SINAPACK 200 PLC SINAPACK 200
User Manual

This manual applies to the following models, and the corresponding networks supported by the models are listed in the table below:

Model	Network
SINAPACK 200	WIFI and WAN cable networks, use WAN by default

Table of Contents

1. Product Introduction

This chapter mainly introduces the outlook, accessories, dimension, specifications and mechanism of SINAPACK 200.

1. Brief Introduction
2. Product Outlook
3. Accessories
4. Dimension
5. Working Mechanism
6. Specifications
7. Typical Usecases

1.1 Brief Introduction

SINAPACK 200 is an industrially designed product, and is especially used with PLCs. SINAPACK 200 provides program download and data acquisition functionalities for PLCs that have RJ-45 Ethernet interface, or RS232/RS485 serial interfaces. It supports PLCs from Siemens, Mitsubishi, Omron, Panasonic, Delta, Fatek, etc. SINAPACK 200 connects with WIFI/WAN network, and with PLC programming tools or SCADA software to implement remote program download and data acquisition.

SINAPACK 200 is an enhanced version of PLC-505. Compared with PLC-505, its panel is more compact, and has stand-up shape in response to customers' request that can massively save installation space.

SINAPACK 200 has two RJ-45 Ethernet interfaces, one of which (LAN1) can be used as WAN as well, one RS232 and one RS485 serial interfaces. Ethernet interfaces and serial interfaces can be used at the same time.

SINAPACK 200 has WIFI functionality, and supports 802.11b/g/n protocol. In theory the highest speed can be 150Mbps. Mobile phones, PCs or other devices that have WIFI functionality can bind SINAPACK 200's WIFI access point and share Internet access via SINAPACK 200.

This greatly extends the number of devices that can connect with SINAPACK 200 at the same time.

SINAPACK 200 can use WAN or WIFI network: in case cable network is available, WAN (LAN1) port can be used to access cable network; and in case WIFI is available, SINAPACK 200 can be configured to access internet via WIFI. WAN and WIFI are all supported by SINAPACK 200, this greatly facilitates customer's project deployment that customers do not have to choose different devices from different suppliers because of different network access at the spot. This can not only save procurement cost, but also reduce maintenance effort for the projects.

SINAPACK 200 is easy to use, and is plug-n-play without any configuration. Together with eTung's eYun platform and Virhub/Vircom software, it can be easy to integrate with PLC programming software, and there is no extra integration effort. SINAPACK 200 is stable and easy-to-use, thus greatly facilitates project deployment.

1.2 Product Outlook

Figure 1-1: SINAPACK 200 whole view

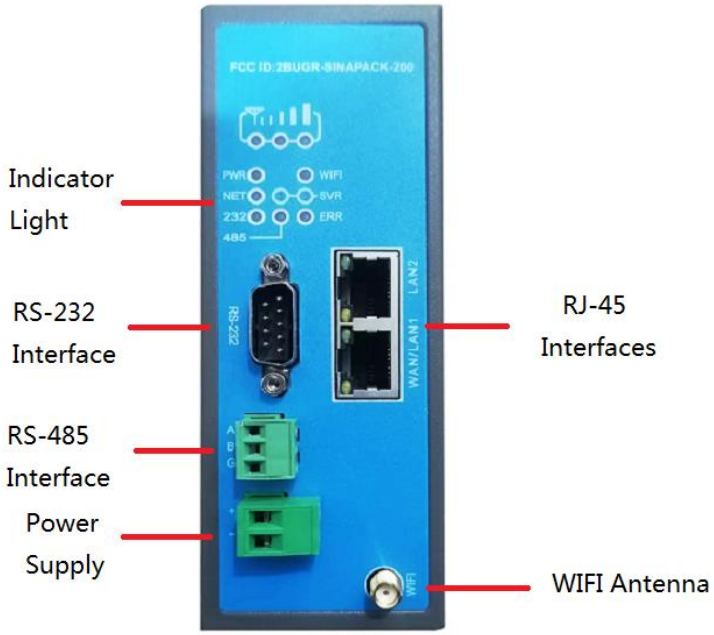


Figure 1-2: SINAPACK 200 panel view

1.3 Standard Accessories

Figure 1-3: WIFI dual-frequency antenna

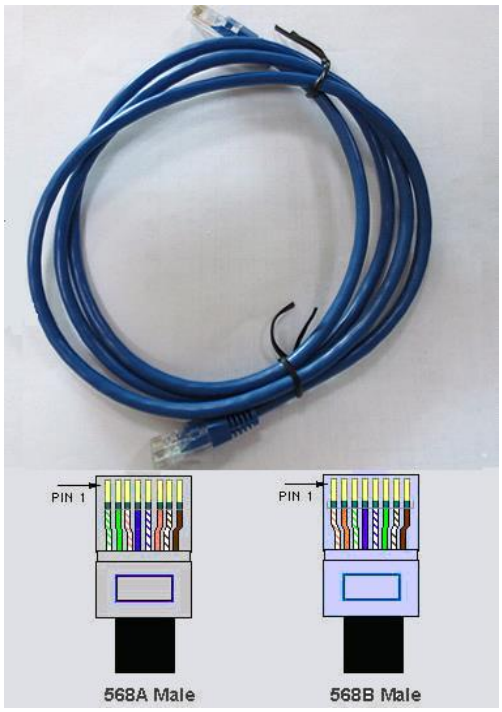


Figure 1-4: Cross cable

NOTE: The accessories may be different because of different models and customer requirements, the figures above are just for reference.

1.4 Dimension

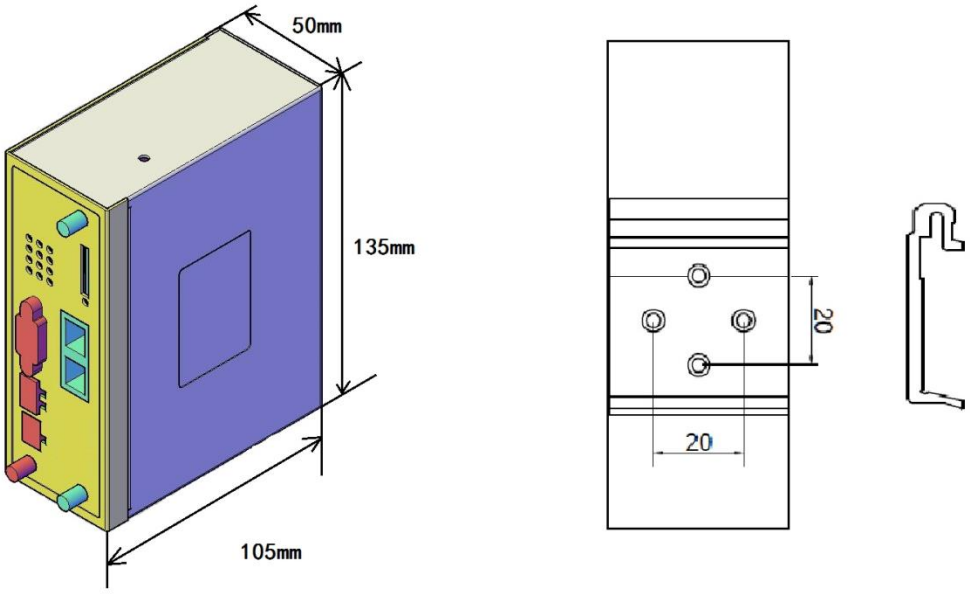


Figure 1-5: SINAPACK 200 dimension

1.5 Working Mechanism

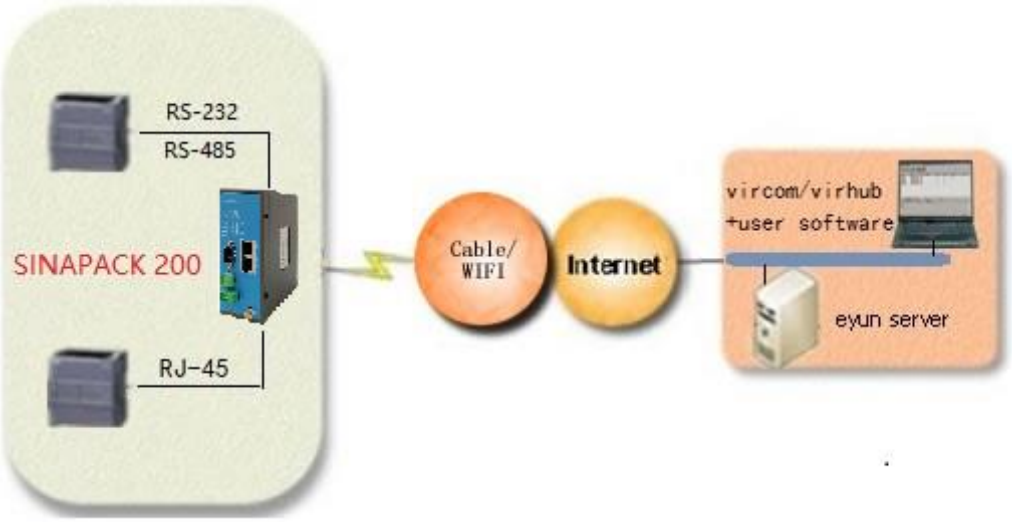


Figure 1-6: SINAPACK 200 working mechanism

SINAPACK 200 has RJ45 Ethernet interface and RS232/RS485 serial interface, so it can connect with PLCs that have Ethernet interface or serial interface, and Ethernet and serial interfaces can be used at the same time.

1. **Usage of Ethernet interface**
   SINAPACK 200 connects with PLC via Ethernet cross cable, and after power on, it connects into Internet via Cable/WIFI network, then establishes connection with mServer. At the same time Virhub software is run at the host computer and connects to mServer as well. Then with Virhub functionality PLC and the host computer are in the same virtual LAN, and user software at the host computer can then access PLC, to download or update program.

2. **Usage of serial interface**

SINAPACK 200 connects PLC with RS232 (or RS485) serial port. After power on it connects into Internet via Cable/WIFI network, then establishes connection with mServer. At the same time Vircom is run at the host computer and connects to mServer as well, then user software at the host computer can use the virtual serial port from Vircom to implement bi-directional communication with PLC, thus perform remote control and program update.

1.6 Specifications

1.6.1 Technical Parameters

- Basic Parameters
  - Power Supply: +12 ~ +48V wide range of voltage input
  - Power Connector: terminal
  - Max Current: 350mA@+12V DC
  - Standby Current: 250mA@+12V DC
  - Network & Frequency:
    WIFI IEEE 802.11n/g/b: 2.4G
    WAN
  - Data Interface: RS232/RS485, two RJ45 Ethernet interfaces
  - Working current: 250 mA@+12V DC
  - Standby current: 200 mA@+12V DC
  - Temperature: -30ºC ~ +80ºC
  - Humidity: 95%@+40ºC
  - Dimension: 105*50*135mm (excluding antenna and handle)
  - Weight: 600g

- Basic Functions
  - Support NAT
  - Support DHCP server
  - Support DNS Proxy
  - Support port forwarding
  - Support DMZ host(IP address mapping)
  - Support configuring static route table
  - Support real-time speed display of wireless network
  - Support configuring with serial port, telnet and web interface
  - Support serial port DTU function, Ethernet and serial interfaces can be used at the same time
  - Support agent client

1.6.2 Indicator Light Description

LED Indicato	Color	Status	Description

r Light			
Signal lights	Orange	Always light	There are three signal lights. All lights one means the signal is strongest.
PWR	Red	Always light	Device is working
		Extinguished	Device is not working
WIFI	Green	Always light	WIFI is enabled
		Extinguished	WIFI is not enabled
NET	Green	Always light	Connected to Internet
		Extinguished	No connection to Internet
SVR1	Green	Always light	DTU has connected to data center
		Extinguished	DTU does not connect to data center
SVR2	Green	Always light	Connection to mServer is established.
		Extinguished	Connection to mServer is not established.
232	Green	Flashing	Receive data from RS232 interface
		Extinguished	No data received from RS232 interface
485	Green	Flashing	Receive data from RS485 interface
		Extinguished	No data received from RS485 interface
ERR	Red	Extinguished	Reserved

Table 1-1 SINAPACK 200 indicator light description

1.6.3 Serial Port Definition

Type	**RS-232**		
Pin	2	3	5
Definition	**RXD**	**TXD**	**GND**

Table 1-2: SINAPACK 200 RS232 serial port (Standard RS-232 DB9 male port) pin definition

Type	**RS-485**		
Pin	A	B	G
Definition	**A**	**B**	**GND**

Table 1-3: SINAPACK 200 RS485 serial port pin definition

1.6.4 RESET Button

To reset SINAPACK 200 to default, login its configuration web page, and choose “System tools” -> “Restore set”; Or: press the RESET button continuously, the signal lights will flash one by one, until all lights are on, that means the reset is finished.

Figure 1-7: SINAPACK 200 reset button

1.7 Typical Usecases

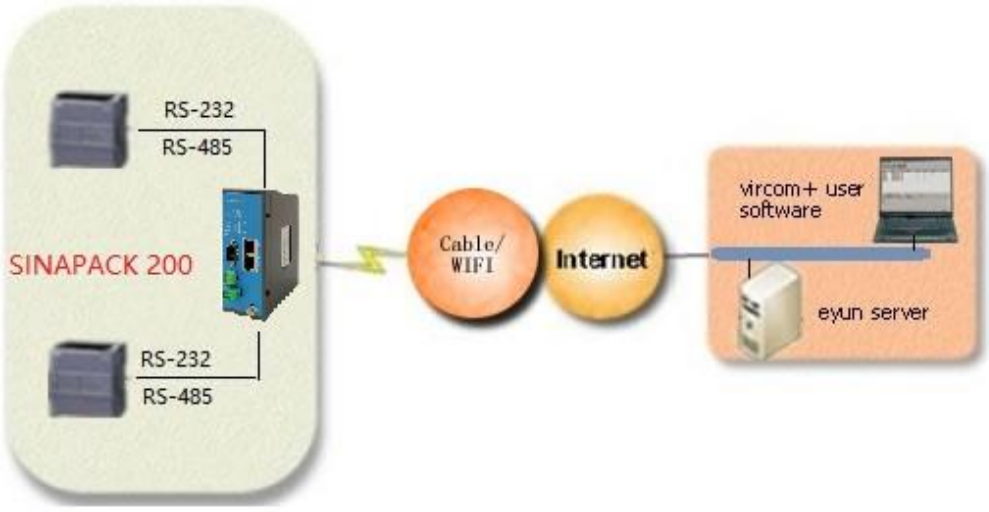


Figure 1-8: Implement PLC remote monitoring and program update via

SINAPACK 200's serial functionality

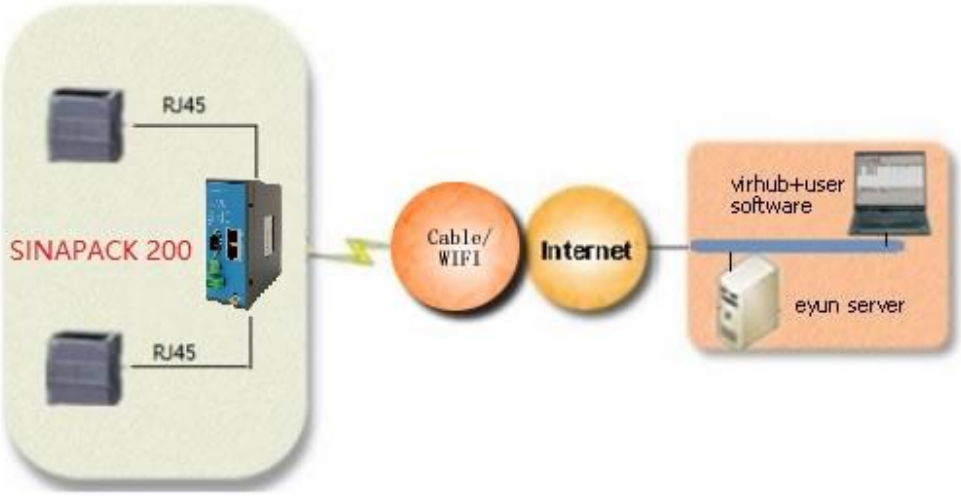


Figure 1-9: Implement PLC remote monitoring and program update via SINAPACK 200's virhub functionality

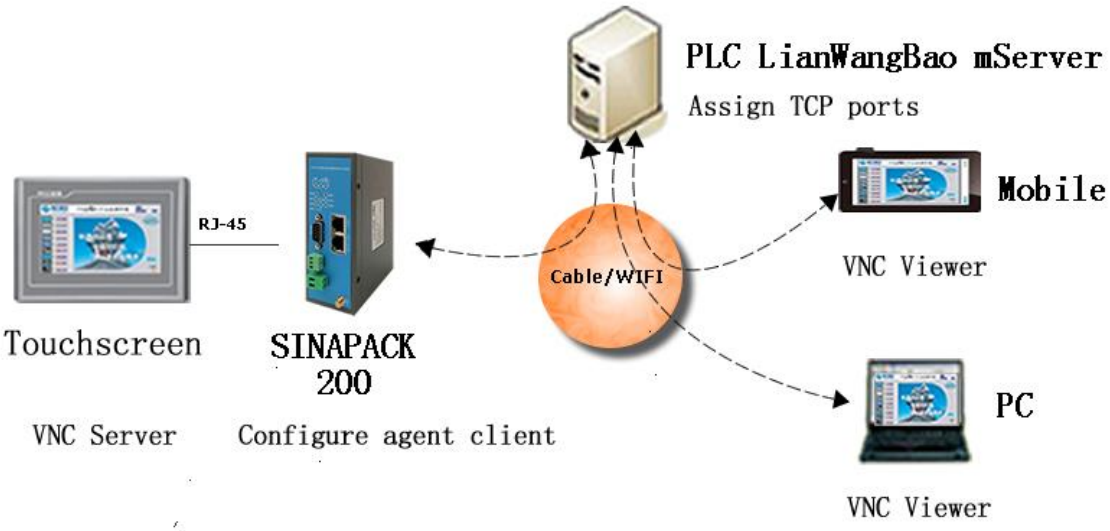


Figure 1-10: Implement remote control of touchscreen desktop via SINAPACK 200's agent client functionality and VNC software

2. Device Configurations

This chapter introduces how to use SINAPACK 200 and related parameters.

