

USR-N5X0 Connects to USR Cloud

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1. How to Read Serial Modbus Data in USR Cloud

1.1. Preparation

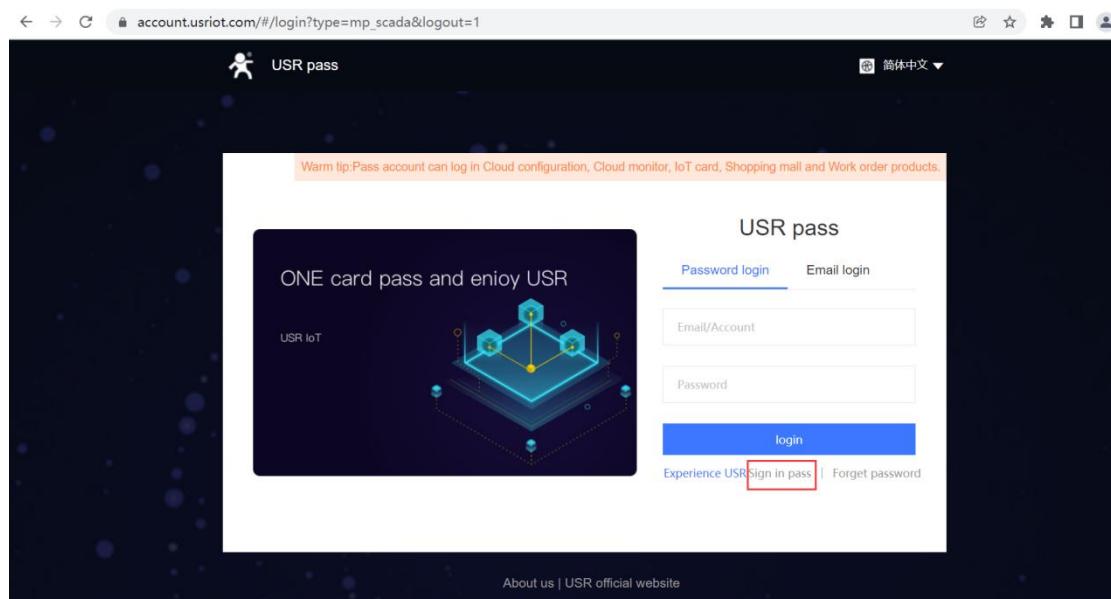
- (1) USR-N520 *1
- (2) RS485 serial to USB cable *1
- (3) Ethernet cable *1
- (4) 12V/1A power adaptor *1
- (5) Modbus simulation software: Modbus Slave & Modbus Poll
- (6) Serial tool, you can also download our company's USR-TCP232-Test software from this link:
https://www.pusr.com/Support/download_hits.html?id=304

1.2. Add a New Device in USR Cloud

In this chapter, we will introduce how to add a new device in PUSR Cloud and make it online.

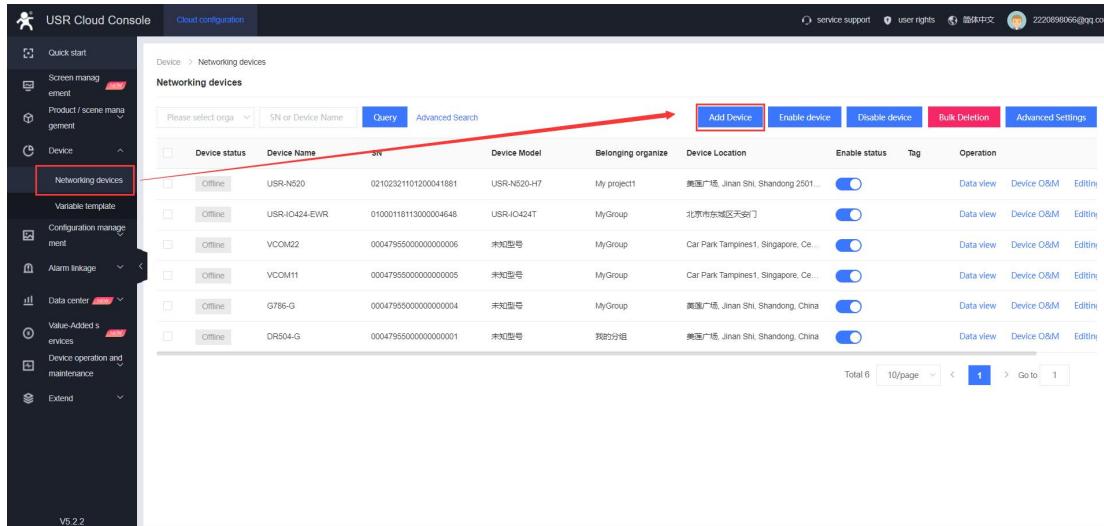
1.2.1. Register an Account

Register an account in USR Cloud firstly: <https://mp.usriot.com/>



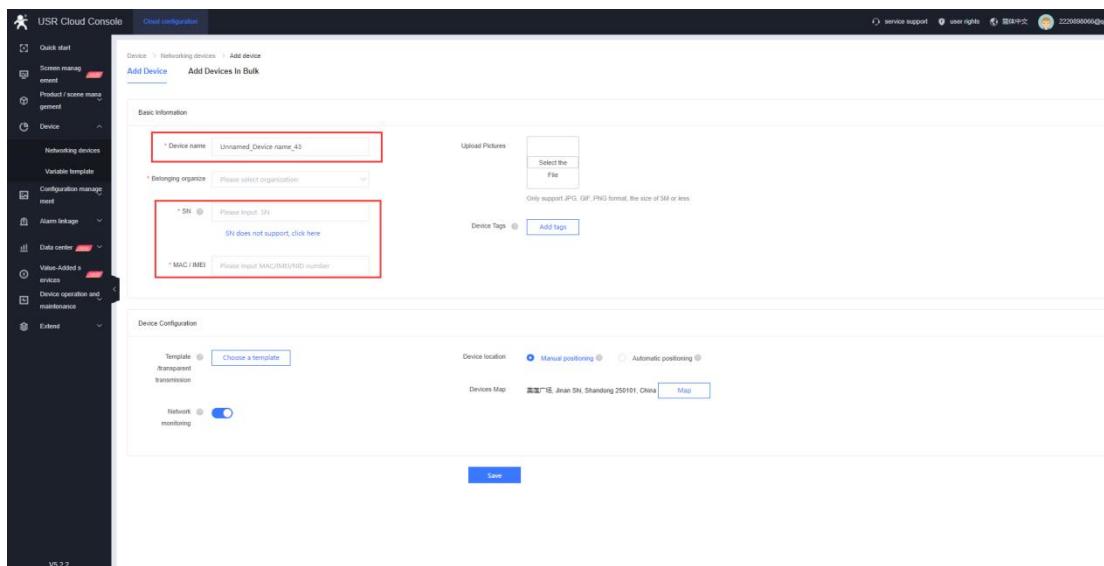
1.2.2. Add Device

- In Device--Network devices, click “Add Device”.

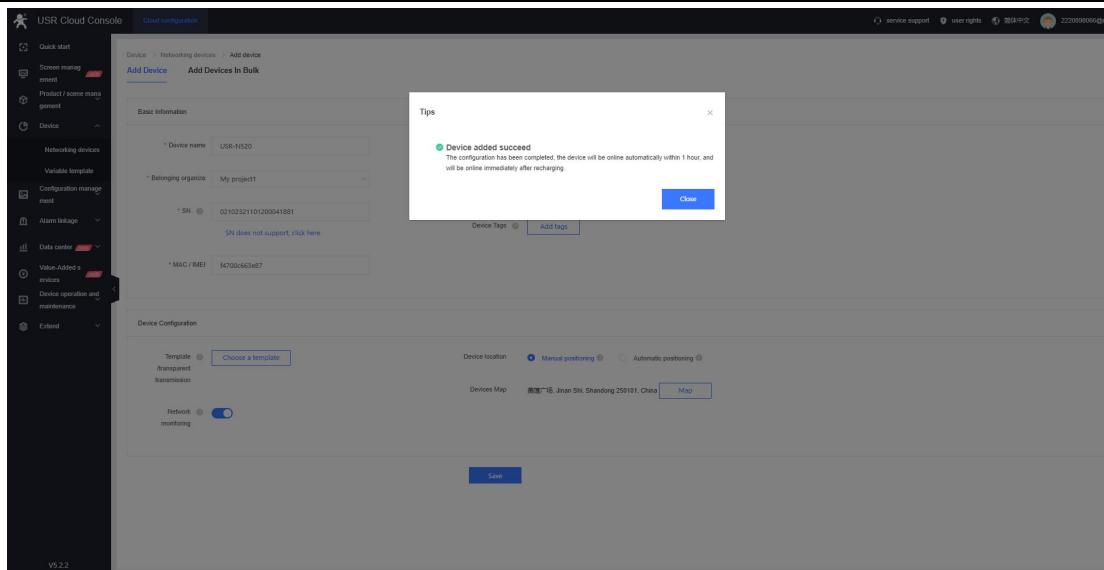


The screenshot shows the 'Networking devices' page in the USR Cloud Console. On the left is a sidebar with various management options. The main area displays a table of devices with columns for status, name, model, organization, location, enable status, and operations. At the top right of the table is a blue 'Add Device' button, which is highlighted with a red arrow. The table shows several entries, including 'USR-N520', 'USR-IO424-EWR', and 'VCOM22'.

- Change the device name, fill in the SN and MAC of the device, other parameters can be changed according to your requirements, then click **Save**. You can check the SN and MAC in the back label of the device.



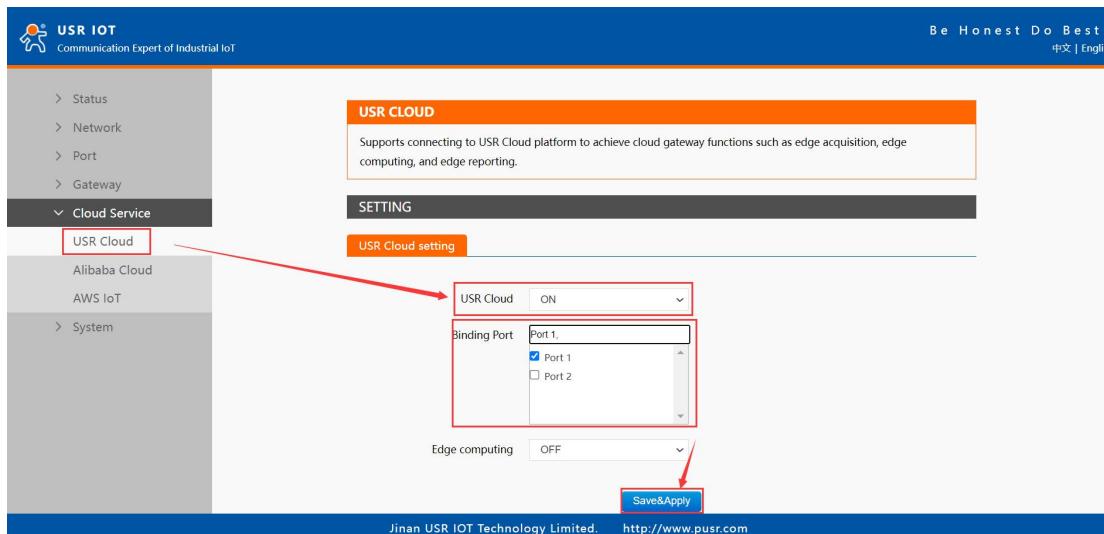
The screenshot shows the 'Add Device' form. It has two main sections: 'Basic Information' and 'Device Configuration'. In the 'Basic Information' section, fields for 'Device name' (set to 'Unnamed_Device_name_43'), 'SN' (with a note 'SN does not support, click here'), and 'MAC (IMI)' (with a note 'Please input MAC/IMI/IMD number') are highlighted with red boxes. The 'Device Configuration' section includes options for 'Template transparent transmission', 'Device location' (set to 'Manual positioning'), and 'Devices Map' (set to 'Jinan Sh, Shandong 250101, China'). A 'Save' button is at the bottom.

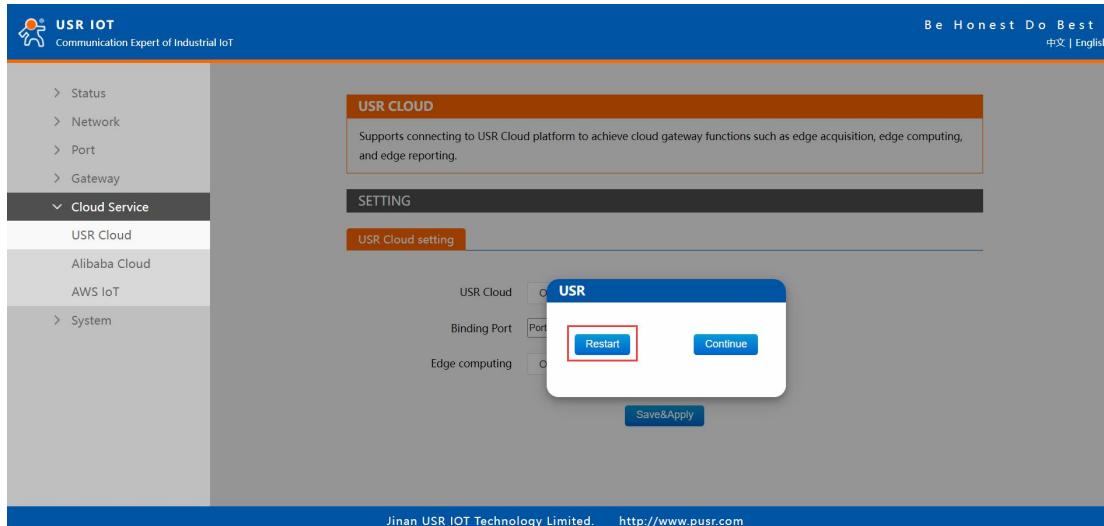


1.2.3. Enable USR Cloud Function

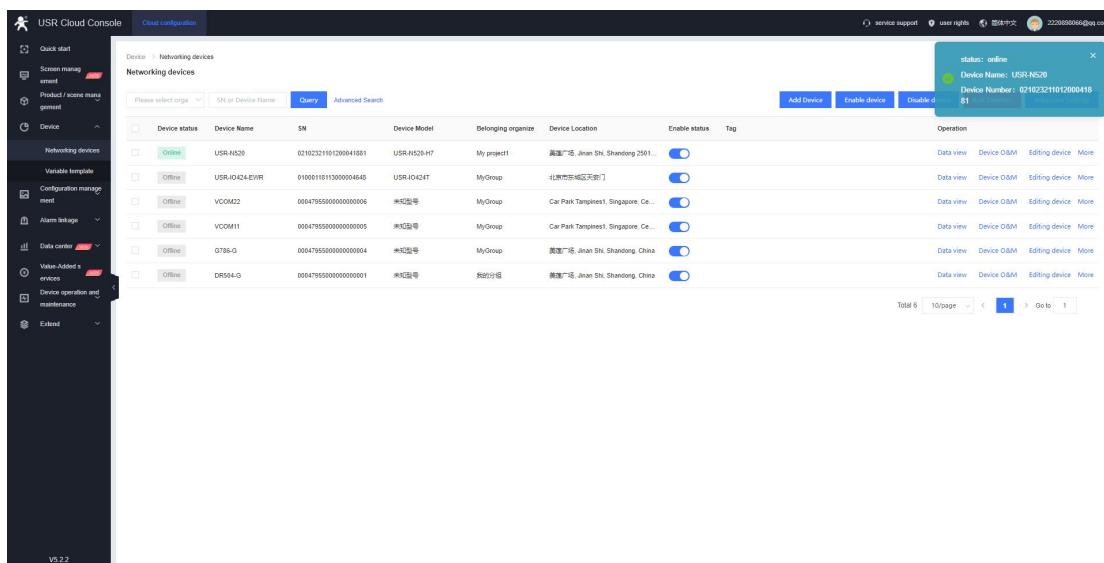
In **Cloud Service--USR Cloud**, enable USR Cloud function, choose the serial port, click “**Save&Apply**”, then restart the device to take the parameters effect.

