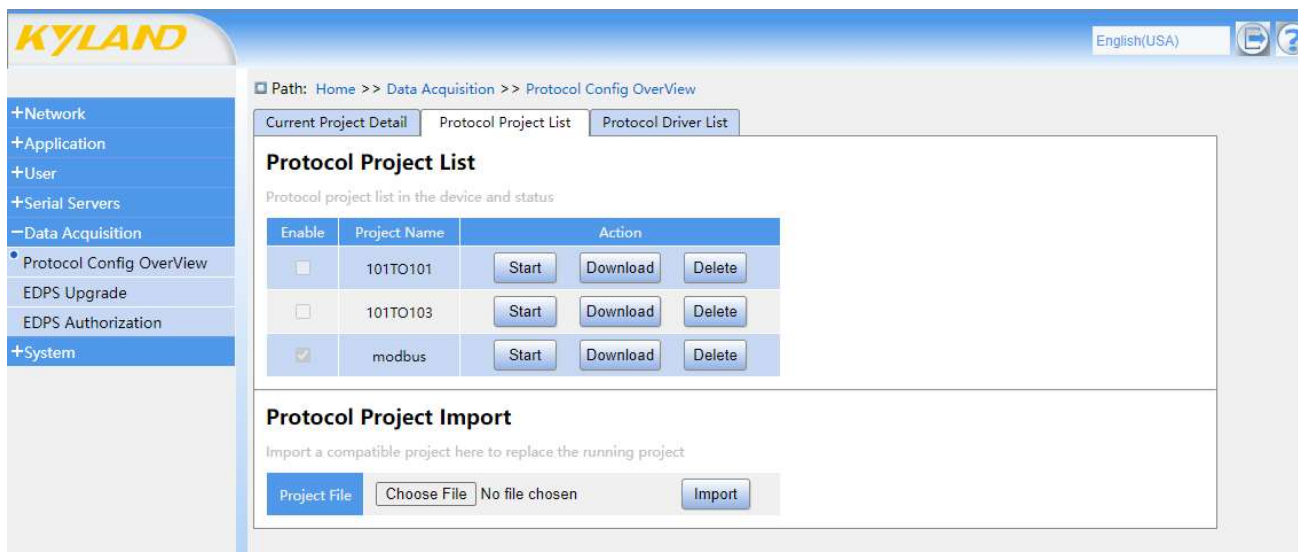
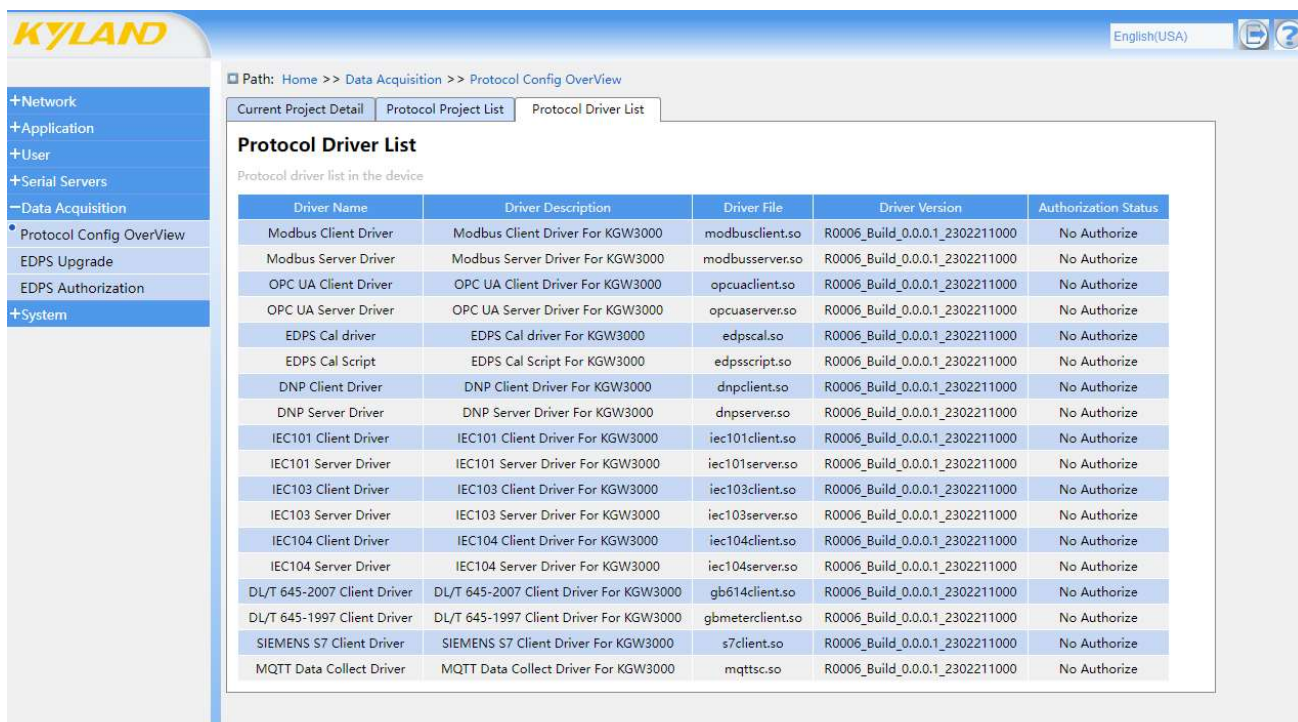


Figure 45 Protocol Engineering List

### Protocol driver list

In the protocol driver list, you can view the communication protocol driver information supported by this device, including driver name, driver description, driver file name, driver version and authorization status.



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Figure 46 Protocol Driver List

### 4.8.2 EDPS upgrade

The EDPS upgrade page is mainly used for updating and upgrading EDPS functions.

Click the "Browse" button, select the upgrade file path, and then click the "Upgrade EDPS" button to upgrade the EDPS of the webpage. When the page shows that the upgrade is successful, the device EDPS function is successfully updated and upgraded.

The EDPS upgrade function does not affect the existing protocol engineering files in the equipment and the authorization of EDPS.

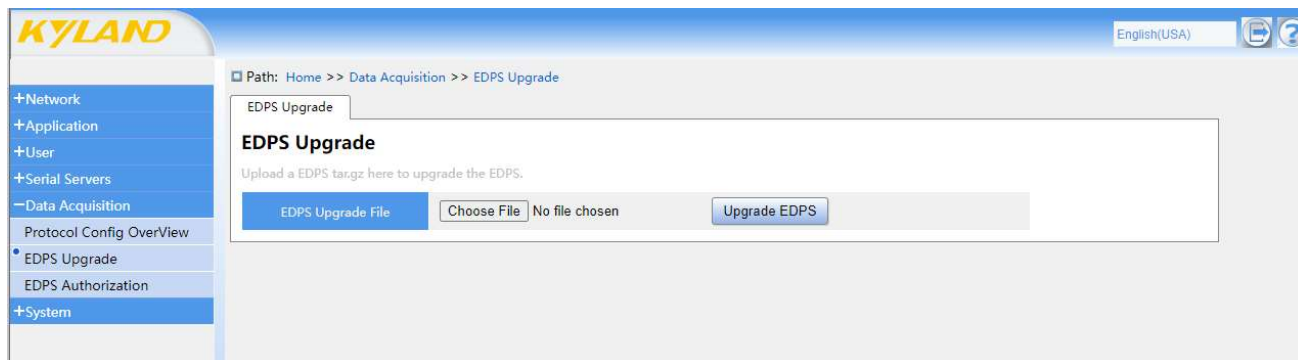


Figure 47 EDPS Upgrade

### 4.8.3 EDPS authorization

EDPS authorization page is mainly used for EDPS authorization authentication, and it can only run normally and stably after authorization authentication.

Click the "Export" button to export the machine code file to the local computer. Then, submit the machine code file to the manufacturer to generate the authorization file.

Click the "Browse" button, select the path of the authorization file, and click the "Import" button to import the authorization file into the device. When the page display operation is successful, the EDPS authorization of the device is successful.

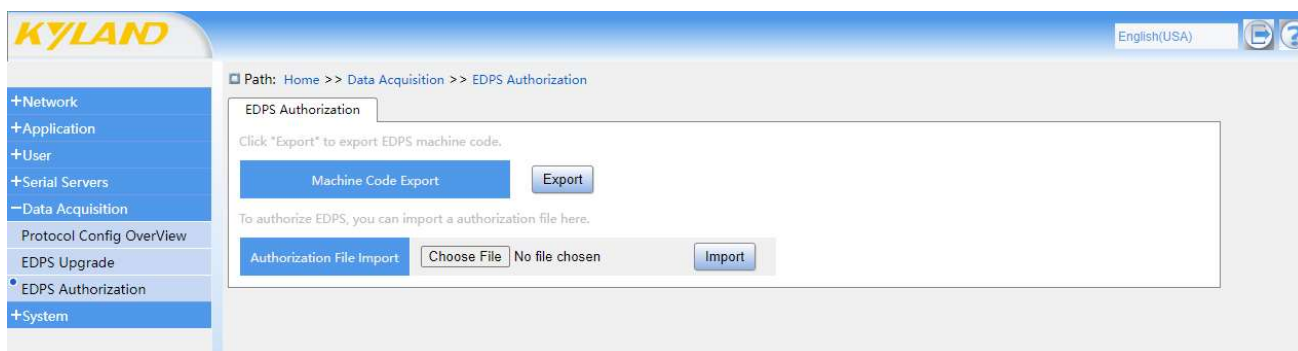


Figure 48 EDPS Authorization

## 4.9 System

### 4.9.1 Log

The system log page is used to record the running information of equipment, and the log can be downloaded, which is convenient for daily maintenance and fault detection of equipment.

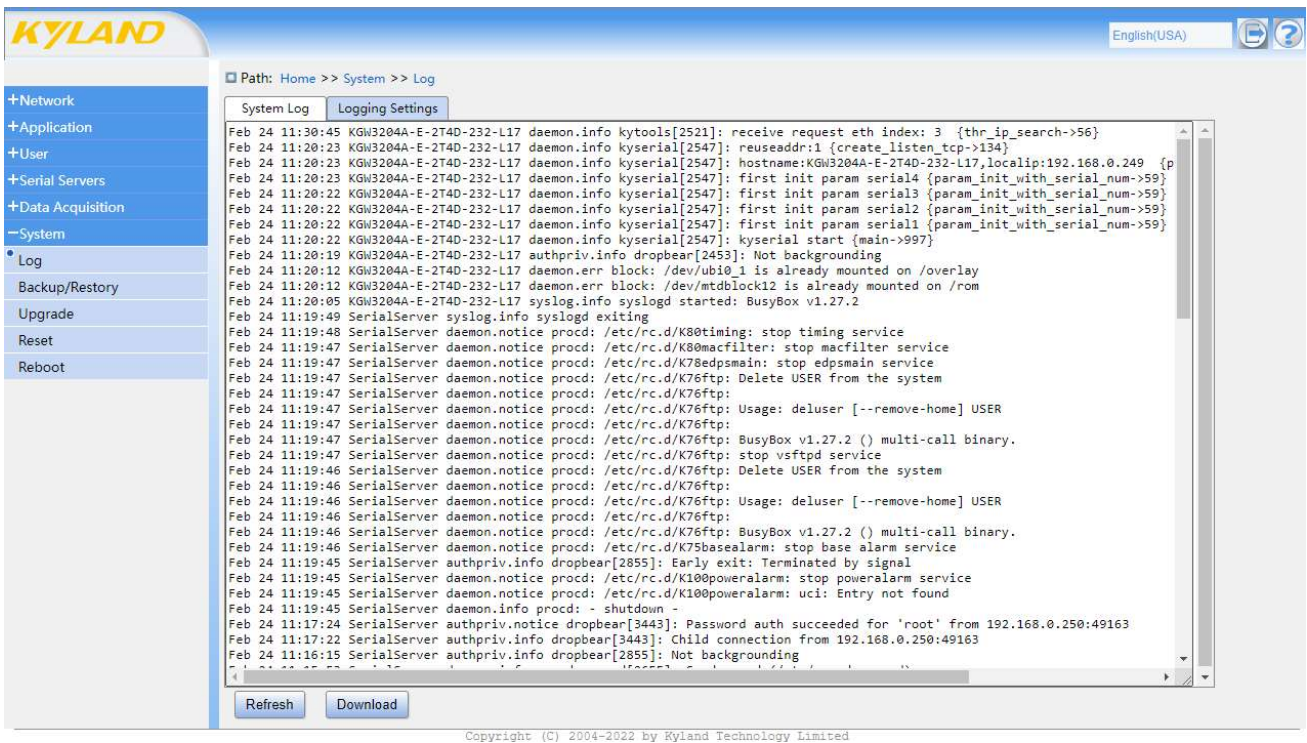


Figure 49 System Log

Log settings are used to send log information to the designated external server, and can be used to remotely monitor equipment operation information.

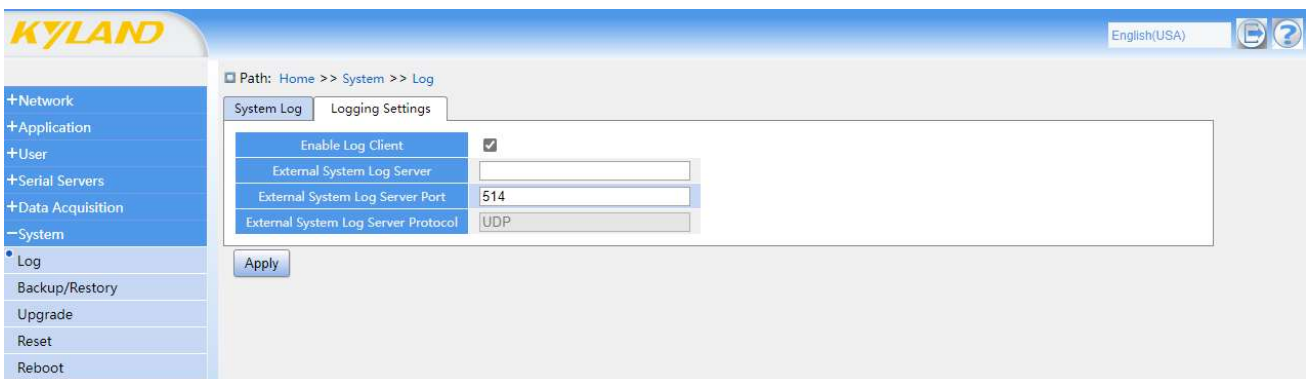


Figure 50 Log Settings  
Table 42 Log Settings

| Parameter                    | Value       | Description                     |
|------------------------------|-------------|---------------------------------|
| External log server          | Ip address  | External server IP address      |
| External log server port     | Port number | External server port number     |
| External log server protocol | UDP         | Only UDP protocol is supported. |

#### 4.9.2 Backup/recovery

The backup and recovery page can be used for configuration backup and upload.

Click "Generate Backup" to download the current configuration file and archive the backup to the local area. Click "Browse" button, select the path of the local configuration file, and click "Upload Backup" to import the local configuration file, and use the local configuration file to restore the device configuration information.

