

## Guideline to configure Modbus RTU to TCP of Serial device for 4G Router

The following content uses a Local test environment as an testing example, shown as Figure1. For User's public Server network environment just refer to Figure2.

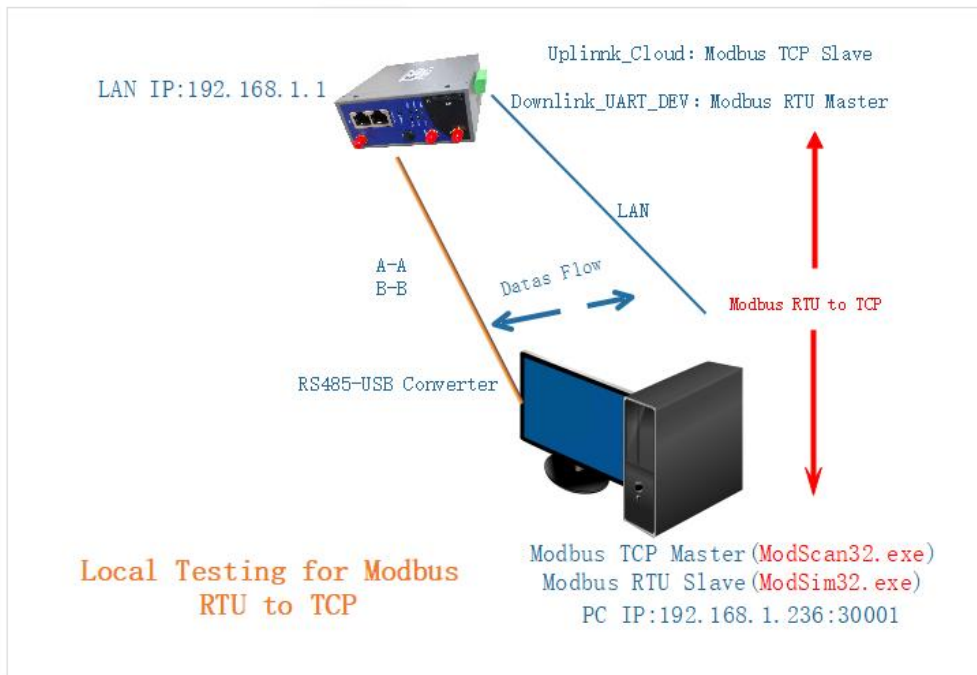


Figure1

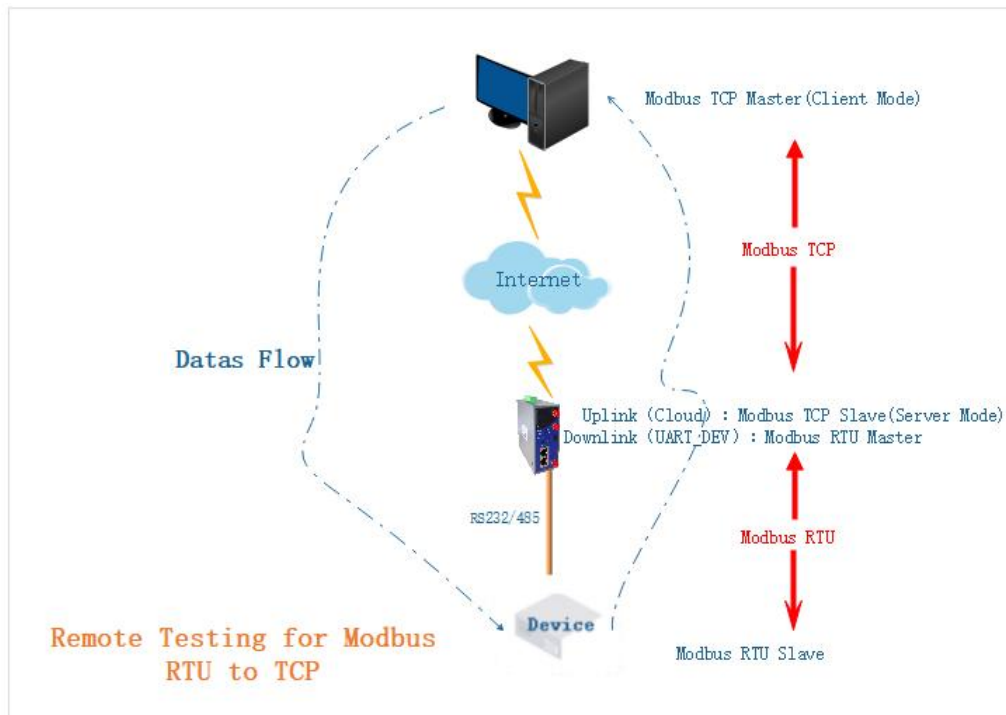
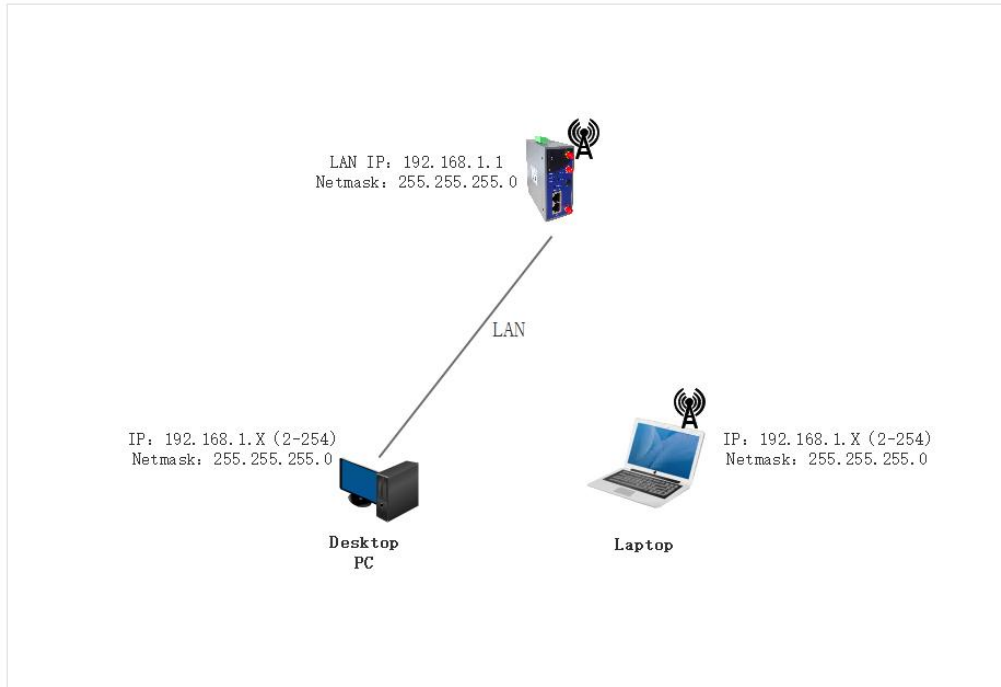
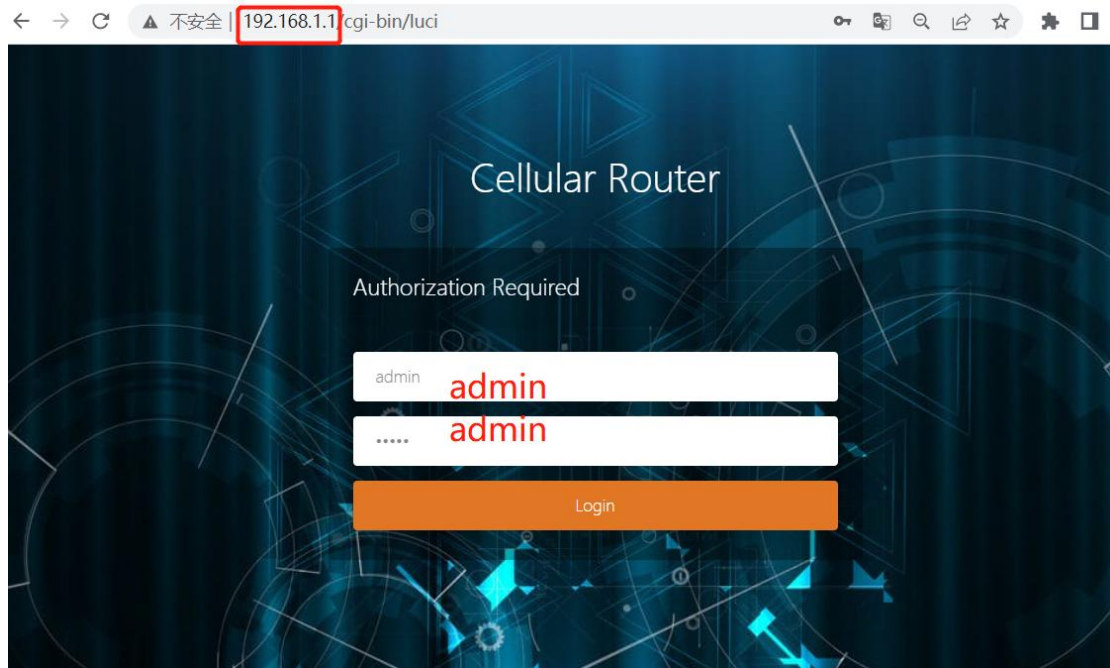


Figure2

1. Connect the LAN port of the router to the computer, and set the automatic dhcp mode for the computer Network Interface Card, and ensure that the computer can obtain the address 192.168.1.x, netmask 255.255.255.0.



2. Open the browser, type the default IP address of the router with 192.168.1.1, then press Enter. And then input the username/password with admin/admin to login the Router.