Note: USR Cloud is a public server, so USR-N5X0 device needs to connect to the public network firstly.





After configuring the device, it will be online in USR Cloud. If it is still offline, please check if the network of N5X0 device is normal.



1.3. Display Data in USR Cloud

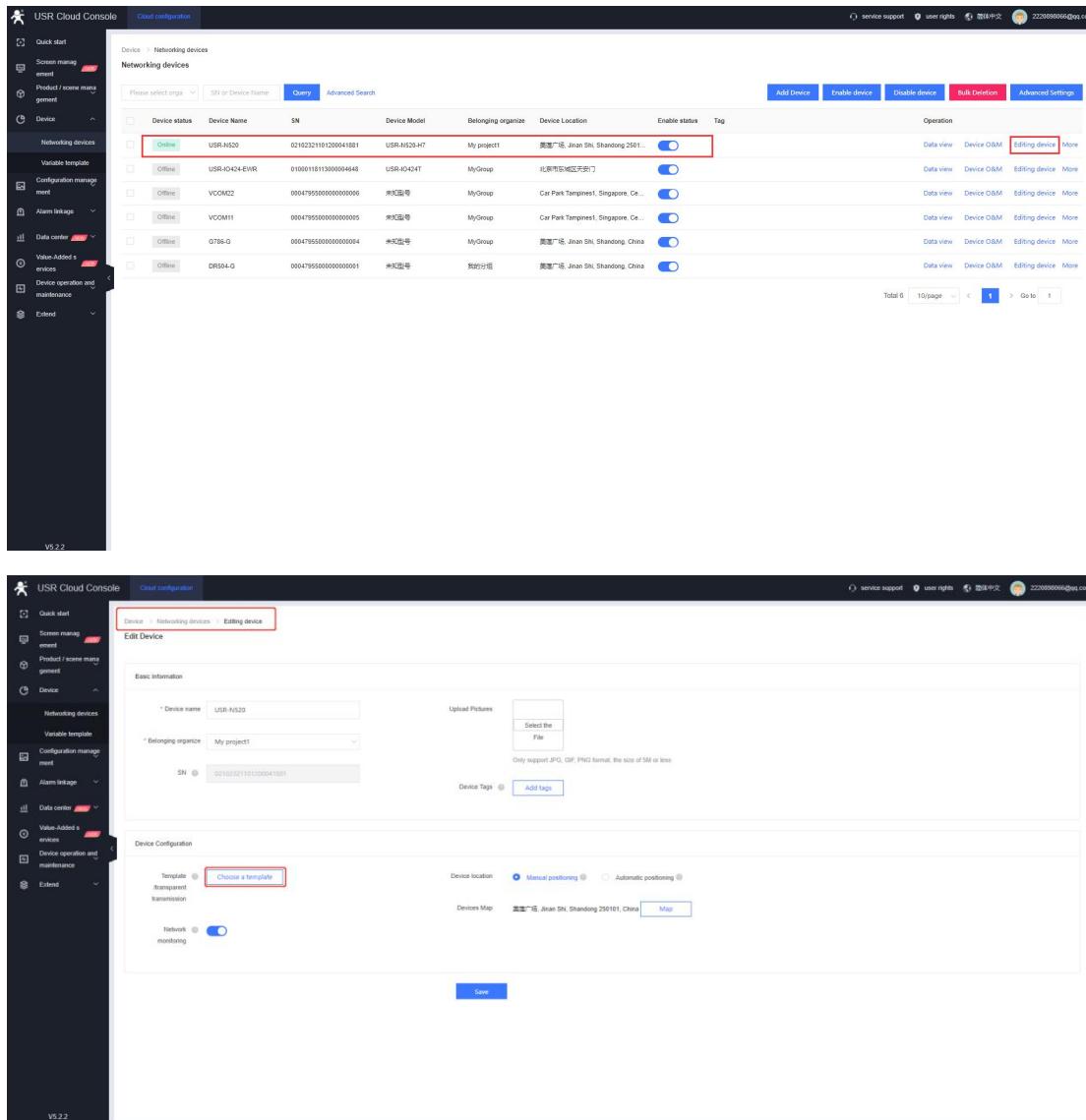
In this chapter, we will introduce how to achieve remote data communication via transparent transmission group, cloud polling and edge computing.

1.3.1. Cloud Polling

USR Cloud can read serial Modbus data via Cloud polling mode, in this test, we use Modbus slave software to simulate the terminal Modbus RTU device.

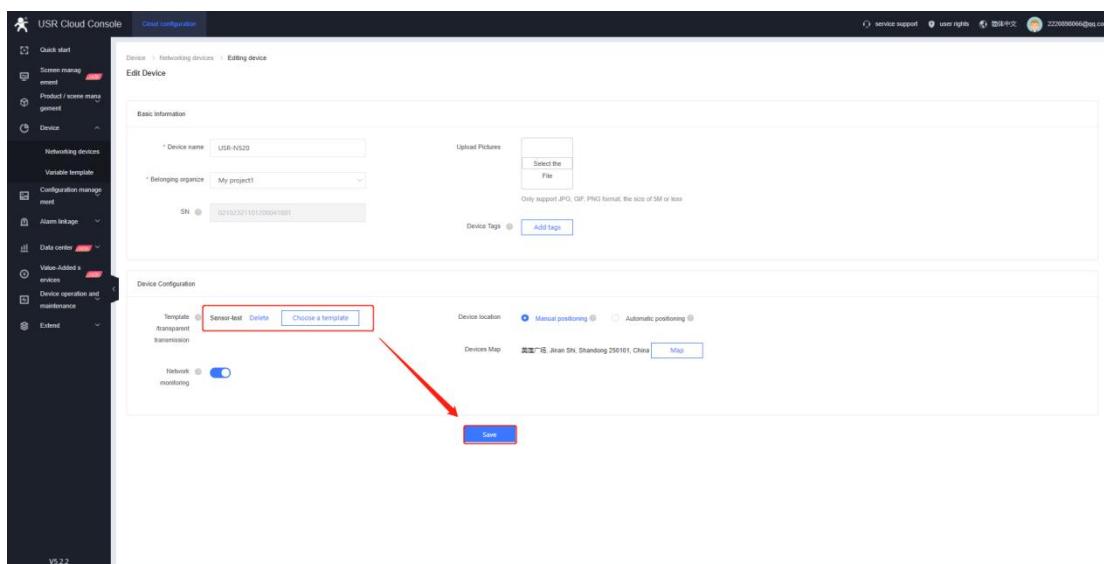
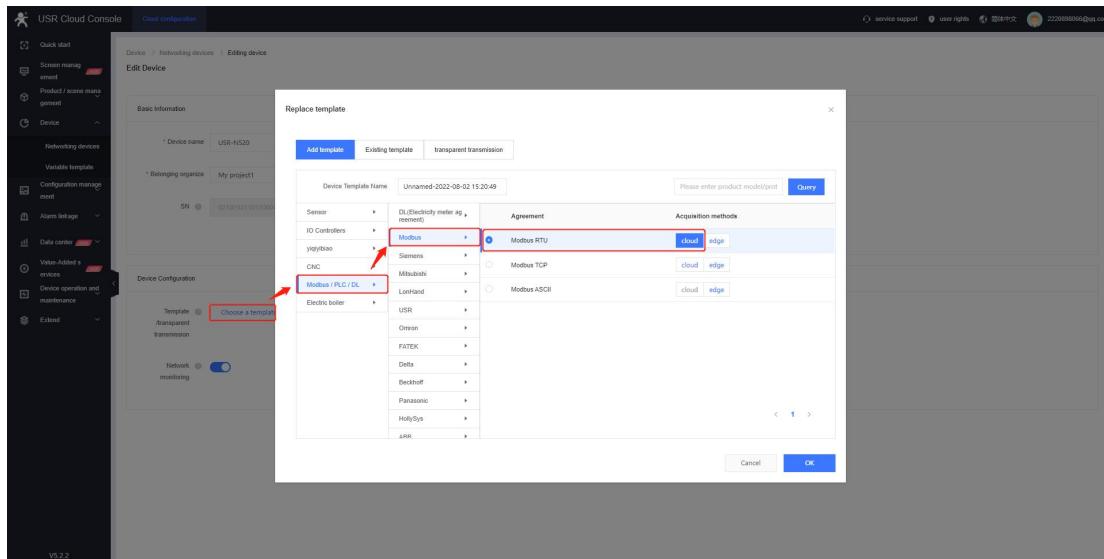
1.3.1.1. Variable Template

1. In USR Cloud, click **Editing Device** to add the device template.

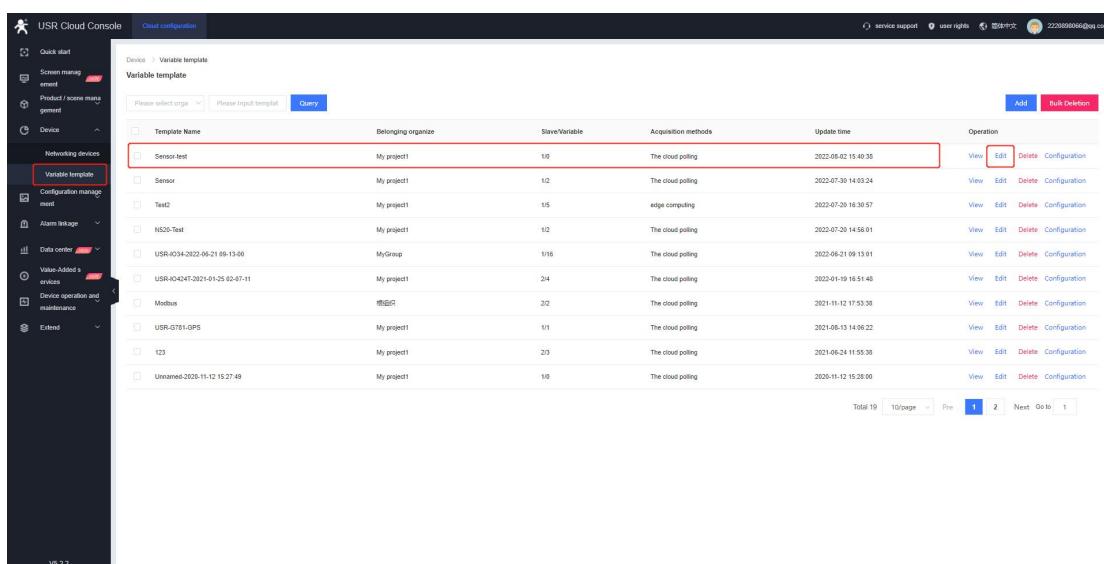


The image shows two screenshots of the USR Cloud Console interface. The top screenshot displays a list of networking devices. A specific device, 'USR-N520', is selected and highlighted with a red box. The bottom screenshot shows the 'Edit Device' dialog for this selected device. The 'Basic Information' tab is active, showing the device name 'USR-N520' and belonging organization 'My project1'. The 'Device Configuration' tab is also visible, showing options like 'Template' (set to 'transparent transmission'), 'Device location' (set to 'Manual positioning'), and 'Devices Map' (set to 'Jinan Shi, Shandong 250101, China').