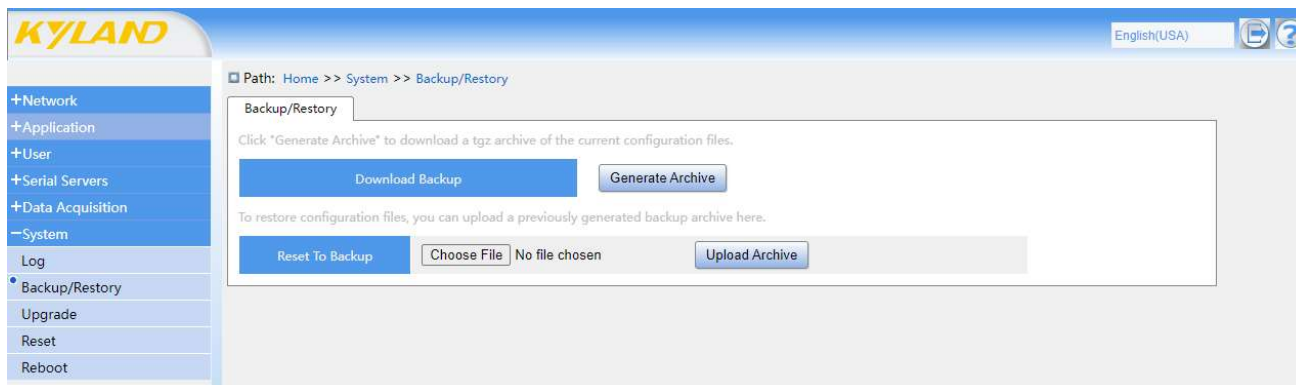


Figure 51 Backup and Recovery Page

### 4.9.3 Upgrade

The upgrade page can be used for firmware upgrade and update.

Click the "Select File" button, select the upgrade file path, and then click the "Upgrade" button to upgrade the webpage firmware. After the upgrade is successful, the gateway device automatically restarts and the system is updated successfully.

Check the "Keep Configuration" button, and the configuration will be kept after the upgrade. If "Keep Configuration" is not checked, the configuration will not be kept after upgrading, and the configuration information will be restored to the factory default configuration status.

**Note: When upgrading the firmware of KPS/KGW3x0xA series, the EDPS firmware will be upgraded at the same time.**

**Note: The upgrade will stop the related business procedures. If the related business is used after the upgrade fails, the machine needs to be restarted.**

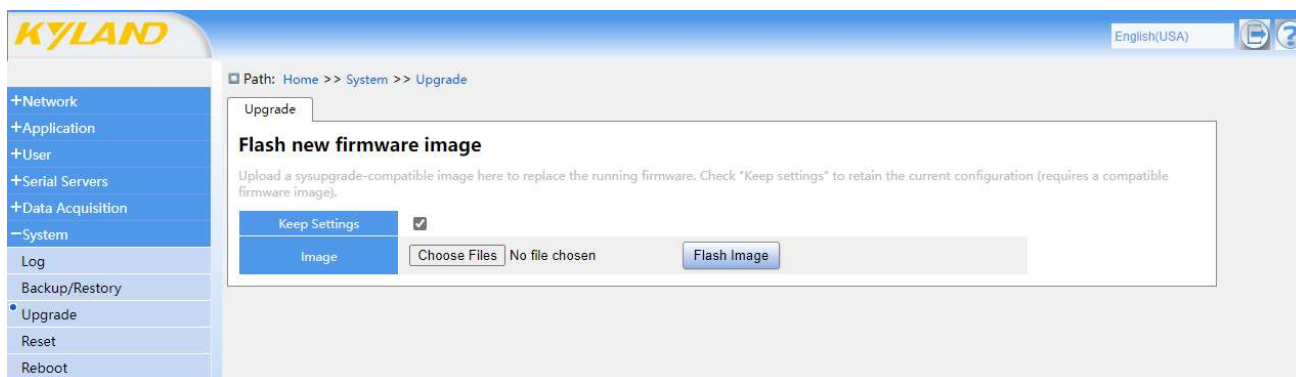


Figure 52 Upgrade page

#### 4.9.4 System reset

The system reset page is used to restore this equipment to the factory setting state.

When all the setting information on the device needs to be cleared, click the "Perform Reset" button to restore the new generation gateway to the factory default settings.

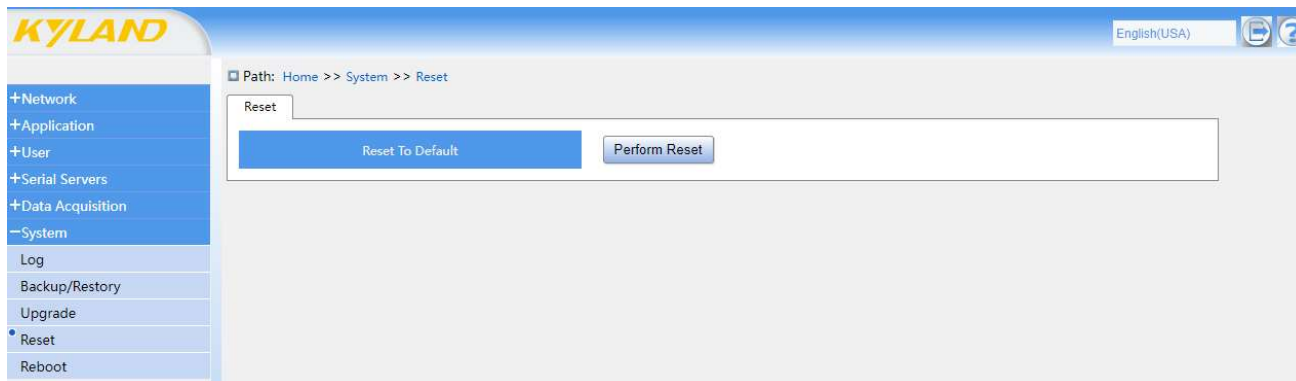


Figure 53 System Reset Page

**Note: Restoring the factory settings will completely reset the equipment, and the equipment configuration parameters will be restored to the factory default configuration state. Please back up the important configuration information of the equipment before using to restore the factory settings.**

#### 4.9.5 Restart

The restart page is used to restart this device.

When it is necessary to restart the equipment, click the "Execute Restart" button to restart the equipment.

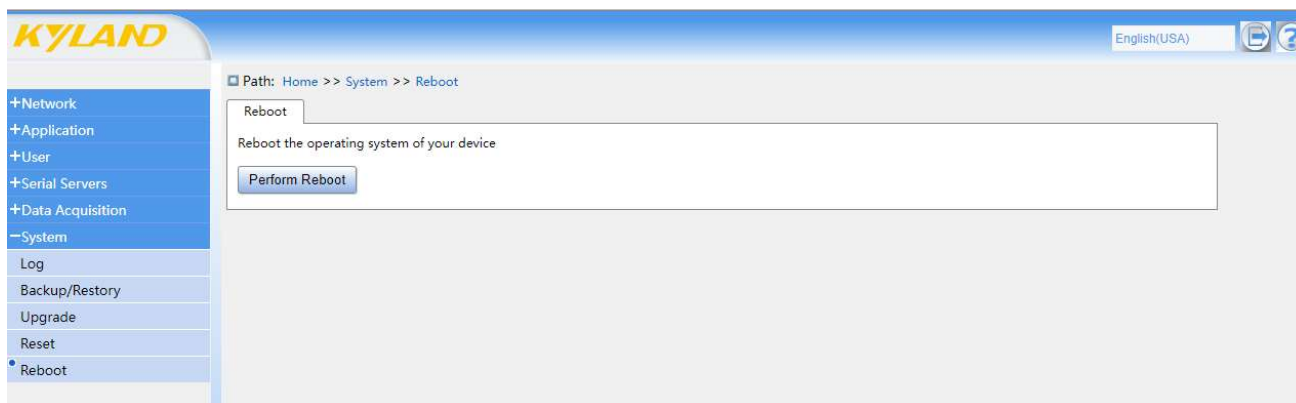


Figure 54 Restart the Page

#### 4.10 Help

There is a "Help" button in the upper right corner of the Web interface. Click "Help" to jump to the official page of Kyland Technology.





Figure 55 Help Page

## 4.11 Quit

After logging in to the Web page and completing the page configuration, click the exit button to exit the Web login state, so as to prevent the abnormal function of the device caused by wrong operation. The Exit button is located in the upper right corner of the interface.



Figure 56 Exit the Page

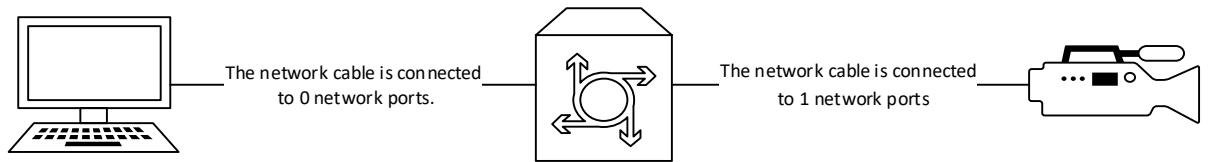
## 5 Operational Use Case

### 5.1 Network Port Bridging Operation Case

#### **Bridge function is not enabled**

A. Network port 0 and network port 1 are different network segments

Without configuring a gateway, you cannot communicate with each other. When two network ports need to be able to communicate with each other, you need to configure one of the network ports as the gateway of the other network port (for example, configure the gateway of network port 0:192.168.0.249 to network port 1:192.168.1.249)



Close the bridge, the two network ports have different IP network segments.

ip:192.168.0.250  
Gateway: 192.168.0.249

ip0:192.168.0.249  
ip0gateway:192.168.1.249  
ip1:192.168.0.249

ip:192.168.1.111  
Gateway: 192.168.1.249

## B. Network port 0 and network port 1 are the same CIDR segments

The two network ports cannot access each other to communicate, and network port 0 and network port 1 are in an independent working mode.

### Bridge function is enabled

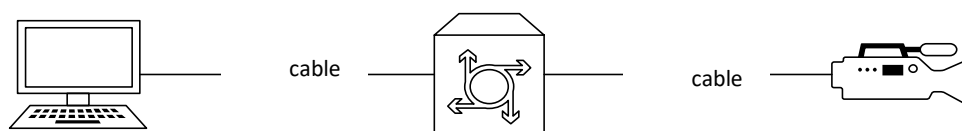
When the network mode is to enable the bridging function, the serial server can work in LAN-LAN or LAN-WAN mode.

When two devices need to be able to access and communicate with each other on the same network segment, choose LAN-LAN mode. Check Enable Bridging, and check "Ethernet Adapter eth1". At this time, the ports 0 and 1 are LAN ports.

When different network segments need to be able to access each other for communication, choose LAN-WAN mode. Check enable bridging, and uncheck "Ethernet adapter eth1". At this time, Ethernet port 0(eth0) is LAN port and Ethernet port 1(eth1) is WAN port.

### A. bridging with the same network segment

Physical connection:



ip:192.168.0.242

Open the bridge, two network ports have the same IP.

ip:192.168.0.249

ip:192.168.0.111

On the Web page, check Enable Bridging, turn on the bridging function, check "Ethernet Adapter eth1", set the IP address and subnet mask, and click "Apply" to enable two devices on the same network segment to communicate with each other.

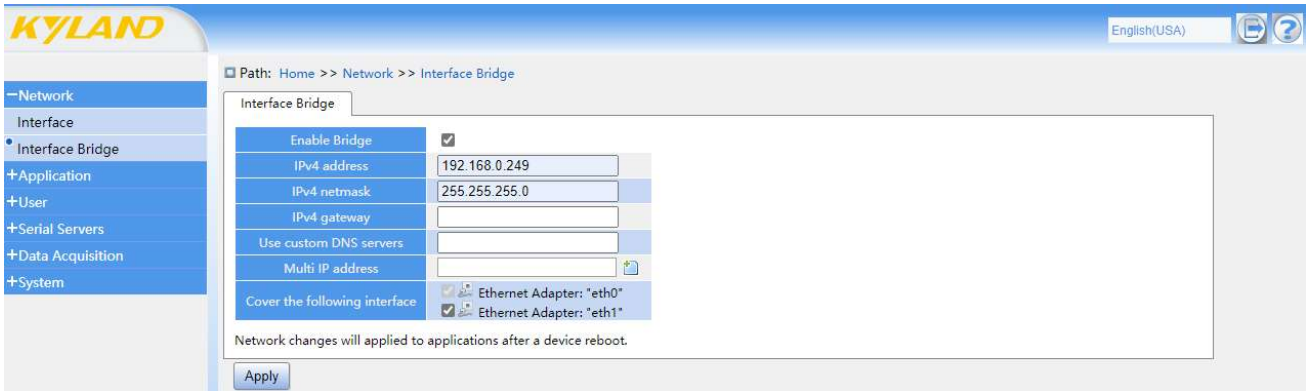
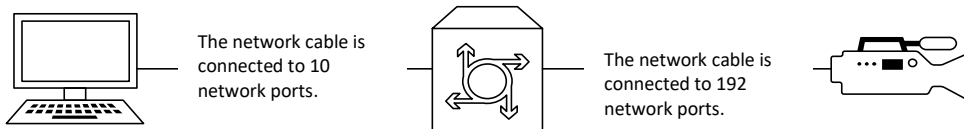


Figure 57 Bridging the network ports of the same network segment

Ping another device (IP: 192.168.0.111) on a PC with an IP of 192.168.0.242, and you can ping.

### B. Bridging different network segments

Physical connection:



|                         |  |                          |
|-------------------------|--|--------------------------|
|                         | Open the bridge, the two network ports have different IP network segments. |                          |
| id: 10. 12. 2. 233      | ip0: 10. 12. 2. 249  | id: 192. 168. 0. 111     |
| Gateway: 10. 12. 2. 249 | ip1: 192. 168. 0. 249  | Gateway 192. 168. 0. 249 |

Leave "Ethernet adapter eth1" unchecked on the Web page, select the protocol, set the IP address and subnet mask, and click "Apply" to enable two devices with different network segments to communicate with each other.

**Note: the gateway must be configured correctly, otherwise communication cannot be carried out.**

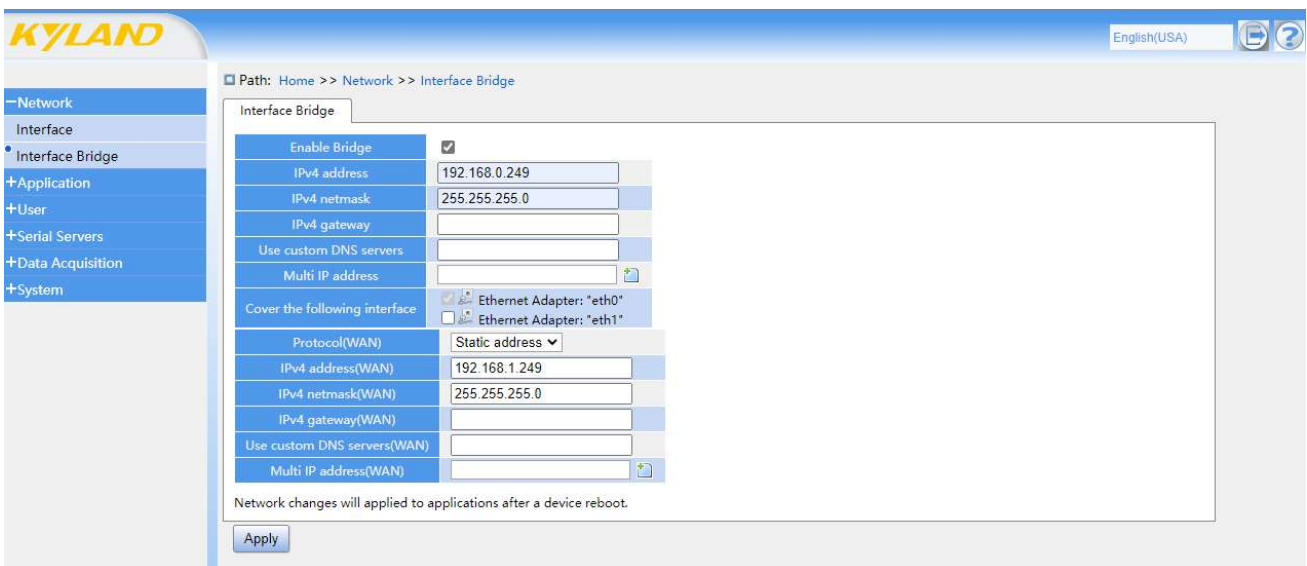


Figure 58 Bridge of Network Ports of Different Network Segments

Ping another device (IP:192.168.0.111) on a PC with an IP of 10.12.2.233, and you can ping.