1. Configurations
2. Parameters
3. Restore to default
4. Firmware Update
5. Remote Configurations

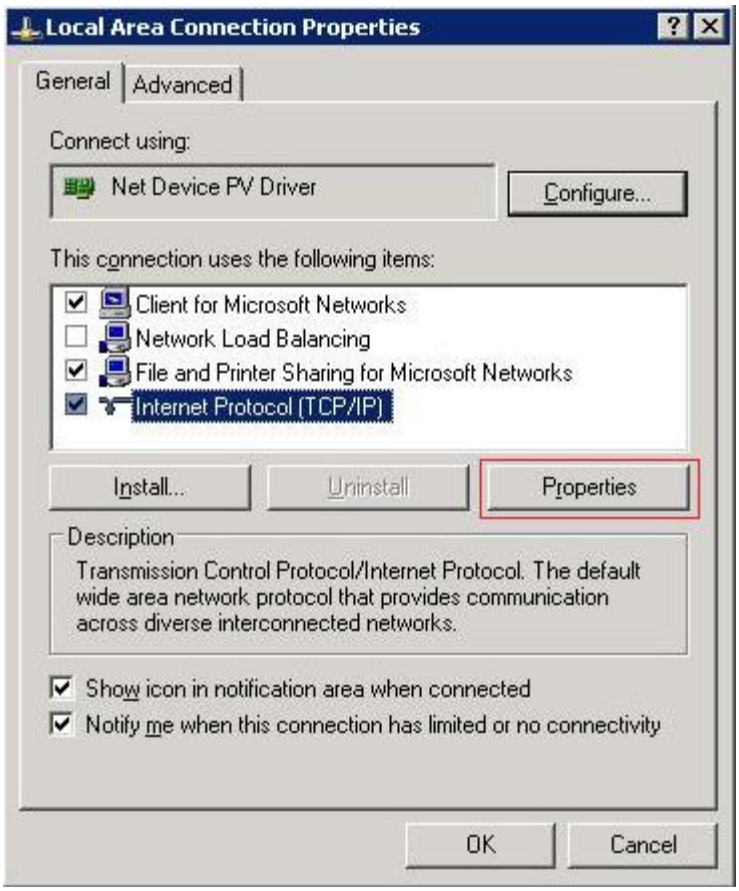
2.1 Configurations

2.1.1 Preparation

- ✧ One cross Ethernet cable used to connect SINAPACK 200 with PC or customer device;
- ✧ One power supply.

2.1.2 Configuring SINAPACK 200

- ✧ Connect SINAPACK 200’s LAN(LAN2) with PC via a cross Ethernet cable;
- ✧ Boot PC, and set IP address as "Automatically obtain IP address";


Local Area Connection Properties
General
Advanced
Connect using:
Net Device PV Driver
Configure...
This connection uses the following items:
Client for Microsoft Networks
Network Load Balancing
File and Printer Sharing for Microsoft Networks
Internet Protocol (TCP/IP)
Install...
Uninstall
Properties
Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.
Show icon in notification area when connected
Notify me when this connection has limited or no connectivity
OK
Cancel

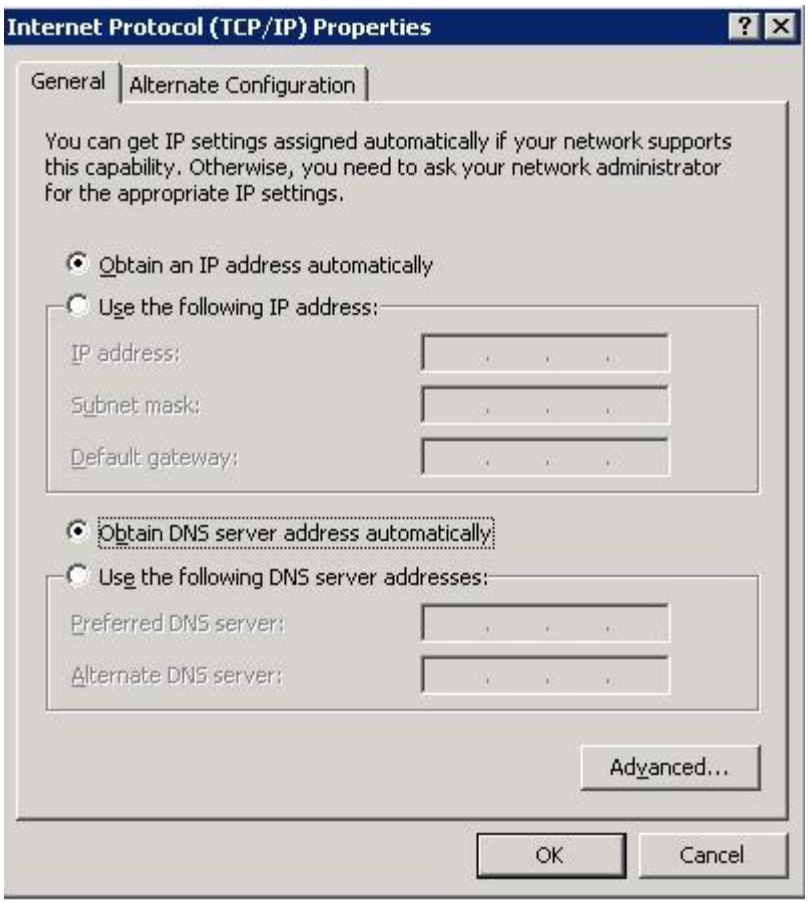


Figure 2-1: Set IP address as "Automatically obtain IP address"

- ✧ Open IE browser, input address "http://192.168.10.1" and press Enter;
- ✧ Input "root" as username and "1234" as password, then press Enter to login web configuration interface and configure the device.

Figure 2-2: Login router configuration interface

- ✧ It is clear to see each configuration item in the router configuration interface. To change some parameter, click it, modify and then save it, then reboot the router.

  Below shows SINAPACK 200's current status, including: product ID, version, running time, current time, CPU usage, memory usage, status, model and model manufacturer, WAN/LAN connection status, current status, network, network speed, and signal, etc.

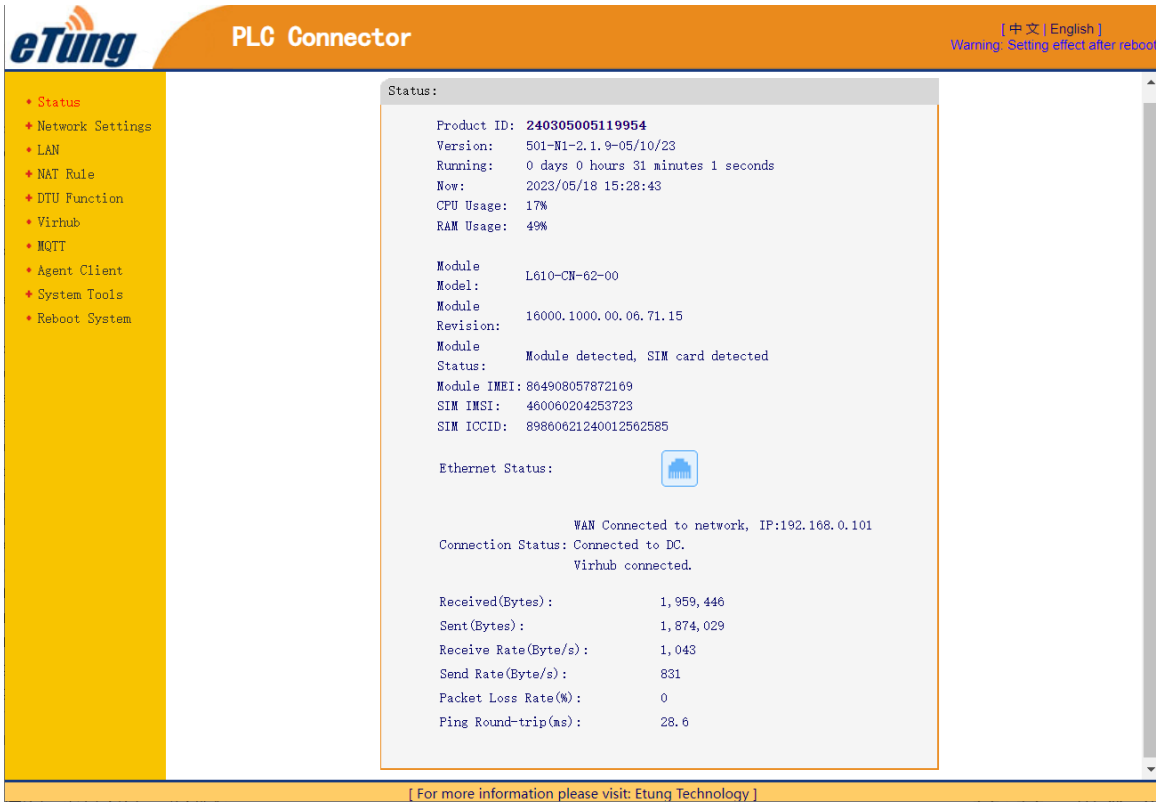
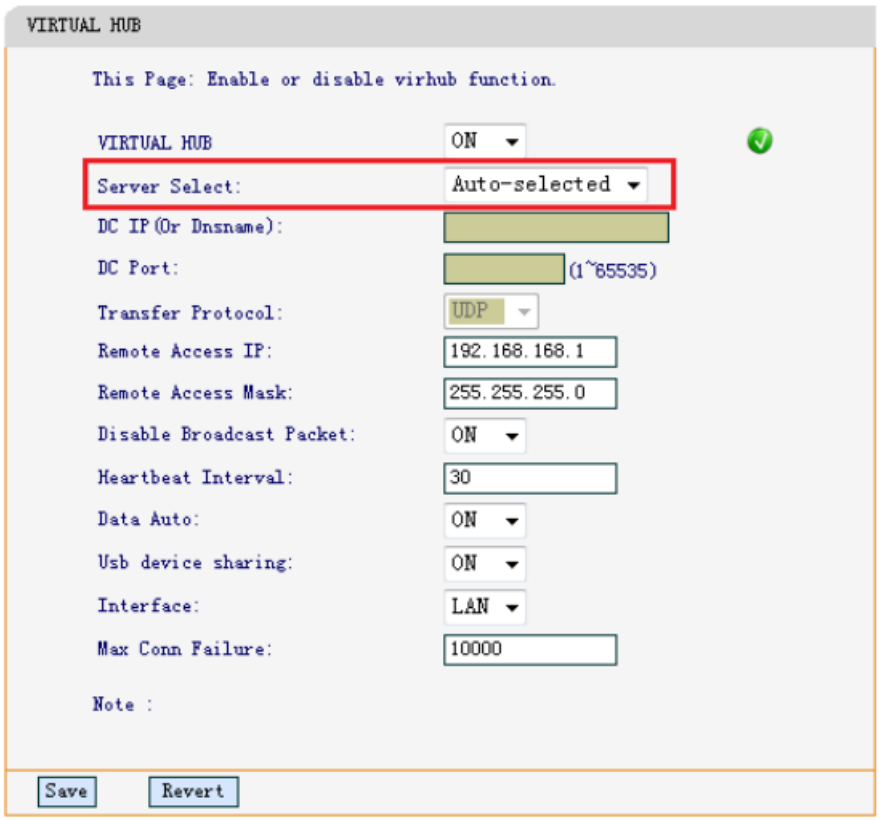


Figure 2-3: Current Status

To use virhub functionality, click "Virhub", virhub functionality is enabled by default; server is set to auto-selected by default that means SINAPACK 200 will automatically choose the server that is near it and has lowest network delay.



Server can also be set manually, as shown in the figure below, Server is set to “Self-defined”, and then input server domain/IP and port accordingly.

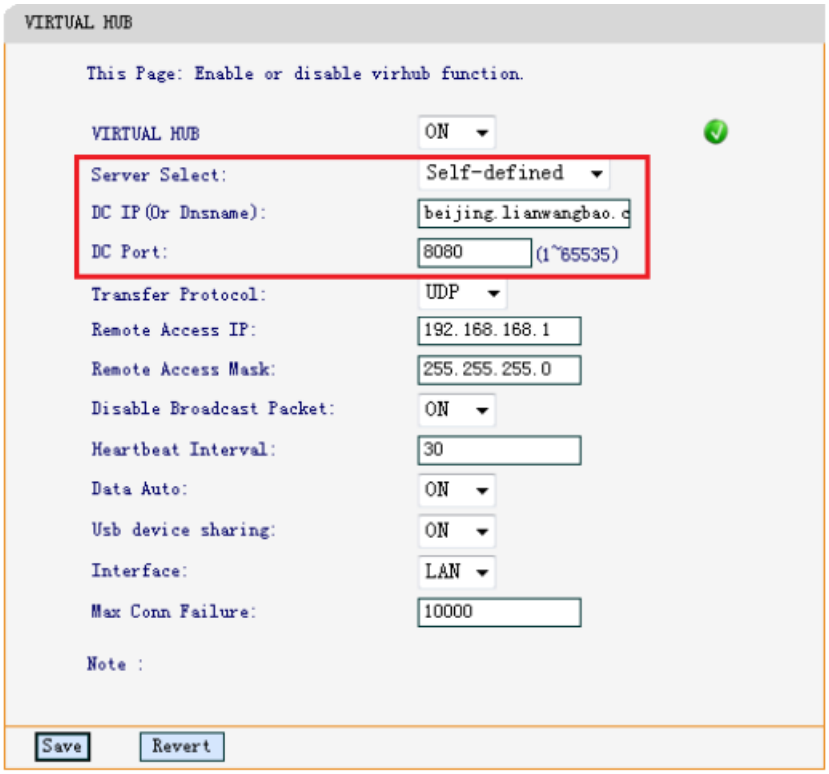
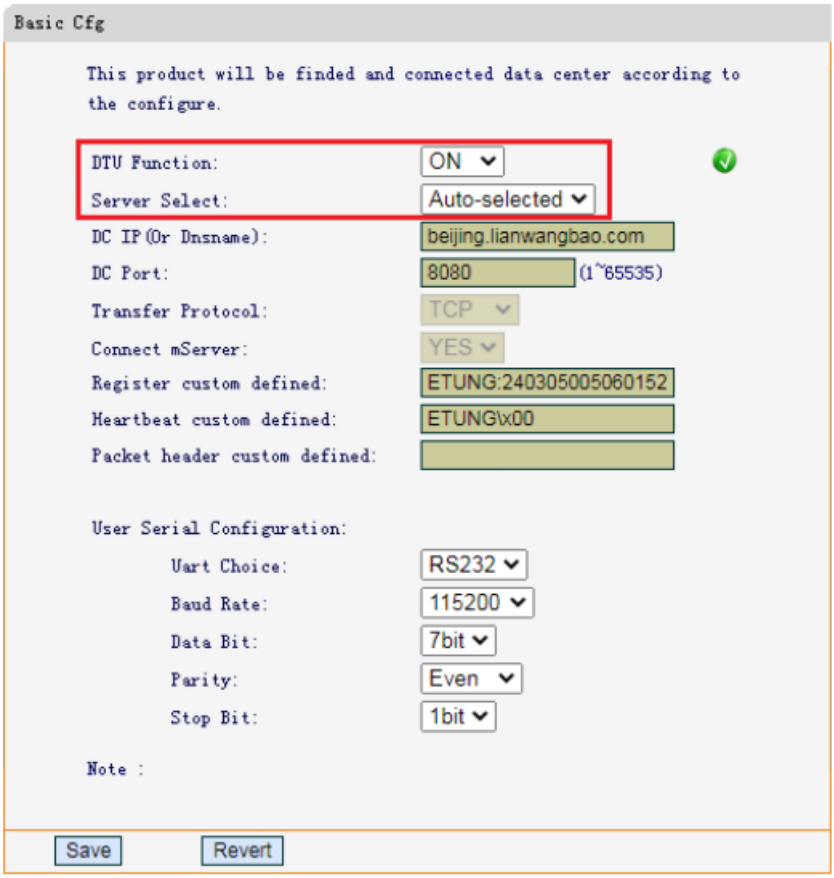


Figure 2-4: Configure virhub functionality

To use DTU functionality, click “DTU Function” -> “Basic Cfg”. DTU function is enabled by default; server is set to auto-selected by default that means SINAPACK 200 will automatically choose the server that is near it and has lowest network delay.



Server can also be set manually, as shown in the figure below, Server is set to "Self-defined", and then input server domain/IP and port accordingly.