3. After logging, you will see overview details about the router system, including the software/hardware version, product model, product id, networking mode, and MAC address, etc.

The screenshot shows the web interface for an M2M wireless terminal. The browser address bar displays '192.168.1.1/cgi-bin/luci/'. The page title is 'M2M wireless terminal' and 'Cellular Router'. The left sidebar contains navigation menus for 'System Status', 'Basic Network', 'Advanced Network', 'VPN Configuration', 'System Management', and 'Logout'. The main content area is titled 'Status' and contains a table with system information:

System			
Router Name	M2M	Product Name	ZR2721S
Firmware Version	Premium Wireless Router v2.5.221125	Product ID	1120ZR21908270518
Local Time	Mon Nov 28 19:44:33 2022	Hardware Class	Single Model Single Card
Uptime	0h 8m 39s	MAC Address	34:0a:68:24:b8:ec
Load Average	1.06, 1.11, 0.58	WAN Mode	4G/5G and Wired

Below the system table is the 'MobileWAN Status' section, which includes fields for Interface, Gateway, IPv4Address, DNS, Modem Type, Modem IMEI, Modem IMSI, Modem ICCID, and Network Operator.

4. Check the LAN IP address of the router and PC address connected to router, shown as follows:

The screenshot shows the 'Wired Network' configuration page in the web interface. The 'LAN' tab is selected and highlighted with a red box. The page title is 'Interfaces - LAN'. Below the title is a section for 'Common Configuration' with two tabs: 'General Setup' and 'Advanced Settings'. The 'General Setup' tab is active, showing the following configuration:

Common Configuration	
Status	Collecting data...
Protocol	Static address
IPv4 address	192.168.1.1/24
Use custom DNS servers	
IPv6 assignment length	64
IPv6 assignment hint	

The screenshot shows the 'System Status' page with the 'Overview' tab selected. The left sidebar contains navigation options: Overview, Routes, System Log, Kernel Log, Realtime Graphs, Basic Network, Advanced Network, VPN Configuration, System Management, and Logout. The main content area displays network details for the 'eth1' interface, including MAC Address (34:0A:68:24:B8:EC), Netmask (255.255.255.255), and Gateway (0.0.0.0). Below this, there are sections for Active Connections (160 / 16384 (0%)), Memory usage (Total Available: 72172 kB / 123688 kB (58%), Free: 64404 kB / 123688 kB (52%), Buffered: 7768 kB / 123688 kB (6%)), DHCP Leases, and Wireless status. The DHCP Leases table is highlighted with a red box:

Hostname	IP Address	MAC-Address	Leasetime remaining
mc007	192.168.1.236	E4:E7:49:1A:A7:F3	11h 49m 21s

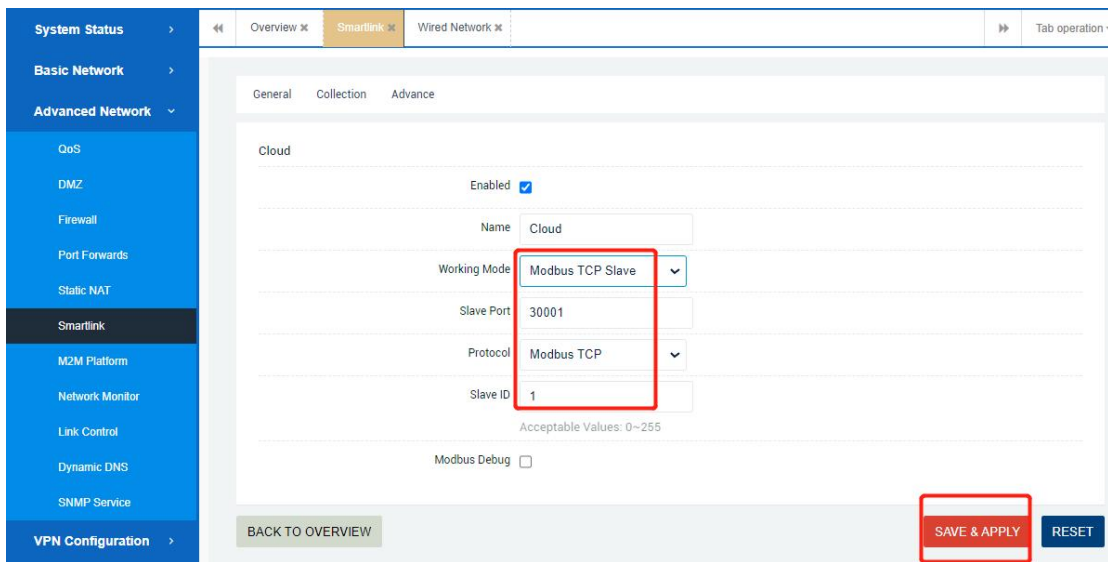
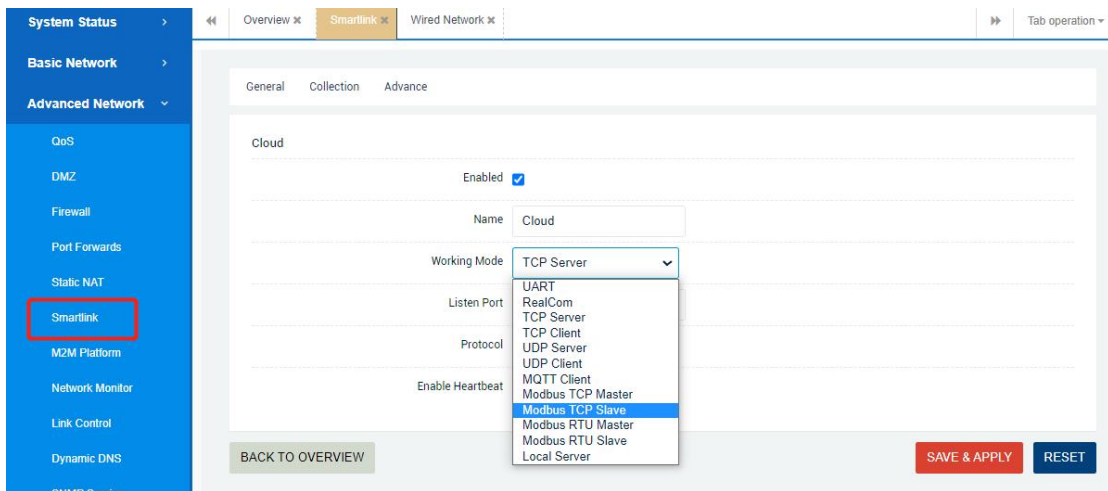
5. Start to configure smartlink usage.