## 5.2 Transparent Transfer Operation Cases

A KGW3204A and a computer are used, and the serial interface type of the gateway is RS-232. As a TCP Server, the gateway uses a USB-to-RS-232 serial communication line at the USB end of the computer, and the DB9 port of the USB-to-RS-232 serial communication line is connected to the serial port S1 of the terminal of this equipment.

**Note: This operation case is that the serial port uses transparent transmission communication protocol, RS-232 serial port connection mode, and the network port uses TCP Server and TCPClient network communication mode. If the serial port is an RS-485 cable or the network mode adopts other modes, the configuration item can be changed to the corresponding mode, and the operation method is similar.**

### 5.2.1 TCP Server mode

#### A. Configuring the Web console

Start KGW3204A, enter the IP address in the browser, and enter the user name and password to log in to the Web page.

Click "serial server"->"serial interface settings" in the navigation bar, select serial port 1, TCP Server for network mode, Transparent for transmission mode, fill in the local port with more than 1024, and the maximum number of connections is 4, set the serial port baud rate, data bits, parity bits, stop bits and other configuration applications, and click "Apply" to save.

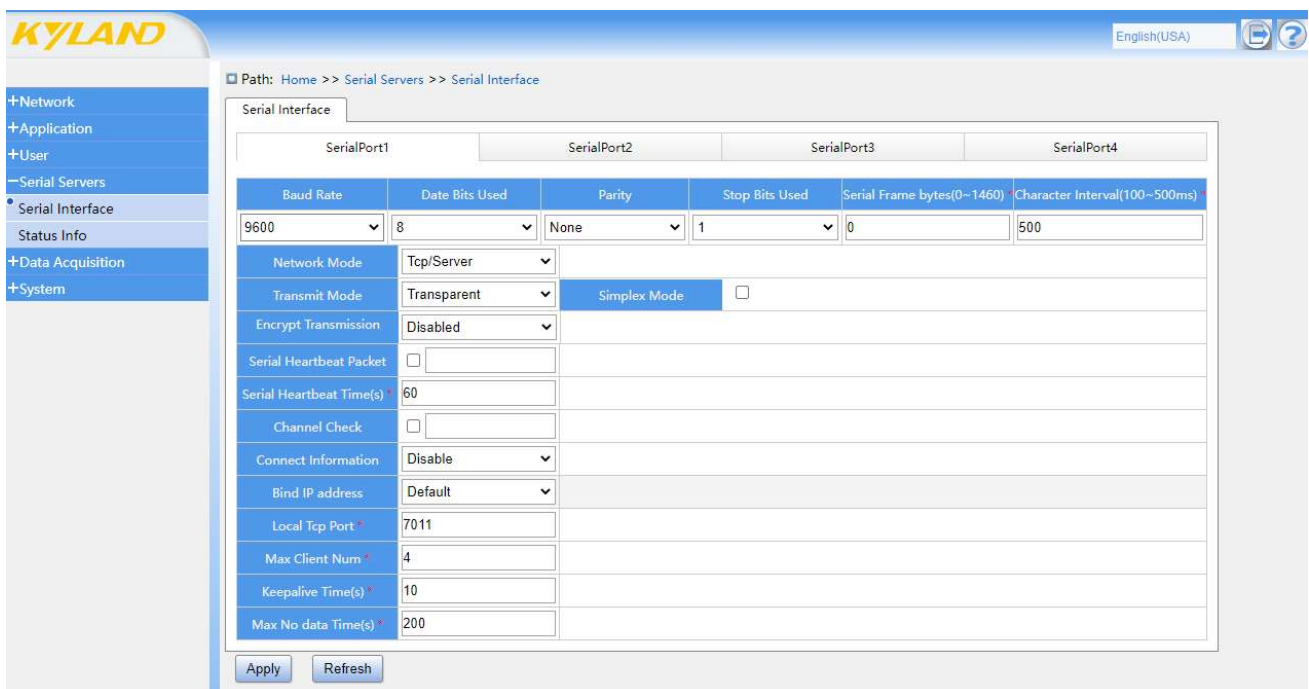


Figure 59 Web Configuration TCP Server Page

## B. Configure PC-side parameters

The PC end uses USB to RS-232 serial communication line, and the serial end of the serial communication line connects the terminal of KGW3204A to connect the PC with the device S1.

Open the integrated debugging management tool "KyCMT", right-click the serial network debugging assistant column to create a new debugging assistant, select TCP Client as the communication port, fill in the local host address, fill in the KGW3204A device IP and port number for the remote address, and click Connect. Right-click to create a new debugging assistant, select COM as the communication port, and configure the parameters related to the serial port to be the same as those of the serial port S1 of KGW3204A equipment. Click Open after the configuration is completed.

After the above operations are completed, enter the numerical value in the data sending area of KyCMT, and you can see that the data receiving area of the integrated debugging management tool can receive the corresponding data, and the two-way communication of data is successful, as shown in the following figure.

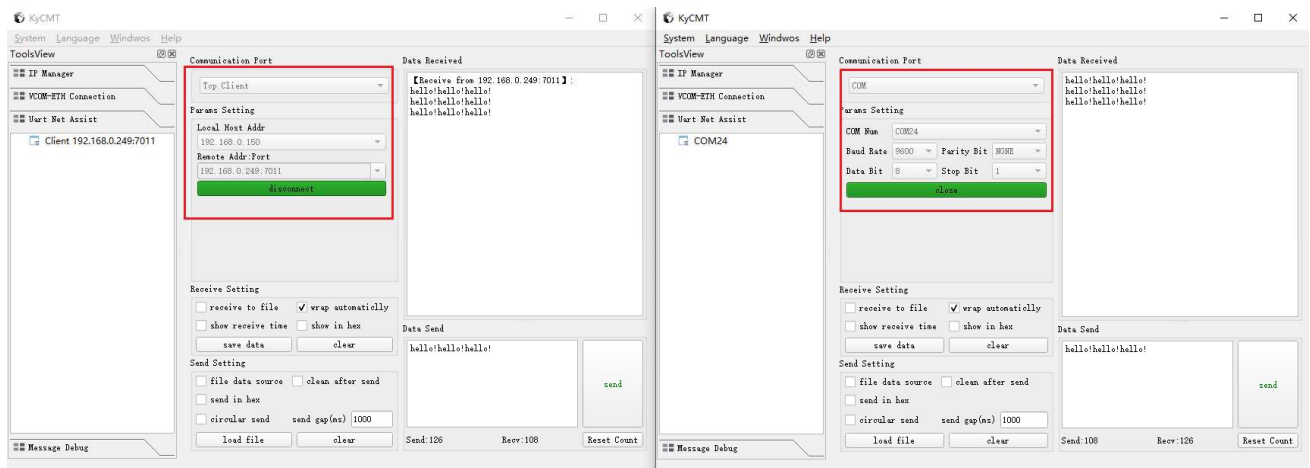


Figure 60 Configuration of Integrated Debugging Management Tool Parameters

### 5.2.2 TCP Client mode

#### A. Configure PC-side parameters

The PC end uses USB to RS-232 serial communication line, and the serial end of the serial communication line connects the terminal of KGW3204A to connect the PC with the device S1.

Open the integrated debugging management tool "KyCMT", right-click the serial network debugging assistant column to create a new debugging assistant, select TCP Server as the communication port, fill in the local host address, and click Connect if the local port is above 1024. Right-click to create a new debugging assistant, select COM as the communication port, and configure the parameters related to the serial port to be the same as those of the serial port S1 of KGW3204A equipment. Click Open after the configuration is completed.

## B. Configuring the Web console

Start KGW3204A, enter the IP address in the browser, and enter the user name and password to log in to the Web page.

Click "serial server"->"serial interface settings" in the navigation bar, select serial port 1, TCP Client for network mode, Transparent for transmission mode, and fill in the IP and port configured in step a for the destination IP and port. The local port can be left blank (KGW3204A uses the filled-in port to establish connection), and up to four non-repetitive links can be added, and configuration applications such as serial port baud rate, data bits, parity bits and stop bits can be set.

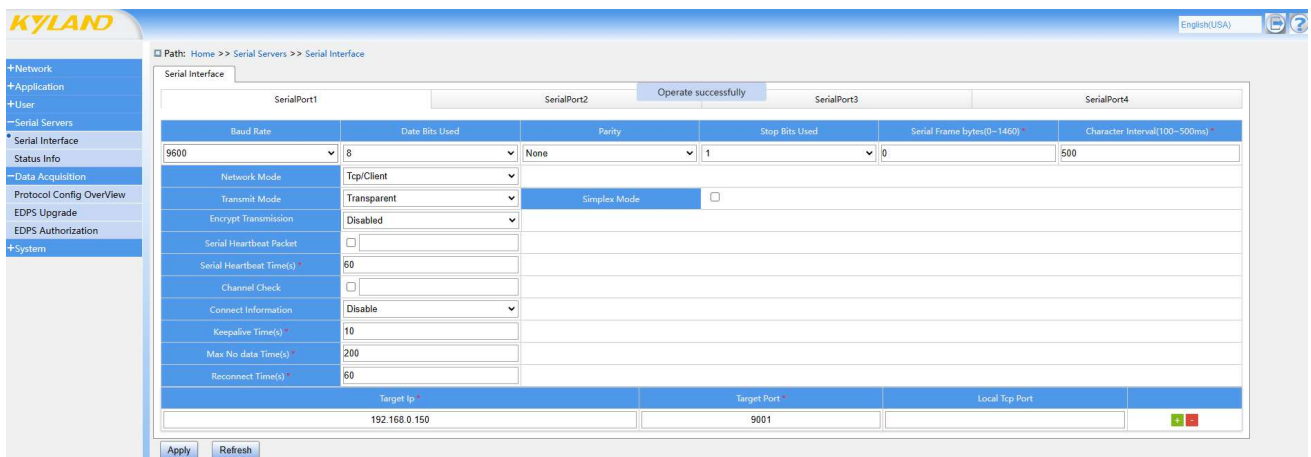


Figure 61 Web Configuration TCP Client Page

After the above operations are completed, enter the numerical value in the data sending area of KyCMT, and you can see that the data receiving area of the integrated debugging management tool can receive the corresponding data, and the two-way communication of data is successful, as shown in the following figure.

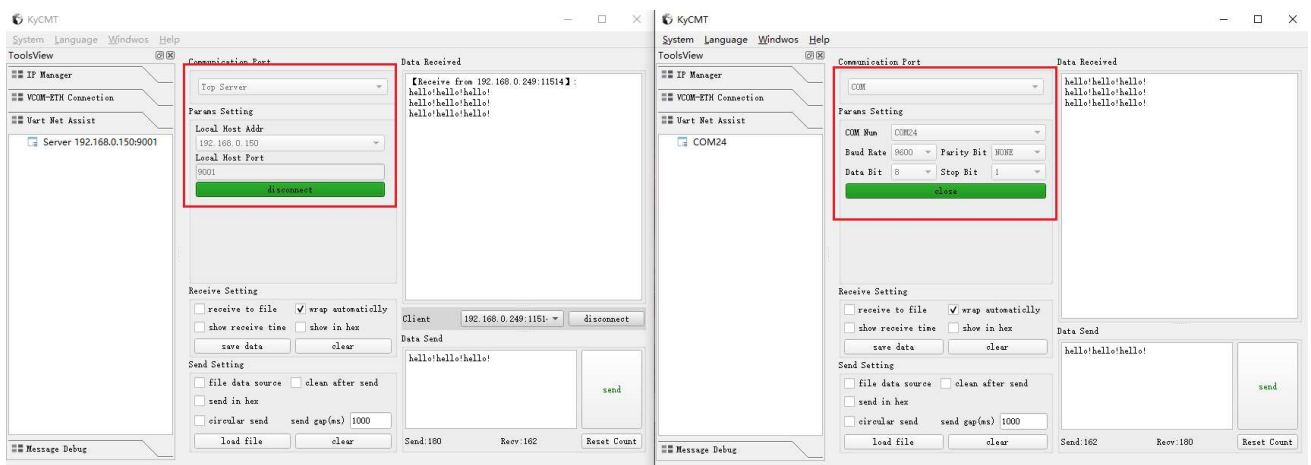


Figure 62 Configuration of Integrated Debugging Management Tool Parameters

## 5.3 ModbusRTU operation case

A KGW3204A and a computer are used, and the serial interface type of the device is RS-232. KGW3204A is a TCP Server. The USB end of the computer uses a USB-to-RS-232 serial communication line, and the DB9 port of the USB-to-RS-232 serial communication line is connected to the serial port S1 of the terminal of this equipment.

**Note: In this operation case, Modbus RTU communication protocol and RS-232 serial connection mode are used at the serial port, and TCP Server and TCP Client network communication mode are used at the network port. If the serial port is an RS-485 cable, or the network mode adopts other modes, the configuration item can be changed to the corresponding mode, and the operation method is similar.**

### 5.3.1 TCP Server mode

#### A. Configuring the Web console

Start KGW3204A, enter the IP address of the serial server in the browser, and enter the user name and password to log in to the Web page.

Click "Serial Server"->"Serial Interface Settings" in the navigation bar, select serial port 1, TCP Server for network mode, Modbus RTU for transmission mode, and fill in the local port with more than 1024, and the maximum number of connections is 4. Set the serial port baud rate, data bits, parity bits, stop bits and other configuration applications, and click "Apply" to save.

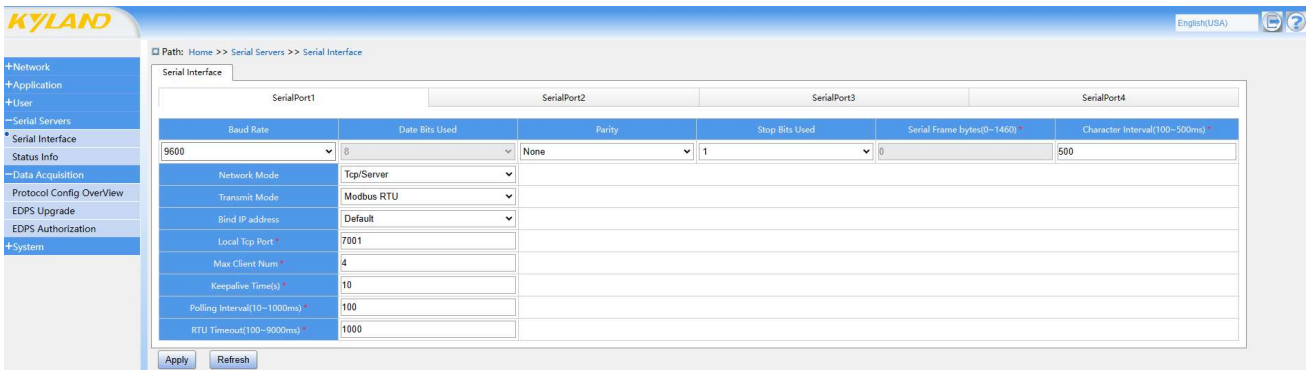


Figure 63 Configuring a Web Page

#### B. Configure PC-side parameters

The PC end uses USB to RS-232 serial communication line, and the serial end of the serial communication line is connected to the terminal of KGW3204A, which connects the PC with the device S1.