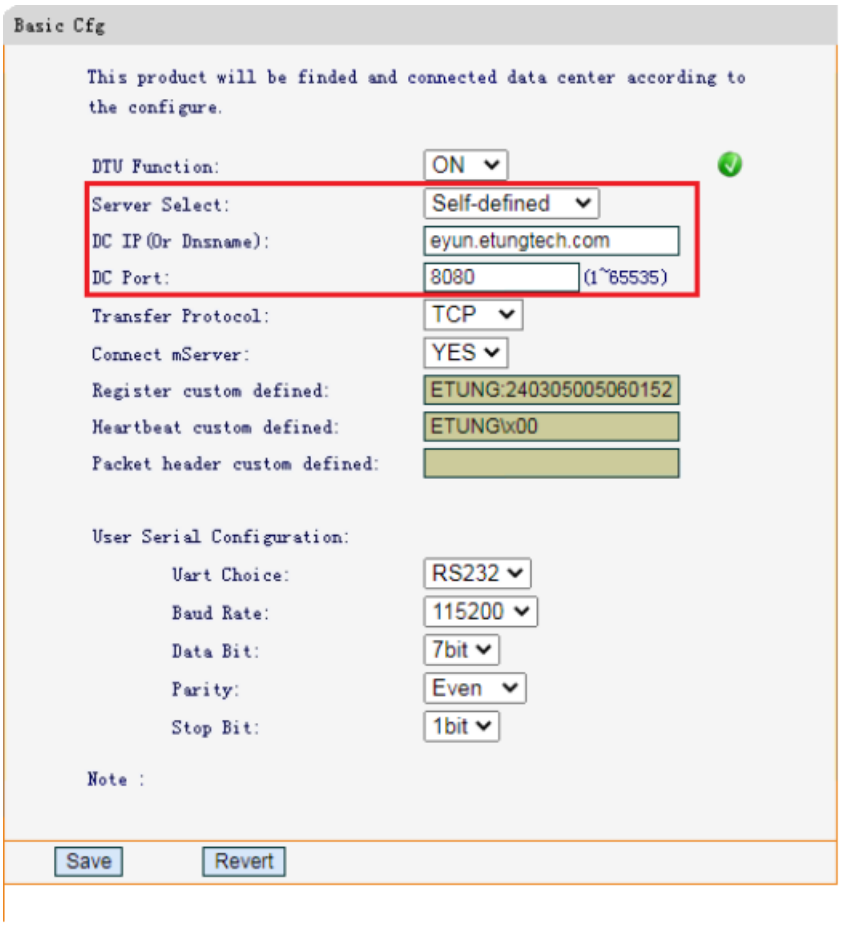


Figure 2-5: Configure DTU functionality

SINAPACK 200 has one RS232 and one RS485 serial port, choose either serial port to use in “UART Choice”:

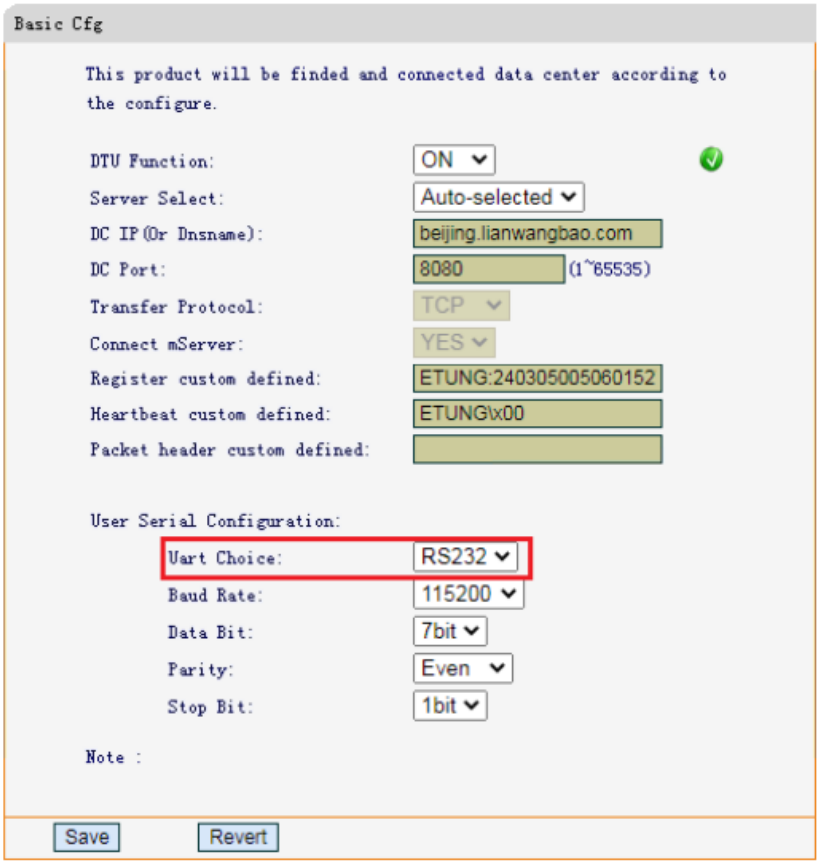


Figure 2-6: Choose serial port

In case that SINAPACK 200 is used together with VNC software to perform remote access, agent client functionality is used. To configure agent client functionality, click “Agent Client”, set mServer (plc.SINAPACK 200.com) DN and port (8080), the default values are eTung mServer DN and port, normally keep the default values, unless users build its own mServer. Then configure device information, set device IP (for example, 192.168.10.20) and port (for example, 5900), and tick “Enable”, then click Save and reboot SINAPACK 200.

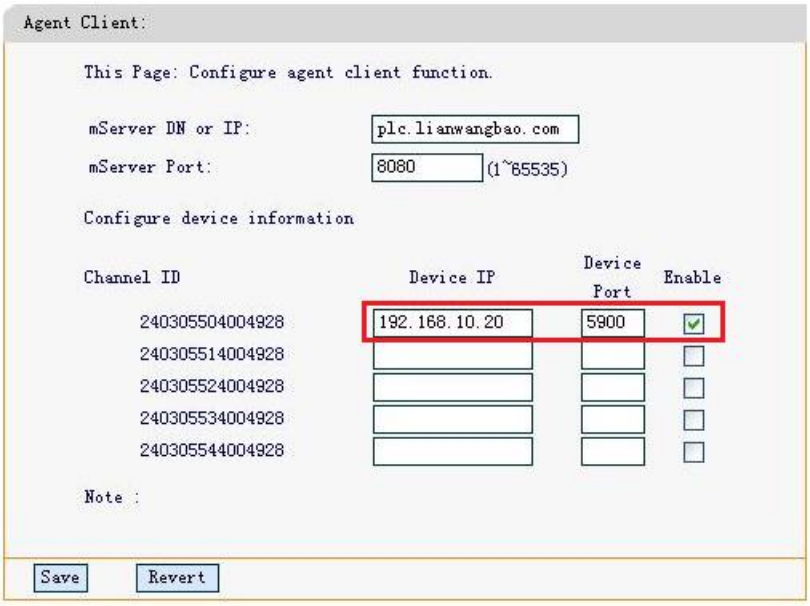


Figure 2-7: Configure agent client functionality

It is possible to configure multiple lines in agent client configuration, each line corresponds to a channel, and at most 5 channels are supported. Each channel has a 15-byte channel ID. The channel ID is derived from SINAPACK 200's IMEI. For example, SINAPACK 200's IMEI is 240305001234567, then the agent clients' channel ID is 2403055X1234567, and X can be 0~4, to represent one of the five channels. For example, set two channels as shown in the figure below:

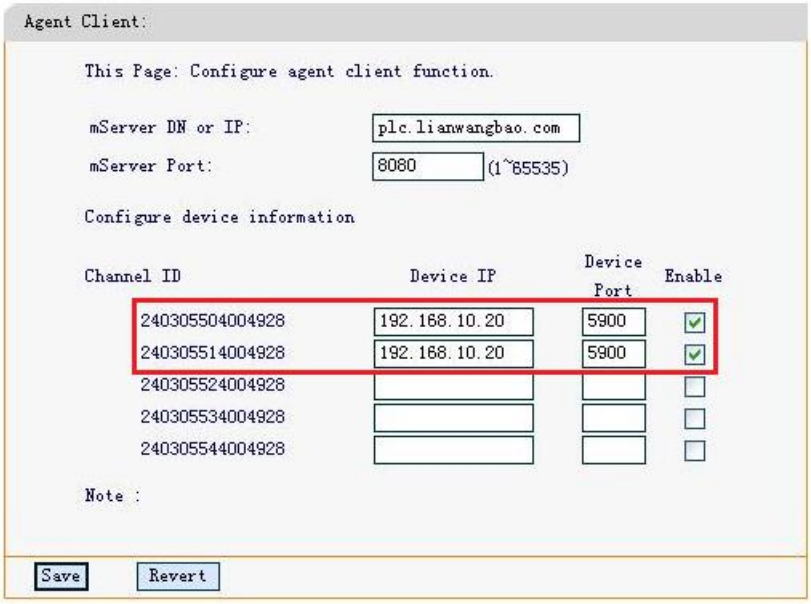


Figure 2-8: Configure multiple channels in agent client functionality

2.2 Configuration Parameters

Each configuration menu has multiple parameters, and some of them have sub-menus. Details are described below.

Configuration Menu Item		Description
Current status		Show device information, connection and data transfer status.
Network Settings	Network Select	Configure to use cable network (WAN) or WIFI, set ICMP host, and whether to allow external access.
	WAN	Configure WAN interface, WAN is enabled by default.
	WIFI client	Configure WIFI parameters. Once WIFI is enabled, WAN will be disabled.
LAN		Set inner IP and DHCP
WIFI Hotspot		Configure WIFI hotspot parameters. WIFI hotspot and WIFI client cannot be used at the same time, to enable WIFI hotspot function, please disable WIFI client if it is enabled: set network to WAN in network settings.
Forwarding rules	NAT	Whether the device connected with router can access internet via NAT.
	Port forwarding	Use pre-defined port to forward data from internet to some inner IP's dedicated port.
	DMZ host	Forward data from internet directly to some inner IP.
Routing		Forward data to a pre-defined inner IP
DTU Function	Simple Cfg	Set data center address and serial port parameters, by default server is set to auto-selected, and there is no need to change.
	Advanced Cfg	Set advanced parameters, for example, frame size for data transmission, and timeout for data received from serial port.
	Link Management	Set heart beat parameters, normally with default values
Virhub		Set server address for Virhub function, "Auto-selected" by default that means it will automatically choose the server that is near it and has lowest network delay.

MQTT		Set MQTT version. There are two versions: Standard and General, and General by default.
Agent Client		Configure agent client. Configure mServer domain and port, the master device's IP ad port. Allow at most 5 agent clients.
System tools	System settings	Set router's communication parameters, normally with default values
	Show system log	Show router's connection and communication logs
	Show DTU log	Show router's data transfer logs with DTU function
	Restore to default	Restore to initial default settings with one key
	Update firmware	Update router's firmware
	Change password	Change password logging router(1234 by default)
Reboot		Reboot router

Table 2-1: Details of configuration parameters

2.3 Restore to Default

According to the description of "Configuring SINAPACK 200", after entering SINAPACK 200 configuration interface, select "System Tools" and then "Restore Set".

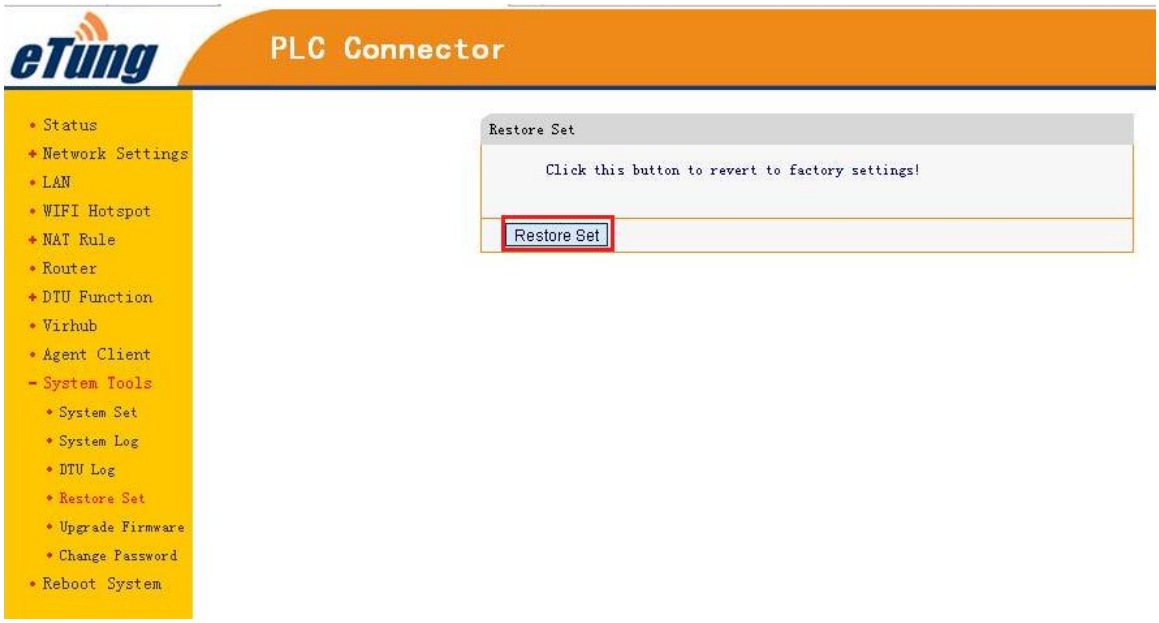


Figure 2-9: Restore to default

Or: press the RESET button continuously to reset it to default.

2.4 Firmware Update

- ✧ Ask eTung for firmware to update. The firmware (*.img) can be uploaded from local disk, or downloaded from a server from Internet.

✧ According to the description of "Configuring SINAPACK 200", connect SINAPACK 200 with PC via a cross Ethernet cable, open browser, input http://192.168.10.1 as URL, input username and password (by default username is root and password is 1234), and login router configuration webpage.

- ✧ Select "System tools" and then "Upgrade Firmware";
- ✧ If the firmware is on the local disk, click "Browse", select the file (.img) to update, and click "Open", then click "Upload/Download":

Figure 2-10: Upgrade firmware

✧ If the firmware can be downloaded from a server, input download URL (please ask eTung technical support for the URL), and click "Upload/Download":

Figure 2-11: Input URL and download firmware

✧ Wait for a moment, until "Update" is shown, choose "Delete the configuration" (delete all configurations), or "Only keep the network configuration" (delete all configurations except network configuration), then click "Update". It will prompt the file system has been updated, the original settings is clear, and the system is rebooting. Wait a moment and then refresh the webpage to see the configuration page again.

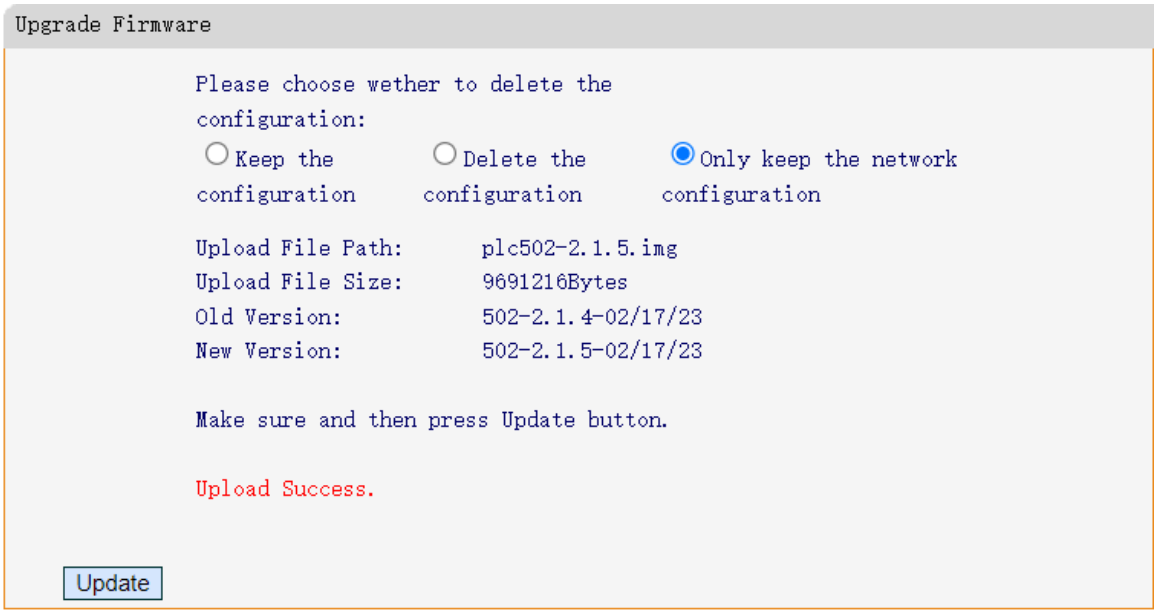


Figure 2-12: Choose delete the configuration or keep network configuration

2.5 Remote Configurations

Remote AT commands can be used on SINAPACK 200 to modify configuration parameters remotely. Details are described below:

NOTE: this can be used only when enabling DTU function or virhub function, and SINAPACK 200 is shown online in mServer.

Choose the router in mServer's console, right-click it and choose "Remote Control", in the popped-up dialog, input AT commands in "CMD List" on the left side.

For example, input the following command to change the data center's address and port:

AT+MSERVER=3g.etungtech.com,8080

Click "Send" afterwards, and if successful, a "OK" will show in "CMD Response" on the right side. Then SINAPACK 200 will be offline from the original mServer, and connect to the new data center and port.