5.1 to config 'cloud'/'uplink device' option: set it to Modbus TCP Slave mode, and set a customized listening port, such as 30001.

The screenshot shows the 'Smartlink' configuration page. The left sidebar is expanded to show 'Advanced Network' > 'Smartlink'. The main content area has three tabs: General, Collection, and Advance. The 'General' tab is active and shows the following configuration sections:

- Mode Configuration:** A table with columns 'Enabled', 'Uplink Device', and 'Downlink Device'. The 'Enabled' checkbox is checked. 'Uplink Device' is set to 'Cloud' and 'Downlink Device' is 'UART\_DEV'. There are 'EDIT' and 'DELETE' buttons for this entry, and an 'ADD' button below.
- Connection Configuration:** A table with columns 'Enabled', 'Name', 'Working Mode', 'Target Address', 'Status', 'Conns', and 'Protocol'. The first entry is 'Cloud' with 'Working Mode' 'TCP Server', 'Target Address' '30001', 'Status' 'Listening', and 'Conns' '0'. This entry is highlighted with a red box, and its 'EDIT' button is also highlighted with a red box. The second entry is 'UART\_DEV' with 'Working Mode' 'UART', 'Target Address' 'COM1', 'Status' 'Connected', and 'Conns' '1'. There are 'EDIT' and 'DELETE' buttons for each entry, and an 'ADD' button below.
- Serial Configuration:** A table with columns 'Interface', 'Speed', 'Data Bit', 'Stop Bit', 'Parity', and 'Flow Control'. The 'Interface' is 'COM1', 'Speed' is '115200', 'Data Bit' is '8', 'Stop Bit' is '1', 'Parity' is 'None', and 'Flow Control' is 'None'. There is an 'EDIT' button for this entry.

At the bottom right of the page, there are 'SAVE & APPLY' and 'RESET' buttons.



5.2 to modify 'Downlink Device' from UART mode to 'Modbus RTU Master' mode and select protocol to Modbus RTU, Slave ID to 1 as an example. ALL shown as below.

System Status > Overview x Smartlink x Wired Network x Tab operation v

Basic Network >

Advanced Network v

- QoS
- DMZ
- Firewall
- Port Forwards
- Static NAT
- Smartlink**
- M2M Platform
- Network Monitor
- Link Control
- Dynamic DNS
- SNMP Service

VPN Configuration >

System Management >

Logout

General Collection Advance

### Mode Configuration

Enabled	Uplink Device	Downlink Device	
<input checked="" type="checkbox"/>	Cloud	UART_DEV	<input type="button" value="EDIT"/> <input type="button" value="DELETE"/>

### Connection Configuration

Enabled	Name	Working Mode	Target Address	Status	Conns	Protocol	
<input checked="" type="checkbox"/>	Cloud	Modbus TCP Slave	30001	Listening	0	Modbus TCP	<input type="button" value="EDIT"/> <input type="button" value="DELETE"/>
<input checked="" type="checkbox"/>	UART_DEV	UART	COM1	Connected	1	Pass-Through	<input type="button" value="EDIT"/> <input type="button" value="DELETE"/>

### Serial Configuration

Interface	Speed	Data Bit	Stop Bit	Parity	Flow Control	
COM1	9600	8	1	None	None	<input type="button" value="EDIT"/>