Open the software "Modbus Slave", create a new Mbslave window, click the menu bar Connection-Connection Setup, select Serial Port as the communication port, and configure the

parameters related to the serial port to be the same as those of the device serial port S1, and click OK after configuration.

Then click the menu bar Setup-Slave Definition to configure the device Address (Slave ID), Function code (function), starting address (address) and Quantity.

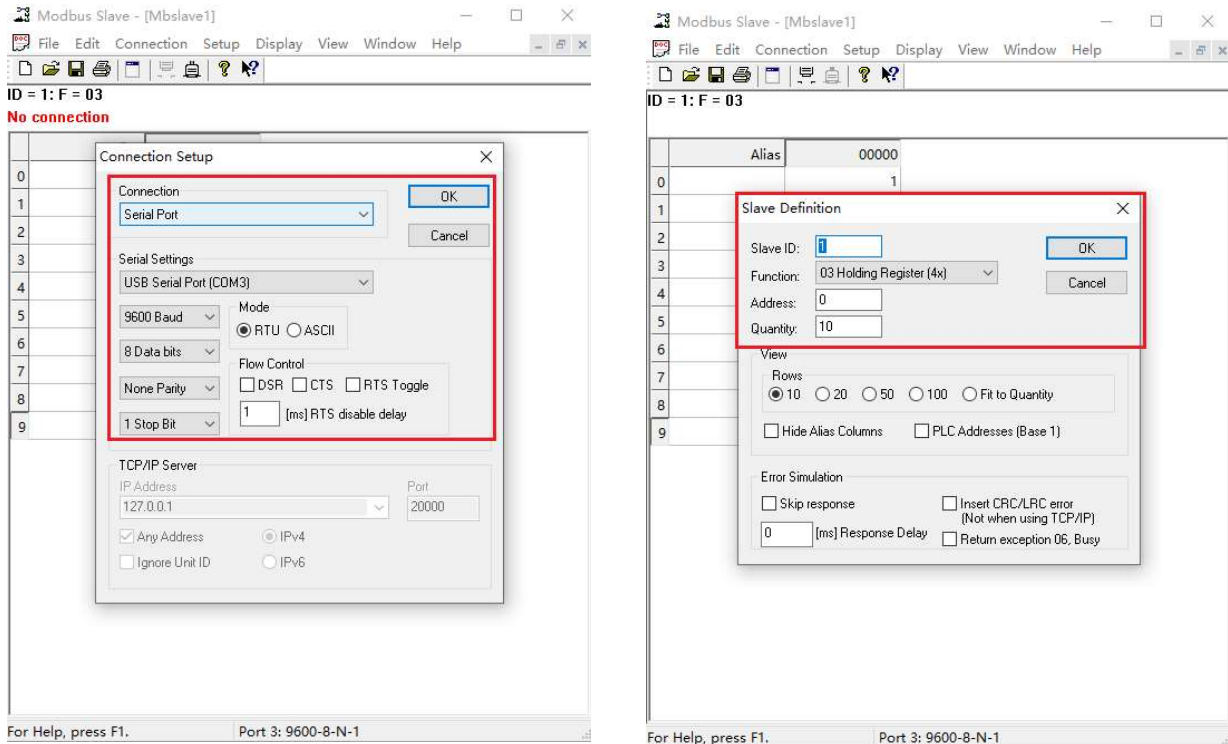


Figure 64 Configure Modbus Slave Tool Parameters

Open the software "Modbus Poll", create a new Mbpoll window, click the menu bar Connection-Connection Setup, select Modbus TCP/IP as the communication port, fill in the device IP of KGW3204A and the port number set in step a for the remote address, and the Response Timeout setting value of the upper computer needs to be greater than the timeout set in the WEB page, and click OK.

Then click the menu bar Setup-Read/Write Definition to configure the device Address (Slave ID), Function code (function), starting address (address) and Quantity (quantity). Modbus Poll configuration parameters need to be consistent with Modbus Slave configuration parameters.



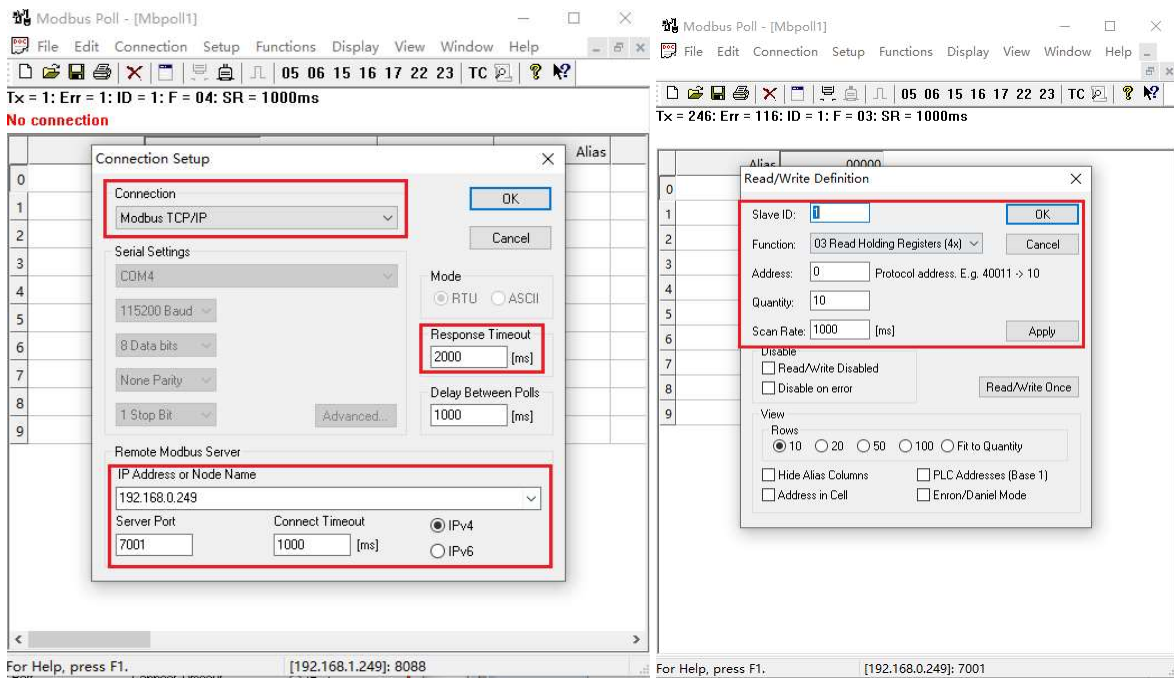


Figure 65 Configuring Modbus Poll Tool Parameters

After the above operations are completed, enter the numerical value in the data sending area of Modbus Slave tool to send, and you can see that the corresponding data can be received in the data receiving area of Modbus Poll tool, and the two-way communication of data is successful, as shown in the figure below.

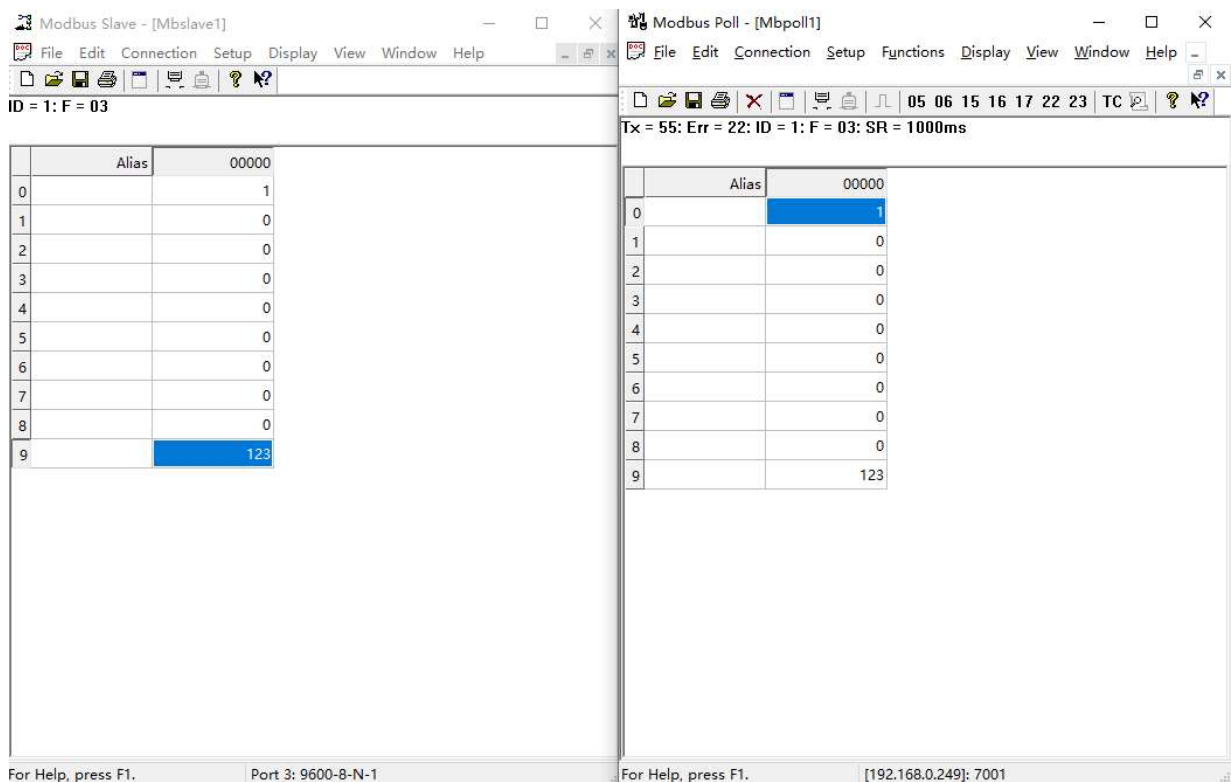


Figure 66 Successful Communication between Modbus slave and Modbus Poll Tool

### 5.3.2 TCP Client mode

#### A. Configure PC-side parameters

The PC end uses USB to RS-232 serial communication line, and the serial end of the serial communication line is connected to the terminal of KGW3204A, which connects the PC with the device S1.

Open the software "Modbus Slave", create a new Mbslave window, click the menu bar Connection-Connection Setup, select Modbus TCP/IP as the communication port, IP Address as the IP of the network port connected with KGW3204A1, and click OK after the configuration.

Then click the menu bar Setup-Slave Definition to configure the device Address (Slave ID), Function code (function), starting address (address) and Quantity.

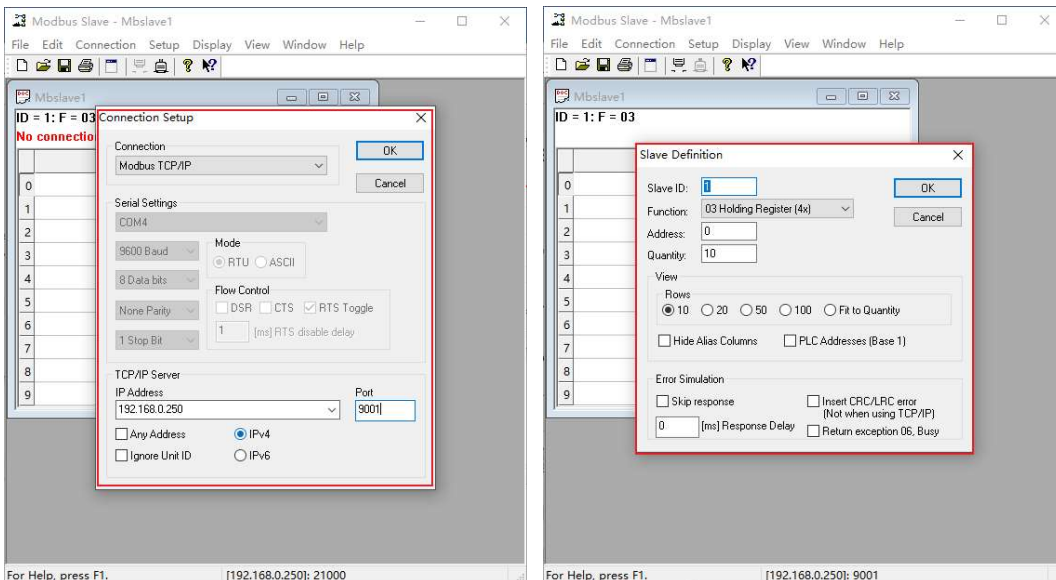


Figure 67 Configure Modbus Slave Tool Parameters

Open the software "Modbus Poll", create a new Mbpoll window, click the menu bar Connection-Connection Setup, and select Serial Port as the communication port. The parameters related to the serial port are configured to be the same as those of the device serial port S1. The Response Timeout setting value of the upper computer needs to be greater than the timeout set by the WEB page, and click OK.

Then click the menu bar Setup-Read/Write Definition to configure the device Address (Slave ID), Function code (function), starting address (address) and Quantity (quantity). Modbus Poll configuration parameters need to be consistent with Modbus Slave configuration parameters.

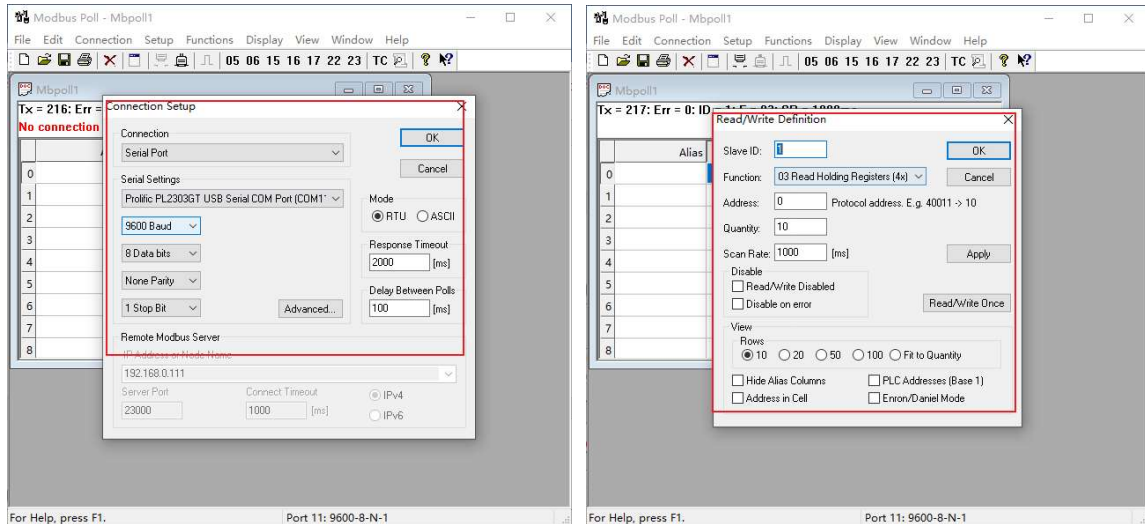


Figure 68 Configuring Modbus Poll Tool Parameters

## B. Configuring the Web console

Start KGW3204A, enter the IP address of the serial server in the browser, and enter the user name and password to log in to the Web page.