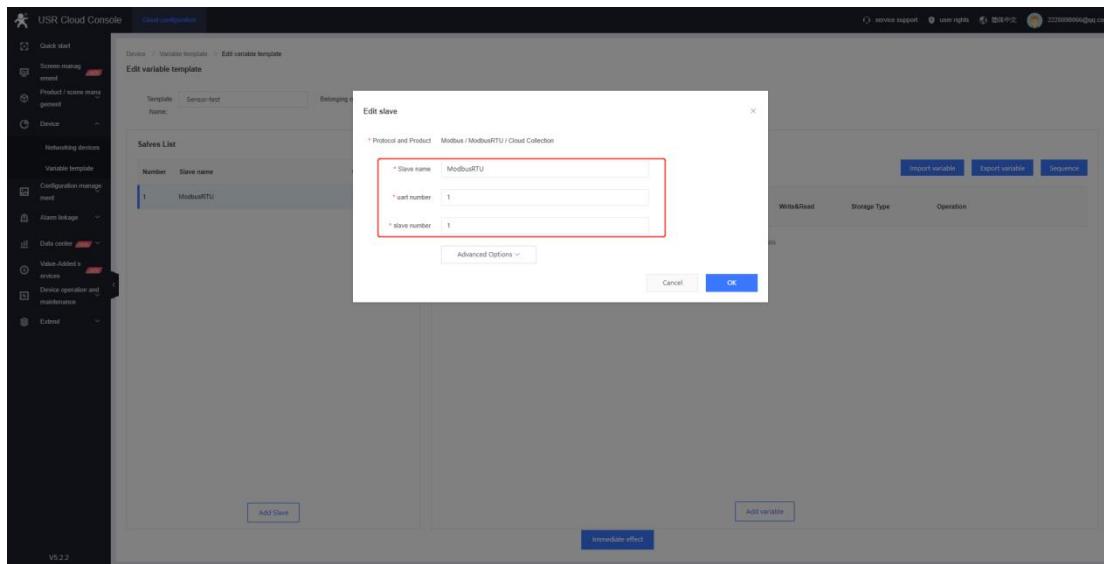
2. Choose **Modbus/PLC/DL--Modbus--Modbus RTU Cloud**, you can also change the template name. Then click **Save**.



3. In Variable template, find the created device template, click Edit to change it.



4. When adding slaves, the slave number should be the slave address of your serial Modbus device, the uart number is the serial number of the connected serial device server. Uart number 1 means port 1, uart number 2 means port 2.



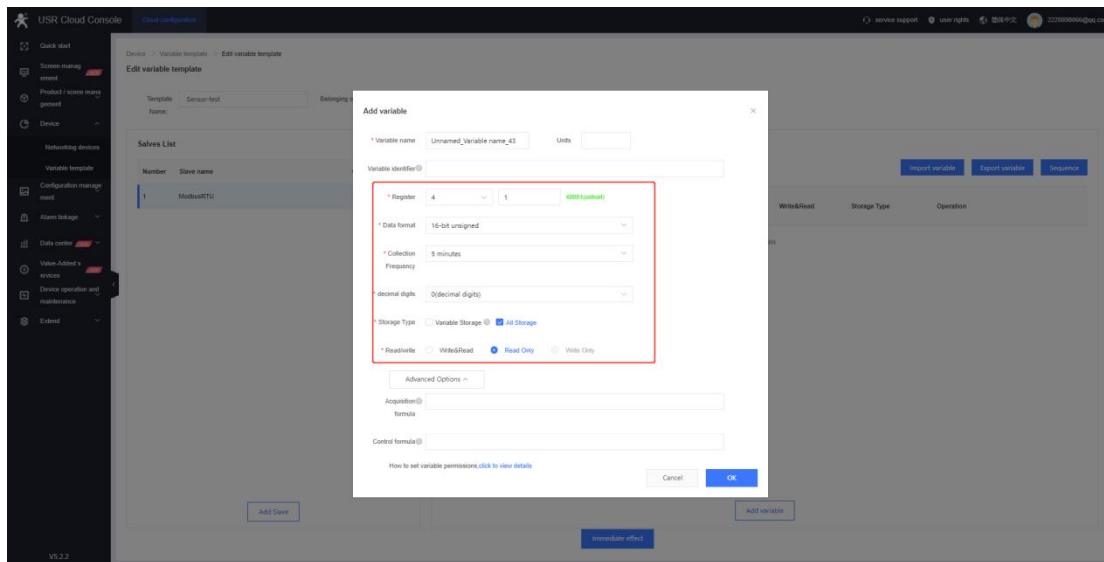
5. When adding the variables(register address), the format is:

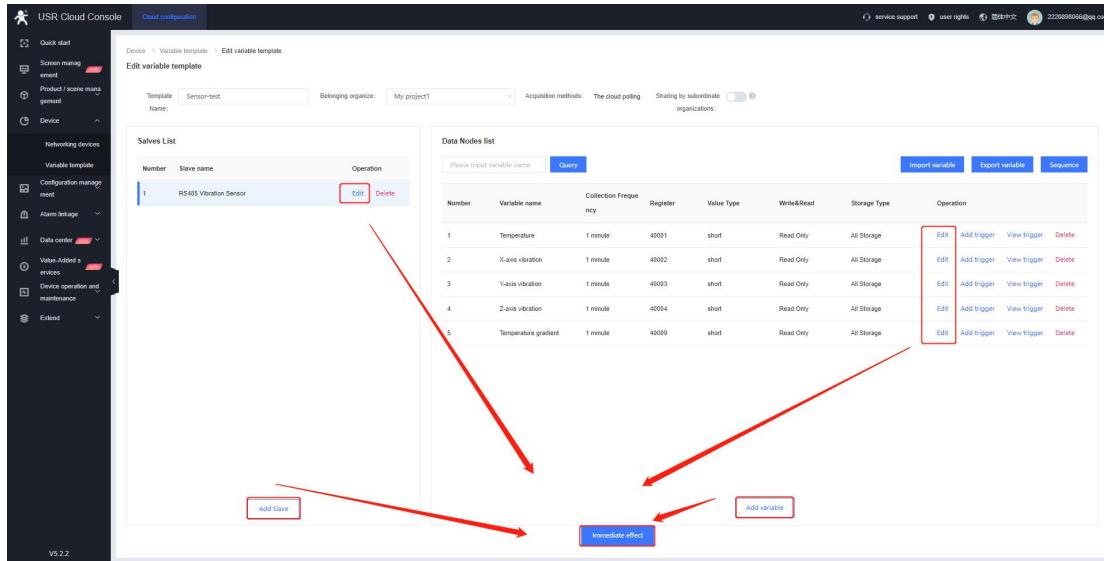
Function code+register address(hexadecimal address needs to be converted to decimal)+1

Same with the configuration software, we need to fill in the decimal register address, which should be the start address+1.

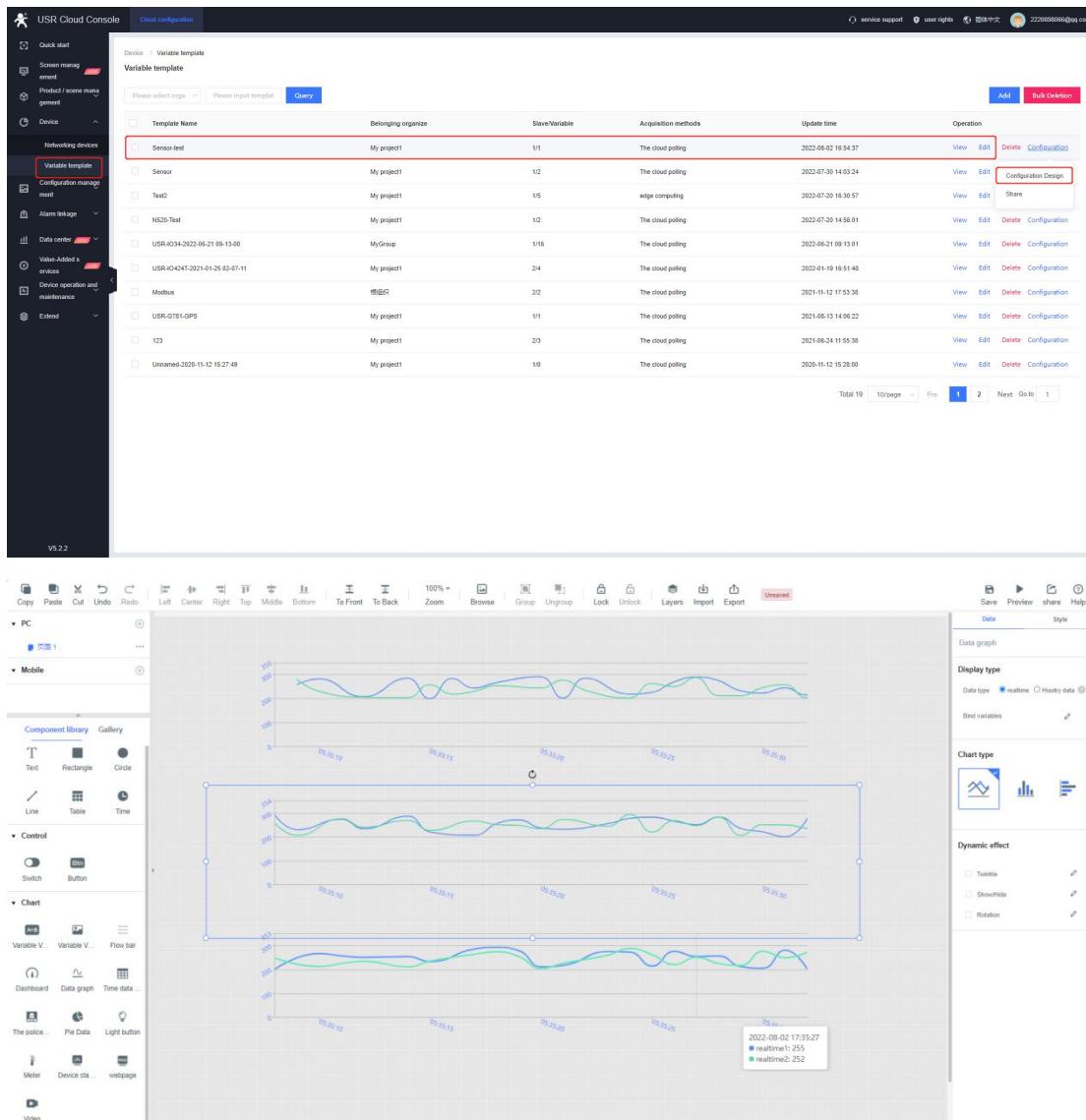
For example:

Function code is 03H or 06H, the start address is 0000H, then we need to fill in 40001.

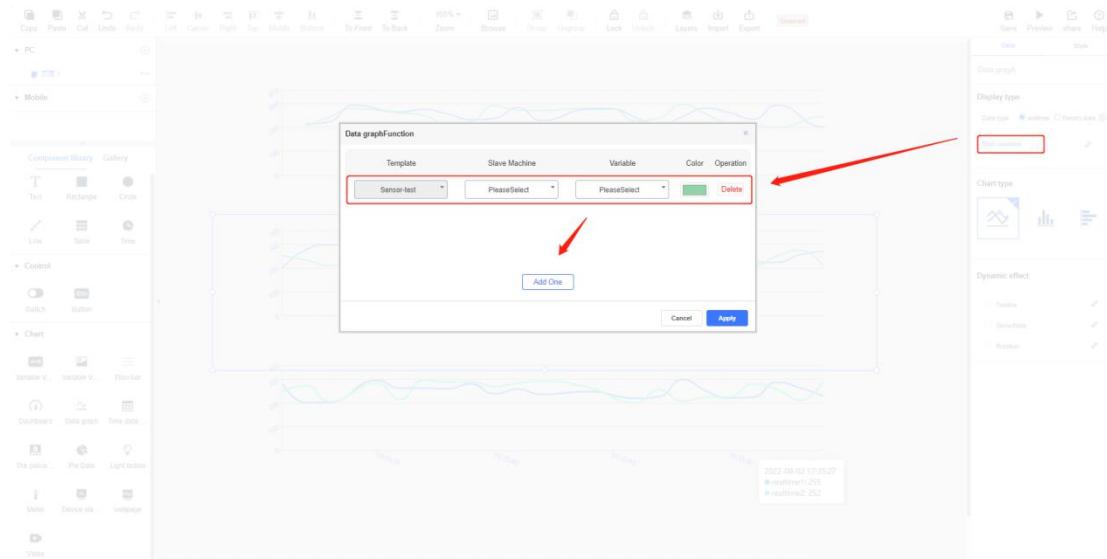




6. In Device--Variable template, you can configure the configuration diagram for your template.



7. Binding the variables to the appropriate component.

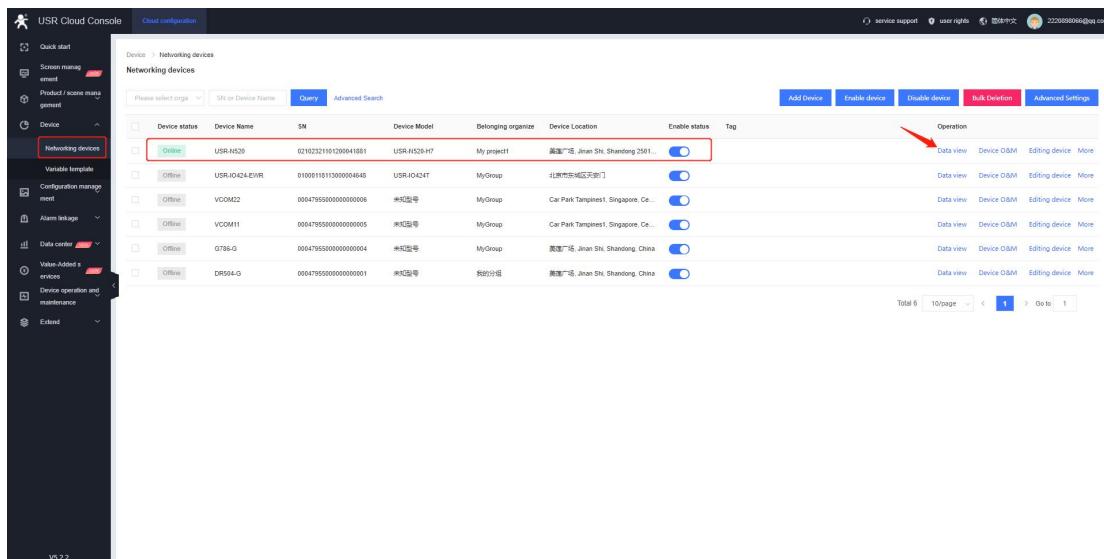


8. After the configuration diagram is completed, it will be displayed in **Monitor screen**.

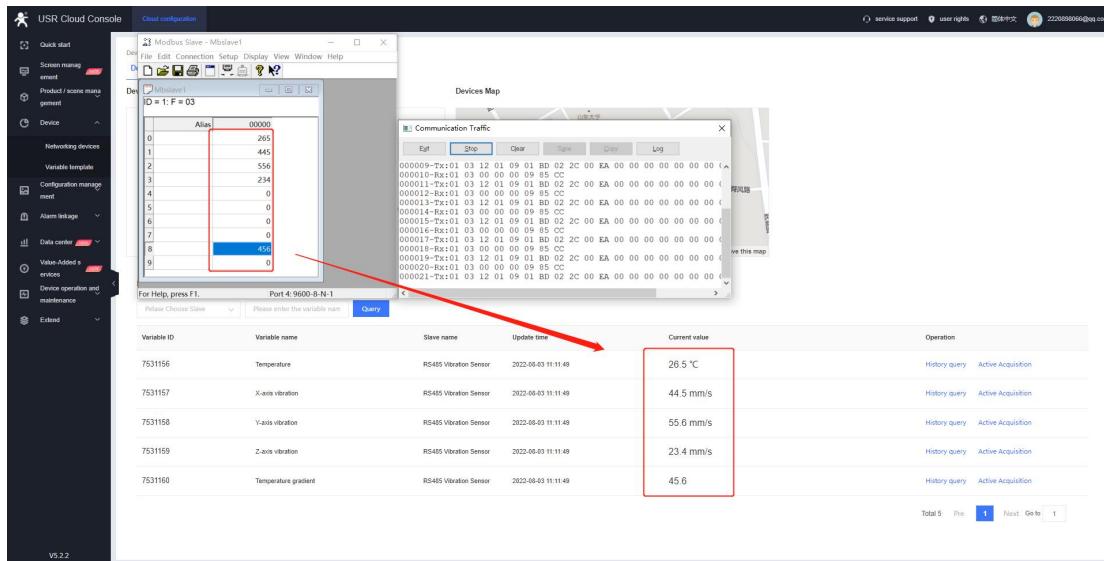
1.3.1.2. Data Monitoring

In this test, we connect the serial port of the device to the PC via RS485 to USB cable, open this serial port in Modbus slave software. Configure the slave ID and register parameters, when receiving the polling commands from USR Cloud and reply via Modbus slave, we can see the Modbus data is displayed in Cloud.