System Status > Overview x Smartlink x Wired Network x Tab operation v

Basic Network >

Advanced Network v

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VPN Configuration >

System Management >

Logout

General Collection Advance

### UART\_DEV

Enabled

Name

Working Mode

Protocol

Device Name

Slave ID   
Acceptable Values: 0~255

Response Timeout   
msec

Byte Timeout   
msec

Modbus Debug

### 5.3 to Set serial port parameters for RS485/232 device, such as baud rate, data bit, and parity bit.

The screenshot shows the Smartlink configuration interface. The left sidebar contains navigation options: System Status, Basic Network, Advanced Network (with sub-items: QoS, DMZ, Firewall, Port Forwards, Static NAT, Smartlink, M2M Platform, Network Monitor, Link Control, Dynamic DNS, SNMP Service), VPN Configuration, System Management, and Logout. The main content area is divided into three sections:

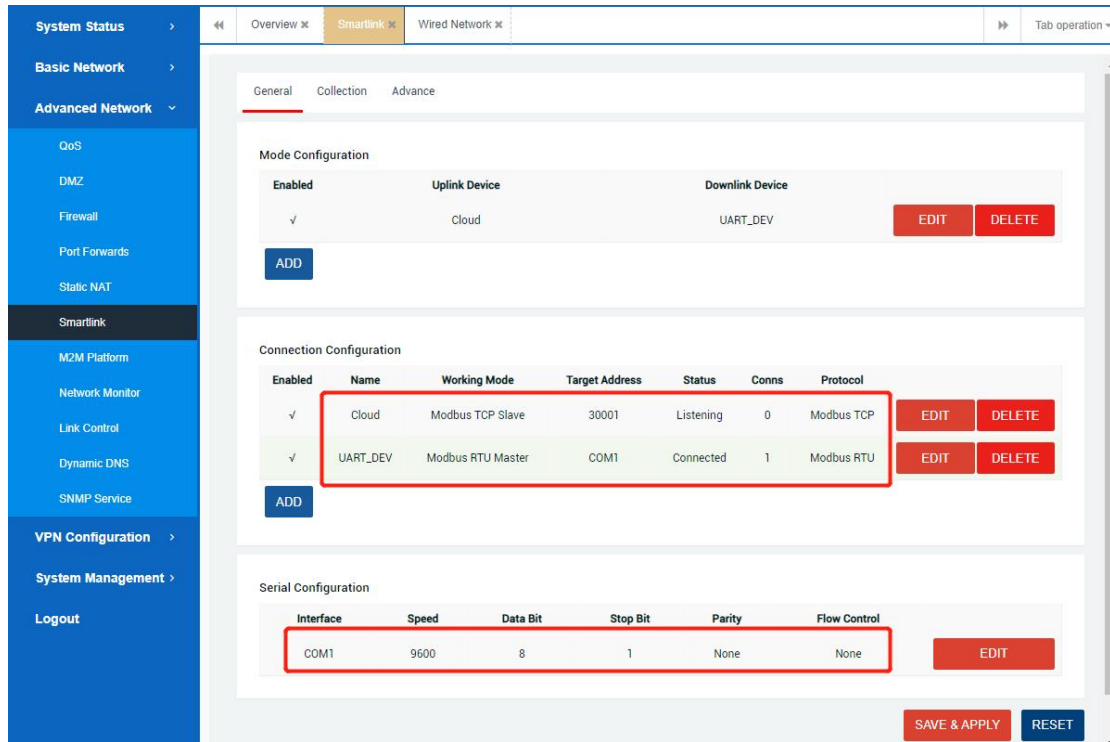
- Mode Configuration:** A table with columns: Enabled, Uplink Device, Downlink Device. One entry is shown with Uplink Device 'Cloud' and Downlink Device 'UART\_DEV'. Buttons for EDIT and DELETE are present.
- Connection Configuration:** A table with columns: Enabled, Name, Working Mode, Target Address, Status, Conns, Protocol. Two entries are shown: one for 'Cloud' (TCP Client, 192.168.1.236:20000, Disconnect) and one for 'UART\_DEV' (UART, COM1, Connected). Buttons for EDIT and DELETE are present.
- Serial Configuration:** A table with columns: Interface, Speed, Data Bit, Stop Bit, Parity, Flow Control. One entry for 'COM1' is shown with Speed '115200', Data Bit '8', Stop Bit '1', Parity 'None', and Flow Control 'None'. An EDIT button is present.

The screenshot shows the detailed configuration for the COM1 serial port. The left sidebar is the same as in the previous screenshot. The main content area has tabs for General, Collection, and Advance. The 'General' tab is active, showing the following settings for COM1:

- Speed: 9600 (dropdown menu)
- Data Bit: 8 (dropdown menu)
- Stop Bit: 1 (dropdown menu)
- Parity: None (dropdown menu)
- Flow Control: None (dropdown menu)
- Enable Frame:
- Frame Interval: 60 msec
- Frame Length: 1460 bytes

At the bottom of the page, there are buttons for BACK TO OVERVIEW, SAVE & APPLY, and RESET.