Click "serial server"->"serial interface settings" in the navigation bar, select serial port 1, TCP Client for network mode and Modbus RTU for transmission mode, add a link, and the Slave Id, target IP and target port settings in the link are consistent with those in Modbus Slave tool settings, set serial port baud rate, data bits, check bits and stop bits, and click "Apply" to save.

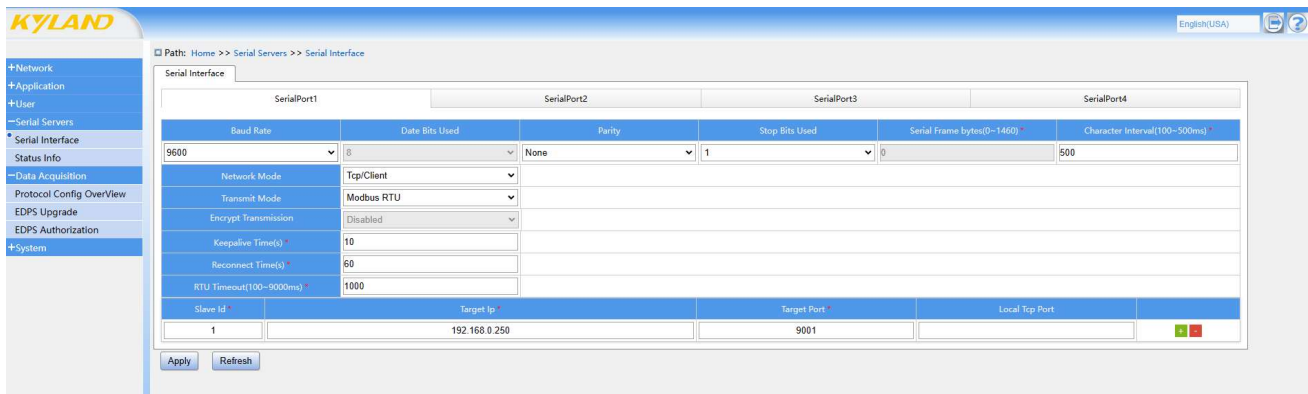


Figure 69 Configuring a Web Page

After the above operations are completed, enter the numerical value in the data sending area of Modbus Slave tool to send, and you can see that the corresponding data can be received in the data receiving area of Modbus Poll tool, and the two-way communication of data is successful, as shown in the figure below.

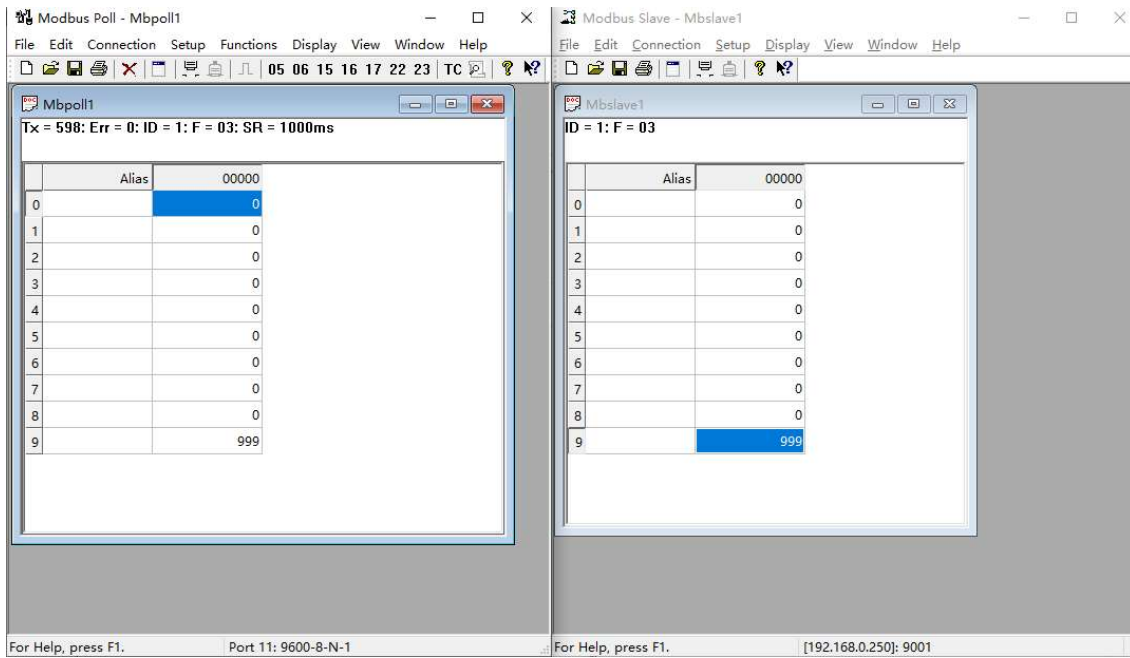


Figure 70 Communication between Modbus slave and Modbus Poll tool is successful.

## 5.4 SSH Mode Operation Case

Using a KGW3204A and a computer, the serial interface type of the device is RS-232. As an SSH server, KGW3204A uses a USB to RS-232 serial communication cable on the USB end of the computer. The DB9 port of the USB to RS-232 serial communication cable is connected to the serial port S1 of the wiring terminal of this device.

**Note:** This operation example uses the communication protocol of Modbus RTU and RS-232 serial port wiring on the serial port end, and the network communication mode of TCP Server and TCP Client on the network port end. If the serial port is connected to an RS-485 cable, or if the network mode adopts another mode, the configuration item can be changed to the corresponding mode, and the operation method is similar.

### A. Configure Web Console

Start KGW3204A, enter the serial server IP address in the browser, and enter the username and password to log in to the web page.

Click "Serial port server" - "Serial interface setting" in the navigation bar, select serial port 1, select SSH Mode for network mode, fill in local ports above 1024, set serial port baud rate, data bits, check bits, stop bits and other configuration applications, and click "Application" to save.

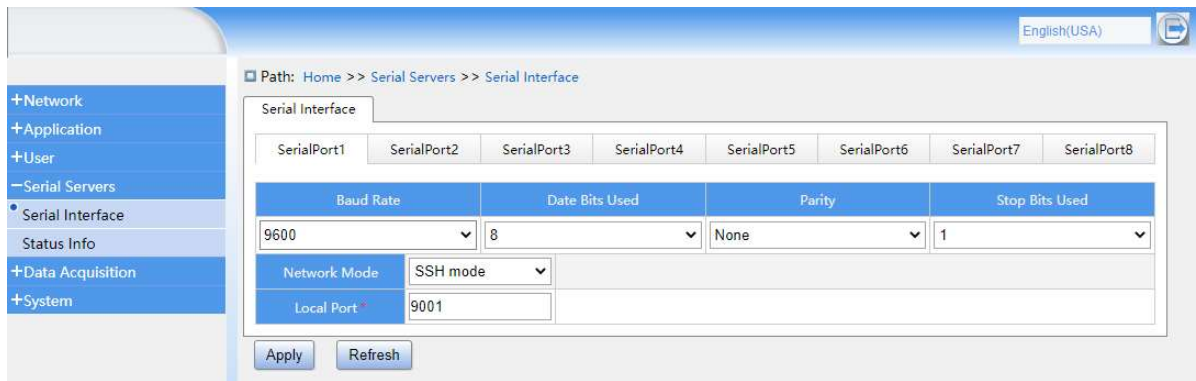


Figure 72 Configure web pages

## B. Configure PC side parameters

Use a USB to RS-232 serial communication cable on the PC end, and connect the serial port of the serial communication cable to the KGW3204A wiring terminal to connect the PC and device S1.

Open the software MobaXterm, create a new SSH connection, fill in the device IP for the remote host IP, and the port number is the same as the configuration on the device WEB page.

Open the integrated debugging management tool "KyCMT", right-click to create a new debugging assistant in the serial network debugging assistant bar, right-click to create a new debugging assistant, select COM for the communication port, and configure the serial port related parameters to the same parameters as the KGW3204A device serial port S1. After the configuration is completed, click Open.

After completing the above operations, input data into the data sending area of KyCMT software and send it. You can see that MobaXterm software can receive the corresponding data, and the data bidirectional communication is successful.

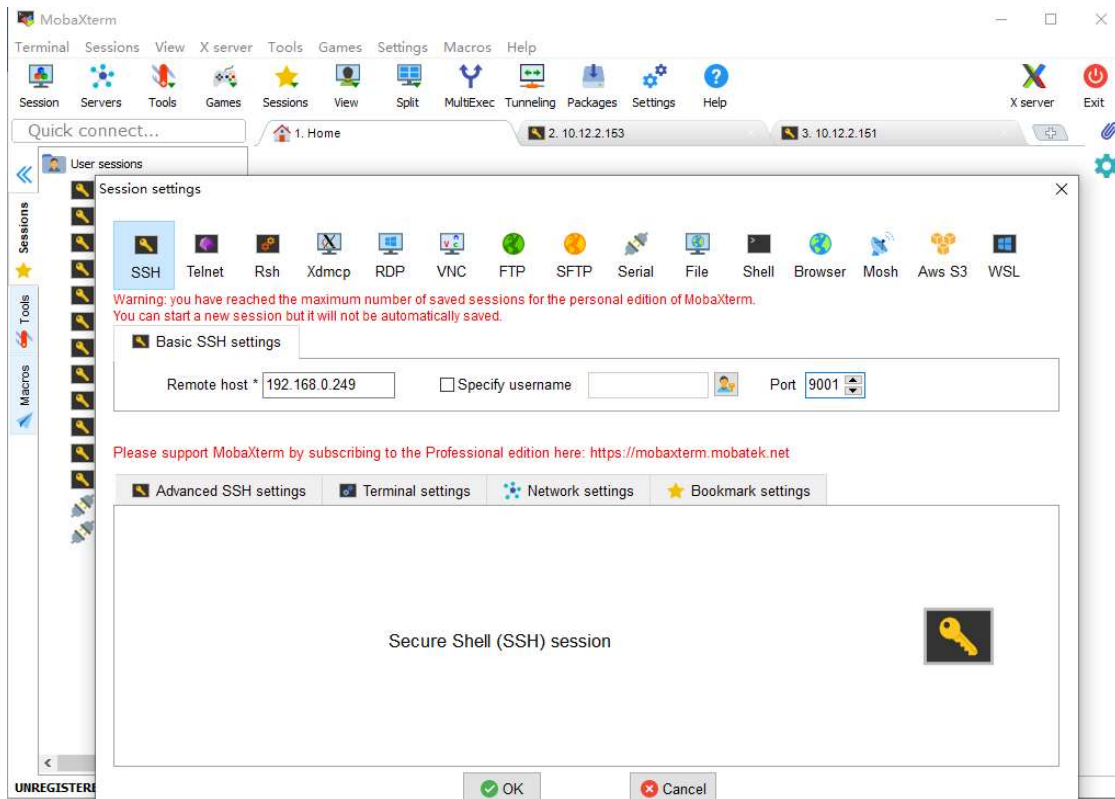


Figure 73 Configure SSH Client Tools

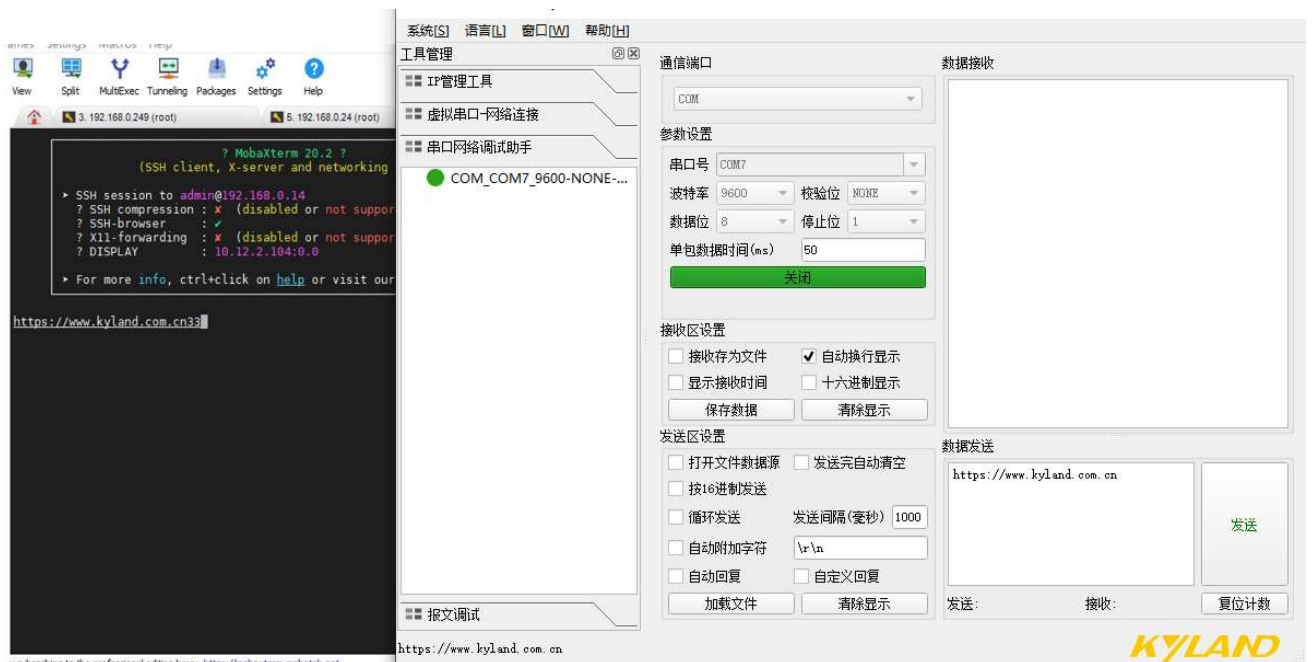


Figure 74 SSH client tool successfully communicates with serial tool

## 5.5 Modbus Protocol Engineering Operation Case

### A.KyPMT configuration protocol project

The configuration protocol project needs to be carried out in the integrated software

KyPMT. Taking the Modbus protocol project as an example, the Modbus RTU acquisition service and Modbus RTU forwarding service are configured, and the specific operations are as follows:

1. New construction
  - a. New engineering and engineering space;
  - b. Click the project name, right-click to create a new project, and select the running platform NUC980 KPS3000.