We can directly click the device name or click **Data View** to check the serial Modbus data.



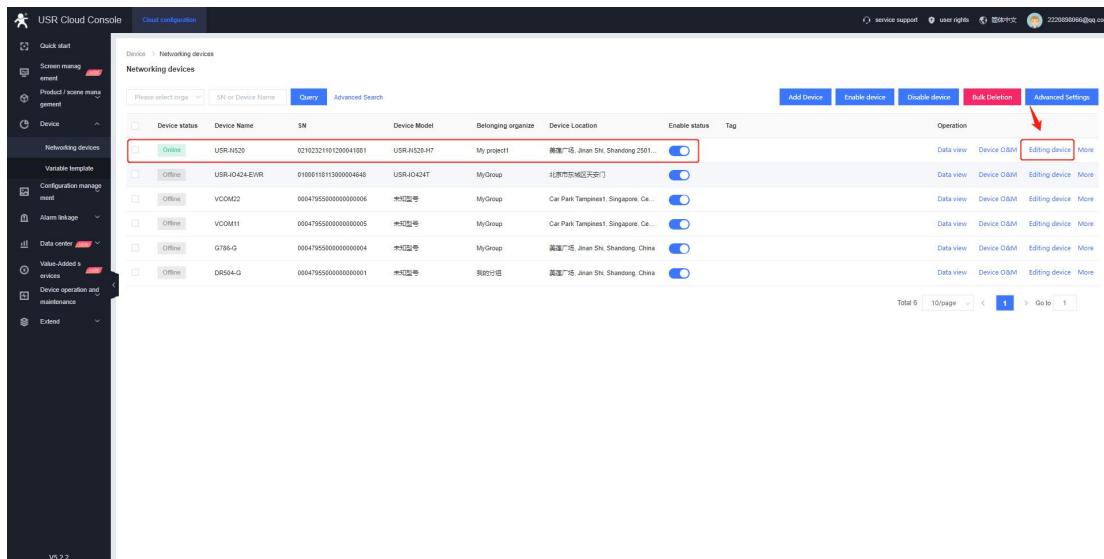
Device status	Device Name	SN	Device Model	Belonging organize	Device Location	Enable status	Tag	Operation
Online	USR-N520	0210321101D00041881	USR-N520-H7	My project1	济南厂区, Jinan Sh, Shandong 2501...	<input checked="" type="checkbox"/>		Data view Device OEM Editing device More
Offline	USRIO424-EVR	01000118113000004640	USR.IO424T	MyGroup	杜邦布带地区车间	<input checked="" type="checkbox"/>		Data view Device OEM Editing device More
Offline	VCOM22	00047955000000000006	串口型号	MyGroup	Car Park Tampines1, Singapore, Ce...	<input checked="" type="checkbox"/>		Data view Device OEM Editing device More
Offline	VCOM11	00047955000000000005	串口型号	MyGroup	Car Park Tampines1, Singapore, Ce...	<input checked="" type="checkbox"/>		Data view Device OEM Editing device More
Offline	OTB-G	00047955000000000004	串口型号	MyGroup	济南厂区, Jinan Sh, Shandong, China	<input checked="" type="checkbox"/>		Data view Device OEM Editing device More
Offline	DR504-G	00047955000000000001	串口型号	我的分组	济南厂区, Jinan Sh, Shandong, China	<input checked="" type="checkbox"/>		Data view Device OEM Editing device More

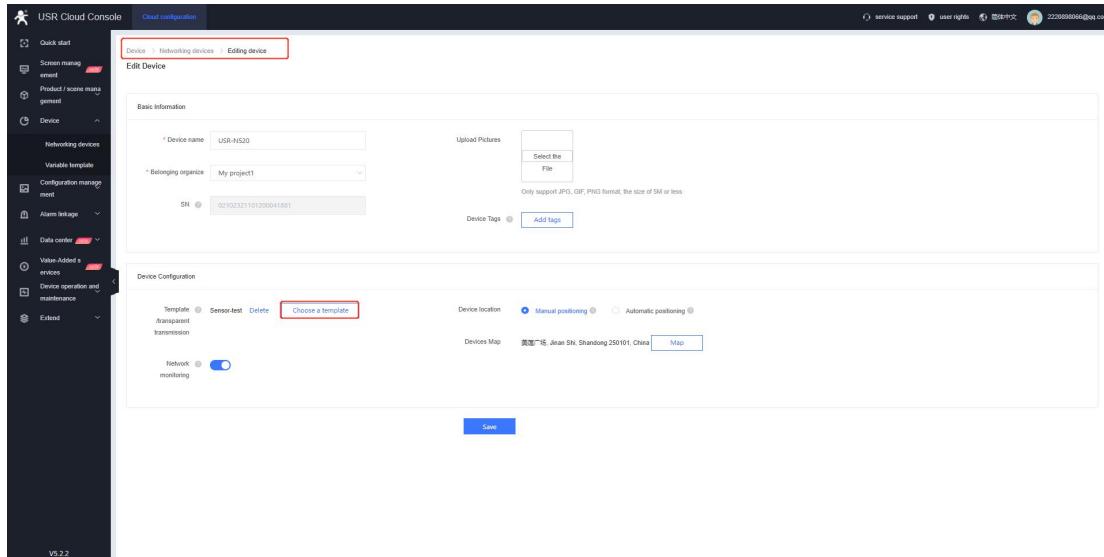
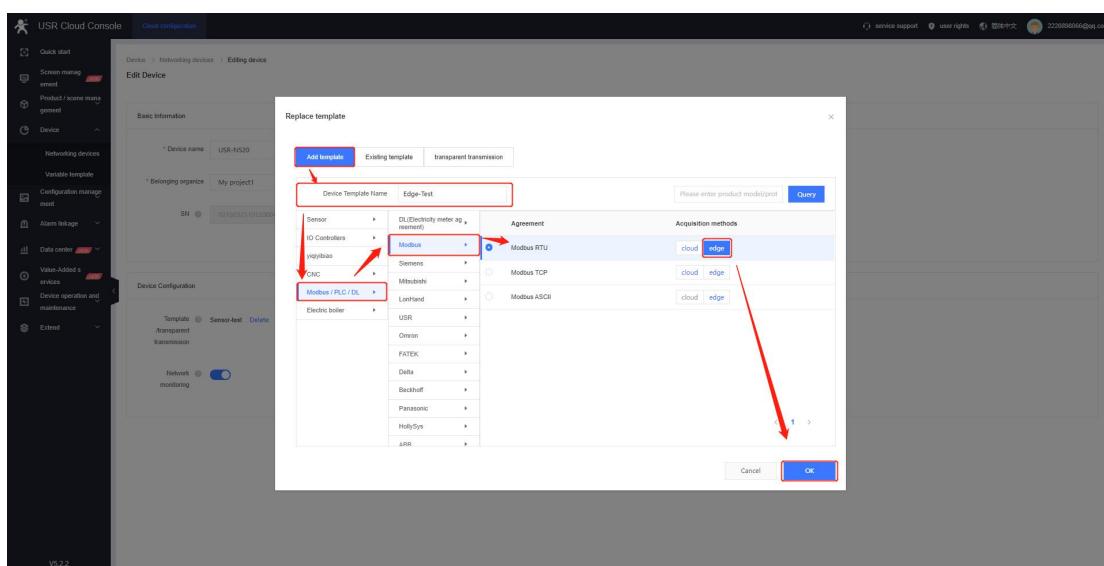


1.3.2. Edge Computing

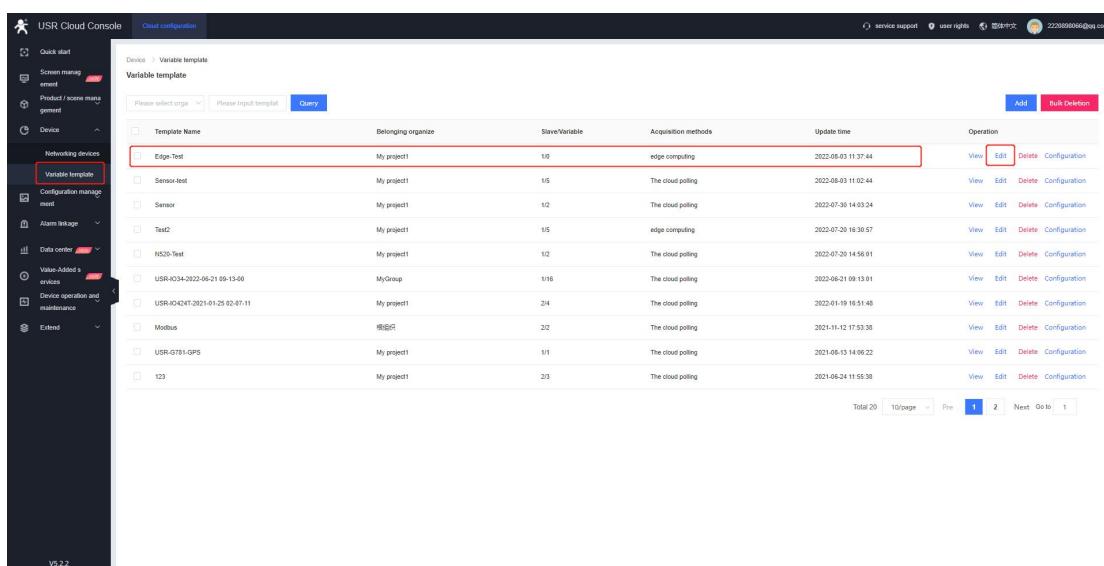
1.3.2.1. Variable Template

1. In Network Devices, click Editing device, change the template to Modbus/PLC/DL--Modbus--Modbus RTU edge.

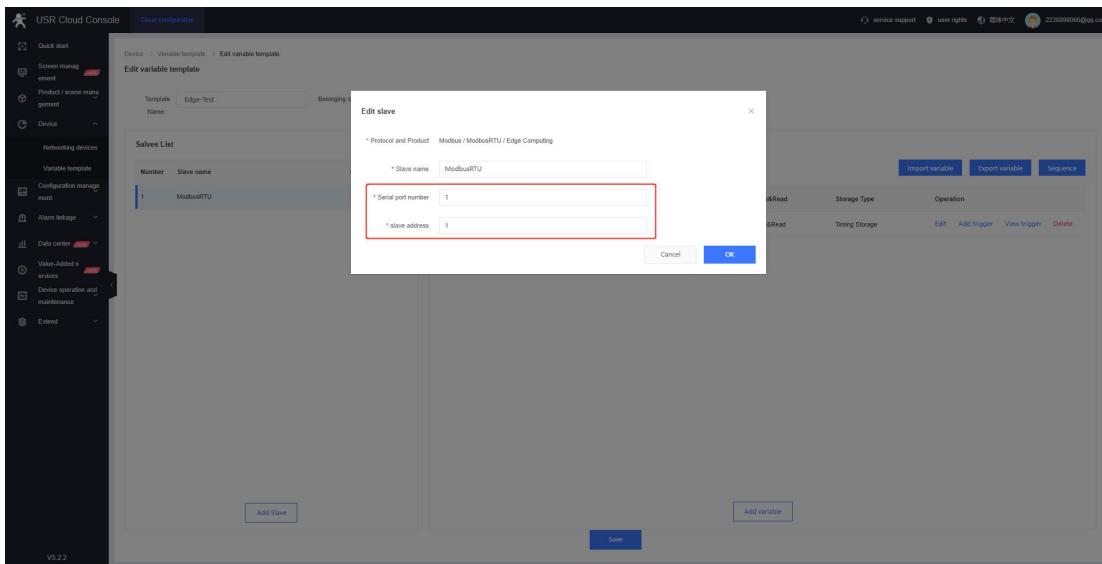


2. In **Variable template**, click **Edit** to change the register type.

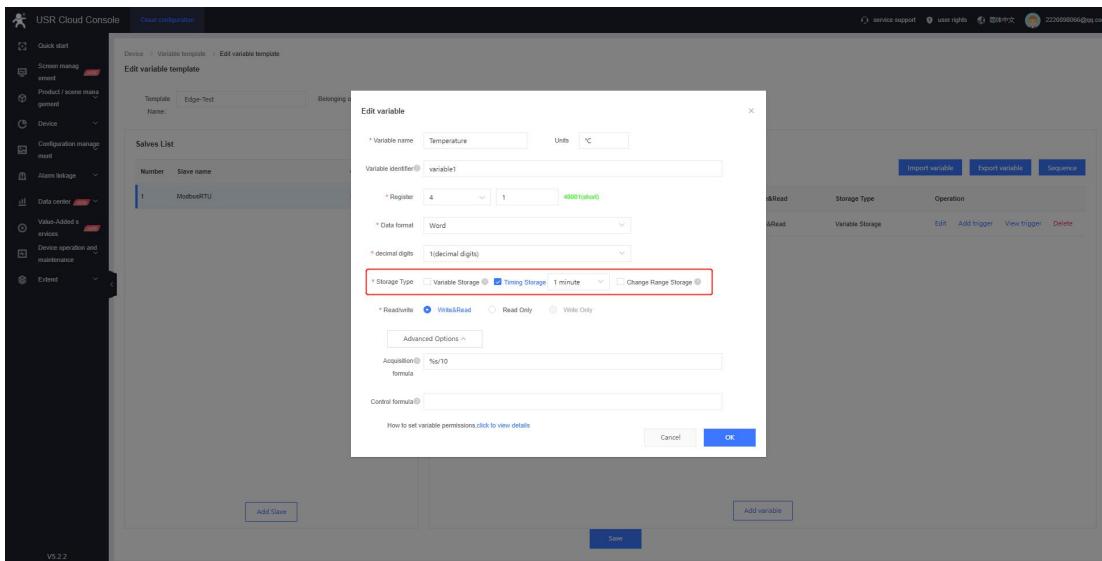


3. The **Slave address** needs to be consistent with the serial Modbus device, and the **Serial port number** should be same with the serial number of the serial device server. 1 means Port 1 and 2 means Port 2.