5.4. All configuration finished as following.



6. Start to test Modbus RTU to TCP communication progress.

6.1 Run the ModSim32.exe tool (to simulate a RS485 RTU device) and ModScan32.exe tool (to simulate a Server tool supporting Modbus TCP protocol) on the computer at the same time;

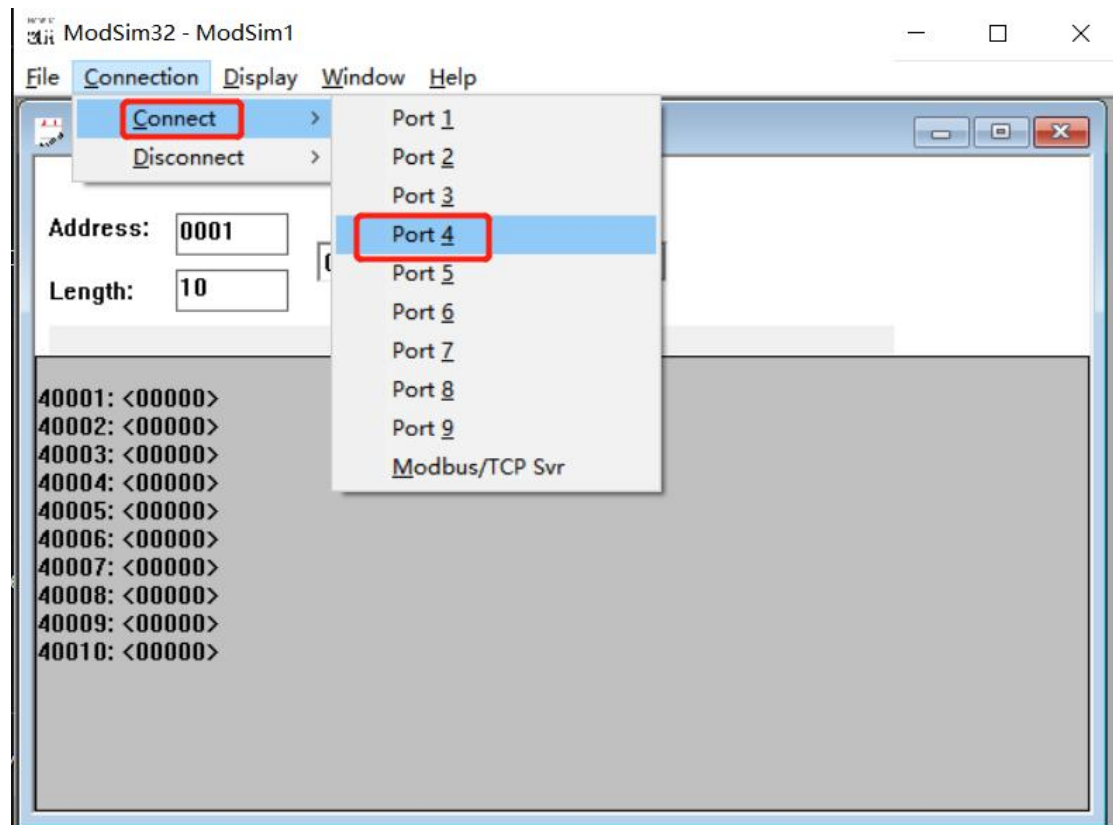