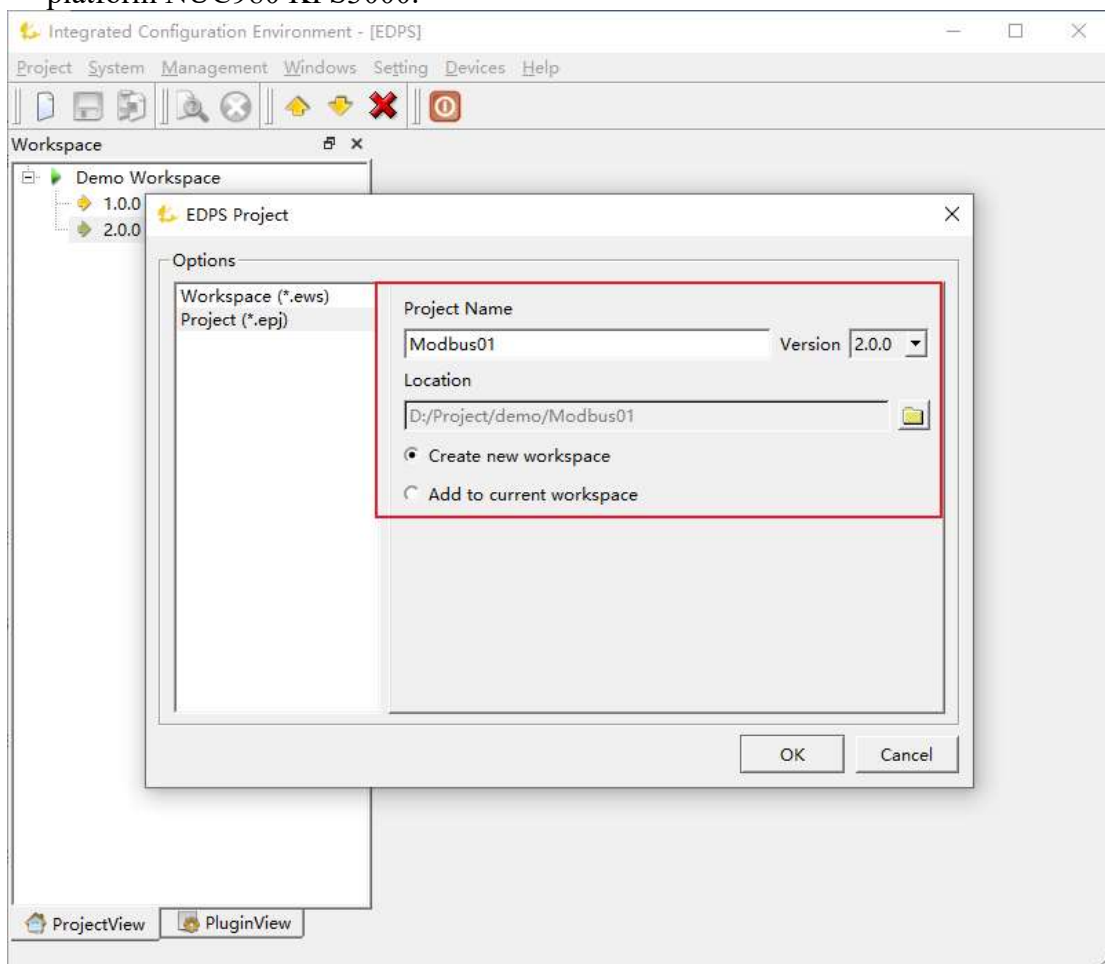


Figure 75 Creating a Project

2. New acquisition service
  - a. In the blank area of acquisition service, right-click to create a new one;
  - b. The new Modbus running port of the port group is a serial port, which needs to be consistent with the setting of the lower computer;
  - c. Set the frame type in the protocol parameters, and select RTU here;
  - d. Click on the device bus, right-click New, and set the device address, which needs to be consistent with the address of the lower computer;
  - e. New analog input;
  - f. Create a new status input.

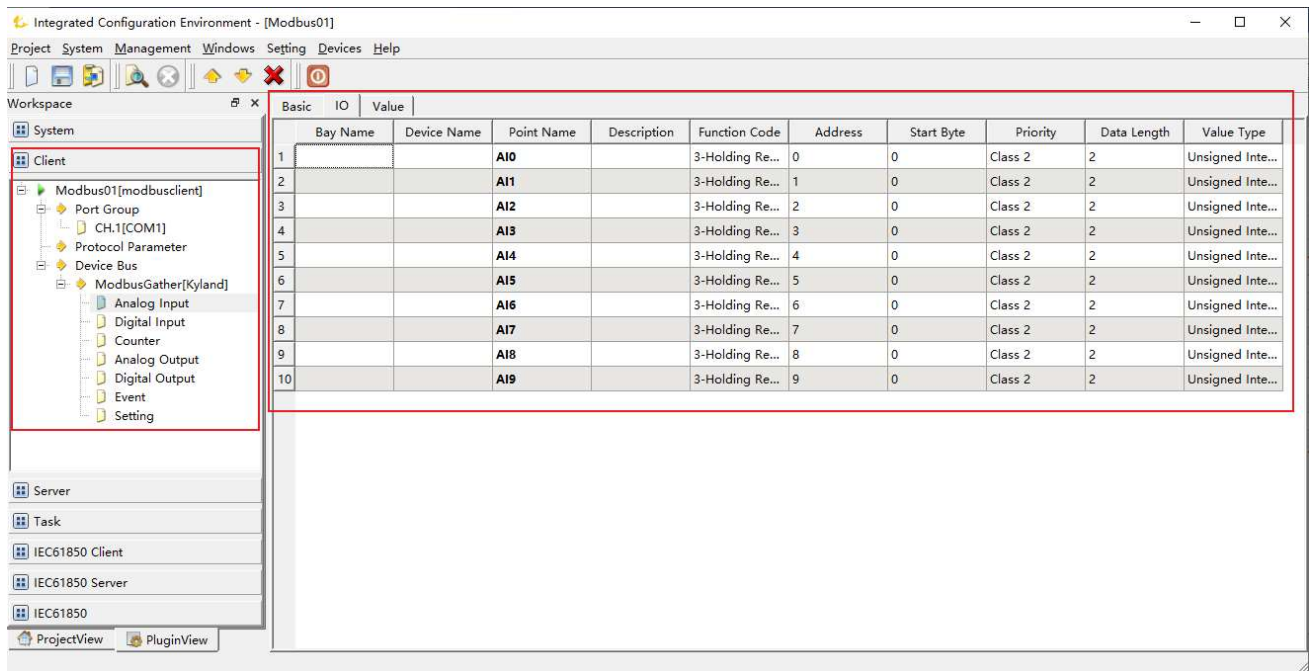


Figure 76 Modbus Acquisition Service

### 3. New forwarding service

The setting steps of forwarding service are the same as those of collecting service.

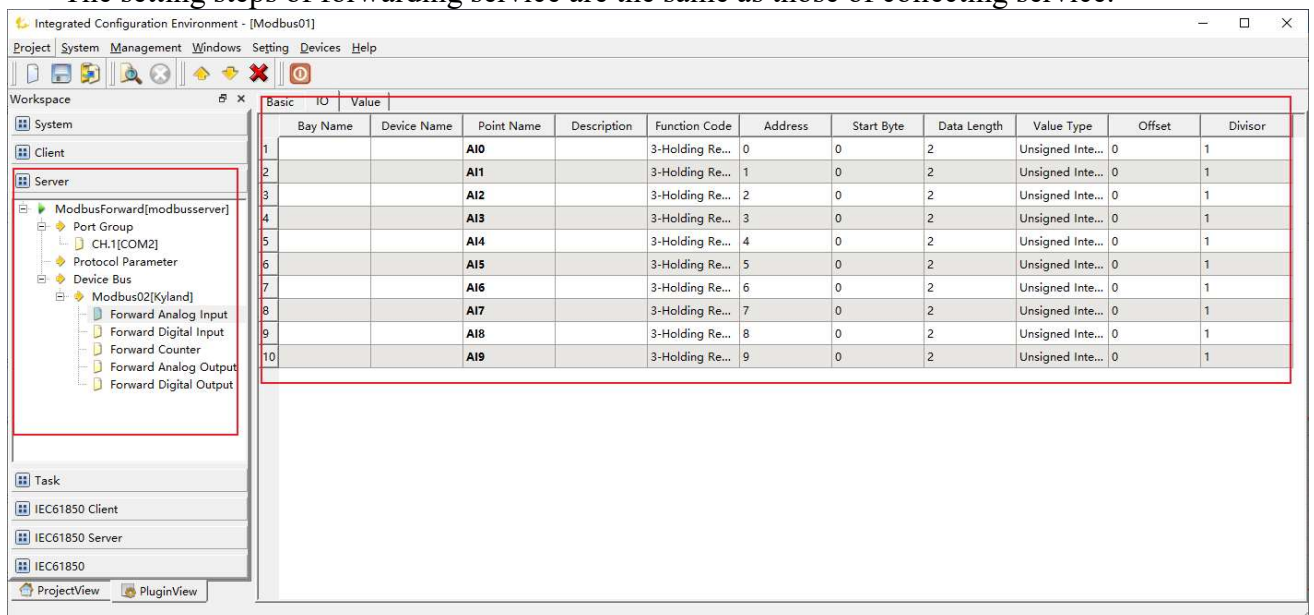


Figure 77 Modbus Forwarding Service

### 4. Download project

Click, download the project, and enter the user name edps and password yckyedps.

Note: For the specific configuration methods of Modbus, DNP, IEC101, IEC103, IEC104, DL/T654-1997, DL/T654-2007, Siemens S7, OPCUA and IEC61850, please refer to the protocol configuration manual under the help menu of KyPMT tools.

**Note: Before this device is connected to a PC and communicates, please ensure that the firewall and security protection software on the PC are closed, otherwise the communication**



connection may be abnormal.

### B. Web page enables engineering

Enter the device IP in the browser, enter the device Web page, click the data acquisition-protocol project list, select the project named Modbus project, and click Enable to activate and run the protocol project;

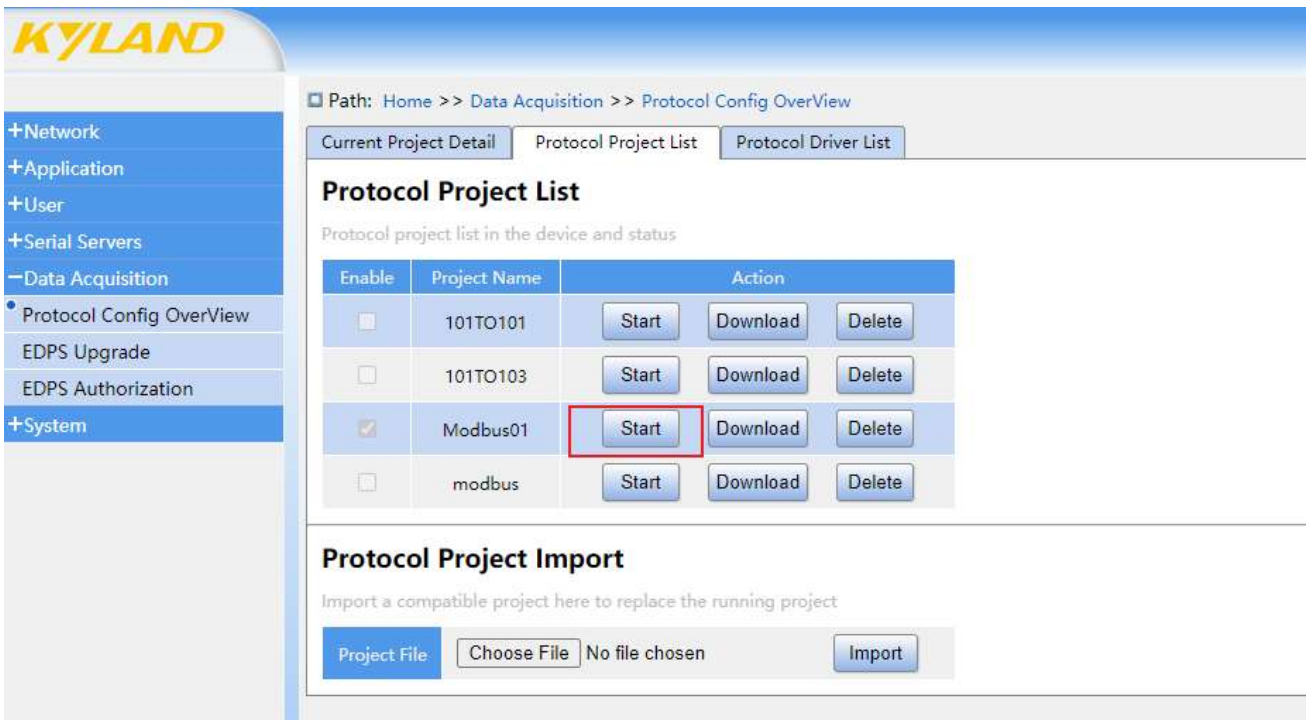


Figure 78 Enabling Project

### C. Software simulates the lower computer and the upper computer.

The PC end uses USB to RS-485 serial communication line, and the serial end of the serial communication line is connected with the terminal of the new generation gateway, which connects the PC with the serial port 1 of gateway equipment, that is, S1.

Open the software "Modbus Slave", create a new Mbslave window, click the menu bar Connection-Connection Setup, and select Serial Port as the communication port. The configuration parameters of serial port should be consistent with those of Modbus acquisition service, and click OK after configuration.

Then click the menu bar Setup-Slave Definition to configure the device Address (Slave ID), Function code (function), starting address (address) and Quantity. The configuration parameters of Modbus Slave need to be consistent with those of Modbus acquisition service.

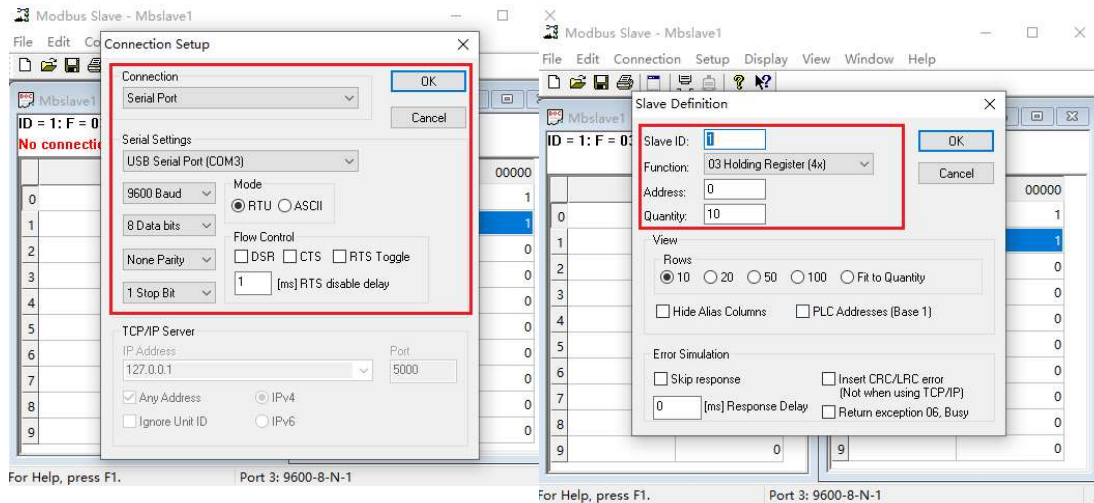


Figure 79 Configure Modbus Slave Tool Parameters

The PC end uses USB to RS-485 serial communication line, and the serial end of the serial communication line is connected with the terminal of the gateway, which connects the PC with the serial port 2 of the gateway equipment, that is, S2.

Open the software "Modbus Poll", create a new Mbpoll window, click the menu bar Connection-Connection Setup, and select Serial Port as the communication port. The configuration parameters of serial port should be consistent with those of Modbus forwarding service, and click OK after configuration.

Then click the menu bar Setup-Read/Write Definition to configure the device Address (Slave ID), Function code (function), starting address (address) and Quantity (quantity). Modbus Poll configuration parameters need to be consistent with those of Modbus forwarding service.