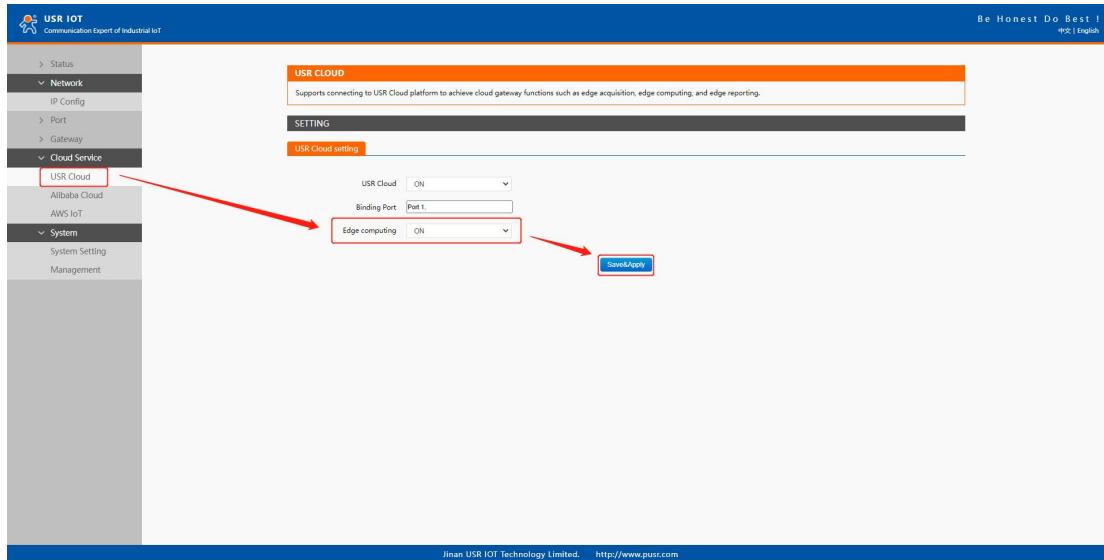
4. The **Storage Type** can be set to **Variable Storage** and **Timing Storage**, in **Timing Storage**, we can configure the storage time interval.

Note: Currently, it supports up to 64 data points.



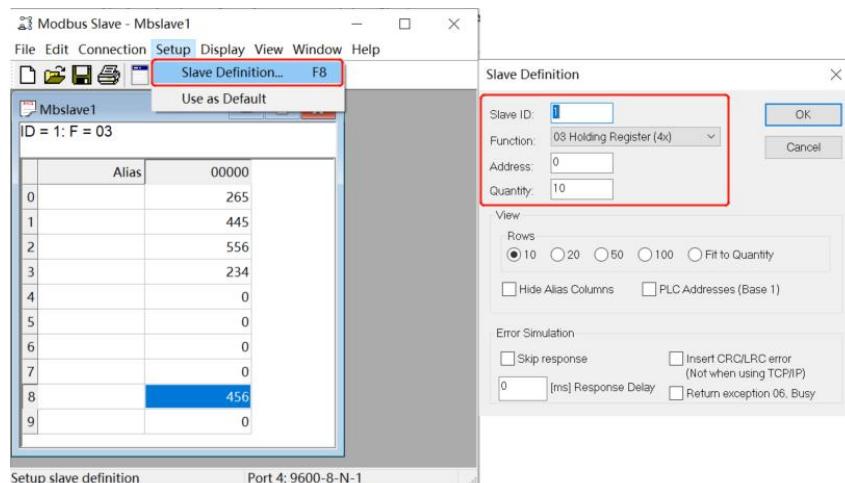
1.3.2.2. Device Configuration

In **Cloud Service--USR Cloud**, enable **Edge computing** function, click **Save&Apply**, then restart the device.

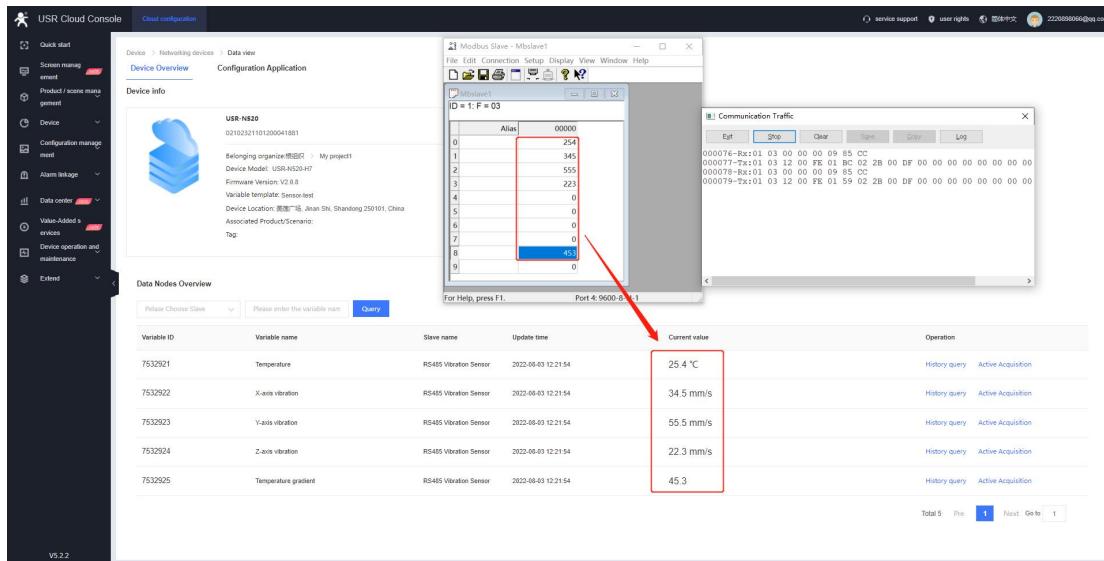


1.3.2.3. Data Display

1. Connect the serial port of the device to Modbus slave simulate software, configure the slave ID and register address.



2. Click the device name to check the serial Modbus data.

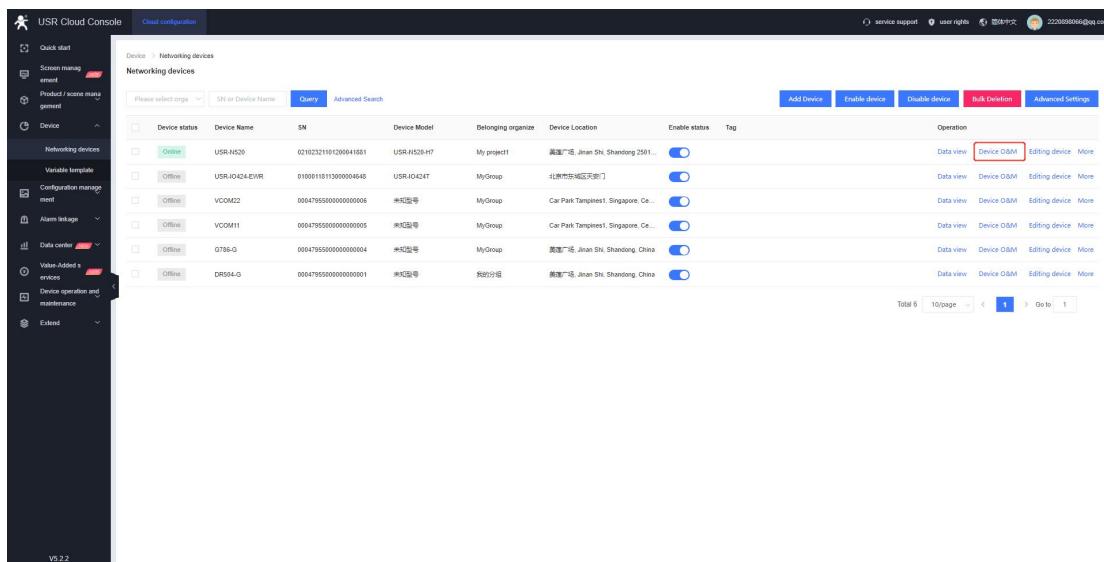


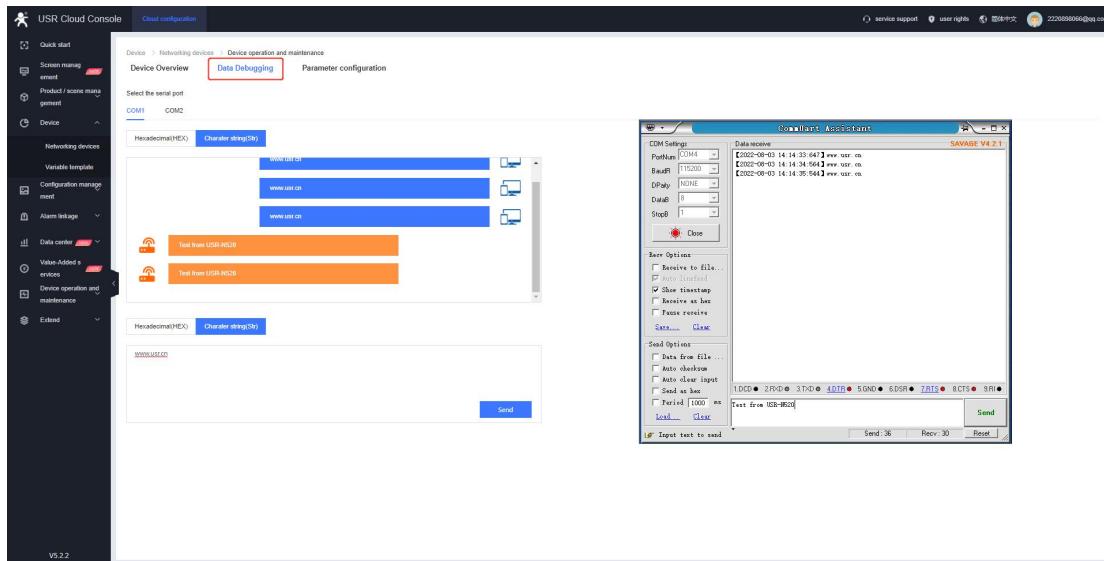
1.3.3. Transparent Data Transmission

1.3.3.1. Data Debugging

This function is used to test the serial data reporting and cloud data sending.

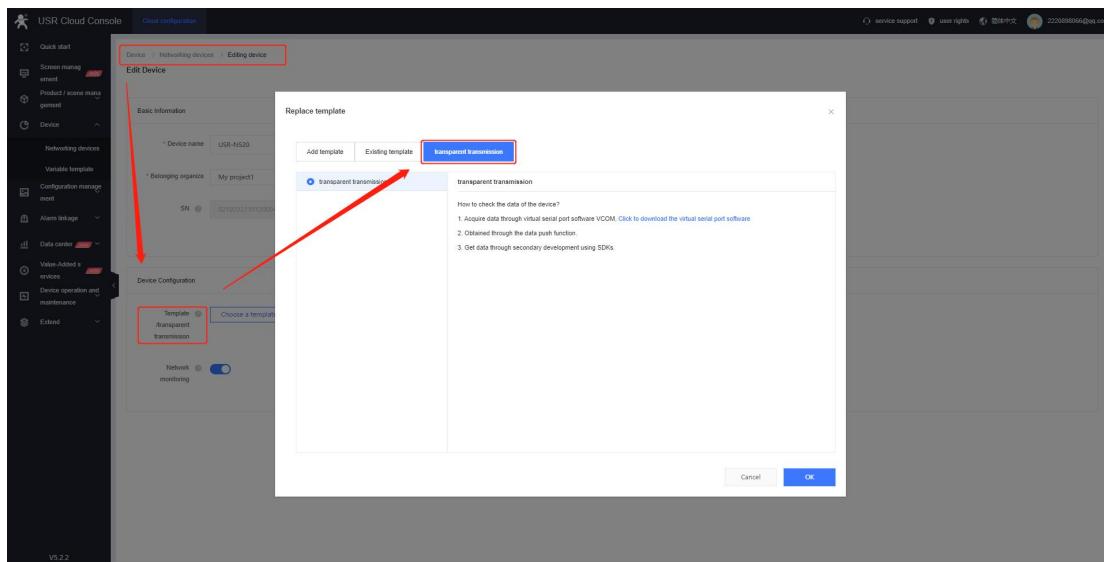
Click **Networking devices--Device O&M**, choose the corresponding com port, we can achieve the data communication between device serial port and USR Cloud.





1.3.3.2. Transparent Transmission Template

We can also change the device template to **Transparent transmission**. After binding the device to transparent template, it can be configured in **Transparent manage** to achieve the data transmission between device and device or device and virtual com port.



