KGW3101 Modbus Gateway
User Manual

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KGW3101 Modbus Gateway

User Manual

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1. Introduction

KGW3101 Modbus Gateway converts protocols between Modbus TCP and Modbus RTU/ASCII. The KGW3101 Modbus Gateway supports redundant power supply and 2KV electromagnetic isolation protection in serial ports.

The following topics are covered in this chapter:

❒ Overview

❒ Package Checklist

❒ Product Features

1.1 Overview

KGW3101 Modbus gateway is a redundant power supply Modbus gateway which converts between Modbus TCP and Modbus RTU/ASCII protocols. For ethernet ports, it can be accessed up to 16 TCP Master/Client devices, or connects to 16 TCP Slave/Server devices. For each serial port, it can physically manage up to 128 serial Master/Slave nodes. All serial ports of gateways provide 2KV isolation protection. Each RS-232/RS-422/RS-485 serial port can be configured individually for Modbus RTU or Modbus ASCII, allowing both types of networks to be integrated with Modbus TCP through one Modbus gateway.

KGW3101 Modbus gateway supports both Transparent mode and Agent mode. In Transparent mode, the gateway will bypass and translate Modbus commands between Modbus TCP/RTU/ASCII. In Agent mode, the gateway will actively poll the Modbus slave devices and store data's in the Modbus's memory. The Modbus master can retrieve Modbus slave devices' data via the gateway's memory.

1.2 Package Checklist

The KGW3101 Modbus gateway is shipped with the following items:

• KGW3101 Modbus Gateway

• Installation Guide

• Documentation CD

• Product Warranty Statement

NOTE: Notify your sales representative if any of the above items is missing or damaged.

1.3 Product Features

• Convert between Modbus TCP and Modbus RTU/ASCII
• 1 auto detectable 10/100Mbps ethernet port and 1 RS-232/RS-422/RS-485 serial port

• Up to 16 TCP Master/Client devices, or connect to up to 16 TCP Slave/Server devices for ethernet ports

• Up to 128 Master/Slave nodes for each serial port

• 15KV ESD protection for the serial port

• 2KV isolation protection for the serial port

• Support HTTPS, SSH2 security configuration protocol

• Support redundant 12-48V DC power supply

• Support "Reset to Factory Default Settings"

• Support IP40 protection level

• Certificates：CE, FCC, UL61010, C1D2 and RoHS

2. Getting Started

This chapter will include the contents as follows.

❒ Connecting Power

❒ Connecting Serial Devices

    ➢ RS-485 Termination Resistors

    ➢ Connecting to a Host or the Network

❒ LED Indicators

❒ Dimension Figures

❒ Pin Assignments

    ➢ Ethernet Ports (RJ45)

    ➢ Serial Ports (DB9 Male)

    ➢ Power Input Ports

❒ Specifications

2.1 Connecting Power

The KGW3101 Modbus gateway can be powered by connecting the power source to the terminal block, and the instruction is as follows.

1. Loosen or remove the screws on the terminal block.

2. Connect the 12~48 VDC power cable to the terminal block.

3. Tighten the connections using the screws on the terminal block.

Note：KGW3101 Modbus gateway does not have the On/Off switch. It automatically runs when it is powered on. The PWR LED on the top panel will glow to indicate that the device is powered on. The device supports two redundant DC power supply.

2.2 Connecting Serial Devices

The serial port is on the front panel. If you connect to the network with multiple devices, please note the following:
1. All devices that are connected to a single serial port must use the same protocol (i.e., either Modbus RTU or Modbus ASCII).

2. Each master device must get its own port on the device.

Please refer to the 2.5 section for the guide of serial ports ：Pin Assignments.

2.2.1 Setting RS-485 Terminal Resistors

When build up the RS485 network in bad conditions, you may need to add terminal resistors to prevent the reflection of serial signals. There is a built-in 120KΩ terminal resistor in KGW3101. For the serial port, the DIP switch on the top panel is used to enable/disable the terminal resistor.

Setting the 120 Ω termination resistor: the switch 1 corresponds to the serial port S1. When switch 1 is set to "ON", it enables the terminal resister, and when switch 1 is set to "OFF", it disables the terminal resistor. The gateway device disable terminal resistors by default.

### 2.2.2 Connecting to a Host or the Network

The 10/100M ethernet port on the front panel is used to connect a host or Ethernet network. The gateway can be connected to other hosts or networks by using this ethernet port. In normal operation, you can use the standard ethernet cable to connect the device to Modbus TCP network. For initial configuration or troubleshooting purposes, you may connect the device directly to a PC. When the Modbus gateway runs, the LED light in the port will light up for checking whether it is connected to the network.

One ethernet port and one corresponded MAC address are provided by KGW3101. The IP address is editable but the MAC address can not be changed.

2.3 LED Indicators

Item	Function	
Reset Button	Press this button at least 5 seconds to reset the device to factory settings.	
LED indicators		
PWR1/PWR2	Green	Steady on: Power is on. Off: Power is off, or power error.
Run	Green	Blinking with 1Hz: Indicates the device is functioning normally. Steady on: Power is on and device is booting up.
E1 (Link/ACT)	Green	Steady on: Ethernet connection. Blinking: Ethernet port is receiving/transmitting data. Off: Ethernet cable has disconnected.
E1 (10/100M)	Yellow	Steady on: 100Mbps connection.(100Base-TX) Off: 10Mbps connection or ethernet cable has disconnected.
S1-T	Green	Blinking: The serial port 1 is transmitting data. Off: No data is being transmitted or received through the serial port.
S1-R	Green	Blinking: The serial port 1 is receiving data. Off: No data is being transmitted or received through the serial port.

2.4 Dimension Figures
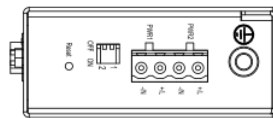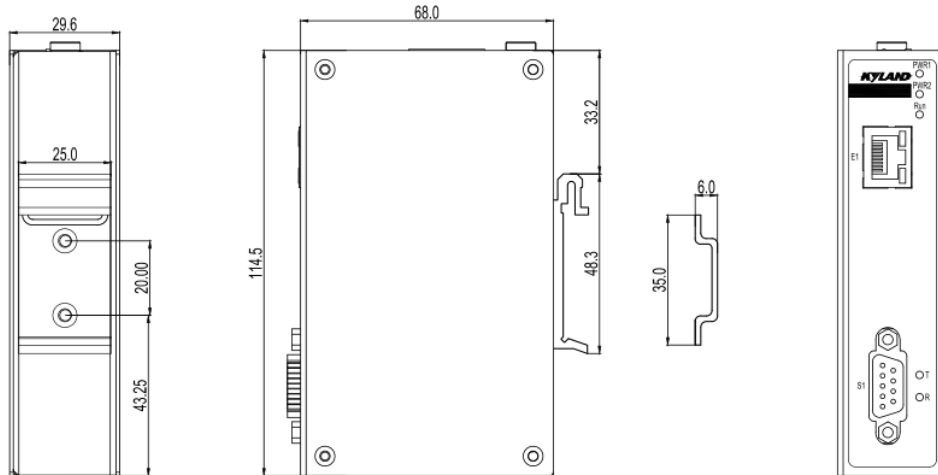
KGW3101 (unit: mm)

2.5 Pin Assignments

2.5.1 Ethernet Ports (RJ45)
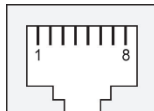
Pin	MDI-X Signal	MDI Signal
1	Rx+	Tx+
2	Rx-	Tx-
3	Tx+	Rx+
6	Tx-	Rx-
4，5，7，8	Unused	Unused

2.5.2 Serial Ports (DB9 Male)

The KGW3101 Modbus gateway uses DB9 (male) serial ports to connect Modbus RTU or ASCII devices. The port supports three serial interfaces: RS- 232, RS-422, and RS-485, and all interface types can be configured by the software.

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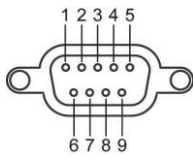
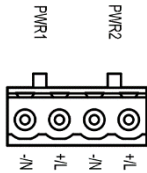| 2	RxD	RxD+(A)	-
3	TxD	TxD-(Z)	Data-(B)
4	RTS	TxD+(Y)	Data+(A)
5	GND	GND	GND
6	–		–
7	–		–
8	–		–
9	–	–	–

2.5.3 Power Input Ports

The KGW3101 Modbus gateway is equipped with a phoenix terminal block whose space is 5.08mm，it has dual power inputs PWR1 and PWR2 for redundancy.