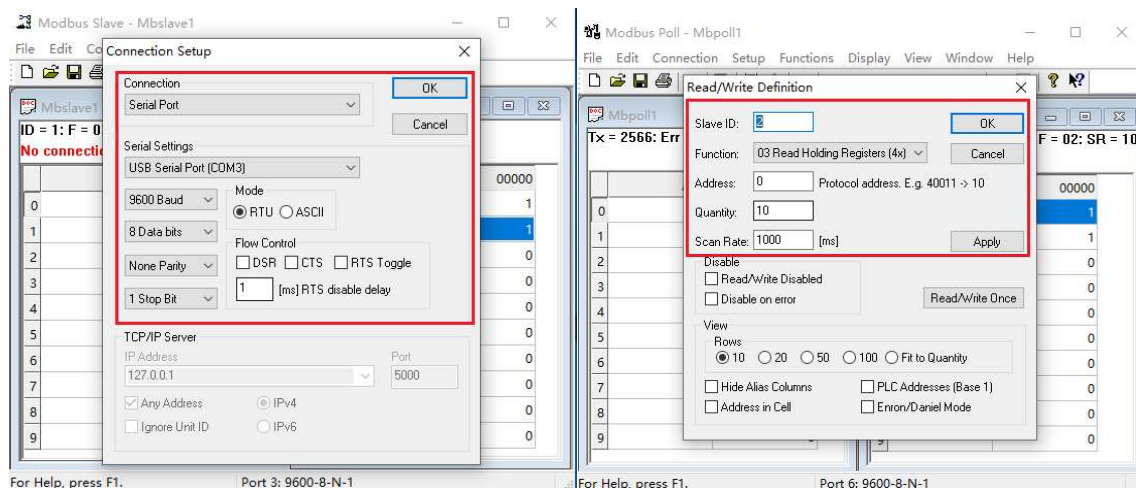


Figure 80 Configuring Modbus Poll Tool Parameters

After the above operations are completed, enter the numerical value in the data sending area of Modbus Slave tool to send, and you can see that the corresponding data can be received in the data receiving area of Modbus Poll tool, and the two-way communication of data is successful, as shown

in the following figure.

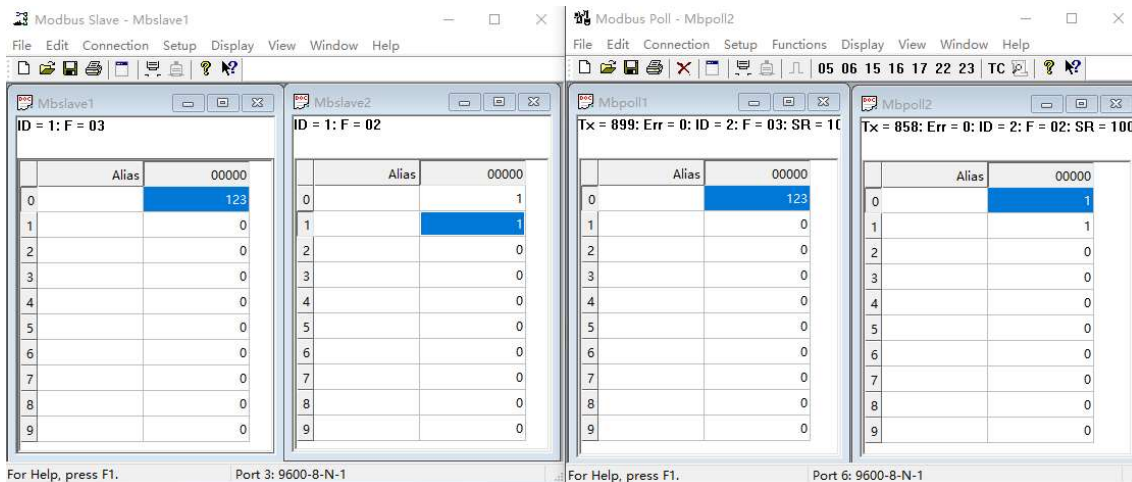


Figure 81 Communication between Modbus slave and Modbus Poll tool is successful

### D.KyPMT observation information point

After the project is activated on the Web page, click the link on the KyPMT tool, enter the user name admin, and click OK to view the information such as the value, quality and update time of the information points in the collection service and forwarding service.

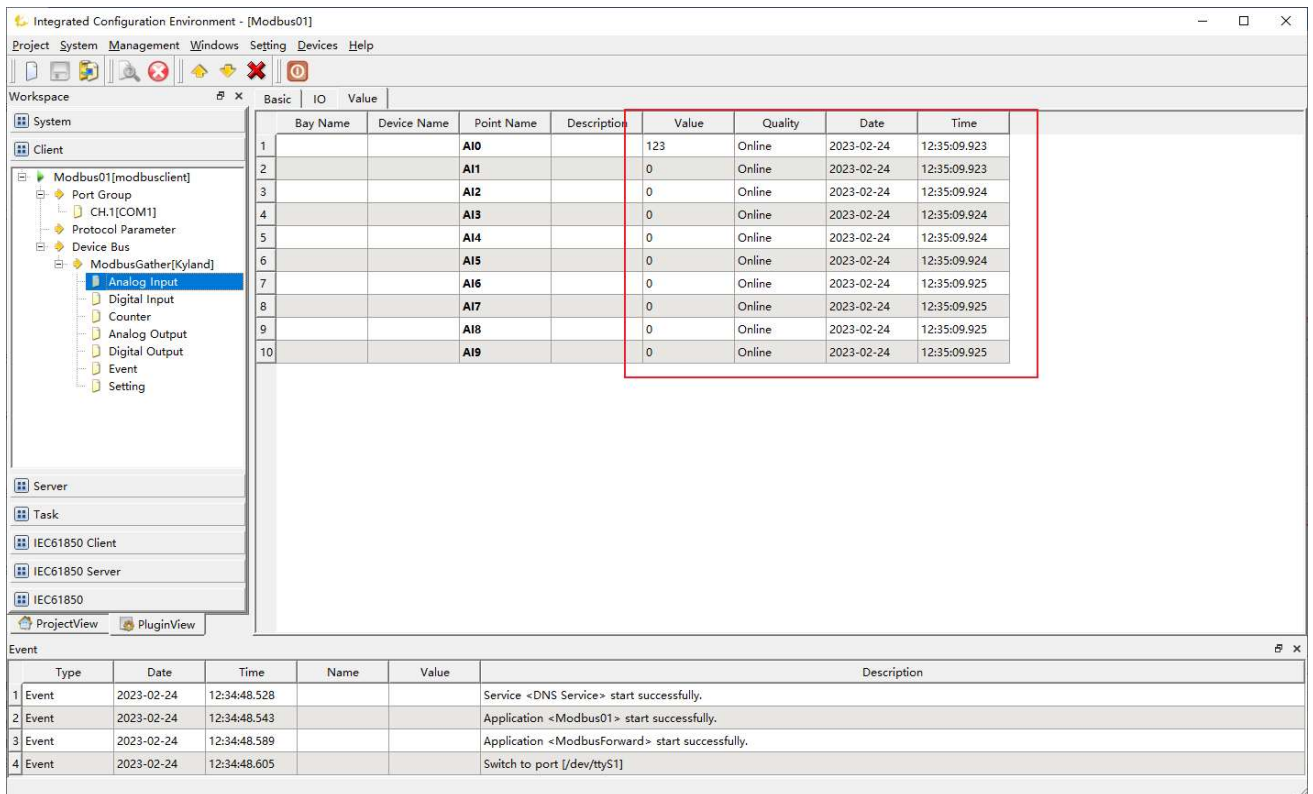


Figure 82 KyPMT Acquisition Service

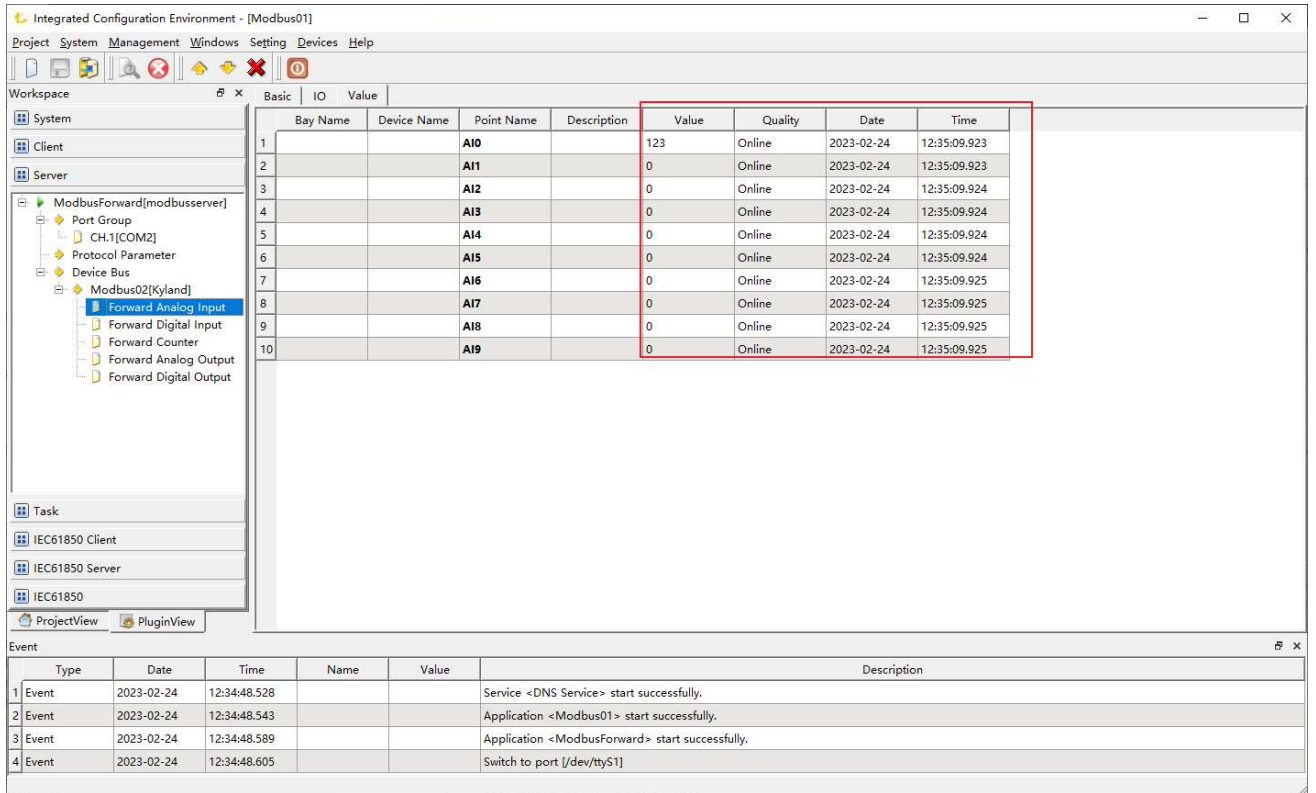


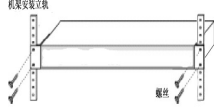
Figure 83 KyPMT Forwarding Service

## 6 Mechanical Dimensions and Packaging

### 6.1 Mechanical Structure

Table 43 Mechanical Structure Parameters

| Products             | KPS/KGW<br>3x0xA<br>series                        | KPS3x0xAL<br>series                               | KGW3204A<br>4G<br>series  | KPS/KGW3224A<br>series   | KPS/KGW320<br>xA-232-485-<br>422 series                                    |
|----------------------|---|---|---|--|--|
| Shell                | SECC<br>electrolytic<br>galvanized<br>steel sheet | SECC<br>electrolytic<br>galvanized<br>steel sheet | SECC<br>electrolytic<br>galvanized<br>steel sheet and<br>AL5052 | SECC electrolytic<br>galvanized steel<br>sheet and 6063<br>aluminum            | SECC<br>electrolytic<br>galvanized<br>steel plate and<br>aluminum<br>shell |
| Protect<br>grade     | IP40  | IP40  | IP30 and<br>above   | IP30 and above   | IP30 and<br>above  |
| Installation<br>mode | DIN rail or<br>wall-<br>mounted                   | DIN rail or<br>wall-mounted                       | DIN rail or<br>wall-mounted                                     | Use four screws<br>to fix the device<br>to the vertical<br>rails on both sides | DIN rail or<br>wall-mounted  |

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  | <p>of the cabinet, and ensure that the grounding terminal of the device is in good contact with the cabinet grounding wire. The installation method is shown in the following figure:</p>  |  |
|--|--|--|--|--|--|