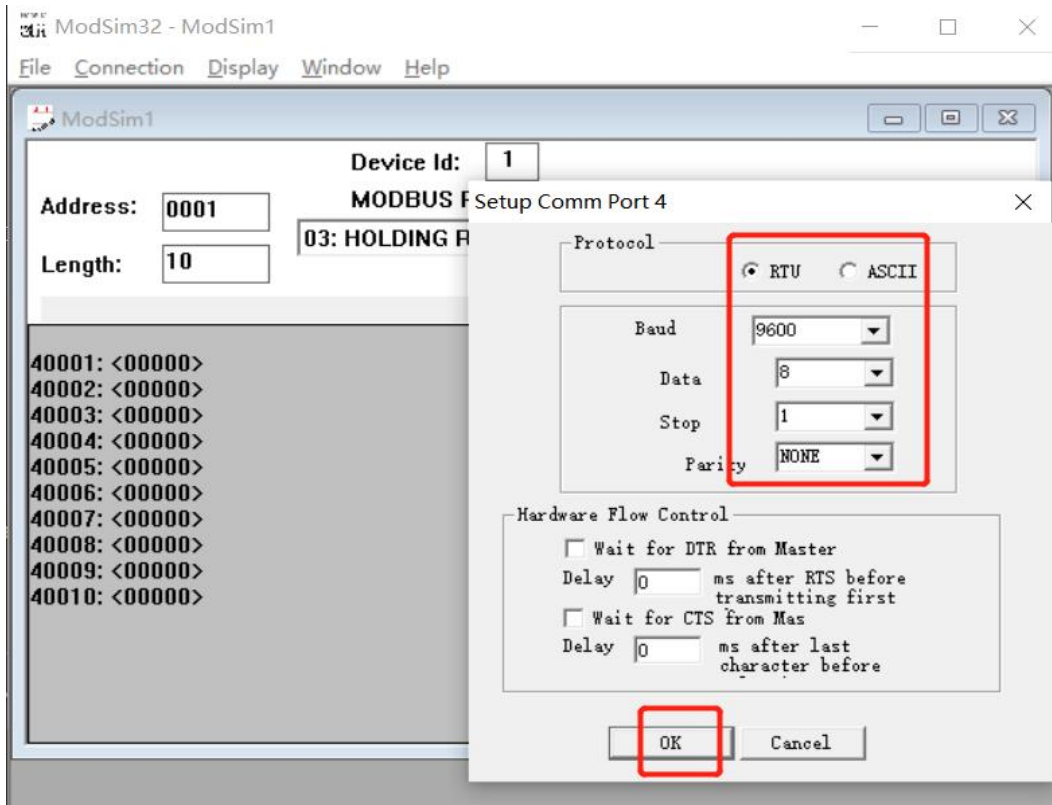


6.1 firstly , to View the com port created by the USB-RS485 converter on the PC (com4 for example).

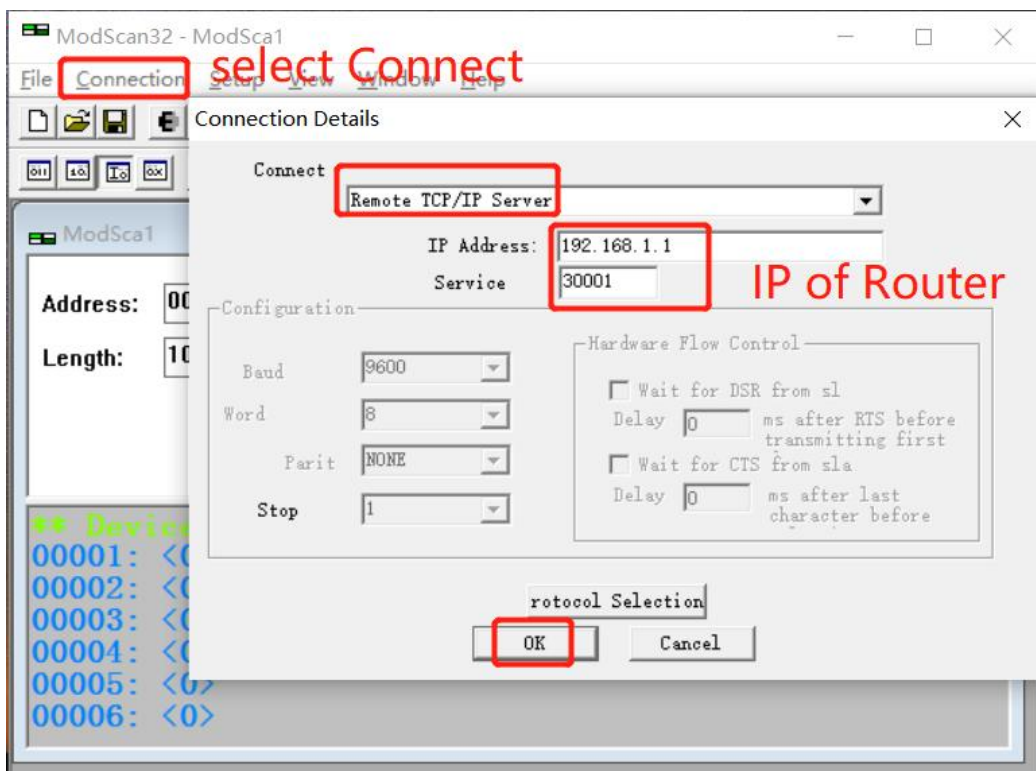


Then to to configure parameters for ModSim tool: to select Port4 and check all serial port parameters as below.