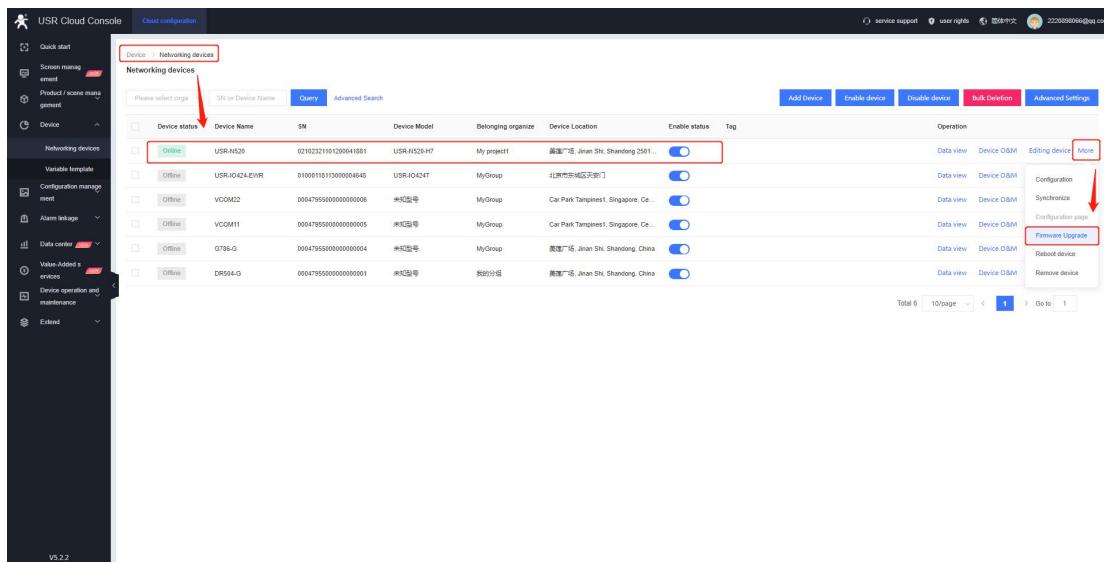
About how to achieve the data transparent transmission between real device and virtual com port, please refer to [Map the Remote Port to Local Virtual Port](#).

2. Remote Firmware Upgrade via Cloud

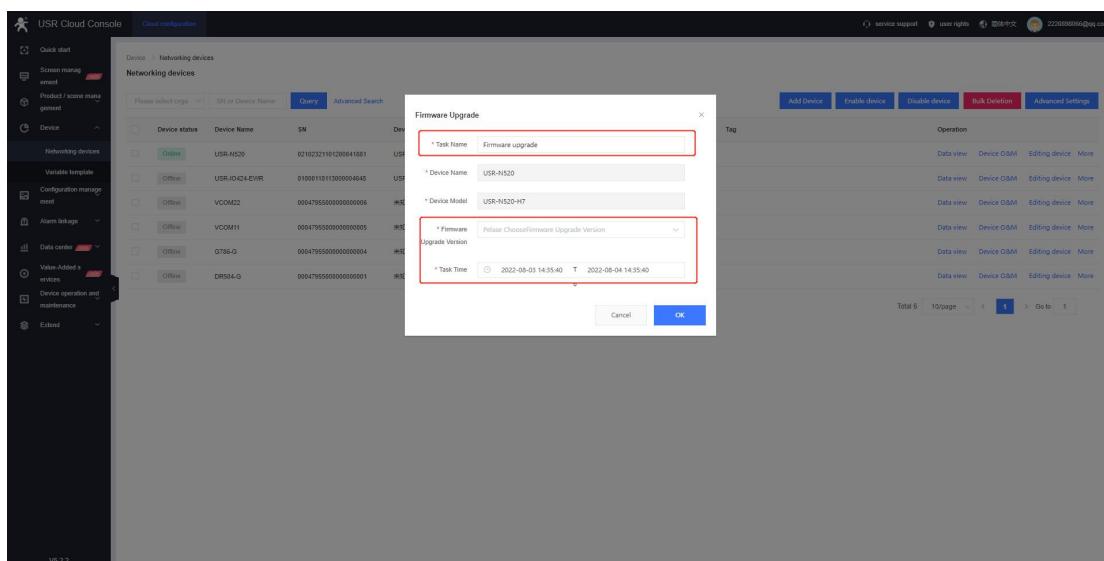
Remote firmware upgrade function is for our USR-N5X0 serial device server.

2.1. Select a Device to Upgrade

In **Device--Networking devices**, select the corresponding device, click **More--Firmware Upgrade**, configure the **Task name**, **Firmware upgrade version** and **Task time**, the device will be upgraded at the set time.



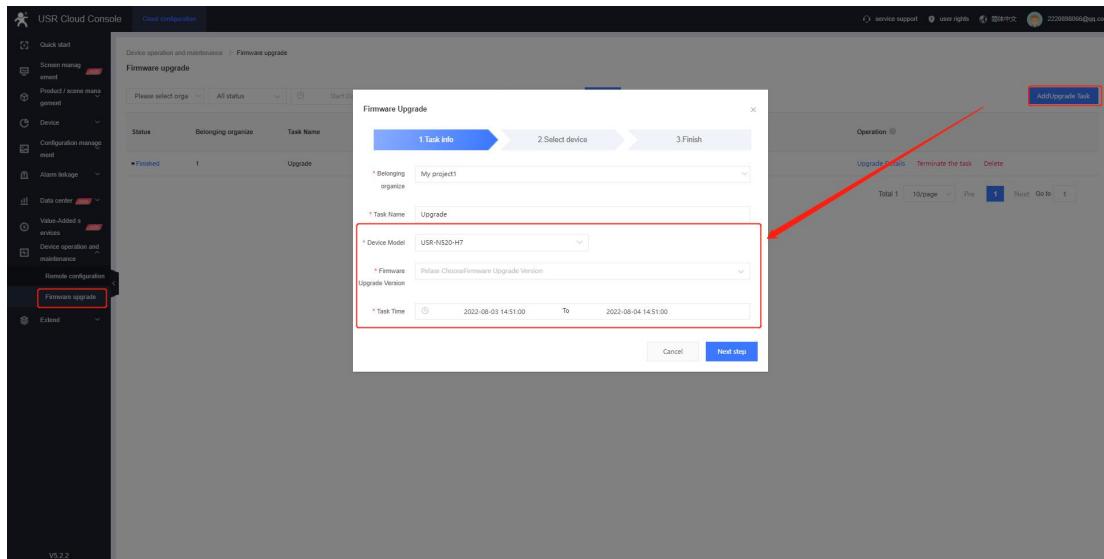
The screenshot shows the 'Networking devices' section of the USR Cloud Console. A red arrow points to the 'More' button next to the selected device (USR-N520). Another red arrow points to the 'Firmware Upgrade' button in the dropdown menu.



The screenshot shows the 'Firmware Upgrade' dialog box. The 'Task Name' field is highlighted with a red box. Other fields include Device Name (USR-N520), Device Model (USR-N520-H7), Firmware Upgrade Version (Please Choose Firmware Upgrade Version), and Task Time (2022-08-03 14:35:40 - 2022-08-04 14:35:40).

2.2. Remote Upgrade Tasks

You can also add the upgrade tasks in **Device operation and maintenance--Firmware upgrade**.

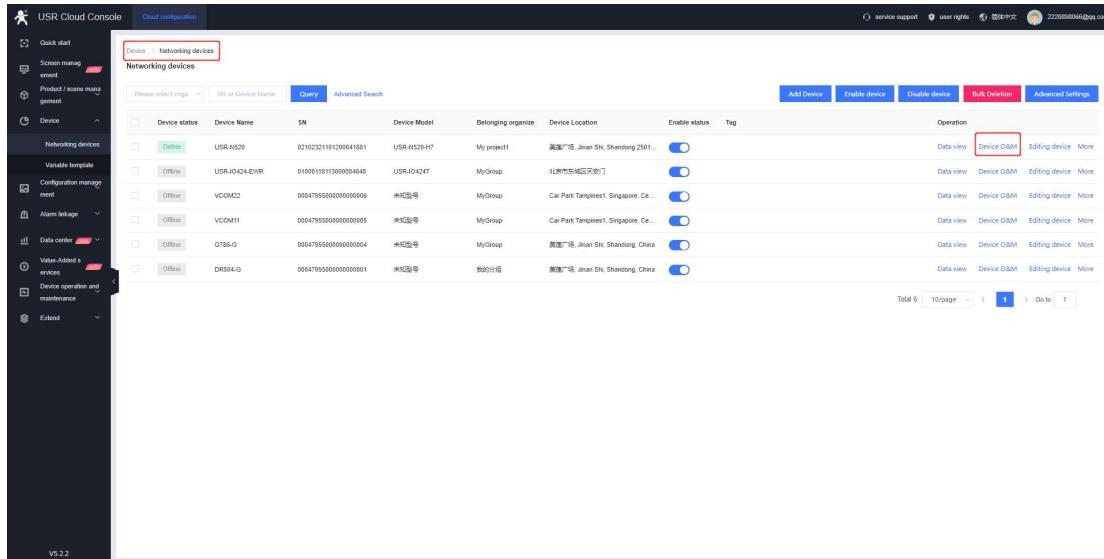


3. Device Remote Configuration via Cloud

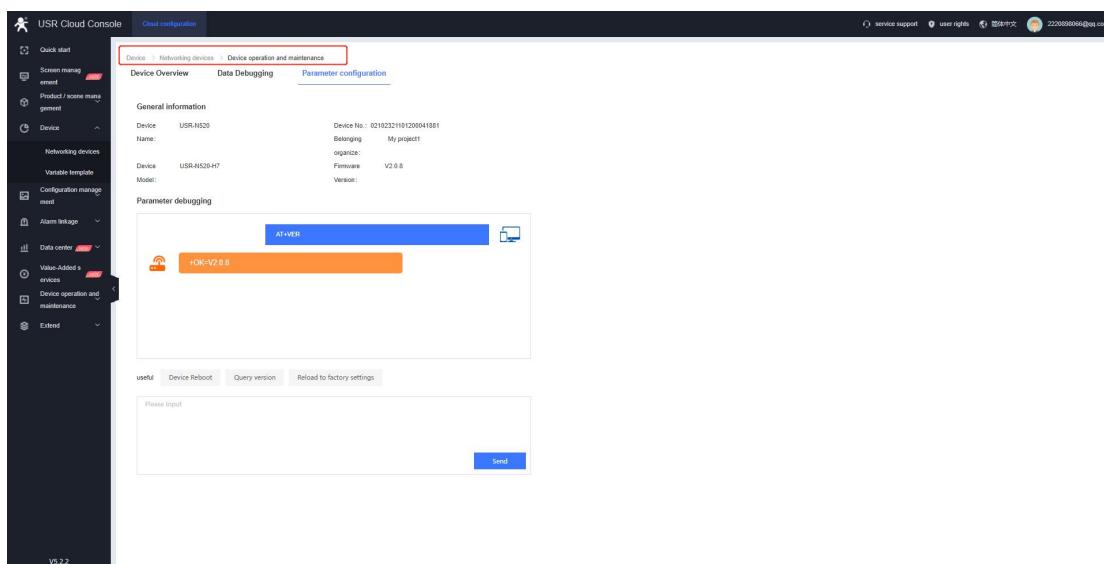
Remote configuration function is for our USR-N5X0 serial device server.

3.1. AT Commands Configuration

In **Device--Network devices**, click **Device O&M--Parameter Configuration**. In this interface, we can directly send AT commands to the serial device server to query or configure parameters. Do not need to add "Enter" after the commands, but only one command can be sent once.



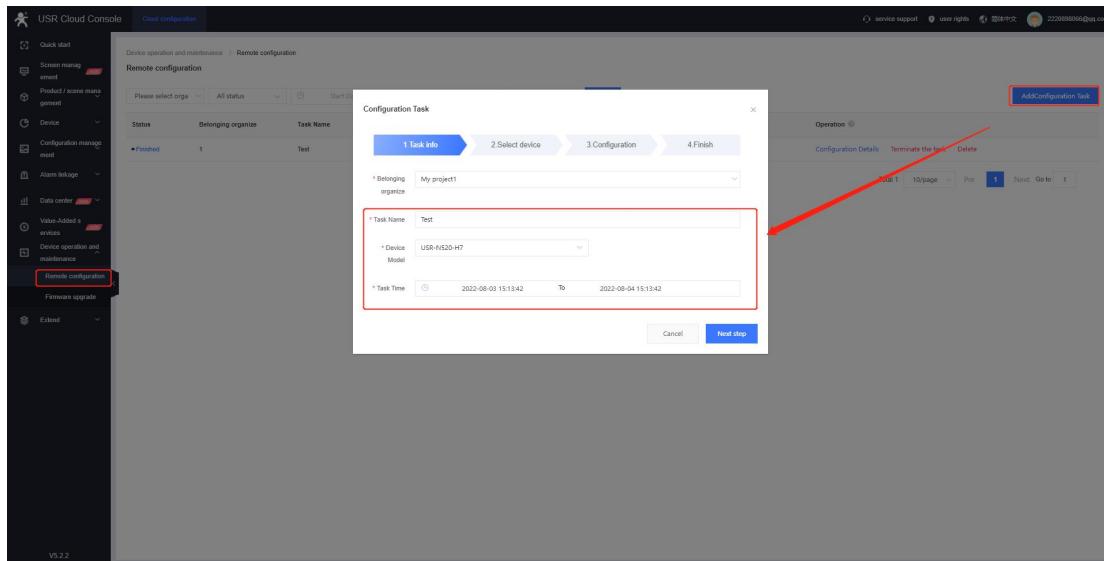
V5.2.2



V5.2.2

3.2. Remote Configuration Tasks

In **Device operation and maintenance--Remote configuration**, click to add the new configuration task, configure the **Task name**, **Device model** and **Task time**, the device will be configured at the set time.