Powe	Pin	Funciton
PWR1	+/L	PWR1 connects to +/L
	-/N	PWR1 connects to -/N
PWR2	+/L	PWR2 connects to +/L
	-/N	PWR2 connects to -/N

2.6 Specifications

Ethernet Interface

Number of Ports: 1

Speed: 10/100 Mbps, Auto MDI/MDIX

Connector: RJ45 × 1

Protocols: Modbus TCP

Magnetic Isolation Protection: 1.5 KV (built-in)

Serial Interface

Number of Ports: 1

Serial Standards: RS-232/RS-422/RS-485, software option supported

Connector: DB9 Male

ESD Protection: 15KV ESD

Magnetic Isolation Protection: 2KV (built-in)

DIP Switch: Enable/Disable RS-485 terminal resistance

Protocols: Modbus RTU/ASCII Master/Slave

Serial Communication Parameters

Data Bits: 7, 8

Stop Bits: 1, 2

Parity: None, Even, Odd, Space, Mark

Flow Control: XON/XOFF, RTS/CTS, None

Baudrate: 300bps - 460.8kbps

Serial Signals

RS-232: TxD, RxD, RTS, CTS, GND

RS-422: Tx+, Tx-, Rx+, Rx-, GND

RS-485: Data+, Data-, GND

Software

Security Protocols： HTTPS, SSH2

LEDs

System: PWR1, PWR2, RUN

Serial ports: S1-T/R

LAN: SPEED, ACT/LINK (RJ45)

Buttons

Reset: Support "Reset to Factory Default Settings"

Physical Characteristics

Housing: Aluminum

Weight: 165g

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

Protection Level: IP40

I**nstallation:** DIN-rail mounting

Environmental Limits

Operating Temperature: -40 to 75℃

Storage Temperature: -40 to 85℃

Operating Humidity: 5 to 95% RH

Power Requirements

Input Voltage： 24VDC recommended (12-48VDC)

Connection Terminal: 5.08mm spacing phoenix terminal block

System Consumption: 1.8W

Surge Protection: Support

Reverse Connect Protection: Support

Redundancy Power: Support

Standards and Certifications

Certifications: CE, FCC, UL61010, C1D2, RoHS

EMI:

EN 55022 Class A

FCC Part 15 Subpart B Class A

EN 55024

EMS:

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

IEC61000-4-3(RS): 10V/m (80MHz–2GHz)

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

IEC61000-4-5(Surge): Power Port: ±1kV/DM, ±2kV/CM; Data Port:±1kV

IEC 61000-4-6 (CS): 10V(150KHz-80MHz)

Machinery:

Vibration: IEC60068-2-6

Surge: IEC60068-2-27

Free-drop: IEC60068-2-32

Warranty

Warranty Period: 5 years

3. Typical Applications

Some typical applications of KGW3101 are covered in this chapter as following topics:

❐   Ethernet Masters with Multiple Serial Slaves

❐   Serial Masters with Multiple Ethernet Slaves

3.1 Ethernet Masters with Multiple Serial Slaves

The ethernet Master can connect multiple Serial Slaves. The KGW3101 supports Modbus TCP Master with up to 16 Modbus TCP Master simultaneous connections. The serial interface supports RS-232, RS-422 and RS-485 modes through software settings. Each serial port can manage 128 Slave nodes.

A. Transparent-A

What we define Transparent-A as the process from Modbus TCP Master to Modbus RTU/ASCII Slave in Transparent mode. In this mode, the ethernet ports should be in Modbus TCP Slave mode, and the serial ports should be in Modbus RTU/ASCII Master mode.
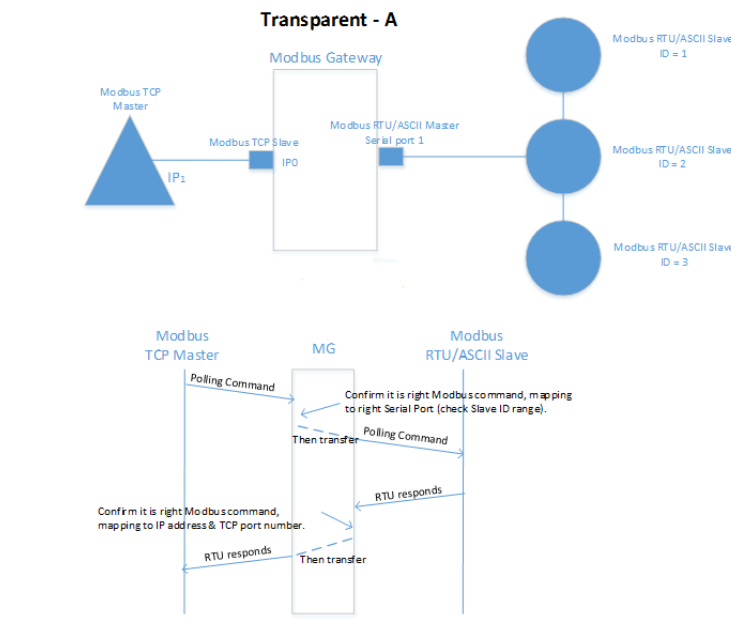
B. Agent-A

What we define Agent-A as the process from Modbus TCP Master to Modbus RTU/ASCII Slave in Agent mode. In this mode, the ethernet port should be in Modbus TCP Slave mode, and the serial port should be in Modbus RTU/ASCII Master mode.

Agent - A

3.2 Serial Masters with Multiple Ethernet Slaves

The serial port Masters can connect to more than one ethernet Slaves. The KGW3101 Modbus gateway supports Modbus TCP Slave with up to 16 simultaneous connections. The serial interface supports RS-232, RS422 and RS-485 through software settings.
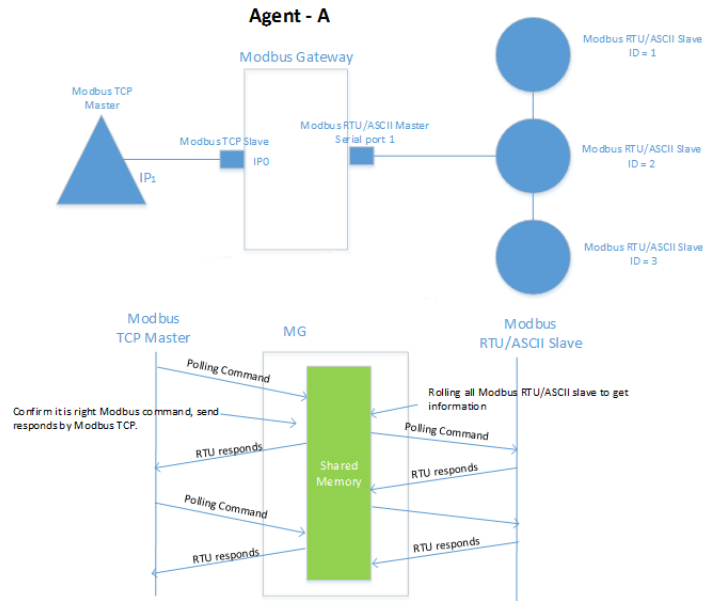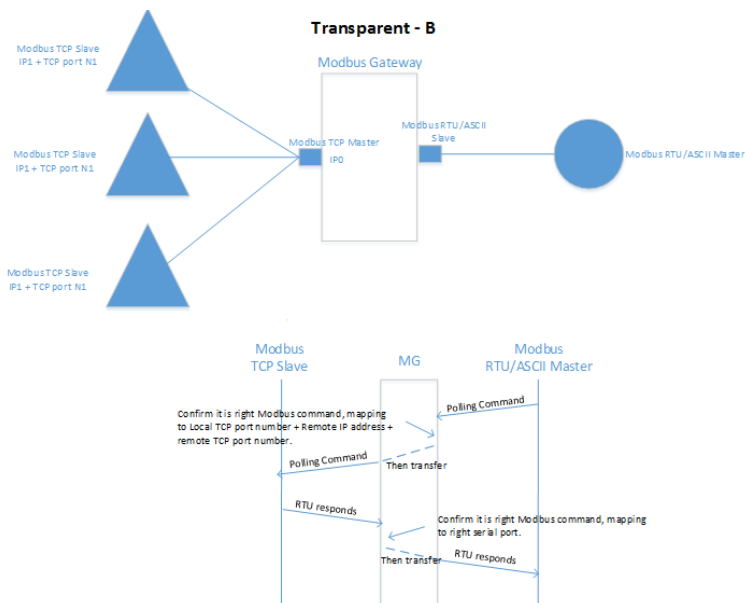
A. Transparent-B

What we define Transparent-B as the process from Modbus TCP Slave to Modbus RTU/ASCII Master in Transparent mode. In this mode, the ethernet port should be in Modbus TCP Master mode, and the serial port should be in Modbus RTU/ASCII Slave mode.