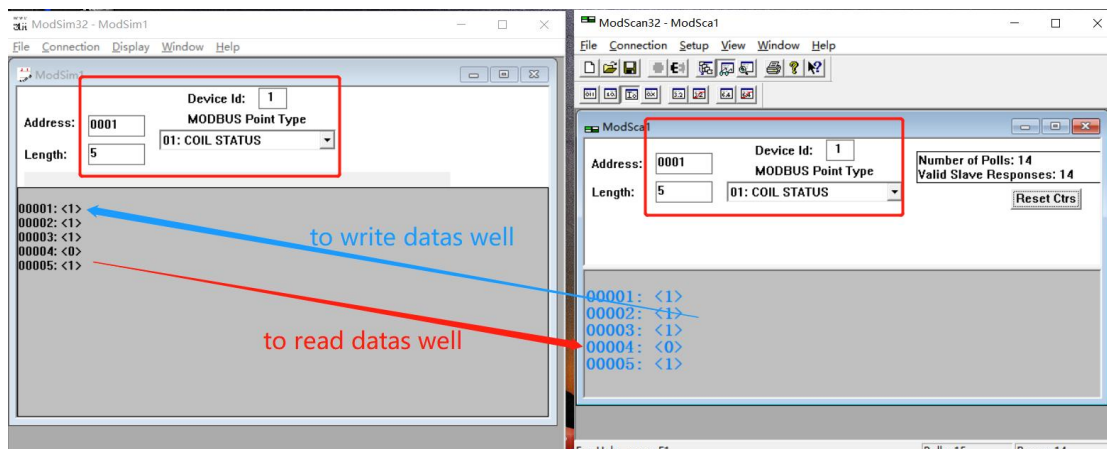
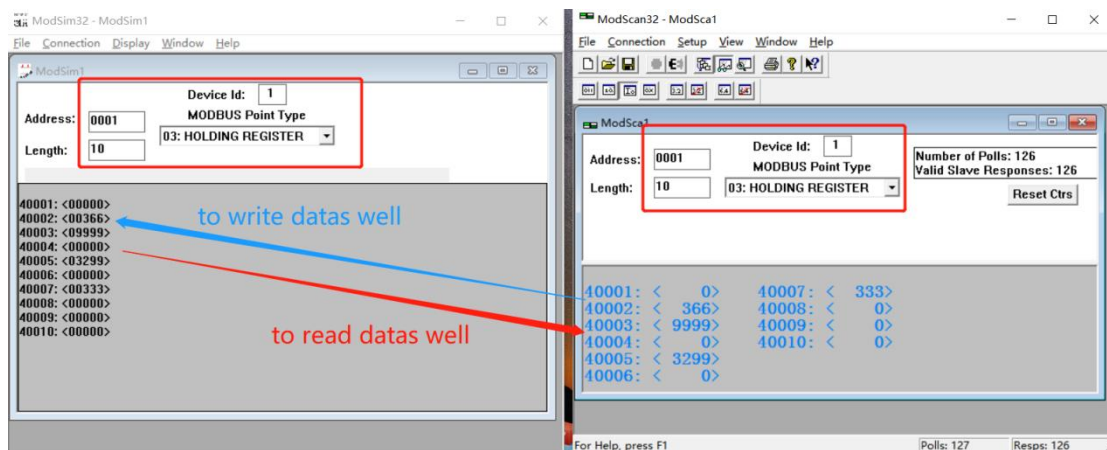
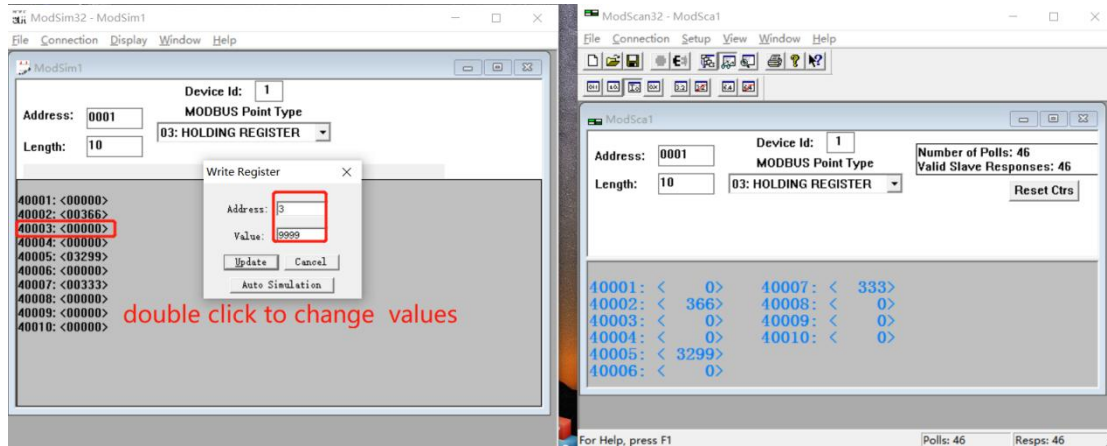




6.2 Secondly, to configure ModScan tool: to select 'Remote TCP/IP Server '(working as Modbus client mode ) and set IP address and port keeping same as LAN address of 4G Router.



6.3 Finally, data flows sending and receiving testing were conducted between the two tools as follows. 2 different Modbus Function code demos (code 3 and code 1) are shown as below.



#### 6.4. Additional note: View serial port data logs.

Enable the log debug button on the Smartlink webpage. You can click download to get a \*.tar log file and decompress it to view the details of the raw HEX datas from Modbus RTU device and Modbus TCP Master.