USR Cloud Console

Device operation and maintenance > Remote configuration

Remote configuration

Please select orga: All status Start Date:

Status	Belonging organize	Task Name
Finished	1	Test

Configuration Task

1 Task info 2 Select device 3 Configuration 4 Finish

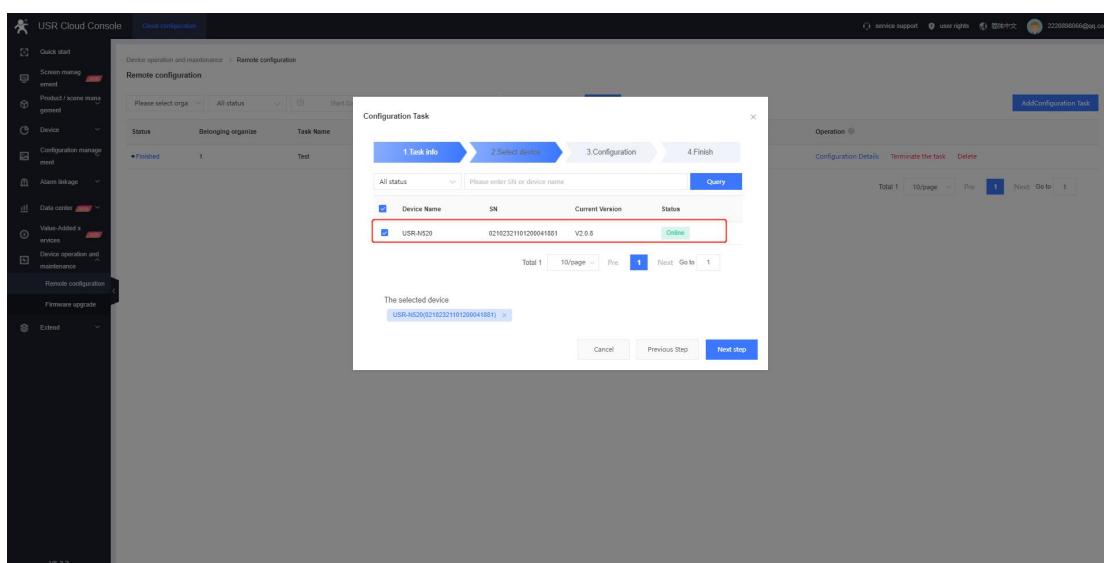
* Belonging organize: My project1

* Task Name: Test

* Device Model: USR-N520-H7

* Task Time: 2022-08-03 15:13:42 To: 2022-08-04 15:13:42

Add Configuration Task



USR Cloud Console

Device operation and maintenance > Remote configuration

Remote configuration

Please select orga: All status Start Date:

Status	Belonging organize	Task Name
Finished	1	Test

Configuration Task

1 Task info 2 Select device 3 Configuration 4 Finish

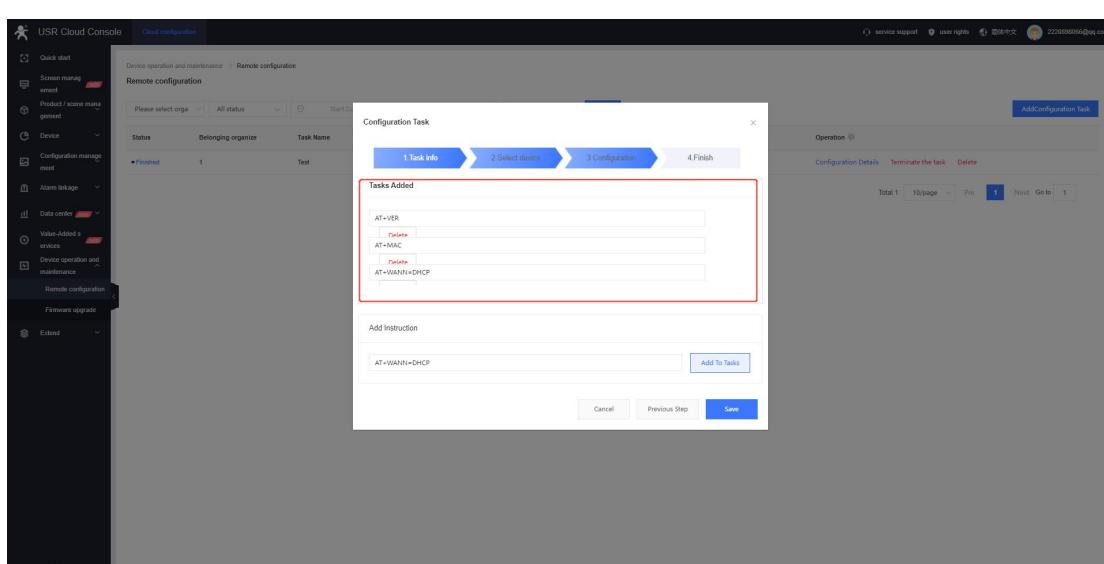
All status Please enter SN or device name Query

Device Name	SN	Current Version	Status
USR-N520	0210231191200041881	V2.0.5	Online

Total 1 10/page Pre 1 Next Go to 1

The selected device: USR-N520(0210231191200041881) <

Cancel Previous Step Next Step Next



USR Cloud Console

Device operation and maintenance > Remote configuration

Remote configuration

Please select orga: All status Start Date:

Status	Belonging organize	Task Name
Finished	1	Test

Configuration Task

1 Task info 2 Select device 3 Configuration 4 Finish

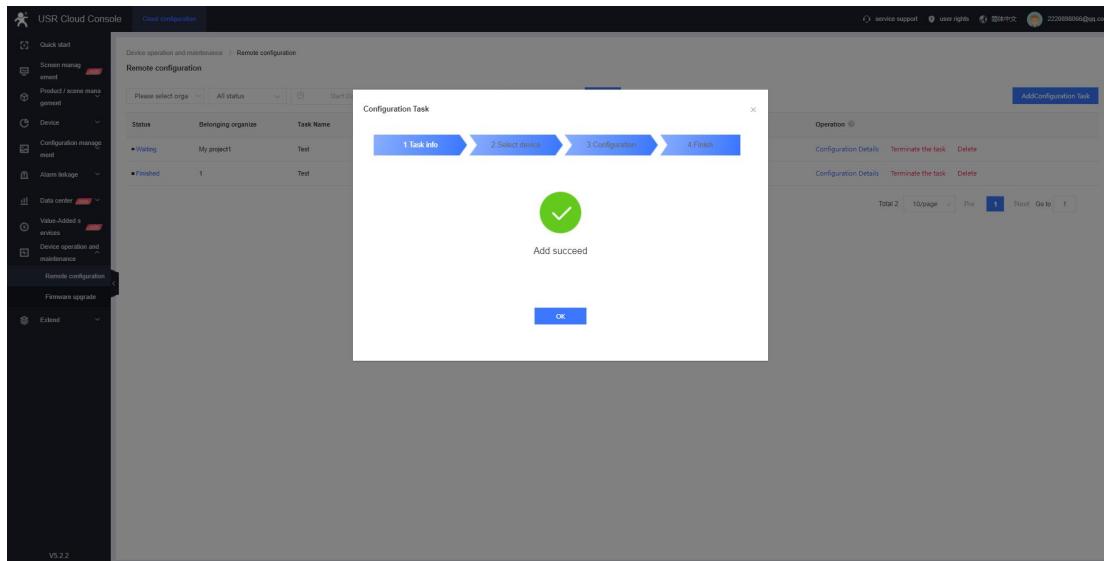
Tasks Added

- AT+VER
- AT+CIPSRV
- AT+CIPMAC
- AT+WANIN+DHCP

Add Instruction

AT+WANIN+DHCP Add To Tasks

Cancel Previous Step Save



4. Map the Remote Port to Local Virtual Port

4.1. Preparation

- (1) USR-N520 *1
- (2) RS485 serial to USB cable *1
- (3) Ethernet cable *1
- (4) 12V/1A power adaptor *1
- (5) Serial tool, you can also download our company's USR-TCP232-Test software from this link:
https://www.pusr.com/Support/download_hits.html?id=304

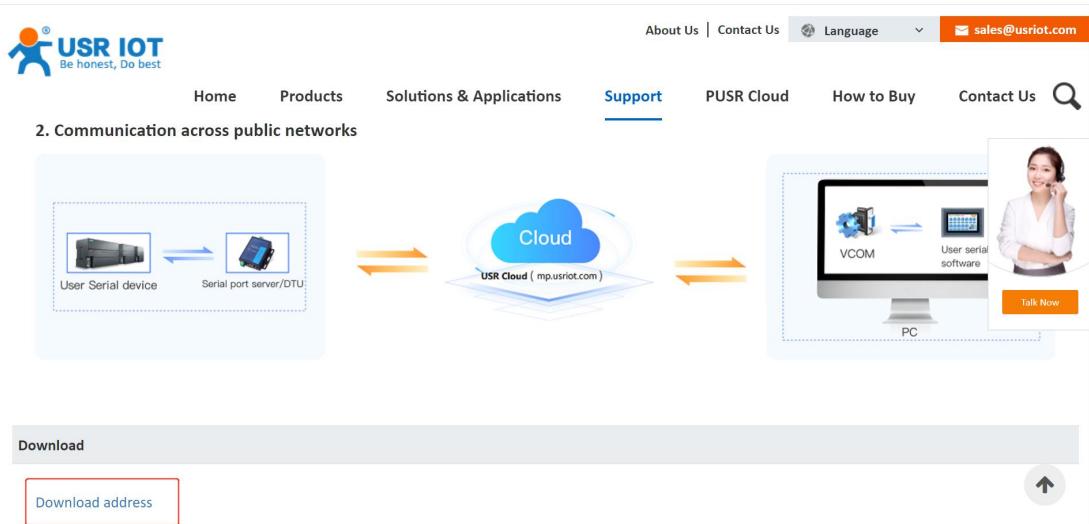
Note: Currently our VCOM software only supports single port data transmission (default to port 1), multiple ports VCOM software will be released in the future.

4.2. Download VCOM Software

Please download our latest version VCOM software from this link:

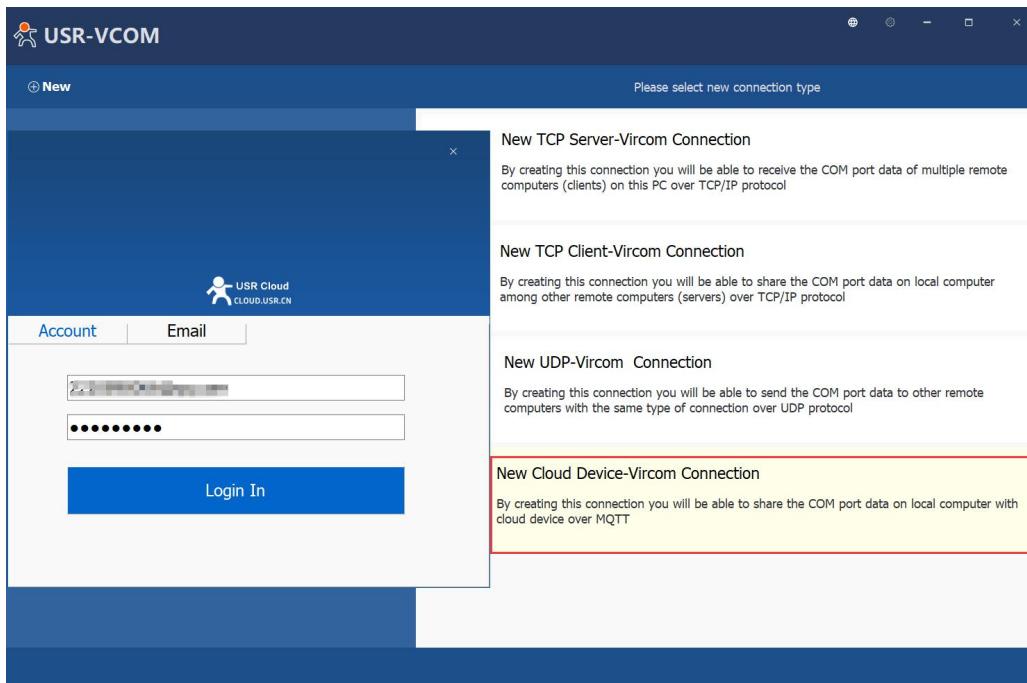
https://www.pusr.com/Support/download_hits.html?id=291

Note: Please disable the firewall and anti-virus software before installing.



4.3. New Cloud Device-VCOM Connection

Click **New Cloud Device-Vircom Connection**, fill in the username and password of your USR Cloud account to login.



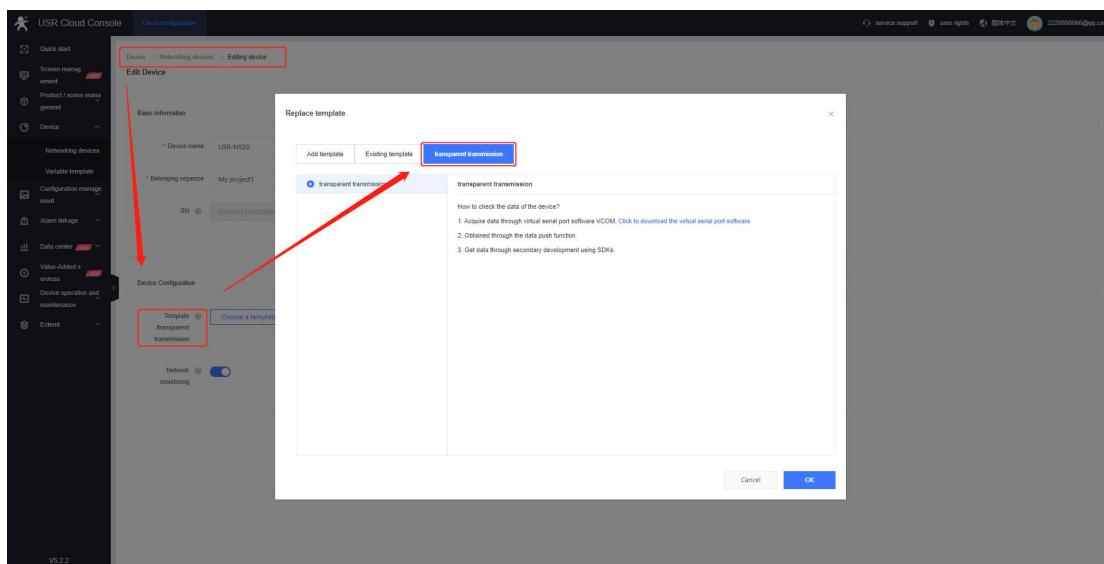
4.4. UDP Transparent Transmission

Data coming from network can be transparently transmitted to the serial port of the device(default to port 1).