Transparent - B

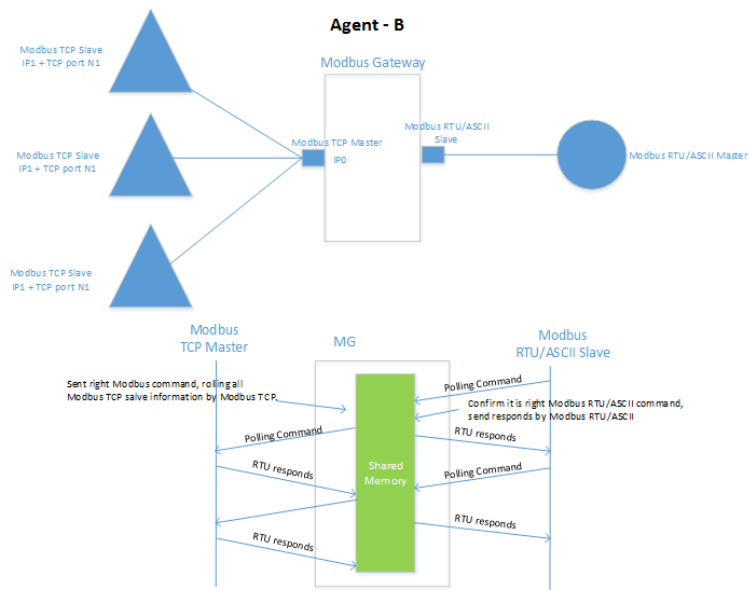B. Agent-B

What we define Agent-B as the process from Modbus TCP Slave to Modbus RTU/ASCII Master in Agent mode. In this mode, the ethernet port should be in Modbus TCP Master mode, and the serial port should be in Modbus RTU/ASCII Slave mode.

4. Web Console Configuration

The KGW3101 Modbus gateway can be configured by built-in Web page, and you can access the home page of KGW3101 through browsers like Mozilla Firefox browser, Microsoft IE browser. The following topics are covered in this chapter:

❒ Log In

❒ Device Information

❒ Network Settings

❒ Serial Port Settings

❒ Operating Settings

    ➢ Operation Mode Settings

    ➢ Transparent Mode

    ➢ Agent Mode

❒ Agent Settings

    ➢ Gateway Operation Settings

    ➢ Device Listing

    ➢ Data Query

❒ Import/Export

❒ Upgrade Firmware

❒ Change Password

❒ Load Factory Default

❒ Save/Reboot

❒ Help

❒ Logout

4.1 Log In

Firstly open your browser.

Then, input **192.168.0.249** (default for E1) in the address input box and click "Login".
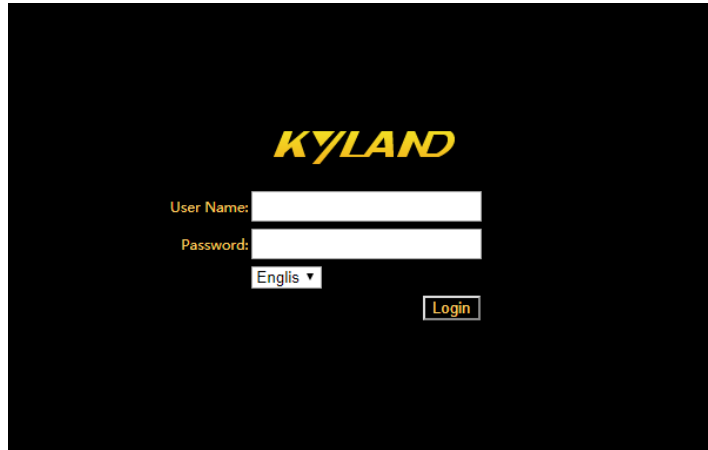
The default username is **admin**, and the password is **admin**. You can also select the operation language (English or Chinese) as your convenience.

4.2 Device Information

You can see the basic information of the device in this page, such as the device name, module type, IP address, current working mode, SN number, firmware version, MAC address and change to mode.

"Change to Mode" allows you to switch the device's work mode between Transparent mode and Agent mode by clicking. The mode will effect without restarting the device.

Note: the parameter modifications of gateway device (except firmware upgrade) is effective immediately by clicking "Save" without restarting the device.

4.3 Network Settings

The Network Setting page is where the device's network settings are configured. You can modify the IP configuration, IP address, subnet address, default gateway, and the device name. Click "Save" to save the current changes to the device and the changing is effective without reboot.

Network Settings	
	E1
IP Mode	Static ▼
IP Address	192.168.0.249
Subnet Mask	255.255.255.0
Default Gateway	Default Gateway

Device Name	
Device Name	KPS3101

Save

Network Settings：

- IP configuration: Select "Static" if you are using a fixed IP address. Select "DHCP" if the IP address is set dynamically.

- IP address: The IP (Internet Protocol) address identifies the server on the TCP/IP network. The default setting E1 is 192.168.0.249

- Netmask: It identifies the server as belonging to a Class A, B, or C network. The default setting is 255.255.255.0

- Gateway: It is the IP address of the router that provides network access outside the server's LAN.

- Device Name: The default model is KGW3101

4.4 Operating Settings

4.4.1 Operation Mode Switch

The KGW3101 Modbus gateway supports two operation mode: Transparent mode and Agent mode. You can see current operation mode in overview page. When powered on, the device's default operation mode is Transparent mode, and it can be switched to Agent mode.

4.4.2 Transparent Mode

A. Transparent-A: Modbus TCP Master- Modbus RTU/ASCII Slave

In this mode, the ethernet port should be in Modbus TCP Slave mode, and the serial port should be in Modbus RTU/ASCII Master mode. The serial port mode should be set to RTU Master mode or ASCII Master mode. The following is RTU Master mode.

Operating Settings	
S1	
Serial Port Mode	RTU Master ▼
Filter Enable	☐
Filter ID Start	1
Filter ID End	247
Protocol	TCP ▼
Gateway Modbus TCP Port	502

Save

Transparent-A Parameters：

- Operating Mode: RTU Master, ASCII Master

- Filter Function: enable/disable the Modbus ID filter function

- Filter ID Start: starting filtered Modbus ID in range of 1-247

- Filter ID End: ending filtered Modbus ID in range of 1-247

- Protocol: TCP or UDP

- Local Port: set port numbers for ethernet communication. The default number of port 1 is 502, and the port 2 is 7002. The range of the local port is 1-65535

B. Transparent-B: Modbus TCP Slave- Modbus RTU/ASCII Master

In this mode, the ethernet port should be in Modbus TCP Master mode, and the serial port should be in Modbus RTU/ASCII Slave mode. The serial port mode should be set to RTU Slave mode or ASCII Slave mode. The following is RTU Slave mode.

Serial Port Mode	RTU Slave ▼					
Slave ID	Remote IP	Remote Port	Local Port	Protocol	Ethernet Port Bind	
148	192.168.0.226	502	7011	TCP ▼	E1 ▼	+ -
149	192.168.0.227	502	7012	TCP ▼	E1 ▼	+ -
150	192.168.0.228	502	7013	TCP ▼	E1 ▼	+ -
151	192.168.0.229	502	7014	TCP ▼	E1 ▼	+ -

Transparent-B Parameters：

- Operating Mode: RTU Slave, ASCII Slave

- Slave ID: the Modbus TCP Slave ID, and the range is 1-247

- Remote IP: the range of IP for Modbus TCP is 1-247

- Remote port: the network communication port for Modbus TCP Server, and the range is 1-65535

- Local Port: the port range is 1-65535

- Protocol: TCP or UDP

- Ethernet Binding: the network port for specific data communication

- Slave Device Operation: the gateway device can support up to 16 slave device which can be pressed "+" or "-" to add or remove the slave device

In the RTU/ASCII Slave mode, you should make sure the unique of the slave ID and IP address. The remote port number and IP address must be unique, and the local port number should be unique as shown in the following picture.