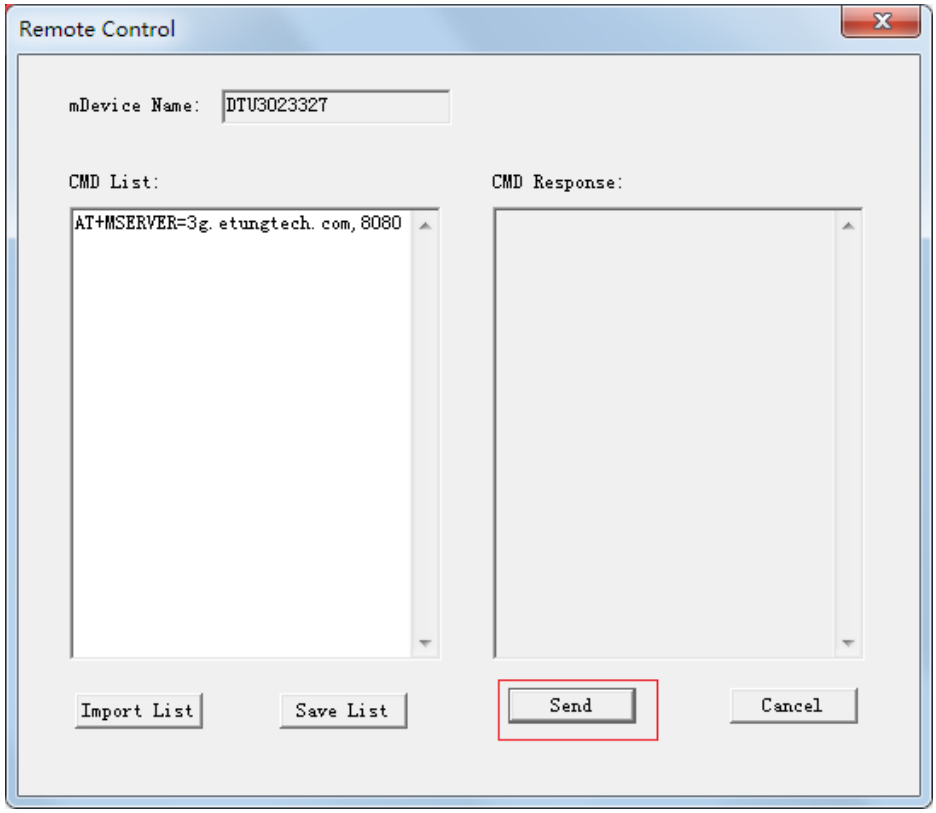


Figure 2-12: Transfer Terminal remotely

Below are remote AT commands that are supported on SINAPACK 200 Ethernet channels.

1) AT+MSERVER=addr, port
   Change data center address and port, with reply OK or ERROR.
   addr: data center address, either IP address or domain
   port: data center port

2) AT+CSQ
   Query signal strength and network mode, with the following reply:
   OK:sig_quality,net_mode
   sig_quality: 0-31, bigger value means better signal quality
   net_mode:

3) AT+REBOOT
   Reboot the router, with reply OK.

4) AT+HBI?
   Query heart beat interval (unit: second), with reply OK.

5) AT+HBI=interval
   Set heart beat interval (unit: second), with reply OK.

6) AT+SMSPING=PHONE_NUM
   Ask the router to send an SMS to PHONE_NUM, and the content is the router's IMEI number, with reply OK.

7) AT+SMSZHUANFA=txt,info_src,dest
   Ask the router to send an SMS to info_src first with content "txt" (only in English characters and digits), and then forward the reply to dest. dest can be omitted, and if then the reply will be forwarded to the mobile that sends this AT command. If the reply SMS has more than one message, the router will forward the messages one by one.
   For example: AT+SMSZHUANFA=CXLL,10086,13801234567, means to send an SMS to 10086 to query traffic and then forward the reply to 13801234567.

8) AT+RDEBUG&ENABLED=0/1
   Enable/Disable remote debugging, with reply OK.

9) AT+SIMID
   Query SIM IMSI and CCID.

10) AT+CELLID
    Query base station's location code and cell code.

11) AT+OPER
    Query operator information.

12) AT+NETMODE
Query current network in use, with reply:
+NETMODE: WAN/WIFI/MOBILE\r
OK

13) AT+IFSTATUS
Query data interfaces' status, with reply:
+IFSTATUS: SERIAL(0/1,0/1), LAN(0/1,0/1)\r
OK

Bracket SERIAL(0/1,0/1) shows RS232 and RS485 data interfaces' status: 1 means data are received from the serial interface, otherwise 0. Bracket LAN(0/1,0/1) shows LANs' status: 1 means cable line is plugged, otherwise 0.

Appendix 1: Use SINAPACK 200 Virhub Functionality to Implement PLC Program Remote Update

1. **Apply eYun account**
   Access website http://wangkoutong.lianwangbao.com, press "Register", and input registration information. Pay attention that the password should not be too simple. Input a correct email address, then after submit the system will automatically send a web link to the mailbox, just click the link to enable the account.

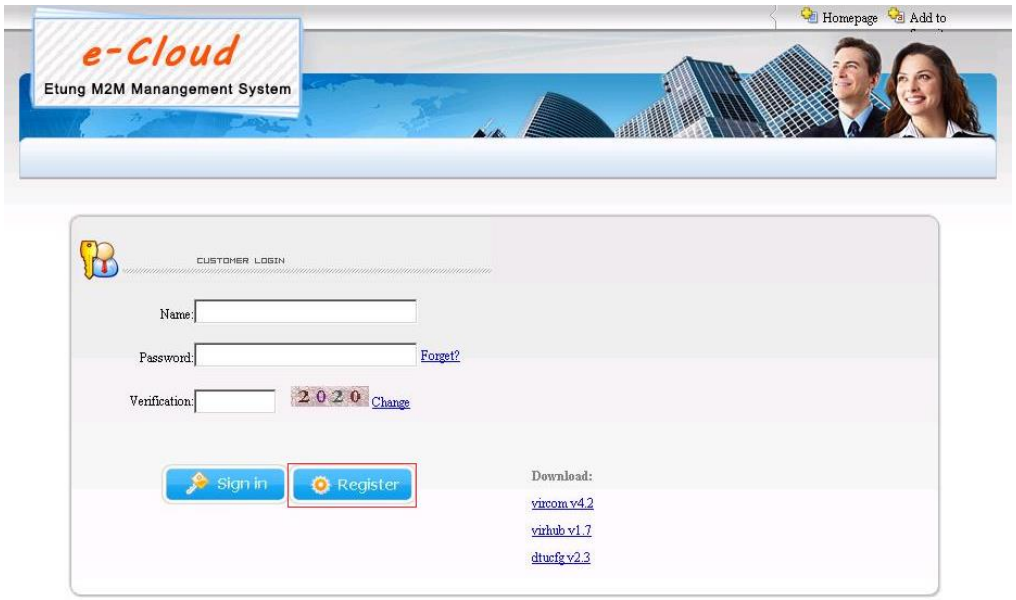


Figure Appendix 1-1: Apply eYun account

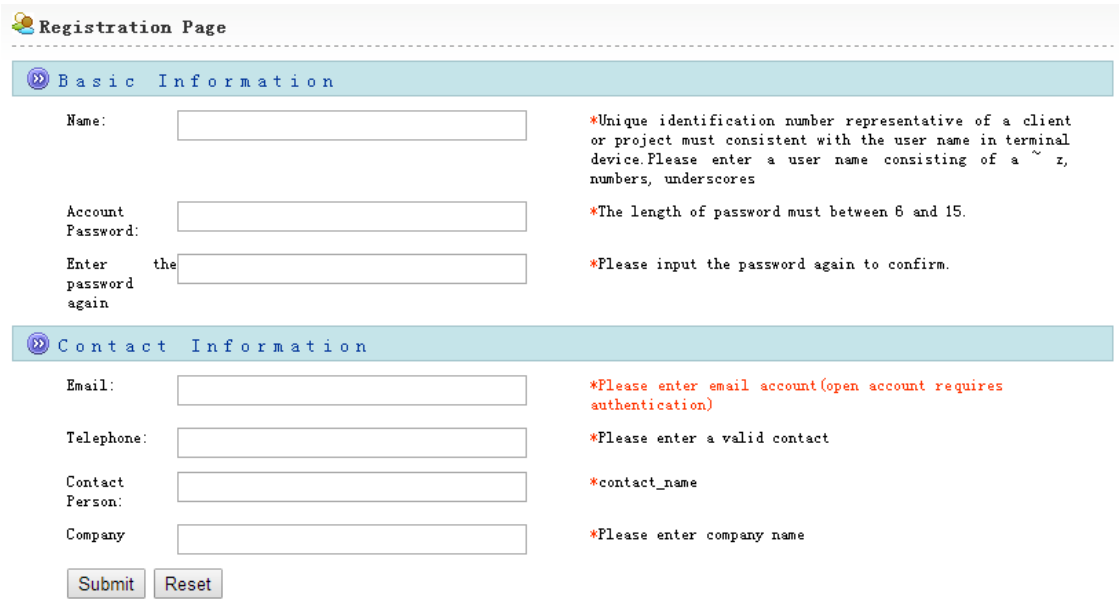


Figure Appendix 1-2: Input registration information

2. Configure SINAPACK 200

- ✧ Connect SINAPACK 200 with PC via Ethernet cross cable, and the IP address in PC is set to obtain automatically;
- ✧ Open browser and input URL: 192.168.10.1;
- ✧ Input username: root, and password: 1234 to login;
- ✧ Choose “Virhub” in the menu list, enable virhub, server is set to auto-selected by default that means SINAPACK 200 will automatically choose the server that is near it and has lowest network delay.
- ✧ Choose “Reboot System” in the menu list, and reboot SINAPACK 200.

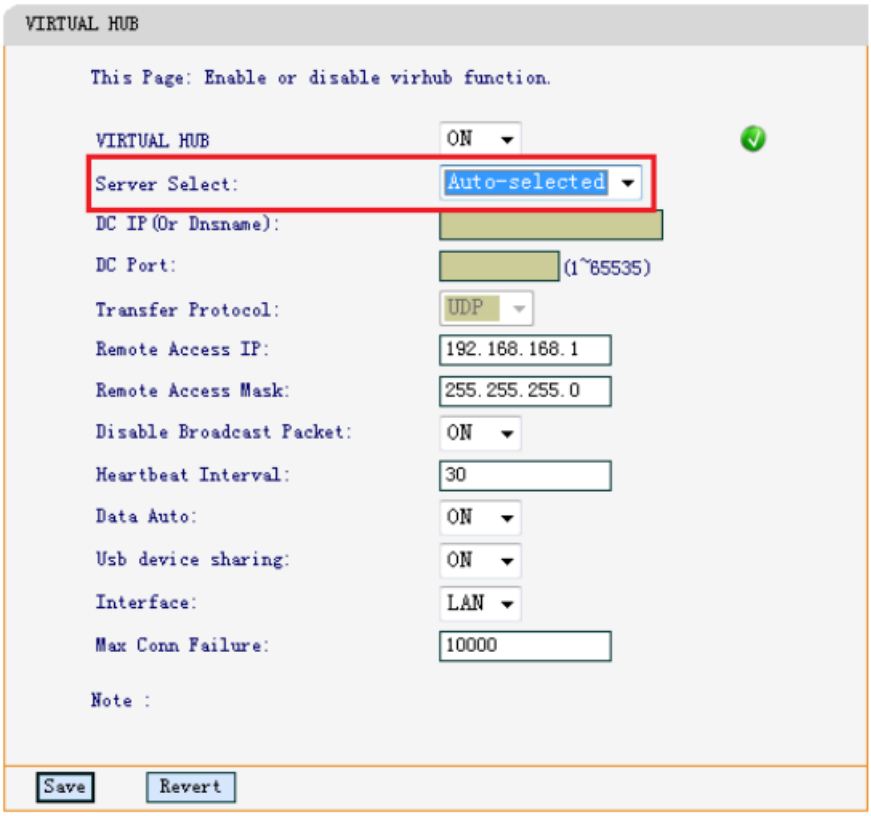


Figure Appendix 1-3: Configure SINAPACK 200's virhub functionality

3. Configure Virhub software

Open and run Virhub installation package from eTung's CD, or downloaded from eTung's website: www.etungtech.com: Downloads->Software. Run Virhub and click "Settings", server is set to "Auto Select" by default, input the username and password applied before.

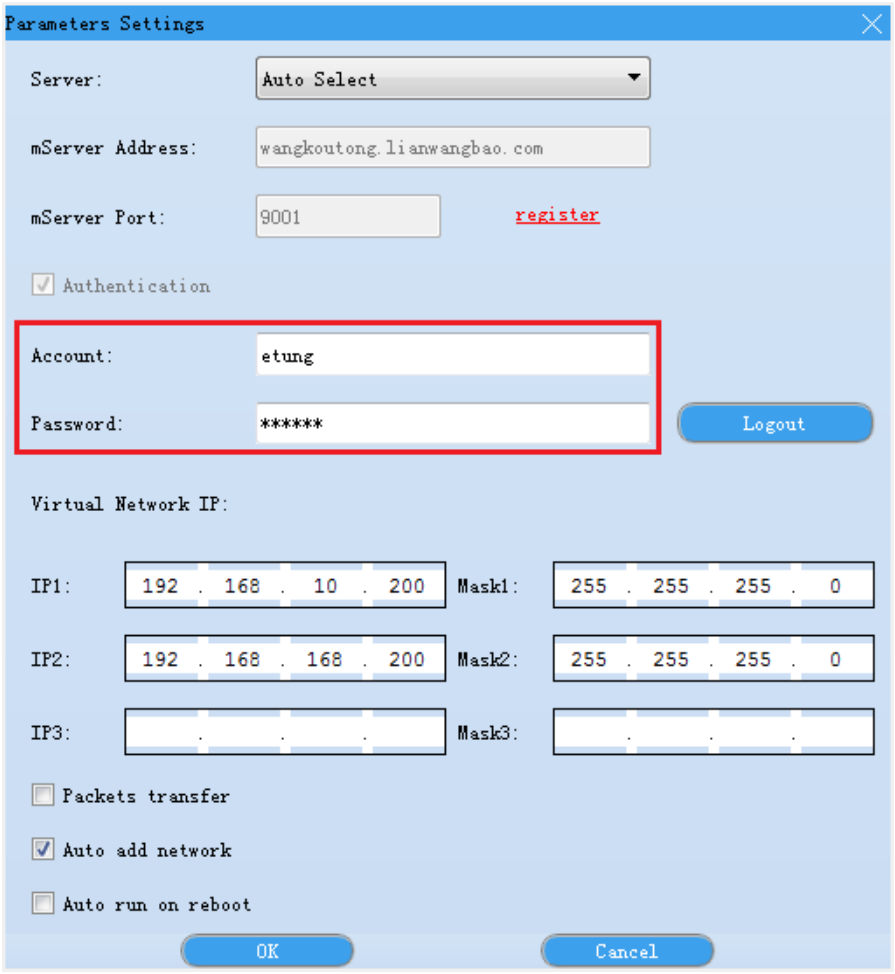


Figure Appendix 1-4: Login Virhub

1) Configure virtual network adapter's IP address: in the "Settings" dialog, we can set virtual net adapter's IP address in "Virtual Network IP". Set IP1 to be in the same IP range as PLC's IP that connects to SINAPACK 200, for example, PLC's IP is 192.168.10.20, and then set IP1 to 192.168.10.200. The virtual net adapter is used to build a virtual LAN with PLC. In Virhub IP1, IP2 and IP3 can be set on the virtual net adapter. If all PLCs are in the same IP range, then just set IP1.