4.4.1. Variable Template

In **Device--Network devices**, click to edit the device, change the device template to **Transparent transmission**.



4.4.2. VCOM Software Configuration

1. Click to add a new virtual com port, choose a com port number, select the device that needs to be communicated with.

USR-VCOM

[⊕ New](#)

New Cloud Device-Vicom Connection

Connection name :

Select Serial Port :

Strict baudrate emulation

Synchronize baudrate(RFC2217 similar)

与单个设备通讯 与一组设备通讯

Select a device :

02102321101200041881 | USR-N520
 0100011813000004648 | USR-Io424-EWR
 0004795500000000006 | VCOM22
 0004795500000000005 | VCOM11
 0004795500000000004 | G786-G
 0004795500000000001 | DR504-G

[⊗ Cancel](#) [⊕ New](#)

USR-VCOM

[⊕ New](#)

Info of Cloud device connection : CloudDev COM11

CloudDev COM11

- COM11
- Cloud:02102321101200041881 Online

COM port information

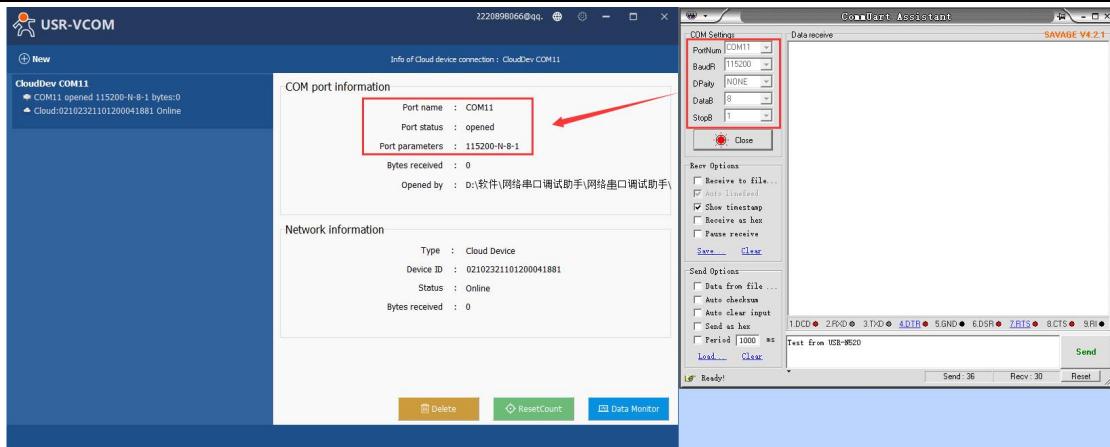
Port name :	COM11
Port status :	closed
Port parameters :	---
Bytes received :	0
Opened by :	

Network information

Type :	Cloud Device
Device ID :	02102321101200041881
Status :	Online
Bytes received :	0

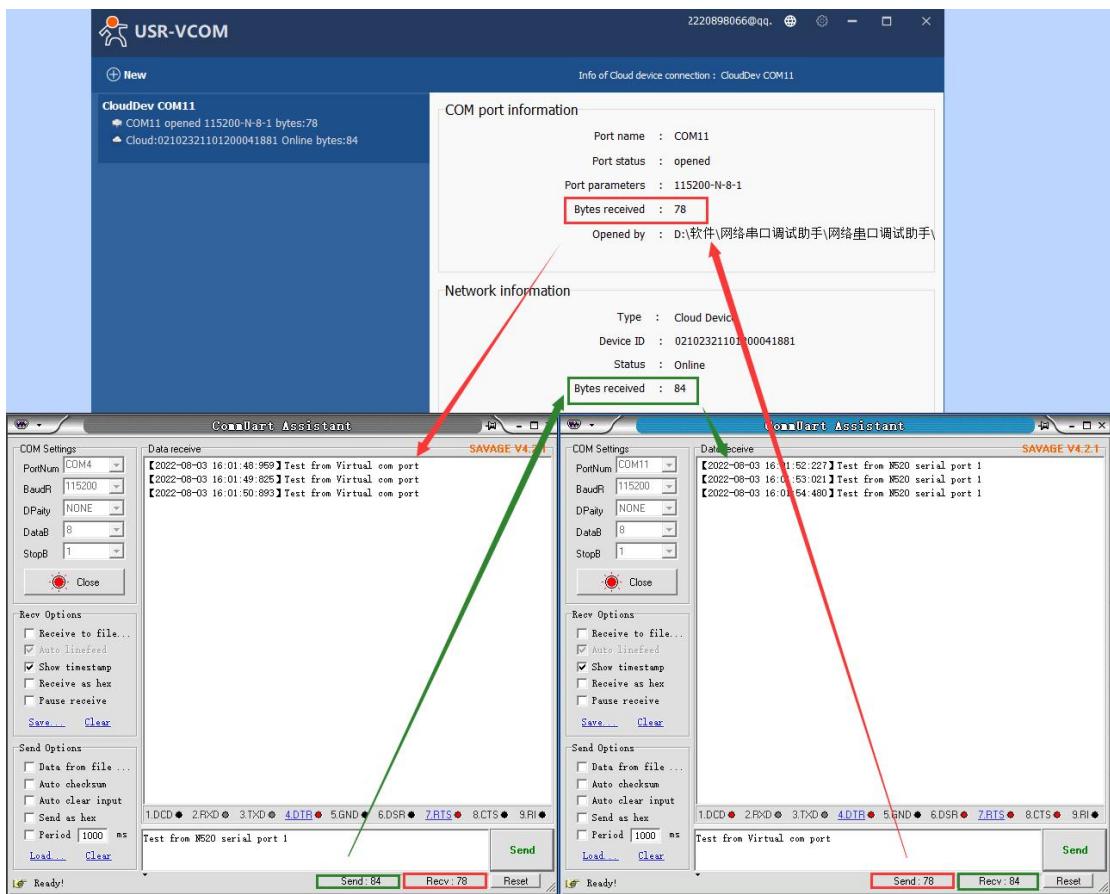
[Data Monitor](#) [Delete](#) [ResetCount](#)

- Open this virtual com port in a serial tool.



4.4.3. Data Transmission Test

Connect the serial port of USR-N520 to the computer via RS485 to USB cable, open this serial port in the second serial tool. They can communicate with each other like below:

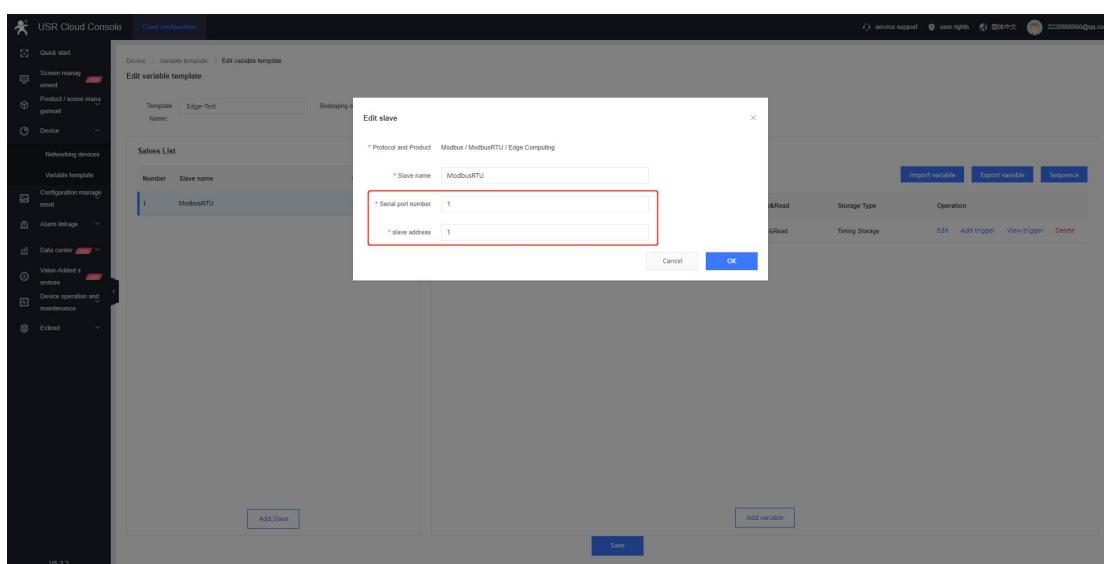
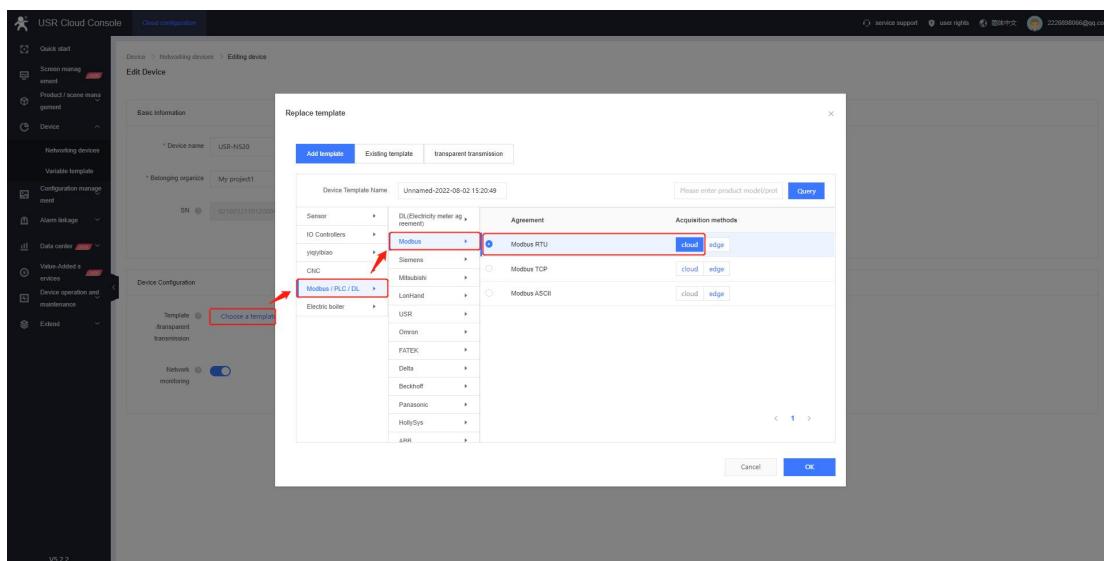


4.5. Exclusive Transparent Transmission

When the **networking devices bound to serial variable template**, we can set the VCOM software to exclusive mode. In this mode, the cloud polling and edge computing data transmission all will be stopped and so that users can upgrade firmware for their serial devices and so on.

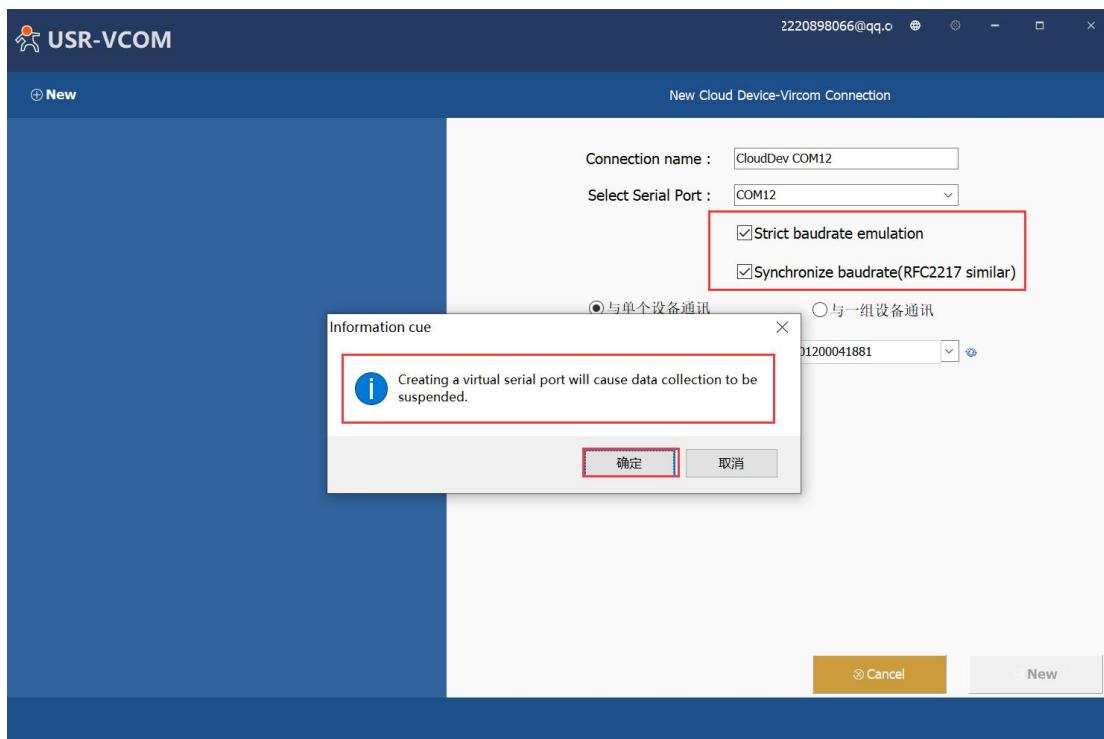
4.5.1. Variable Template

Variable template needs to be changed to Modbus RTU cloud or Modbus RTU edge. The slave in variable template needs to be bound to the serial port number.



4.5.2. VCOM Software Configuration

Enter exclusive mode: Create a new virtual com port, choose the device that need to communicate with.



4.5.3. Data Transmission Test

In exclusive mode, the cloud polling and edge computing Modbus data cannot be sent to the serial port of USR-N520 device. It can only achieve the data transmission between the VCOM and serial port 1 of N520 device. Delete this VCOM will recover the previous Modbus communication.