Serial Port Mode		RTU Slave ▼					
Slave ID	Remote IP	Remote Port	Local Port	Protocol	Ethernet Port Bind		
1	192.168.0.226	502	7011	TCP ▼	E1 ▼	+	-
2	192.168.0.226	503	7012	TCP ▼	E1 ▼	+	-
1	192.168.0.228	502	7013	TCP ▼	E1 ▼	+	-
2	192.168.0.228	503	7014	TCP ▼	E1 ▼	+	-

4.4.3 Agent Mode

When running in agent mode, two Modbus roles must be set. One is the ethernet side (Modbus TCP), and the other is the serial side (Modbus RTU/ASCII). The KGW3101 Modbus supports a Modbus TCP function with Master (Client) and Slave (Server) modes. In Master mode, the Modbus works as a client and tries to build a TCP connection with the remote Modbus TCP server. In this mode, you will need to specify the IP address of the remote device and the relative Modbus command. For Slave mode, the Modbus works as a server and waits for incoming connection from the Modbus TCP client. In this mode the Modbus will waits for incoming Modbus TCP requests and use the internal memory as the Slave register to respond.

There are two work modes used as the serial side of the KGW3101 Modbus. One is the Modbus RTU/ASCII Slave, and the other is Modbus RTU/ASCII Master. In Slave mode, you will need to specify the ID, remote IP and other parameters of the slave device. And in Master mode, for sending the Modbus commands to the Modbus slave device you will need to specify the ID and relative requests of the slave device. For the KGW3101 Modbus gateway, when the serial mode is set to be Slave mode, the ethernet side will be Master mode automatically. If the serial mode is Master mode, the ethernet side is automatically to be Slave mode.

A. Agent-A: Modbus TCP Master- Modbus RTU/ASCII Slave

In Agent-A mode, the device ethernet side is to be Modbus TCP Slave mode, and the serial side is to be Modbus RTU/ASCII Master mode. The serial mode should be set to RTU Master or ASCII Master. The following is RTU Master mode.

Operating Settings	
S1	
Serial Port Mode	RTU Master ▾
Filter Enable	☐
Filter ID Start	1
Filter ID End	247
Protocol	TCP ▾ (Note: In Agent mode, you can modify the Modbus port on the 'Gateway Settings' page.)
Gateway Modbus TCP Port	502 (Note: In Agent mode, you can modify the Modbus port on the 'Gateway Settings' page.)

Save

Agent-A Parameters：

- Operating mode: RTU Master or ASCII Master

- Filter Function: enable/disable the Modbus ID filter function

- Filter Start ID: the range is 1-247

- Filter End ID: the range is 1-247

B. Agent-B: Modbus TCP Slave - Modbus RTU/ASCII Master

In Agent-B mode, the device ethernet side is to be Modbus TCP Master mode, and the serial side is to be Modbus RTU/ASCII Slave mode. The serial mode should be set to RTU Slave or ASCII Slave.

Serial Port Mode	RTU Slave ▾					
Slave ID	Remote IP	Remote Port	Local Port	Protocol	Ethernet Port Bind	
148	192.168.0.226	502	7011	TCP ▾	E1 ▾	+ −
149	192.168.0.227	502	7012	TCP ▾	E1 ▾	+ −
150	192.168.0.228	502	7013	TCP ▾	E1 ▾	+ −
151	192.168.0.229	502	7014	TCP ▾	E1 ▾	+ −

Agent-B Parameters：

- Operating mode: RTU Slave or ASCII Slave

- Slave ID: the range of the ID of the Modbus TCP Slave is 1-247

- Remote IP: the IP address of the Modbus TCP

- Remote port: the network communication port of the Modbus TCP Server

- Local Port: the port range is 1-65535

- Protocol: TCP or UDP

- Slave Device Operation: the gateway device can support up to 16 slave device which could be pressd "+" or "-" to add or remove the slave device

In RTU/ASCII Slave mode, you should note that the set of the TCP Slave ID and IP address and the remote port number can be same, but the remote port number and IP address must be unique, and the

local port number should be unique as well. It is shown as the following picture.

Serial Port Mode	RTU Slave ▾						
Slave ID	Remote IP	Remote Port	Local Port	Protocol	Ethernet Port Bind		
1	192.168.0.226	502	7011	TCP ▾	E1 ▾	+	-
2	192.168.0.226	503	7012	TCP ▾	E1 ▾	+	-
1	192.168.0.228	502	7013	TCP ▾	E1 ▾	+	-
2	192.168.0.228	503	7014	TCP ▾	E1 ▾	+	-

4.5 Serial Settings

The Serial Setting page is where serial port's communication parameters are configured. You can modify the Alias Name, Baud Rate, Data Bit, Parity, Stop Bit, Flow Control, and Hardware Interface. Click "Save" to save the current changes to the device.

Serial Settings	
	S1
Alias	UART_1
Baudrate	115200 ▾
Databits	8 ▾
Stopbits	1 ▾
Parity	None ▾
Flow Control	None ▾
Hardware Interface	RS-232 ▾
Protocol(selected on Operating Settings page)	Disabled ▾

Save

Serial Parameters：

- Alias: the modifiable name of the serial ports

- Baud Rate: support 300bps～460800bps

- Date Bits: 7,8 (ASCII: 7; RTU: 8)

- Stop Bits: 1, 2

- Parity: support None, Even, Odd, Space and Mark

- Flow Control: support None, RTS/CTS, and XON/XOFF

- Hardware Interface: support RS-232, RS-485 and RS-422

4.6 Agent settings (Agent Mode)

Only in Agent mode some agent settings should be carried out for the serial port in KGW3101, such as gateway settings, slave list, and data query. Click "Save" to save the current changes to the device. There is no set operating in transparent mode.

4.6.1 Gateway settings

Gateway Settings	
Gateway Modbus ID	1
Protocol	TCP ▾
Gateway Modbus Port	502
Default Timeout(ms)	1000
Inter-packet TX Delay(ms)	100

Save

Gateway Parameters:

• Gateway Modbus ID: the Modbus address for KGW3101 ranging from 1 to 247

• Protocol: TCP or UDP (only in the Slave mode network protocol setting, the setting in Master mode is invalid)

• Default Timeout (ms): the default timeout ranges form 0 to 6000 ms. Some Modbus Slaves may take more time to boot up than other devices. For certain conditions, it may cause the entire system suffering from repeated exceptions during the initial boot-up. You can force KGW3101 to waiting for booting up before sending the first request with the initial delay setting

• Inter-packet TX Delay (ms): the time-delay to transmit the packet received from the slave device to the upstream. It is the time waiting for the Modbus slave response.

4.6.2 Slave List

The slave list is used for Modbus Slave configuration. You can add, delete, and modify the slave device as well as export the current slave list.

Add Message Delete Message Modify Message

Display 50 ▾ per page   Export   Search:

Item	Serial Port	Slave ID	Alias	Function	Data Address	Data Length	Mapping Address Head
1	1	1	Device_Alias	3	0	10	10
2	1	2	Device_Alias	3	10	10	20

firstpage   prev   1   next   lastpage

Slave List Parameters:

• Add New Slave: add new Modbus slave device

• Delete Slave: delete current Modbus slave device

• Modify Slave: modify the parameters of current Modbus slave device

• Display: display current Modbus slave devices, 10, 20, 50, 100, All

• Export: export current Modbus slave devices, supporting Excel, CVS, and PDF file format

- Searching: search current Modbus slave device by some key words

- COM: the serial port of device (S1)

- Device ID: the ID of the terminal device with 128 terminal devices for the serial port

- Alias: the name of the terminal device

- Function Code: the function ID of the terminal device

- Data Address: the starting data address of the terminal device

- Data Length: the data length of the terminal device

- Mapping Address Head: the mapping address of the terminal device, which means the address of stored data read from serial terminal device. The mapping address heads are different because of the Modbus function ID. The read data with same function ID can not be stored in the overlapped device, on the other side, the read data with different function ID can stored in overlapped device.

A. Add New Slave

Click "Add New Slave" to enter the configuration page.

Message Configuration		
Slave Alias	Device_Alias	
Serial Port	S1 ▼	
Slave ID	1	
Function	03 Holding Register(4x) ▼	
Data Start Addr	Setup slave data start addr	
Data Length	Setup slave data length	
Mapping Addr		☐ Assign next available address
	OK	Cancel

Add New Slave parameters:

- Device Alias: the added new Modbus terminal device name (Default: Device Alias), and the name is modifiable.