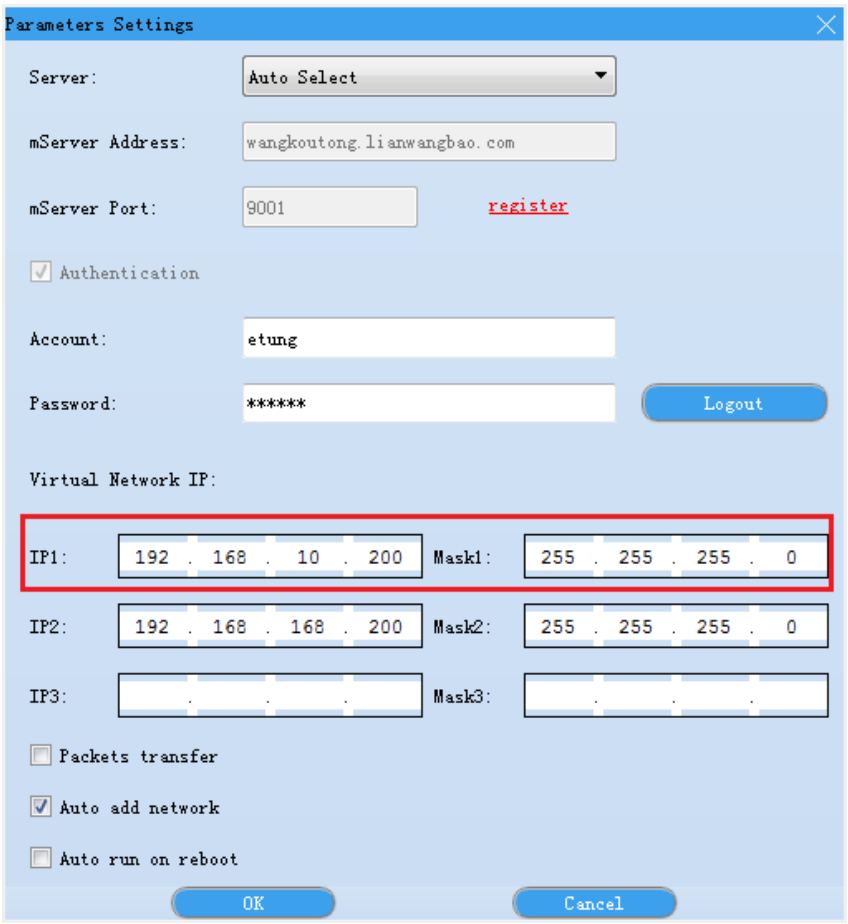


Figure Appendix 1-5: Configure virtual network adapter's IP address

Press "OK" after configuration, in the system info area, there will be a prompt "Setting virtual network ip address successfully", then the software has set the IP address to the virtual net adapter

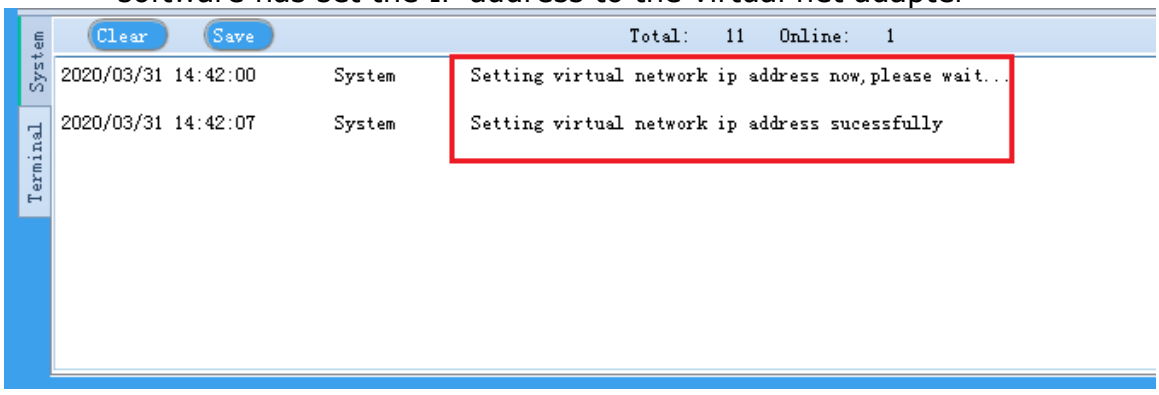


Figure Appendix 1-6: Succeed to set IP address of Virtual network adapter

2) Add device: in Virhub software add SINAPACK 200 to the user account: press "Add Terminal", and input the IMEI number of SINAPACK 200.

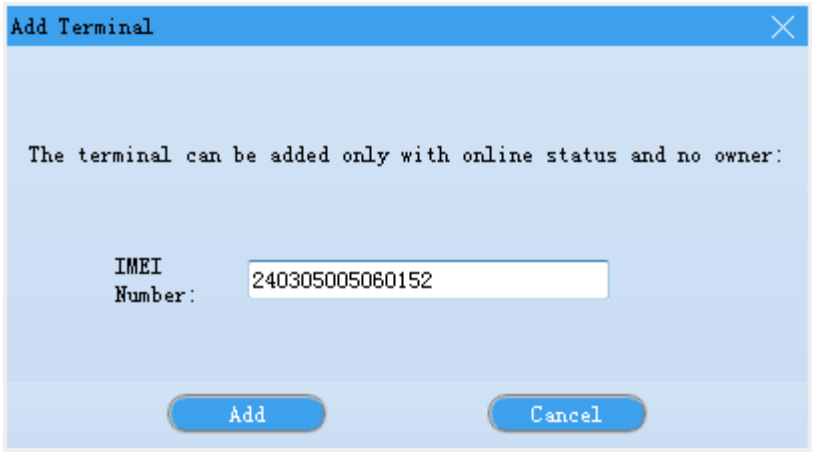


Figure Appendix 1-7: Add device

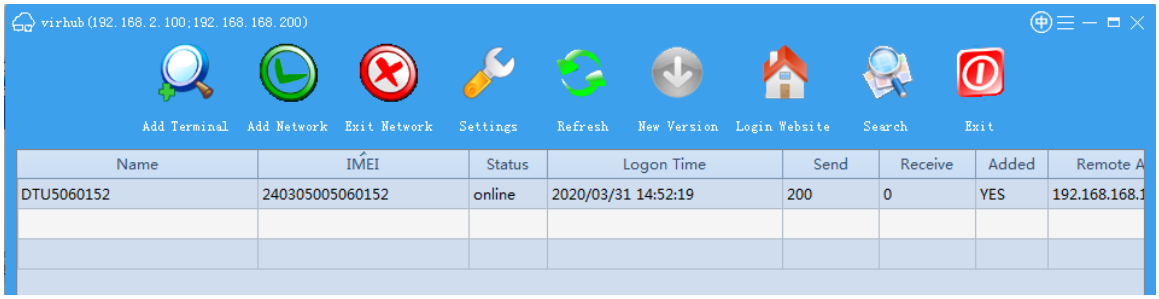


Figure Appendix 1-8: Succeed to add device

If add device fails, please first make sure if the SVR2 led light is on, that means SINAPACK 200has connected to eYun platform. If SINAPACK 200 does not connect to eYun platform, add device will fail.

3) Then Virhub configuration is complete, check if the communication between host pc and PLC is OK. Open a cmd window, input command: ping 192.168.*.* (PLC's IP address), If there are responses, that means the communication is OK, then use PLC programming software to update program. And if there is no response for a long time, please contact eTung technical support.

4) Detect IP address of devices via Virhub
In order that PC running Virhub can communicate with devices at the far end that connect to SINAPACK 200, the devices' IP must be known beforehand. Virhub's "Detect IP" functionality can automatically detect the devices' IP.
In Virhub's interface, right-click the terminal and choose "Detect IP", offer the device IP's subnet area, and then click "Detect IP"; and after a while, the IPs detected will be shown in the list, as shown in the figure below:

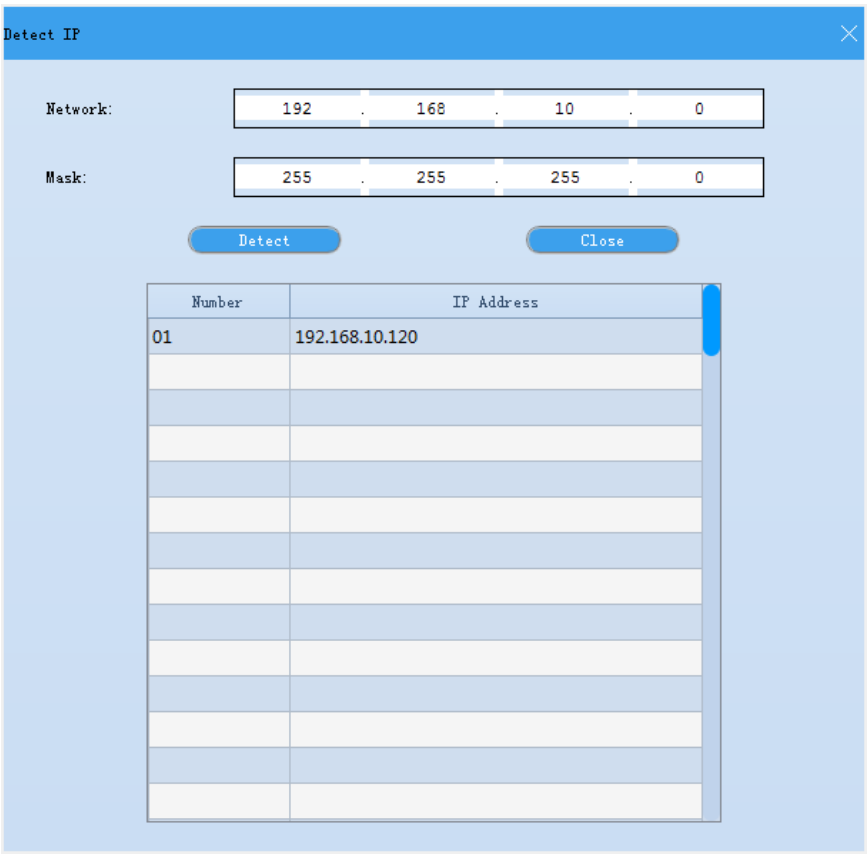


Figure Appendix 1-9: Detect device's IP address

Attention:

1) The terminal must be online to use this functionality;
2) Virhub version must be V9.0 or higher.

4. Access SINAPACK 200 remotely via Virhub

SINAPACK 200 can be accessed remotely via Virhub. Normally, SINAPACK 200 accesses Internet via Cable/WIFI network, and gets an inner IP address, and it cannot be accessed from the internet via this inner IP. eTung's Virhub solution can solve the problem. First, enable Virhub function on SINAPACK 200, and set a remote access IP; the remote access IP is dedicated to access SINAPACK 200 remotely when Virhub is enabled on it. Then run Virhub software on the far-end PC, and configure an IP address on the Virtual Network adapter; this IP must be in the same range as the remote access IP on SINAPACK 200. This way, we can access the router remotely on the far-end PC via the remote access IP, to perform configuration, system monitoring, etc. Below are the details about the configuration procedure.

1) Configure the router's remote access IP
   According to "2.1 Configuring SINAPACK 200", go to the router's Virhub configuration, enable Virhub and configure username, then there are two parameters: "Remote Access IP" and "Remote Access Mask", with default values: 192.168.168.1 and 255.255.255.0.

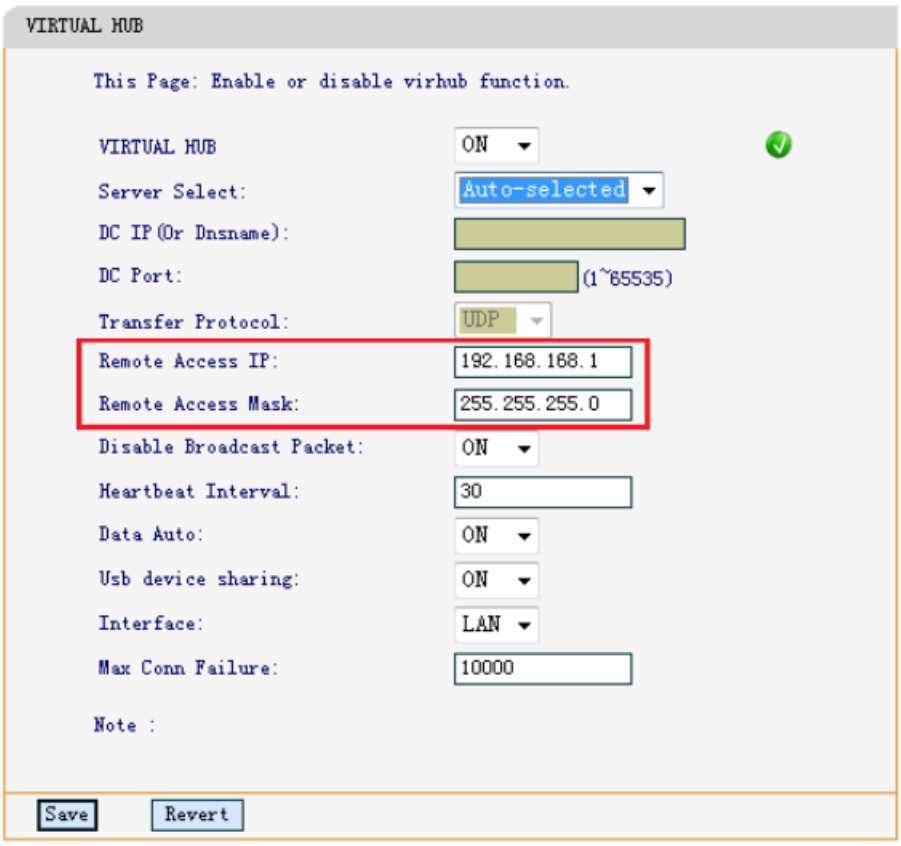


Figure Appendix 1-10: Configure SINAPACK 200r's remote access IP

Normally set the two parameters with default values, and they can also be changed on demand. Press "Save" after configuration, and then reboot the router. These two parameters can also be changed/checked via remote AT commands, please refer "2.5 Remote Configurations".

2) Configure the Virtual Network adapter's IP address to access SINAPACK 200 remotely

Run Virhub software, click button "Configure", and on the popped up "Settings" dialog, set the Virtual Network adapter's IP address in "Virtual Network IP" part. IP2 is the IP address set on the Virtual Network adapter to access SINAPACK 200 remotely via Virhub, and this IP must be in the same range as the "Remote Access IP" (192.168.168.1 by default) set on SINAPACK 200 in step 1), for example, 192.168.168.*.

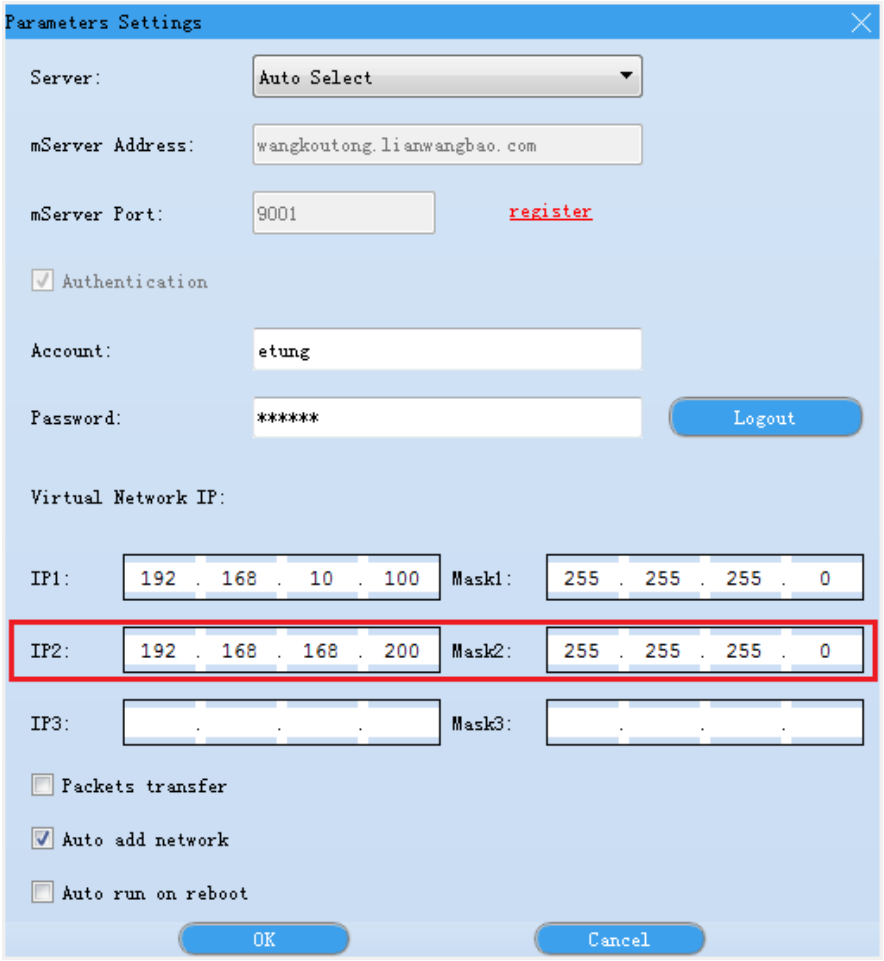


Figure Appendix 1-11: Configure the Virtual Network adapter's IP address to access SINAPACK 200 remotely

Click "OK" after configuration is complete, the software will then set the IP address on the Virtual Network adapter.

3) Access SINAPACK 200 remotely
Open browser, and input SINAPACK 200's remote access IP (192.168.168.1 by default), and then SINAPACK 200's web configuration page shows.

Figure Appendix 1-12: Access SINAPACK 200's Web configuration page remotely

Then we can login the web page to change SINAPACK 200's parameters remotely, just as SINAPACK 200 is directly connected locally.

Attention: When host pc accesses SINAPACK 200's webpage remotely via virhub, it reaches SINAPACK 200 with its remote access IP address, 192.168.168.1 by default. If the default remote access IP address is used, in order to make it work, make sure that only one device is mapped at one time in

virhub, as shown in the figure below, in column “Added”, there should be only one device that is marked as YES, i.e. the device that need to be accessed is added to the virtual network, and disconnect all the other devices from the virtual network (click the device, and then click “Exit Network”).