## 6.2 Dimensional Drawing

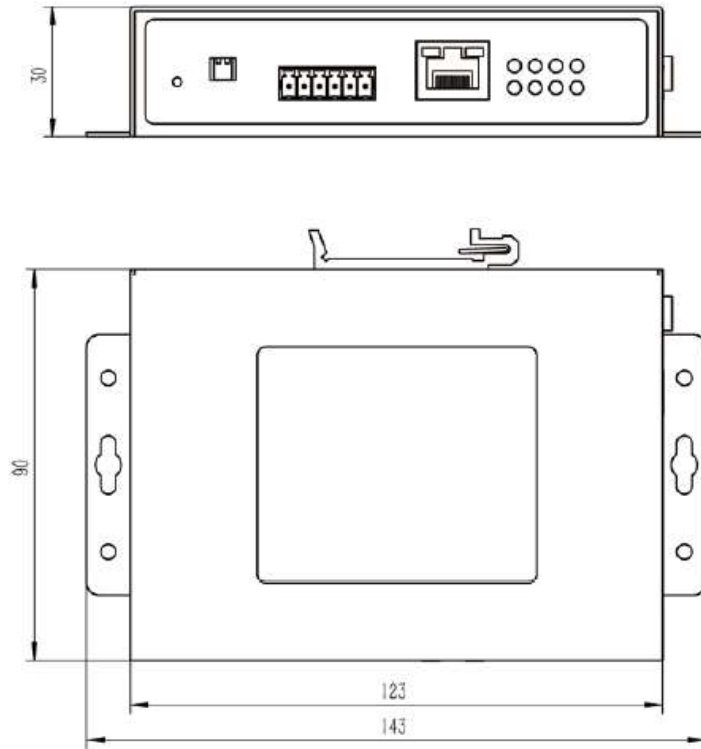
### 6.2.1 KPS/KGW310XA&320XA

Overall dimensions: KPS/KGW3101A: 123x90x30 mm

KPS/KGW3102A: 123x90x30 mm

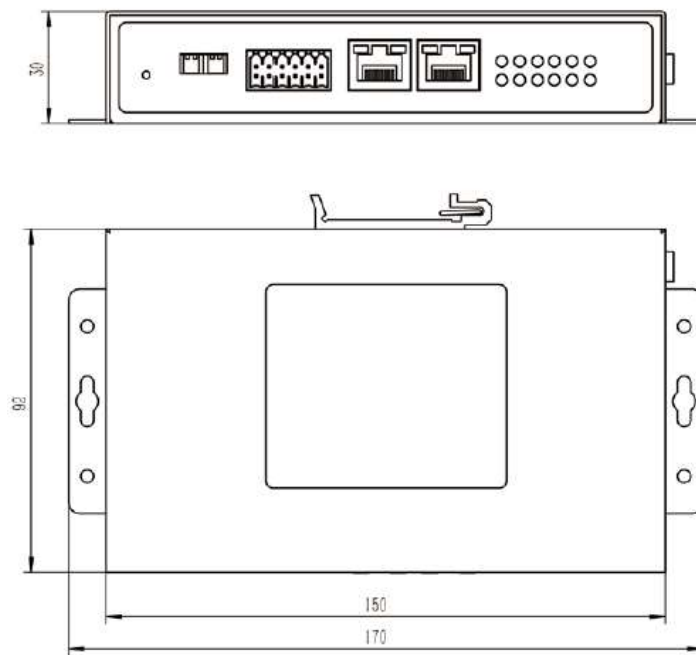
KPS/KGW3204A: 150x92x30 mm

KPS/KGW3208A: 177x100x44 mm



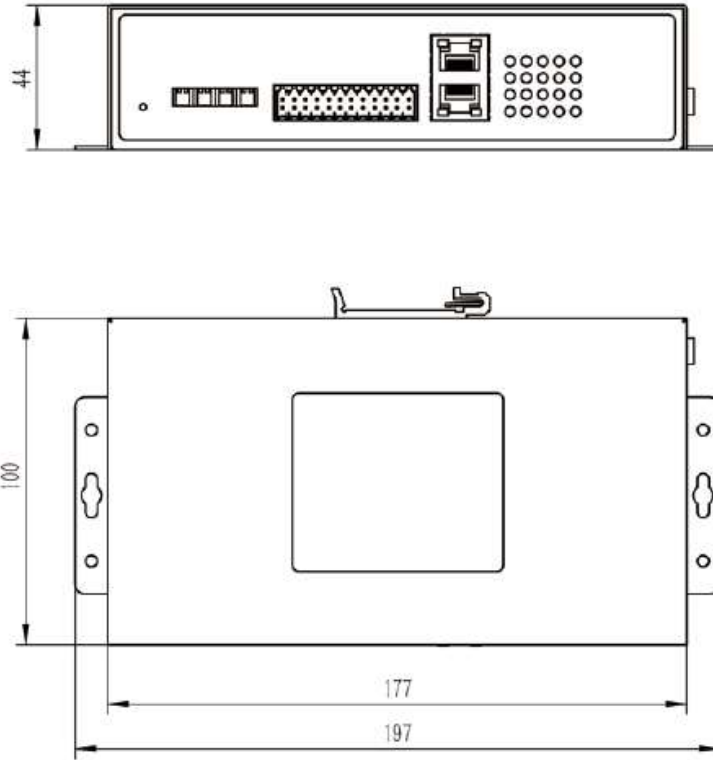
Unit: mm

Figure 84 Dimensions of KPS/KGW 3101a/3102a



Unit: mm

Figure 85 KPS/KGW3204A Dimension Drawing

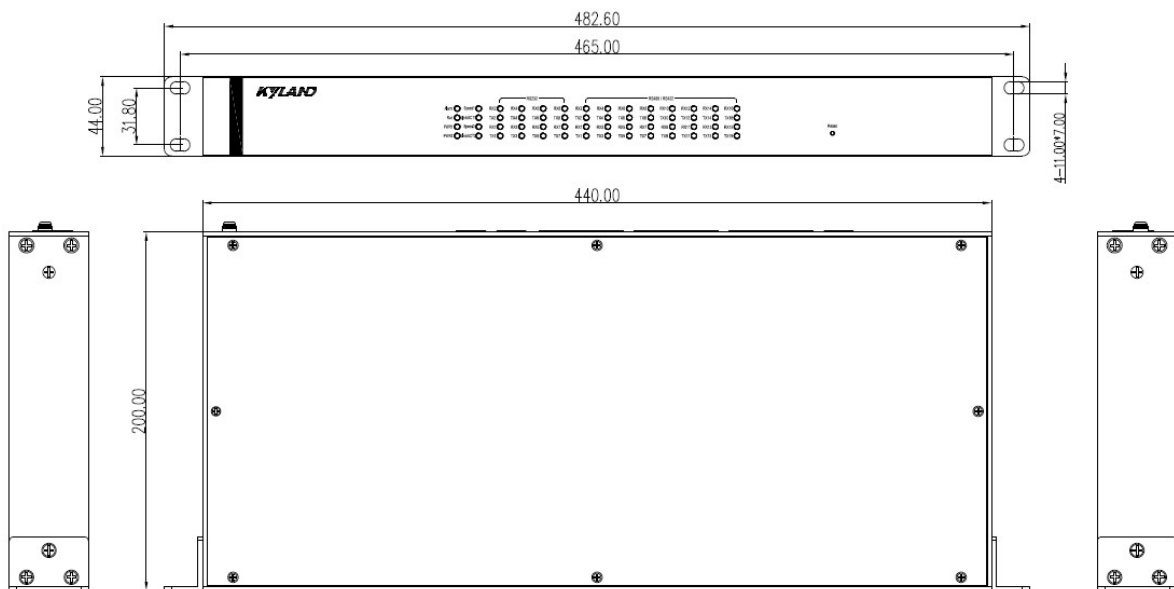


Unit: mm

Figure 86 KPS/KGW3208A Dimension Drawing

### 6.2.2 KPS3224A/KGW3224A

Overall dimensions: 482.6x200x44 mm

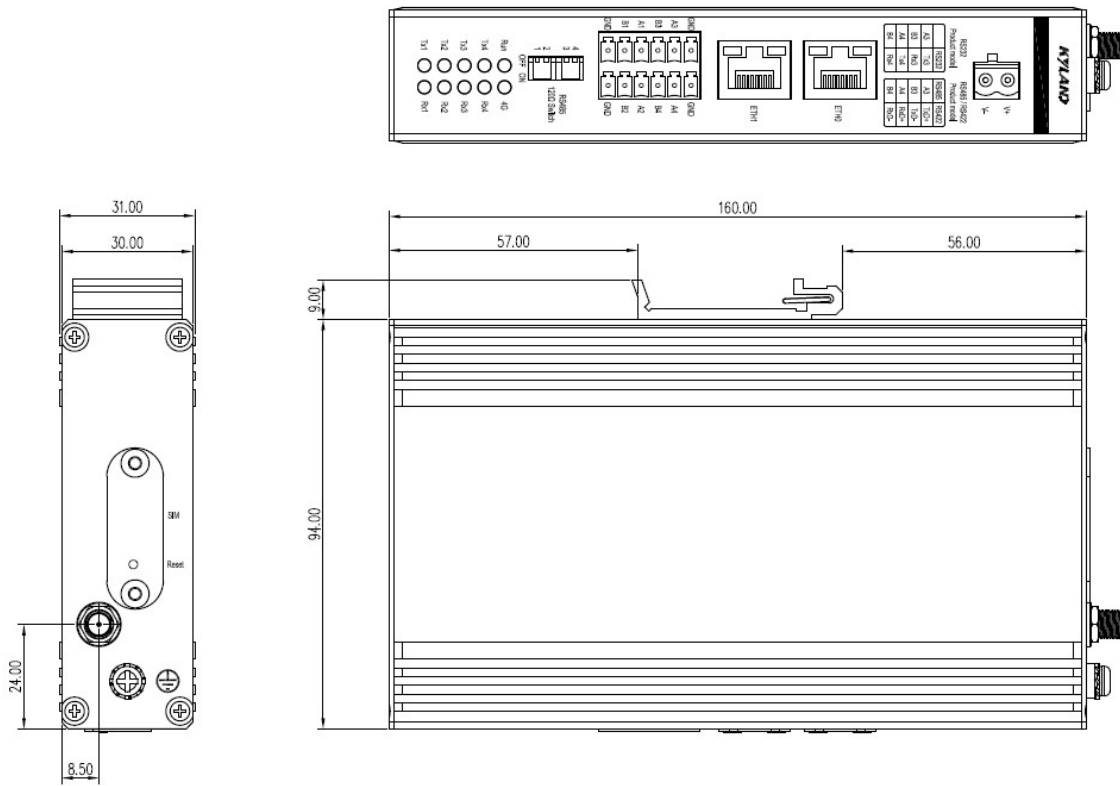


Unit: mm

Figure 87 KPS3224A/KGW3224A Dimension Drawing

### 6.2.3 KGW3204A-2T4D-232/485-4G-L17

Overall dimensions: 160x103x31 mm



Unit: mm

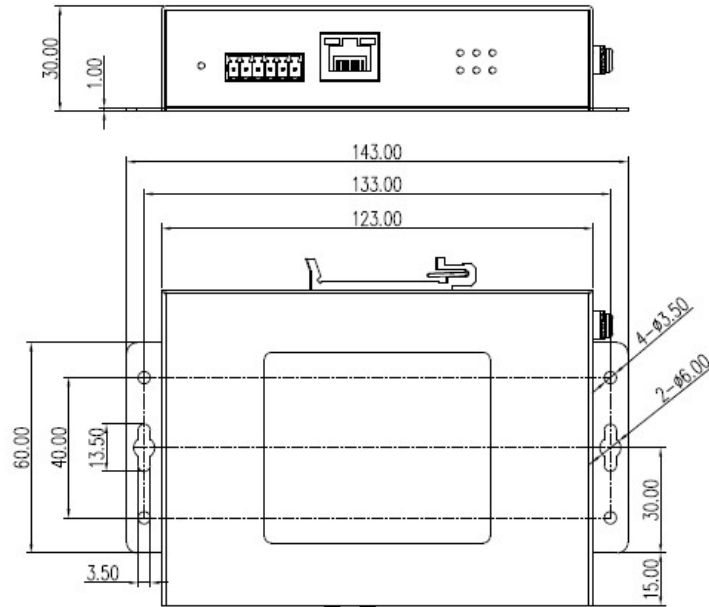
Figure 88 KGW3204A-2T4D-232/485-4G-L17 Dimension Drawing

### 6.2.4 KPS3102AL&KPS3204AL

Overall dimensions:

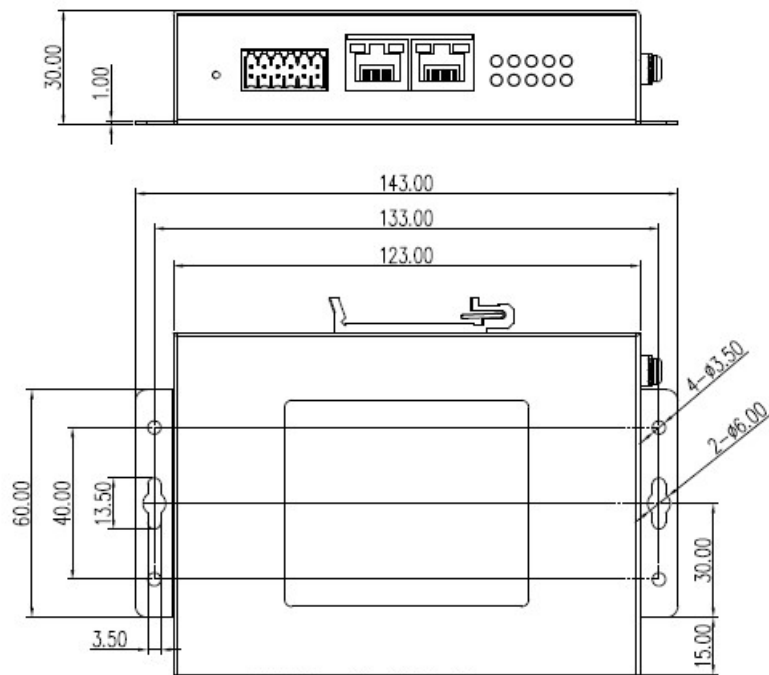
KPS3102AL: 123x90x30 mm ,KPS3204AL: 150x92x30 mm





Unit: mm

Figure 83 KPS3102AL Dimension Drawing



Unit: mm

Figure 89 KPS3204AL Dimension Drawing

## 6.2.5 KPS/KGW3204A-2T4D-232/485/422-L17-L17

Overall dimensions: 137x86x41 mm

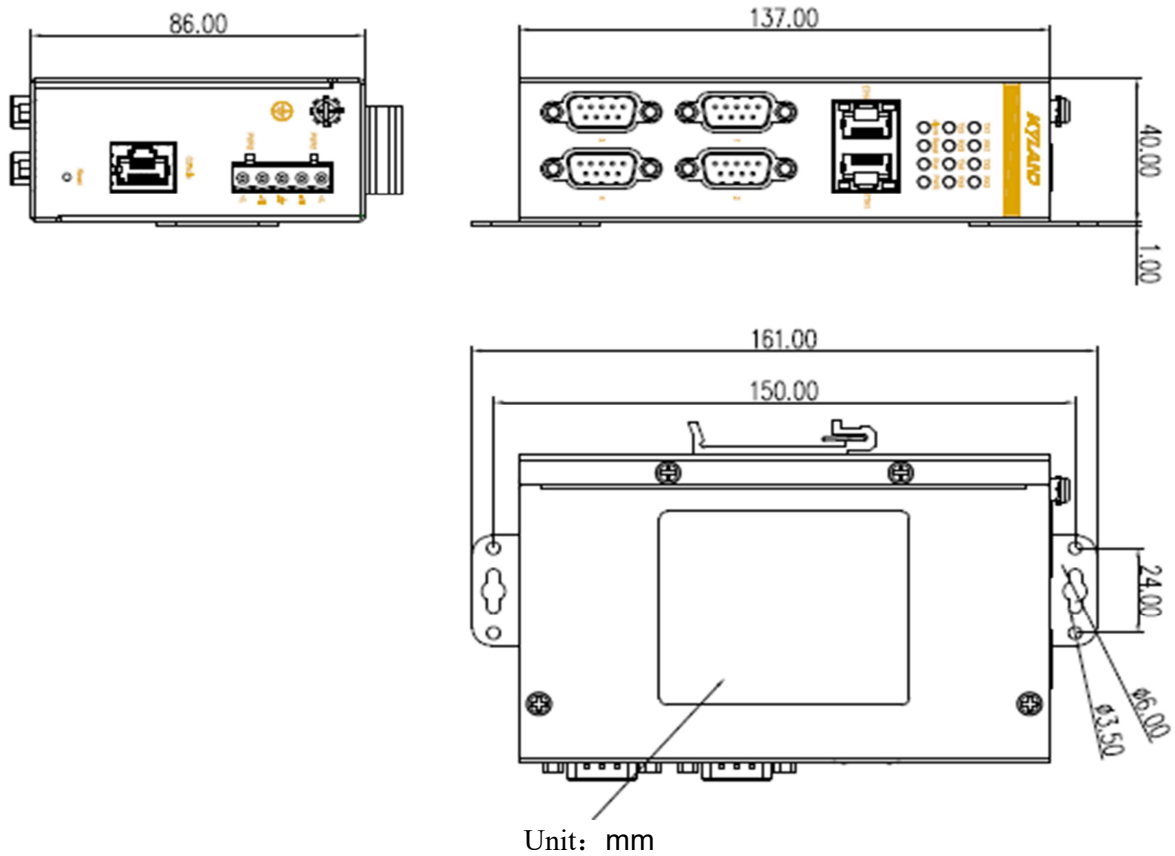


Figure 90 KPS/KGW3204A-2T4D-232/485/422-L17-L17 Dimension Drawing

### 6.3 Packing List

Product packaging includes the following accessories:

- 1 device (4G gateway device includes 4G antenna)
- Packing list
- Certificate

**Note: The user manual can be obtained by QR code. If any of the above items are lost or damaged, please contact a sales representative.**

### 6.4 Quality Assurance

Warranty period: 5 years