- Serial Port: S1

- Slave ID: the ID of added slave device(1-247)

- Function Code: the function code of Modbus protocol

    01: read the coils state

    02: read the input state

    03: read the holding registers

    04: read the input registers

- Data Start Address: the starting data address of device ranging from 0 to 65535

- Data Length: the data length written into terminal device ranging from 1 to 2000

- Mapping Address: the mapping address of terminal device data ranging from 0 to 65535. You can choose to automatically assign mapping address while the device address is redundant occupation.

B. Delete Slave

Select the slave device to be deleted, click "Delete Slave", and click "Save" once all the settings have been changed.

C. Modify Slave

Select the slave device to be modified and click "Modify Slave" to enter the configuration page. The parameters of "Modify Slave" page are same with "Add New Slave" page.

4.6.3 Data Query

You can use the data query function to read the data in the gateway device's current registers.

The data query function is queried according to the function code.

03 Holding Register(4x) ▼	200	10	Data Query

Gateway Memory Address ▲	Value (decimal) ⬍	Value (hexadecimal) ⬍
200	0	0x00
201	0	0x00
202	0	0x00
203	0	0x00
204	0	0x00

Data Query Parameters:

- Function ID: the number of the queried data (01,02,03,04)

- Data Start Address: the starting data address of device ranging from 0 to 65535

- Data Length: the data length written to slave device ranging from 1 to 125

- Gateway Address: display the data started from the setting data query starting address in device registers

- Value (denialism): displaying the data in the register in decimal form

- Value (hexadecimal): displaying the data in the register in hexadecimal form

4.7 Import/Export

The page is to import or export the configuration file for KGW3101. The device name, networks, the serial parameters and operating mode in imported file can be modified.

Import/Export		
Export Config File		Export
Import Config File	Choose File No file chosen	Import
Upload Status	0%	

Import/Export Parameters:

- Export Config File: to export the configuration file of the device

- Import Config File: to import the modified configuration file of the device

- Upload Status: the progress bar of uploading file

4.8 Upgrade Firmware

The Upgrade Firmware page is where the gateway's firmware can be upgraded, and the "Upload Status" is the progress bar of upgrading firmware. After the upgrade successes, reboot the gateway device and the system will start with the new firmware.

Upgrade Firmware		
Upgrade Firmware	Choose File No file chosen	Upgrade
Upload Status	0%	

4.9 Change Password

You can modify the user's password in this page (now the default username is **admin**, and the default password is **admin**).

Password Modify: After input the current password, input the new password twice, then click the "Save" to save the changed password.

Security Management: The default set is visiting to HTTP(Web) console; After click "HTTPS", enable to visit the HTTPS(Web) Console.

Change Password	
User Name	admin
Old Password	Old Password
New Password	New Password
Retype Password	Retype Password
Management Security	☐ HTTPS

Save

4.10 Load Factory Default

The Load Factory Default page is to reset the gateway to factory setting.

Load Factory Default
This function will reset all settings to the factory default values. Be aware that previous settings will be lost.

Load Factory Default

Note: all parameters of the device will be reset to the factory setting, so please do not use the function unless you confirm.

4.11 Save/Reboot

All changes will effect by clicking the "Save" without restarting the gateway. If you need to restart the device, click "reboot" to restart the device.

System Reboot

Reboot

4.12 Help

When you have questions, you can click "Help" icon located in the top right corner of per configuration page.

4.13 Logout

For safety reasons, remember to log out to prevent other people accessing the gateway without the proper authorization.

KYLAND

English ▼ Exit

Help

- Device Information
- Network Settings
- Operating Settings
- Serial Settings
- Import/Export
- Upgrade Firmware
- Change Password
- Load Factory Default
- System Reboot

Device Information			
Device Name	KPS3101	SN	K10A0007A170300001
Model Type	MB-Gateway	Firmware Version	V3.5
IP(E1)	192.168.0.249	MAC(E1)	00:68:01:12:01:00
Current Working Mode	Transparent	Change to Mode	Agent Mode

5. Case Studies

The following topics are covered in this chapter:

❒ Transparent-A

❒ Transparent-B

❒ Agent-A

❒ Agent-B

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5.1 Transparent-A

Using a KGW3101 Modbus Gateway and a PC in Transparent-A mode, the port type is RS-232. The ethernet side works as a Modbus TCP Slave. Connect S1 which works as a Modbus RTU/ASCII Master to PC by DB9 cable.

A. Web Configuration

Power on KGW3101 and log in web server of the device, set the operation mode of device to Transparent mode in "Overview" page.

Device Information			
Device Name	KPS3101	SN	K10A0007A170300001
Model Type	MB-Gateway	Firmware Version	V3.5
IP(E1)	192.168.0.249	MAC(E1)	00:68:01:12:01:00
Current Working Mode	Agent	Change to Mode	Transparent Mode

Then, click "Operating Settings" in navigation bar to set Port S1 to RTU Master mode, and click "Save" to save the change.

Operating Settings	
S1	
Serial Port Mode	RTU Master ▾
Filter Enable	☐
Filter ID Start	1
Filter ID End	247
Protocol	TCP ▾
Gateway Modbus TCP Port	502

Click "Serial Settings" in navigation bar to set the parameters of S1 according to the conditions. At last click the "Save" to save the change.

| Serial Settings	
	S1
Alias	UART_1
Baudrate	115200 ▾
Databits	8 ▾
Stopbits	1 ▾
Parity	None ▾
Flow Control	None ▾
Hardware Interface	RS-232 ▾
Protocol(selected on Operating Settings page)	Disabled ▾

B. PC Configuration

Connect PC and the gateway serial port (S1) by DB9 female cable to configure for PC. Run "Modbus Slave" software on PC. The "Modbus Slave" parameters must be configured as shown in the following figure.
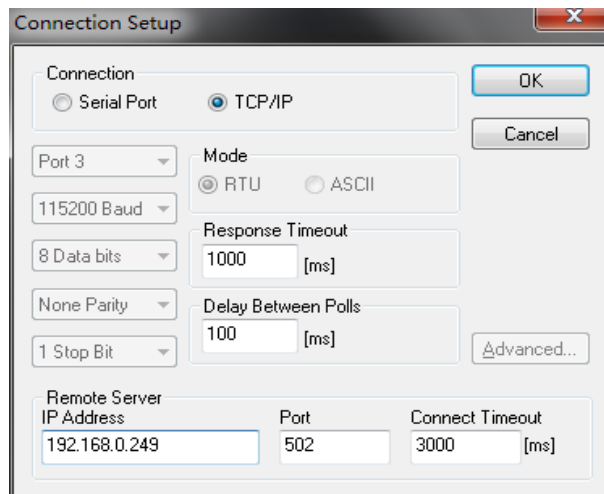
Connection: Serial Port

Mode: RTU

And then click "OK" into the application page.
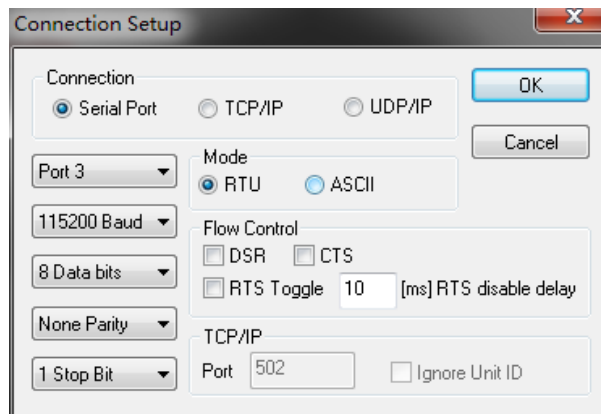
Now run "Modbus Poll" on PC and set the parameters as shown in the following figure. Configure PC which was connected to E1 to **192.168.0.249**. And then click "OK" to enter the application page.