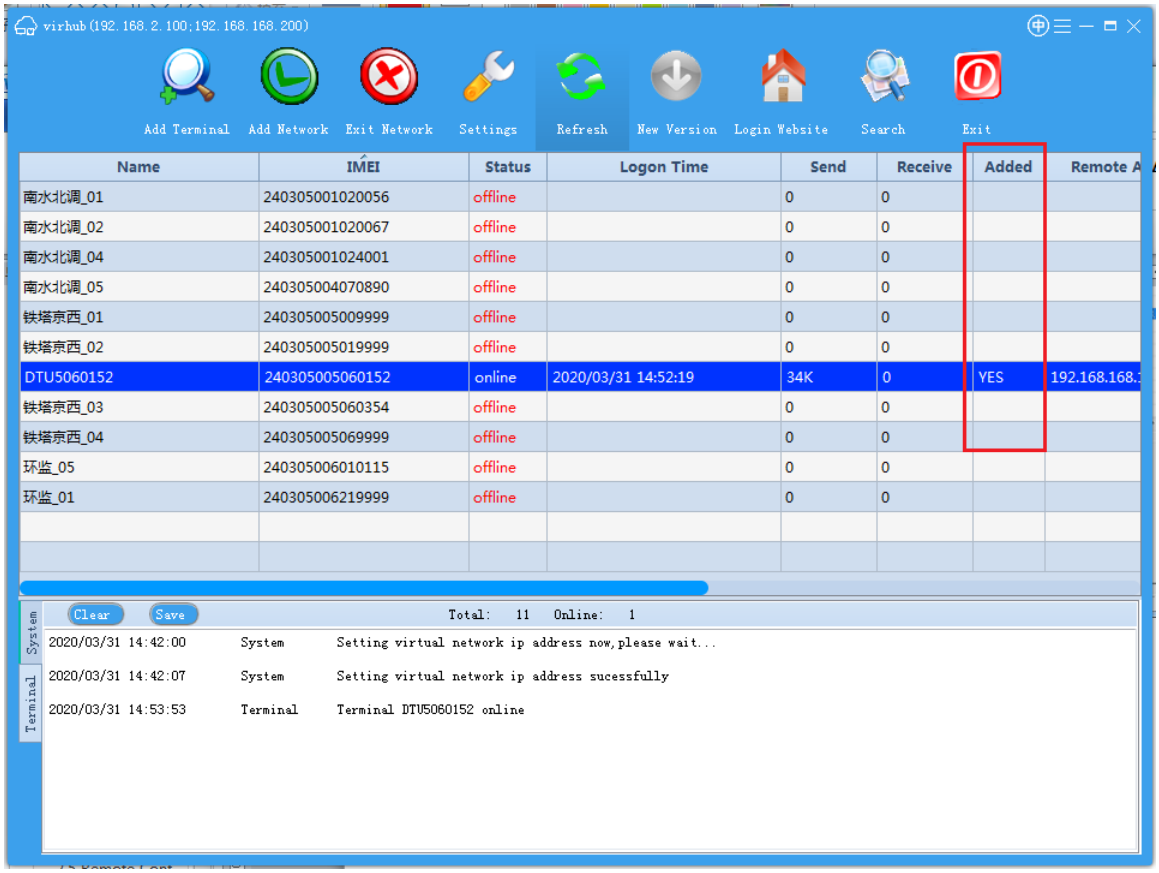


Figure Appendix 1-13: Map device in virhub

Appendix 2: Use SINAPACK 200 Serial Functionality to Implement PLC Program Remote Update

SINAPACK 200 has two user serial ports, so it can connect with PLCs that have serial ports, and perform remote program download and transparent data transmission. eYun platform and Vircom functionality make it easier to implement remote access of PLCs that have serial port. Below we will illustrate the implementation in detail.

1. **Apply SINAPACK 200 eYun account**
   Access website http://chuankoutong.lianwangbao.com, press "Register", and input registration information. Pay attention that the password should not be too simple. Input a correct email address, then after submit the system will automatically send a web link to the mailbox, just click the link to enable the account.

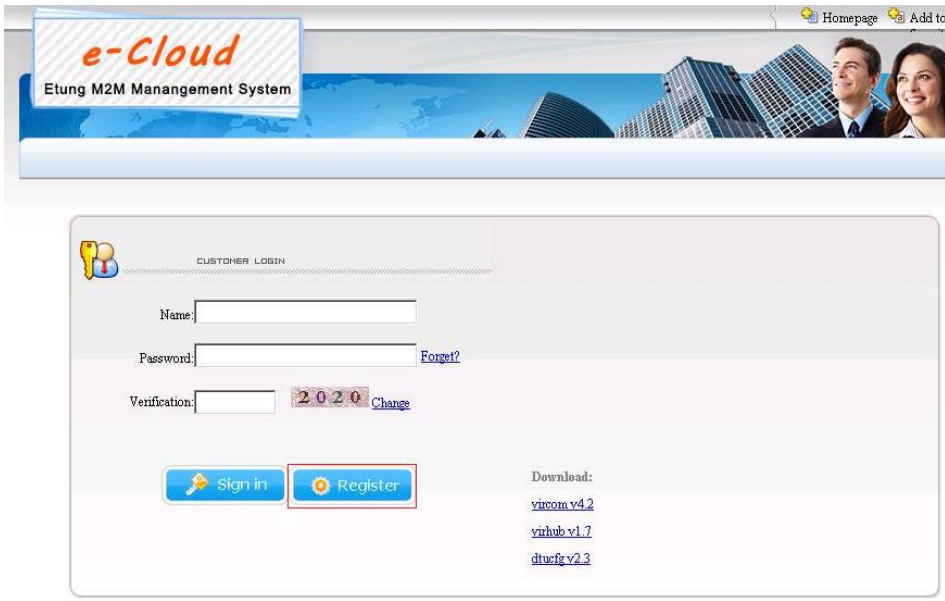


Figure Appendix 2-1: Apply eYun account

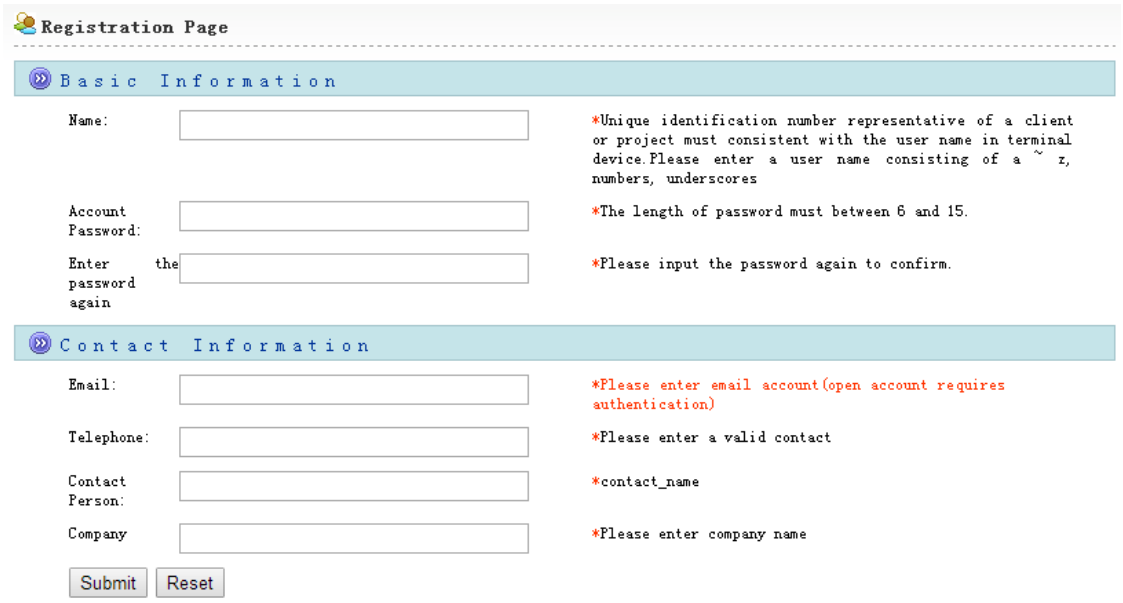


Figure Appendix 2-2: Input registration information

2. Configure SINAPACK 200

- Connect SINAPACK 200 with PC via Ethernet cross cable,
- the IP address in PC is set to obtain automatically;
- Open browser and input URL: 192.168.10.1;
- Input username: root, and password: 1234 to login;
- Choose “DTU Function”;
- DTU function is enabled by default, server is set to auto-selected by default that means SINAPACK 200 will automatically choose the server that is near it and has lowest network delay.
- Choose serial type (RS232 or RS485) based on PLC serial port type, and set serial port parameters (baud rate, data bits, stop bits and parity);
- Click “Save” and choose “Reboot System” in the menu list, and reboot SINAPACK 200.

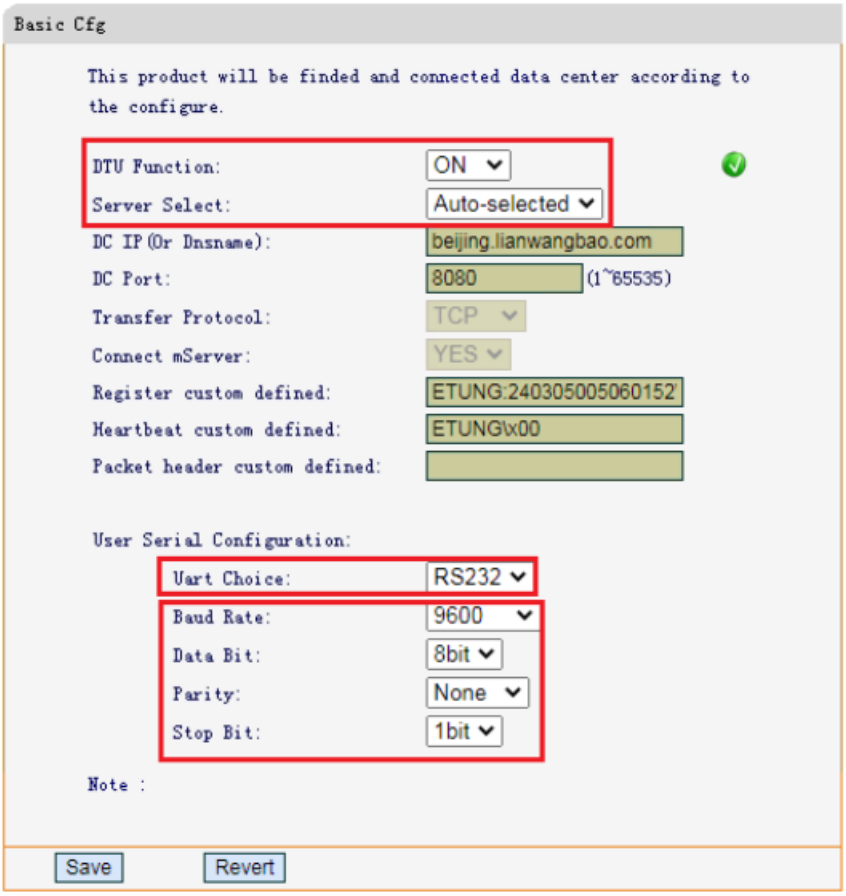


Figure Appendix 2-3: Configure SINAPACK 200's serial functionality

3. Configure Vircom software

Find Vircom installation package from eTung website: www.etungtech.com: Downloads->Software, then download and install Vircom.

- ✧ Run Vircom software, and click "Settings", server is set to auto-selected by default and there is no need to change; input username and password that is applied on eYun platform.
- ✧ Add terminal in Vircom by clicking "Add Terminal", input the IMEI on SINAPACK 200;
- ✧ Choose the device, and then click "Add Com" to map a virtual COM for SINAPACK 200;
- ✧ Run PLC programming software to open the virtual COM and send/receive data.