Finally, input numbers in address 1 and address 2 respectively in "Modbus Slave", the corresponding datas

are as shown in the following figure.
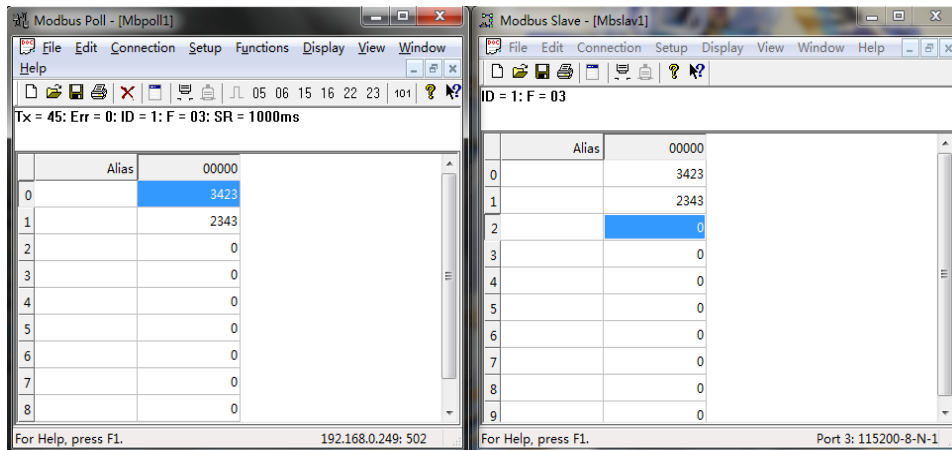
5.2 Transparent-B

Using a KGW3101 Modbus Gateway and a PC in Transparent-B mode, the port type is RS-232. The ethernet side works as a Modbus TCP Master. Connect S1 which works as a Modbus RTU/ASCII Slave to PC by DB9 female cable.

A. Web Configuration

Power on KGW3101 and log in web server of the device, set the operation mode of device to Transparent Mode in "Overview" page.

Device Information			
Device Name	KPS3101	SN	K10A0007A170300001
Model Type	MB-Gateway	Firmware Version	V3.5
IP(E1)	192.168.0.249	MAC(E1)	00:68:01:12:01:00
Current Working Mode	Agent	Change to Mode	Transparent Mode

Then, click "Operating Settings" in navigation bar to set S1 to RTU Slave mode, click "Save" to save the change.

Operating Settings					
S1			S2		

Serial Port Mode	RTU Slave ▼					
Slave ID	Remote IP	Remote Port	Local Port	Protocol	Ethernet Port Bind	
148	192.168.0.226	8001	7011	TCP ▼	E1 ▼	+ -

Click "Serial Settings" in navigation bar to set the parameters of the serial port, and click "Save" to save the change.

| Serial Settings	
	S1
Alias	UART_1
Baudrate	115200 ▾
Databits	8 ▾
Stopbits	1 ▾
Parity	None ▾
Flow Control	None ▾
Hardware Interface	RS-232 ▾
Protocol(selected on Operating Settings page)	Disabled ▾

B. PC Configuration

Connect PC and the gateway serial port (S1) by DB9 female cable to configure for PC. Run "Modbus Poll" software on PC. The "Modbus Poll" parameters must be configured as shown in the following figure.
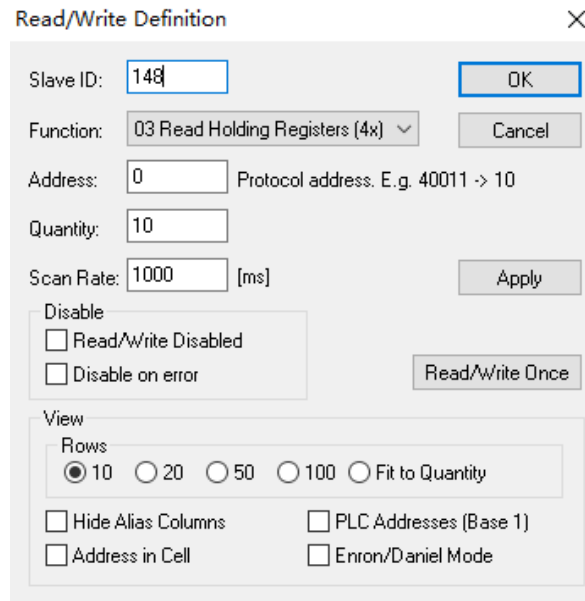
Connection: Serial Port

Mode: RTU

Port: 8001

Please note that the Slave ID should be same with the ID in "Operating Mode". And then click "OK" enter the application page.
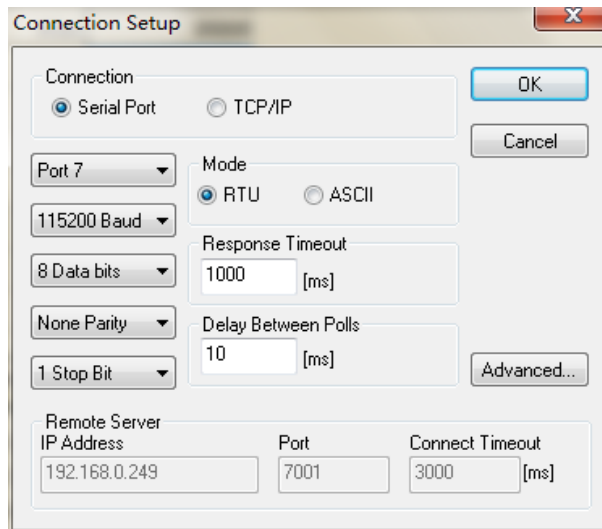
Then run the "Modbus Slave" software on PC and set the parameters as it is shown in the following figure, click "OK" to into the application page. In Setup—>Slave Definition, the Slave ID should be same as the ID in "Operating Mode".
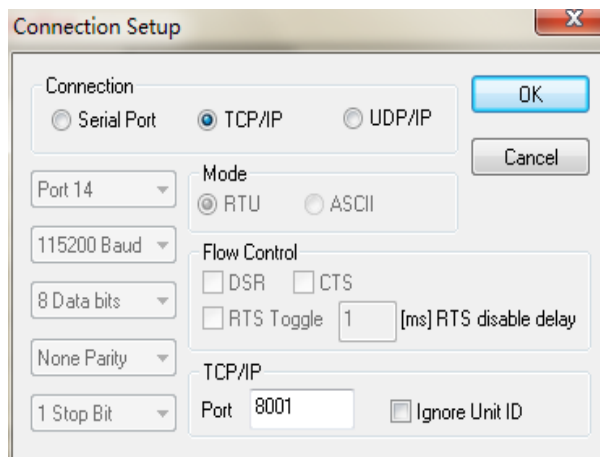
After configuration, input number in address 1 and address 2 respectively in "Modbus Slave" software, and you can see the numbers in corresponding address in "Modbus Poll" software.

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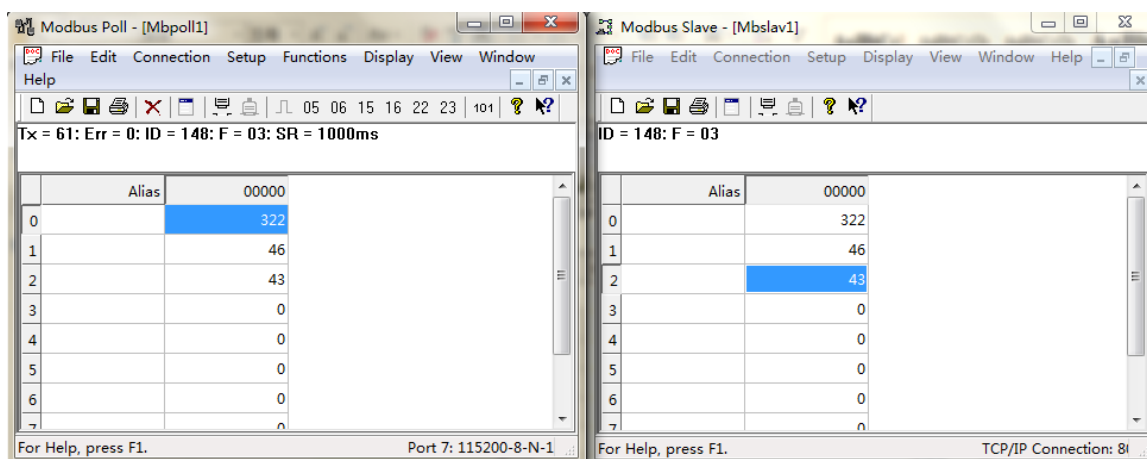
5.3 Agent-A

Using a KGW3101 Modbus Gateway and a PC in Agent-A mode, the port type is RS-232. The ethernet side works as a Modbus TCP Slave. Connect S1 which works as a Modbus RTU/ASCII Master to PC by DB9 female cable.

A. Web Configuration

Power on KGW3101 and log in web server of the device, set the operation mode of device to Agent Mode in "Overview" page.

Device Information			
Device Name	KPS3101	SN	K10A0007A170300001
Model Type	MB-Gateway	Firmware Version	V3.5
IP(E1)	192.168.0.249	MAC(E1)	00:68:01:12:01:00
Current Working Mode	Transparent	Change to Mode	Agent Mode

Next click "Operating Settings" in navigation bar to set S1 to RTU Master mode, and click "Save" to save the change.

Operating Settings	
S1	
Serial Port Mode	RTU Master ▼
Filter Enable	☐
Filter ID Start	1
Filter ID End	247
Protocol	TCP ▼ (Note: In Agent mode, you can modify the Modbus port on the 'Gateway Settings' page.)
Gateway Modbus TCP Port	502 (Note: In Agent mode, you can modify the Modbus port on the 'Gateway Settings' page.)

Then set the parameters of each serial port, click "Save" to save the change.

Serial Settings	
	S1
Alias	UART_1
Baudrate	115200 ▼
Databits	8 ▼
Stopbits	1 ▼
Parity	None ▼
Flow Control	None ▼
Hardware Interface	RS-232 ▼
Protocol(selected on Operating Settings page)	Disabled ▼

Click "Agent Settings" in navigation bar and select "Gateway Settings" to set the parameters of the device, and click "Save" to save the change.

Gateway Settings	
Gateway Modbus ID	1
Protocol	TCP ▼
Gateway Modbus Port	502
Default Timeout(ms)	1000
Inter-packet TX Delay(ms)	100

Enter into the "Device List" in navigation bar and click "Add New Slave" to add a new slave device.

<div align="right">Add Message   Delete Message   Modify Message</div>

Display 50 ▼ per page   Export   Search: [_____]

Item	Serial Port	Slave ID	Alias	Function	Data Address	Data Length	Mapping Address Head	Status
1	1	1	Device_Alias	3	0	10	0	🖼

<div align="right">firstpage   prev   1   next   lastpage</div>

B. PC Configuration

Run "Modbus Slave" software on PC. The "Modbus Slave" parameters must be configured as shown in the following figure. And then click "OK" to enter into the application page.
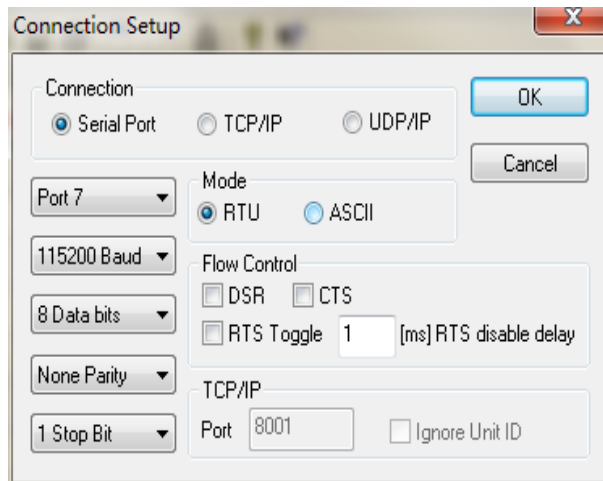
After configuration, click "OK" into the application page, add a Modbus RTU slave that be same as Modbus Slave terminal device.
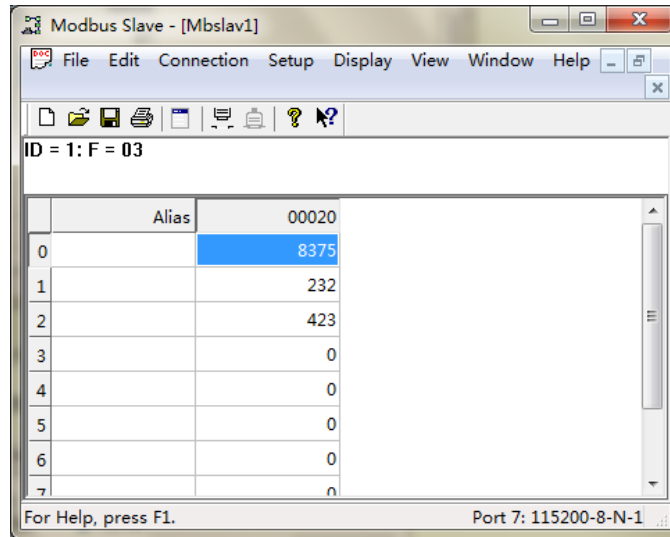
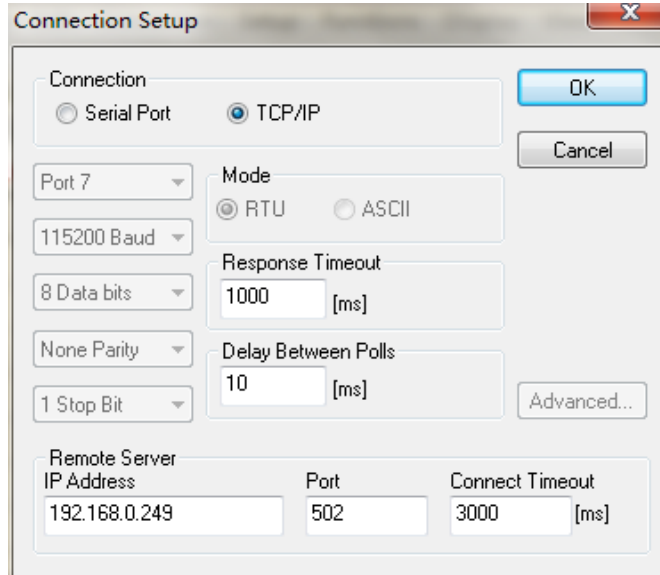Then, run "Modbus Poll" on PC and set the parameters as shown in the following figure.
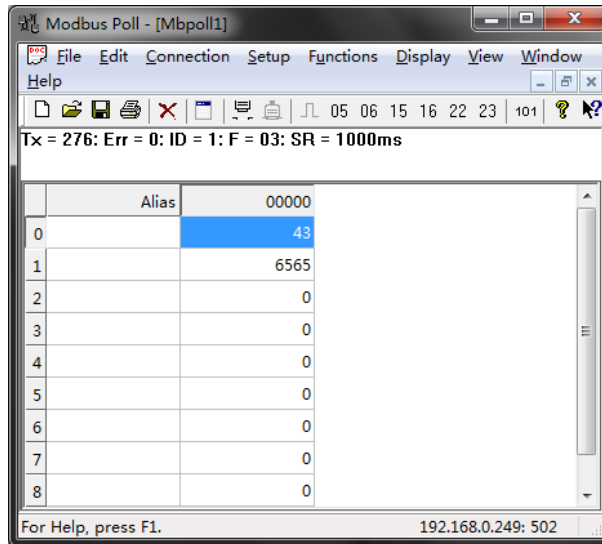
Connection: TCP/IP

Mode: RTU

IP: 192.168.0.249

Port: 502

And then click "OK" to enter into the application page.

In the application page, set the Slave ID in Setup—>Read/Write Definition be same with the Modbus ID in "Gateway Settings", then add a Modbus TCP device in corresponded to the Modbus Slave terminal device.

Finally, input number in address 1 and address 2 respectively in "Modbus Slave" software, and you can see the numbers in corresponding address in "Modbus Poll" software.
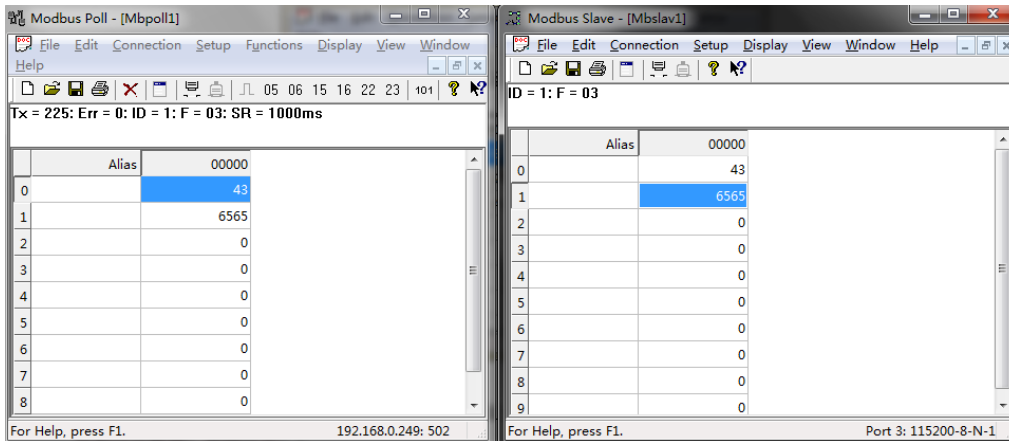
5.4 Agent-B

Using a KGW3101 Modbus Gateway and a PC in Agent-B mode, the port type is RS-232. The ethernet side works as a Modbus TCP Master. Connect S1 which works as a Modbus RTU/ASCII Slave to PC by DB9 female cable.