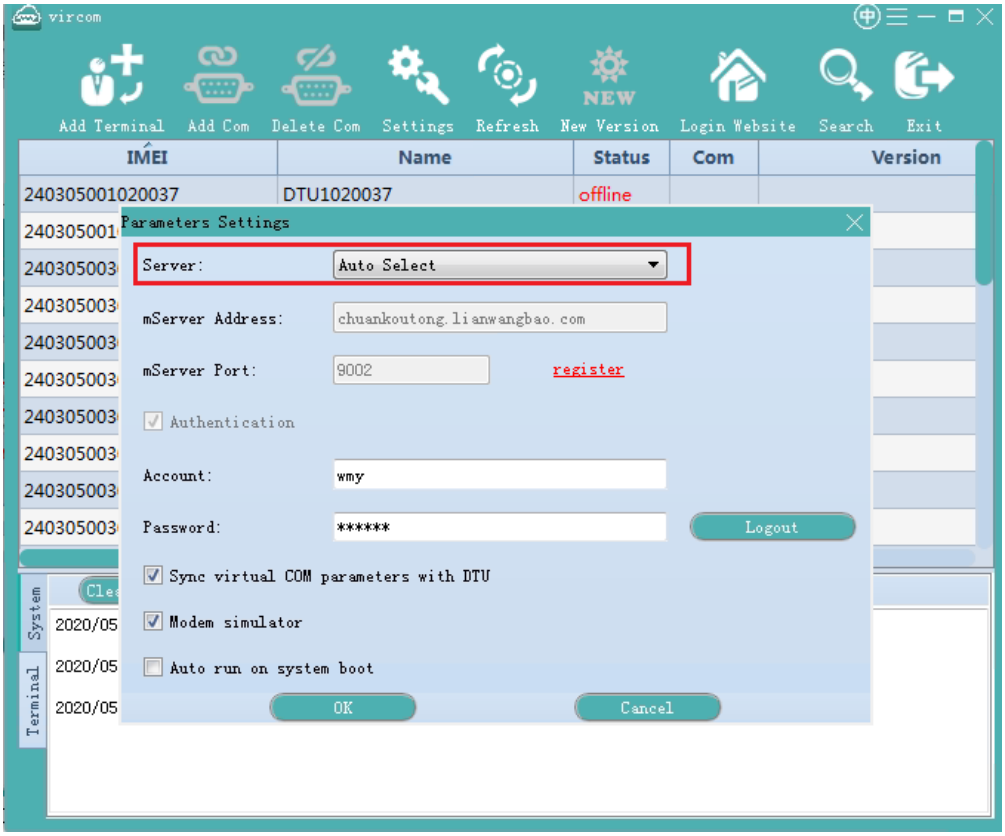


Figure Appendix 2-7: Configure Vircom

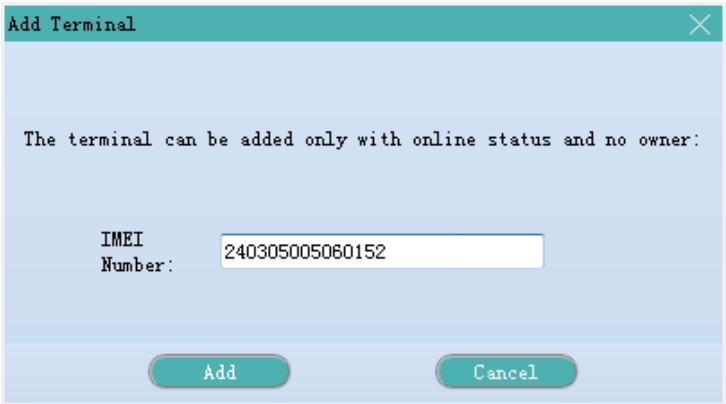


Figure Appendix 2-8: Add terminal

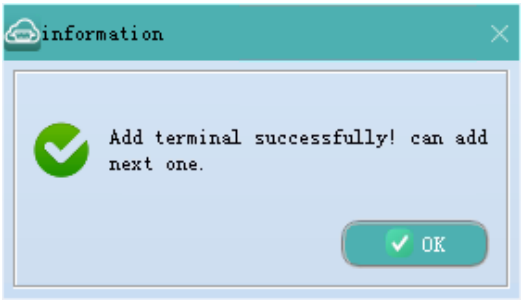


Figure Appendix 2-7: Succeed to add terminal

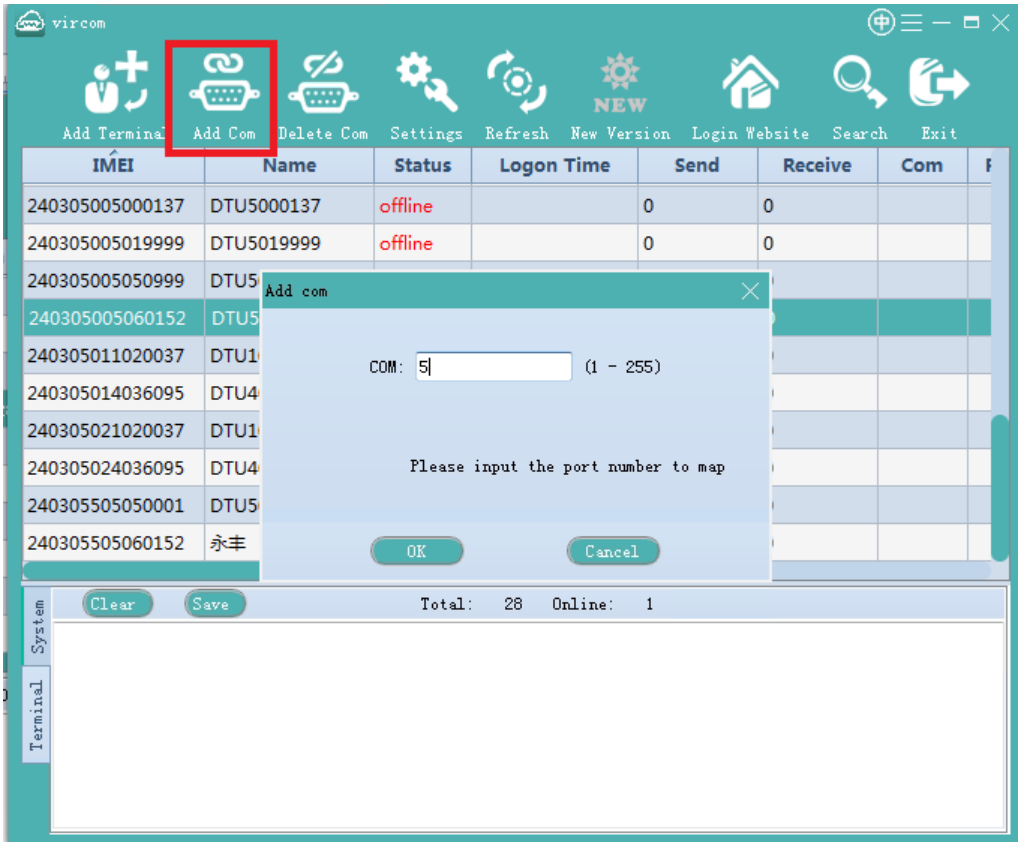


Figure Appendix 2-9: Map a virtual COM

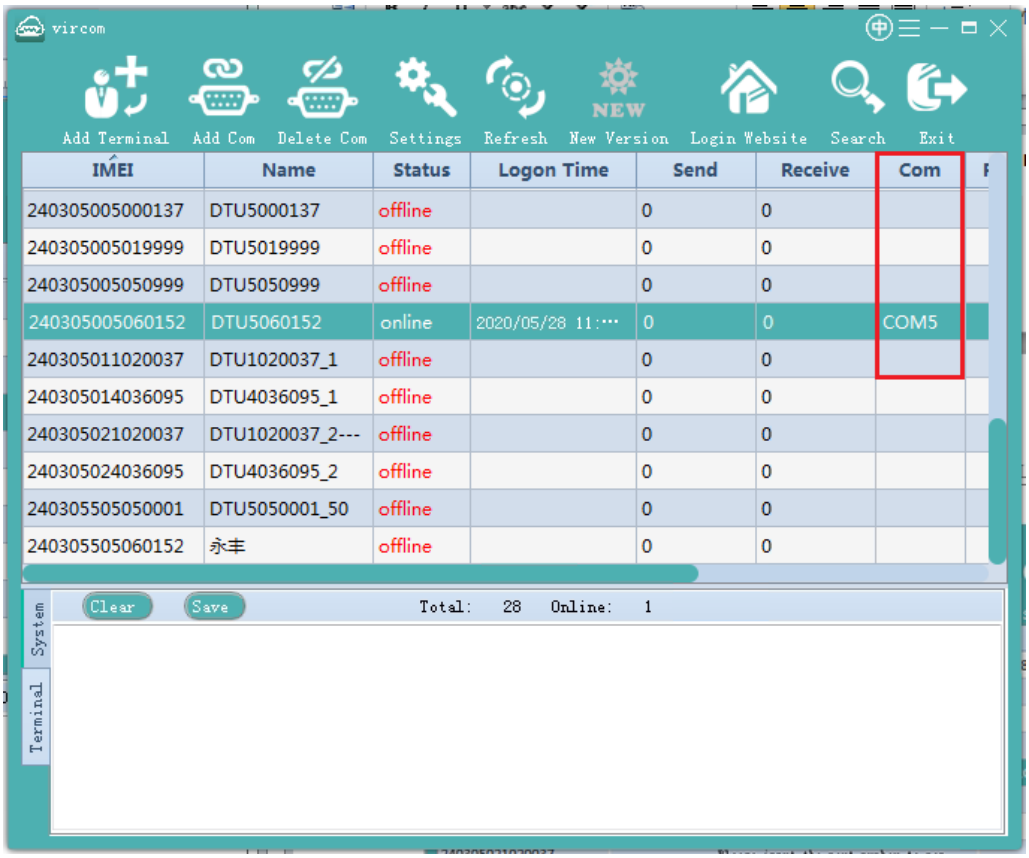


Figure Appendix 2-10: Succeed to map virtual COM

Appendix 3: Configure SINAPACK 200 to Access Internet via Cable/WIFI

1. Configure SINAPACK 200 to access Internet via cable network

According to the description of ch. 2.1 Configurations, login SINAPACK 200's webpage, choose "Network Settings" -> "Network Select", configure to use WAN to access Internet.

For SINAPACK 200, the default network settings are to use WAN:

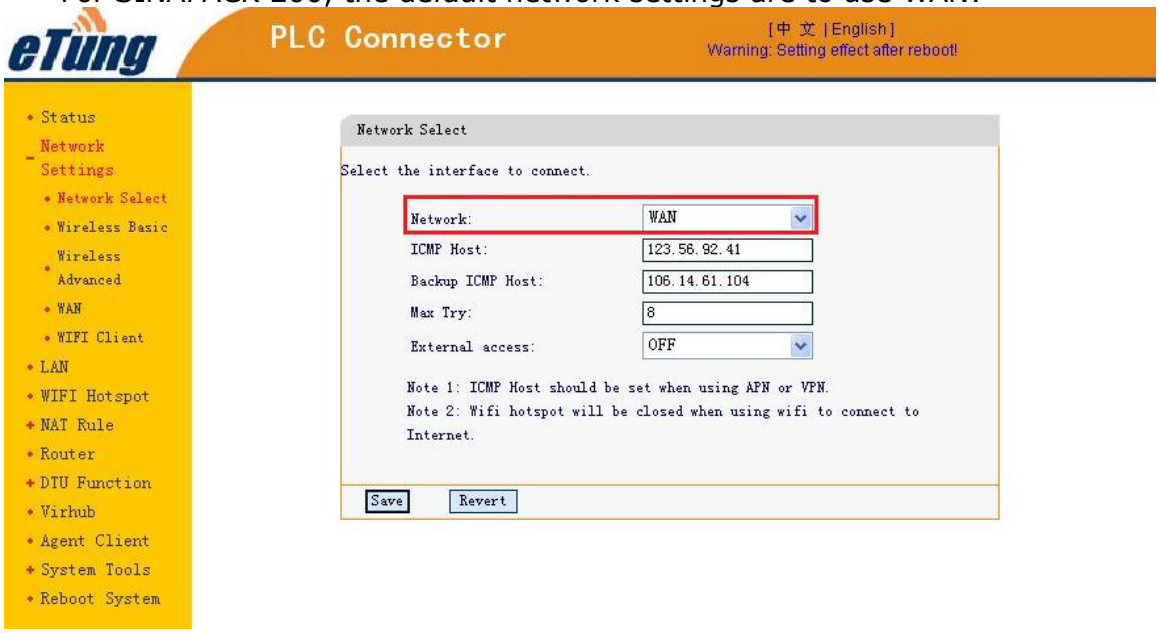


Figure Appendix 3-1: Use WAN to access Internet

Set "Network Select" as WAN, and then click "Save";

Choose "Network Settings" -> "WAN" to configure WAN parameters;

There are three kinds of types: DHCP, PPPoE and STATIC. Choose PPPoE if cable MODEM is used to access internet, and choose DHCP or STATIC if a dedicated line or LAN is used to access internet. Use STATIC if the IP address is static or assigned manually, otherwise use DHCP.

Figure Appendix 3-3: Set type

When choosing PPPoE, PPPoE username and password should be set additionally:

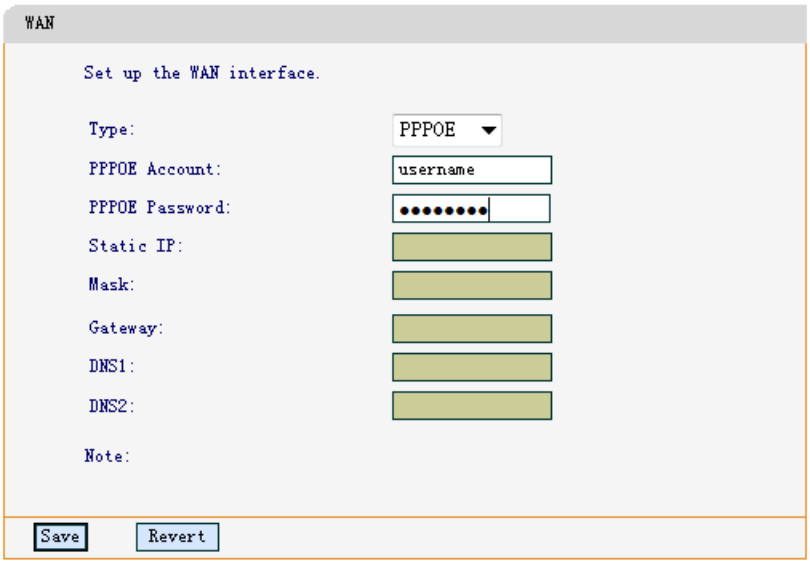


Figure Appendix 3-4: Configure PPPoE username and password

When choosing STATIC, configure static IP, net mask, gateway and DNS accordingly:

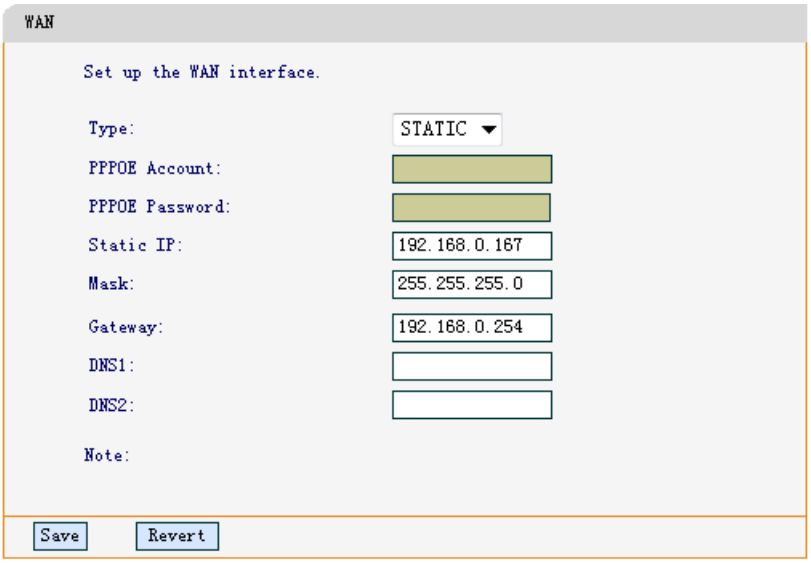


Figure Appendix 3-5: Configure static IP

When choosing DHCP, no additional parameters need to configure:

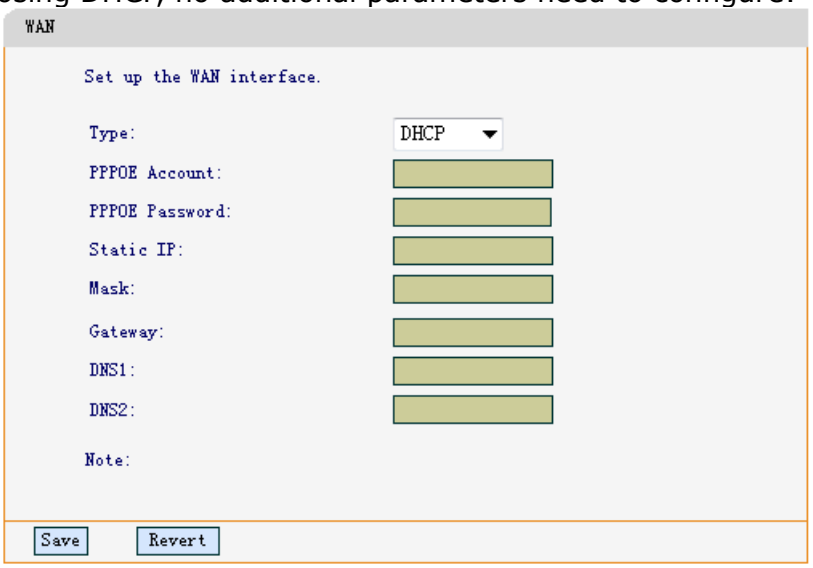


Figure Appendix 3-6: Configure DHCP

Click "Save", and plug in Ethernet cable on LAN1 (WAN) of SINAPACK 200 and connect to the cable network, then reboot SINAPACK 200. After reboot, login SINAPACK 200's web configuration page, it can be seen that SINAPACK 200 has connected to the internet with WAN.

Figure Appendix 3-7: SINAPACK 200 accesses Internet via WAN

2. Configure SINAPACK 200 to access Internet via WIFI

SINAPACK 200 can access Internet via WIFI. According to the description of ch. 2.1 Configurations, login SINAPACK 200's webpage, choose "Network Settings" -> "Network Select", set network as WIFI, then click "Save".

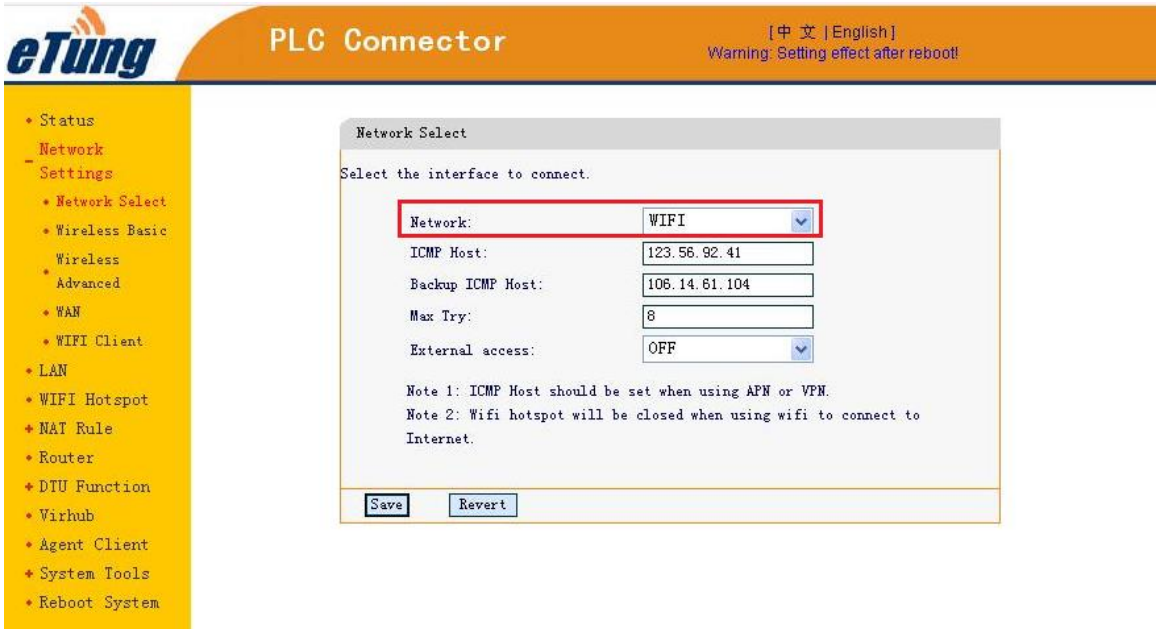


Figure Appendix 3-8: Set network as WIFI

Choose "Network Settings" -> "WIFI Client", to configure WIFI parameters. SINAPACK 200 supports configuring at most 3 WIFI APs. By default AP3 has SSID: ABC and pin: 12345678.

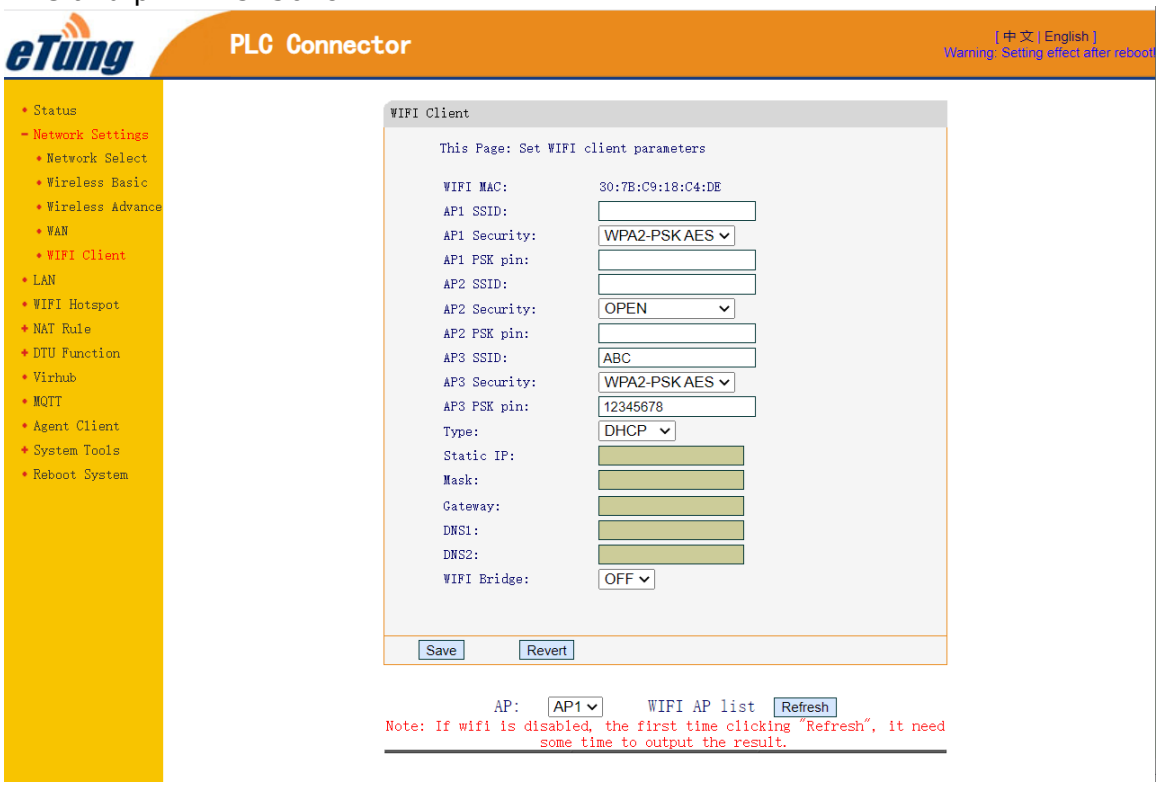


Figure Appendix 3-9: Configure WIFI parameters – 1

Click "Refresh" to search the WIFI APs around:

	SSID	Frequency:	Signal(0-100)	Security
○	etungtech	2412	92	[WPA2]
○	XJ_Wi-Fi5	2462	88	[WPA2]
○	IP-COMyhzt	2427	92	[WPA2]
○	XJ	2462	80	[WPA2]
○	HIK-server	2417	84	[WPA2]
○		2417	84	[WPA2]
○	TP-LINK_1018A_Wi-Fi5	2437	88	[WPA2]
○	TP-LINK_1018A	2437	84	[WPA2]
○	HONGRONG	2412	64	[WPA2]
○	213xhw	2437	64	[WPA2]
○	TP-LINK_1018A	5220	52	[WPA2]
○	TP-LINK_1018A_Wi-Fi5	5220	50	[WPA2]
○	XJ_Wi-Fi5	5220	62	[WPA2]
○	XJ	5220	60	[WPA2]
○	IP-COM_yhzt5G	5200	50	[WPA2]
○	DIRECT-EUMS-LPQZQSIBDUHBmsPX	2412	66	[WPA2]
○	etung	2437	64	[WPA2]
○	IP-COM_AP4	2442	50	[WPA2]
○	HONGRONG_5G	5745	38	[WPA2]
○	IP-COM_1EDC38	2417	48	[WPA2]
○	HUAWEI-B315-D0B7	2437	46	[WPA2]
○		2437	44	[WPA2]
○	IP-COM_AP1	2422	40	[WPA2]
○	HP-Print-11-LaserJet Pro MFP	2437	48	[WPA2]
○		2417	36	[WPA2]
○	DIRECT-91-HP Smart Tank 750	5220	36	[WPA2]
○	nova 8 Pro	2437	24	[WPA2]

Figure Appendix 3-10: Search WIFI APs

Choose WIFI AP in the list, select security type, and input pin, then click “Save”, and reboot SINAPACK 200.