A. Web Configuration

Power on KGW3101 and log in web server of the device, set the operation mode of device to Agent Mode in "Overview" page.

Device Information			
Device Name	KPS3101	SN	K10A0007A170300001
Model Type	MB-Gateway	Firmware Version	V3.5
IP(E1)	192.168.0.249	MAC(E1)	00:68:01:12:01:00
Current Working Mode	Transparent	Change to Mode	Agent Mode

Then, click "Operating Settings" in navigation bar to set S1 to RTU Slave mode, and click "Save" to save the change.

Operating Settings						
S1			S2			

Serial Port Mode	RTU Slave ▾					
Slave ID	Remote IP	Remote Port	Local Port	Protocol	Ethernet Port Bind	
148	192.168.0.226	8001	7011	TCP ▾	E1 ▾	+ −

Then, click "Serial Settings" in navigation bar to set the parameters of the serial port. At last, click the "Save" to save the change.

Serial Settings	
	S1
Alias	UART_1
Baudrate	115200 ▾
Databits	8 ▾
Stopbits	1 ▾
Parity	None ▾
Flow Control	None ▾
Hardware Interface	RS-232 ▾
Protocol(selected on Operating Settings page)	Disabled ▾

Next click "Agent Settings" in navigation bar and select "Gateway Settings" to set the parameters of the device. At last, click the "Save" to save the change.

Gateway Settings	
Gateway Modbus ID	1
Protocol	TCP ▾
Gateway Modbus Port	502
Default Timeout(ms)	1000
Inter-packet TX Delay(ms)	100

Finally click "Device List" in navigation bar and click "Add New Slave" to add a new slave device.

Add Message   Delete Message   Modify Message

Display 50 ▾ per page   Export   Search: [ ]

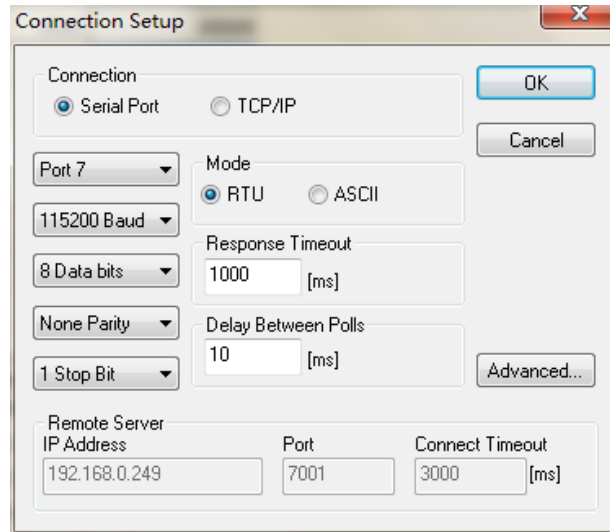| Item	Serial Port	Slave ID	Alias	Function	Data Address	Data Length	Mapping Address Head	Status
1	1	1	Device_Alias	3	0	10	0	

firstpage   prev   1   next   lastpage

B. PC Configuration

Run "Modbus Poll" software on PC. The "Modbus Poll" parameters should be configured as shown in the following figure.
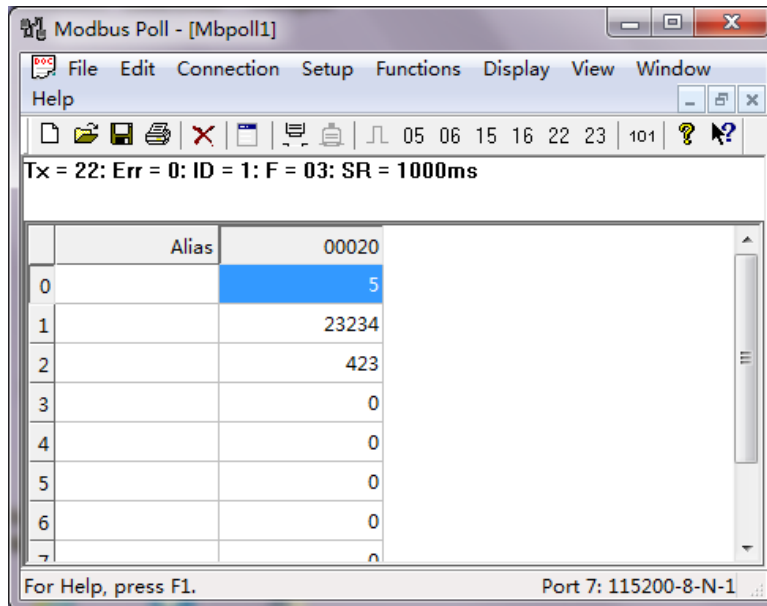
Connection: Serial Port

Mode: RTU

And then click "OK" to enter the application page.

In the application page, make the Slave ID in Setup—>Read/Write Definition be same with the Modbus ID in "Gateway Settings", and then add Modbus RTU device in corresponded to the terminal device.
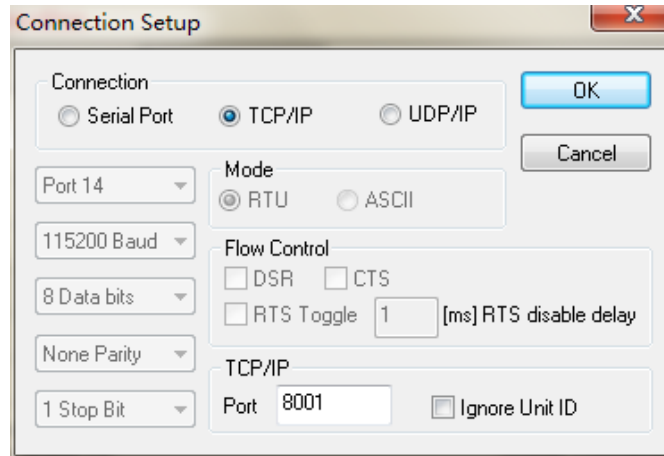

Then, run "Modbus Slave" on PC and set the parameters as shown in the following figure.
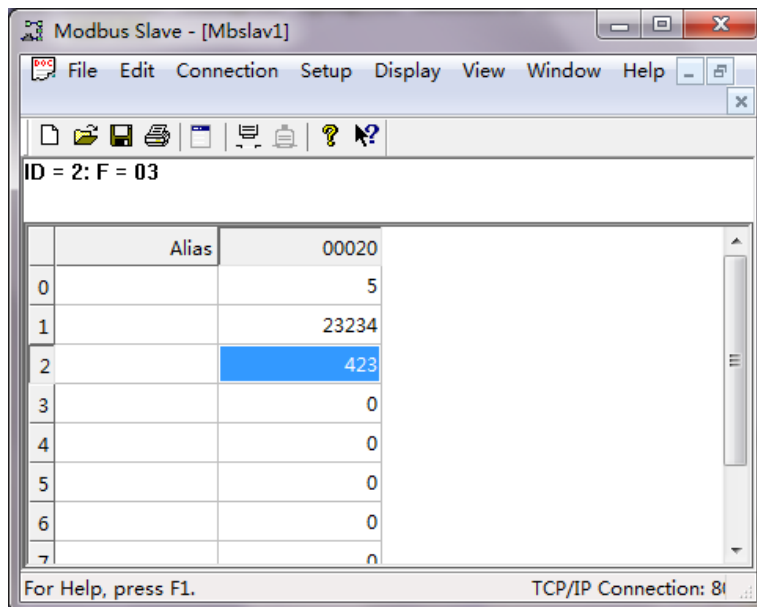
Connection: TCP/IP

Mode: RTU

Port: 8001

And then click "OK" to enter the application page.

In the application page, add a Modbus TCP slave device in corressponded to the Modbus Slave terminal device.

Finally, input number in address 1 and address 2 respectively in "Modbus Slave" software, and you can see the numbers in corresponding address in "Modbus Poll" software.