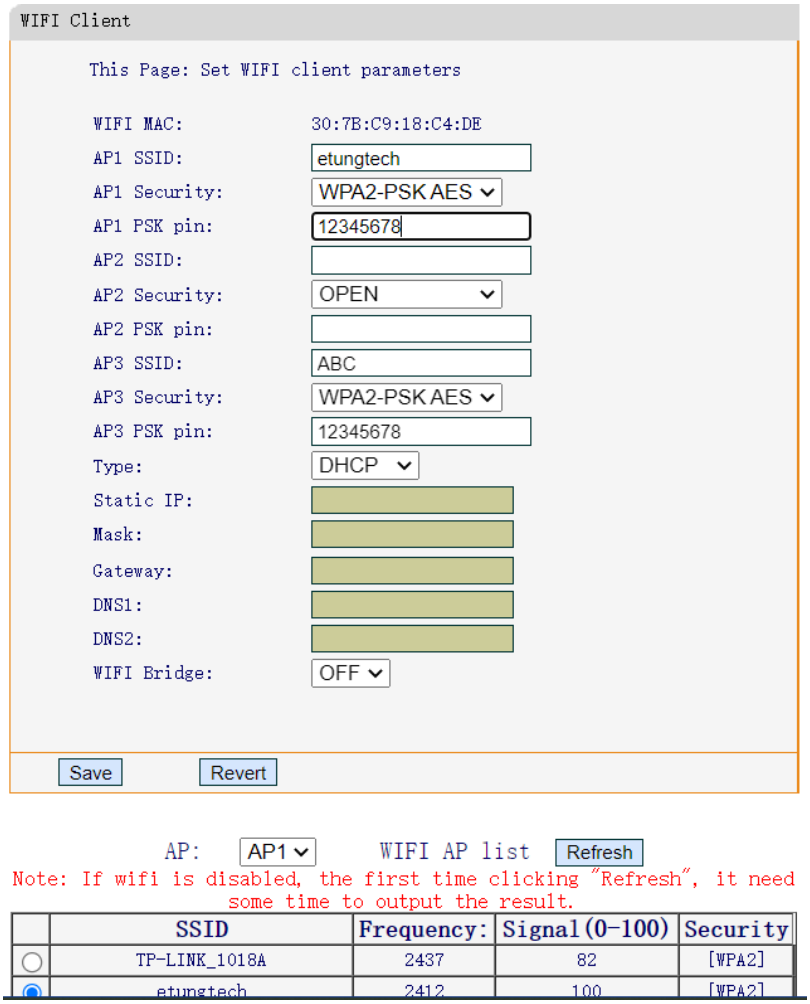


Figure Appendix 3-11: Configure WIFI parameters – 2

By default connection type is DHCP, i.e. get IP address dynamically. It is also supported to assign static IP address manually, and set subnet netmask, default gateway and DNS, as shown in the figure below:

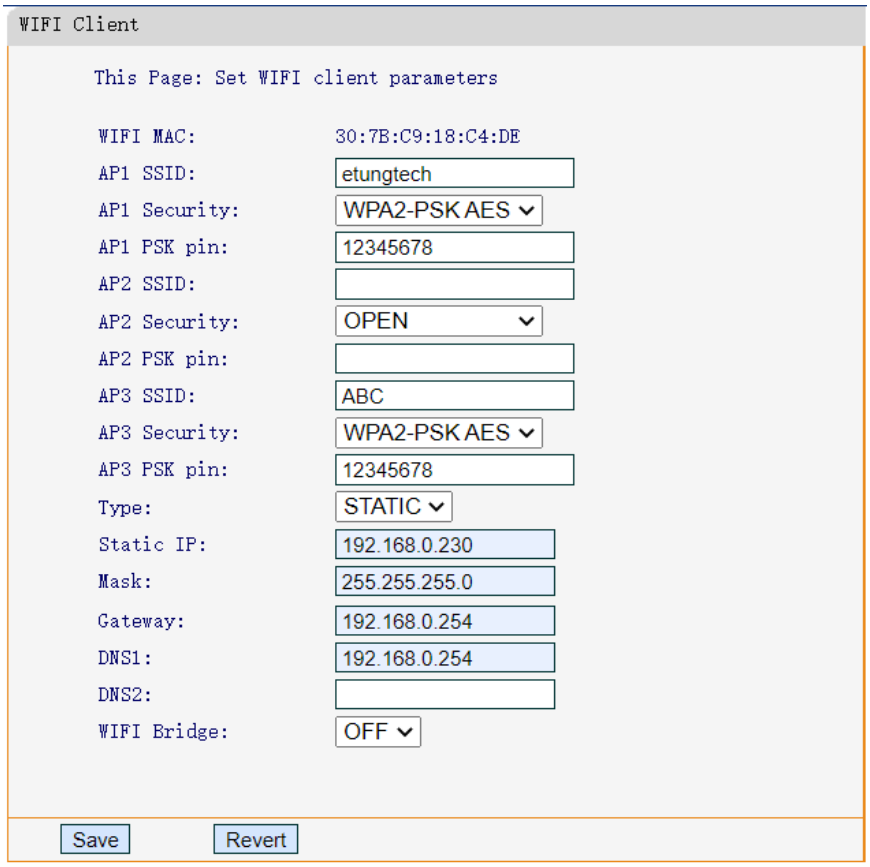


Figure Appendix 3-12: Configure WIFI parameters – 3

After configuration and reboot, login SINAPACK 200's web configuration page, it can be seen that SINAPACK 200 has connected to the internet with WIFI.

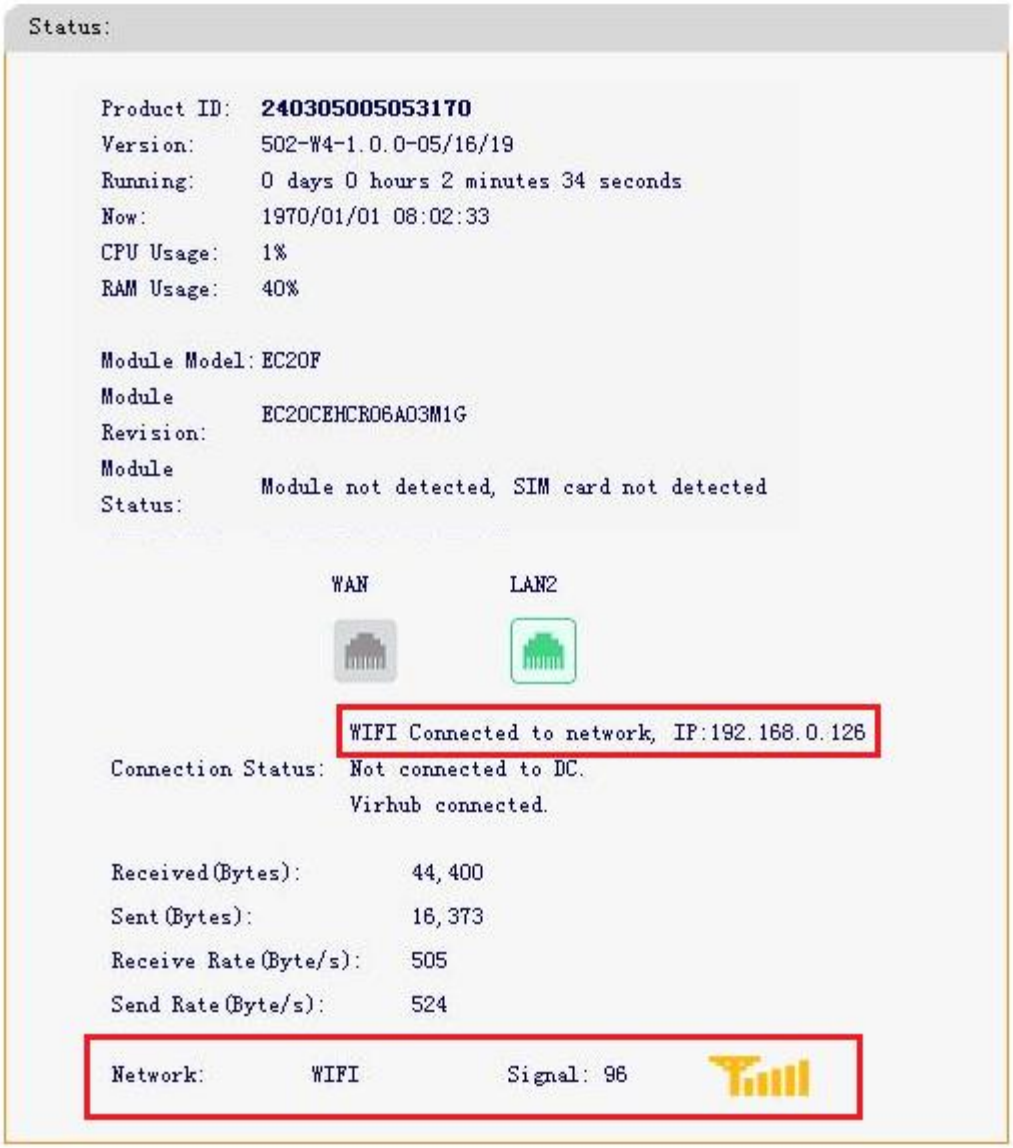
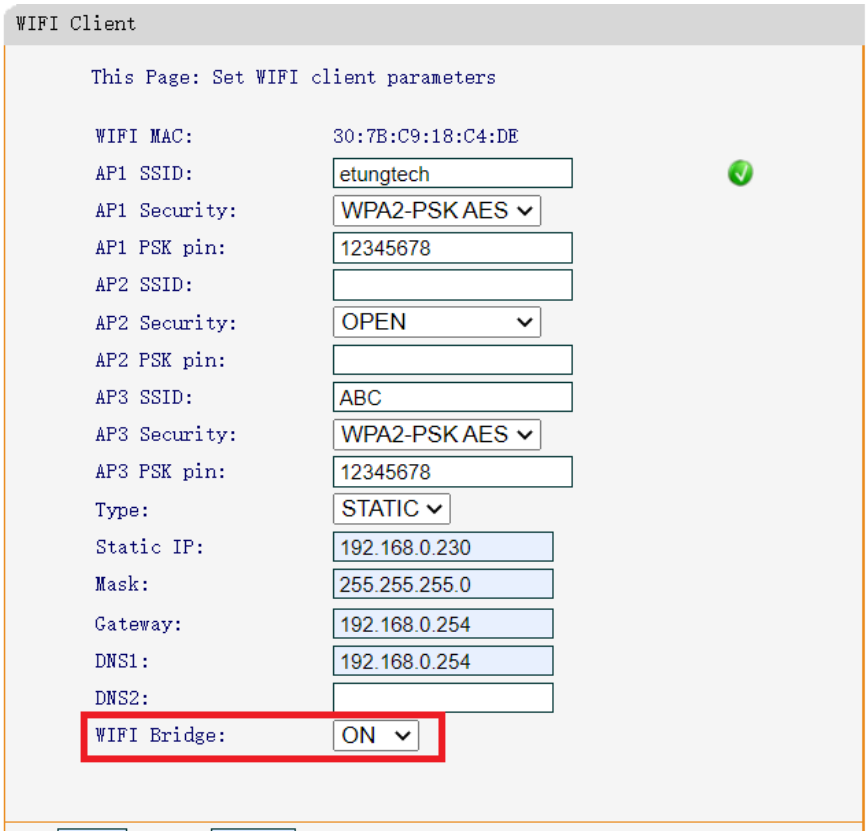


Figure Appendix 3-13: SINAPACK 200 accesses Internet via WIFI

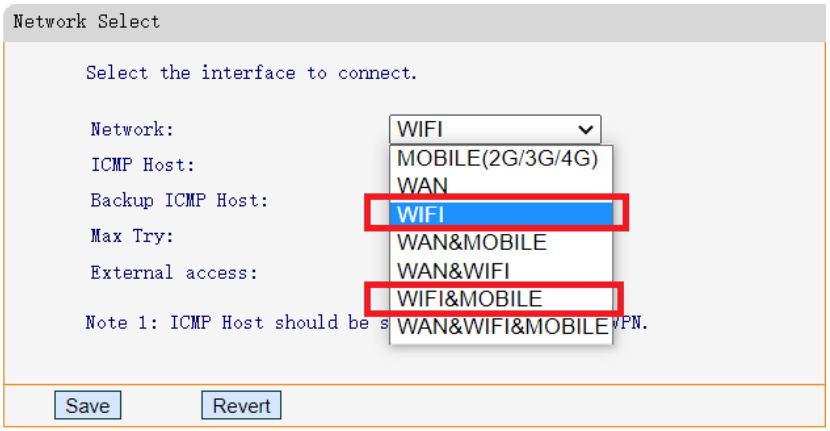
NOTE: Some SINAPACK 200 types do not have WIFI module, and then cannot access Internet via WIFI.

SINAPACK 200 supports WIFI Bridge, and by default it is disabled. Network devices that connect to SINAPACK 200's Ethernet interfaces, have IP addresses that are different from the IP addresses that WIFI AP specifies. So the devices that connects to SINAPACK 200's Ethernet interfaces cannot PING devices that connect to the WIFI AP. WIFI Bridge functionality can solve this problem. After enabling WIFI Bridge, network devices that connect to SINAPACK 200's Ethernet interface can get(or set) IP addresses from WIFI AP, and then they are in the same LAN with those devices connecting to the same WIFI AP, and they can PING each other freely.

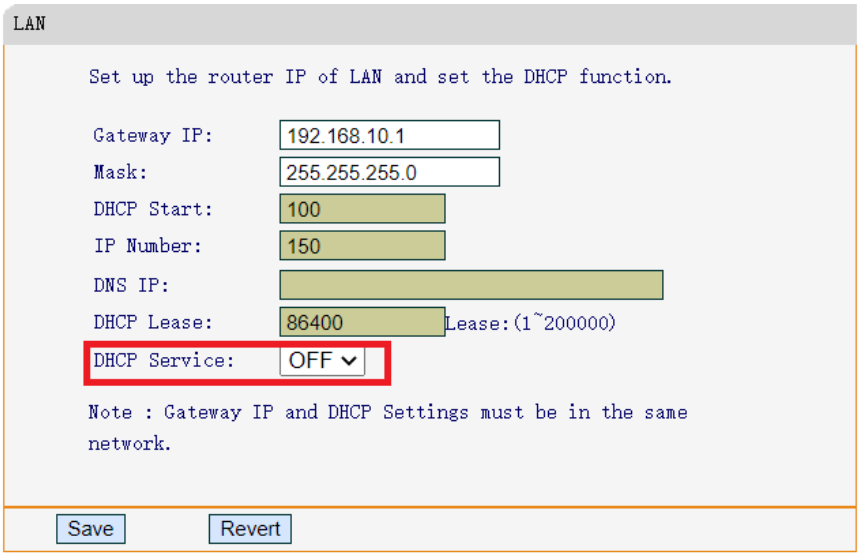


Note:

1. To enable WIFI Bridge, please disable WAN, and choose WIFI.



2. In case devices need to get IP automatically from WIFI AP, please disable SINAPACK 200's DHCP function. Otherwise, SINAPACK 200 will specify IP to the devices, and they cannot get IP from WIFI AP.


LAN
Set up the router IP of LAN and set the DHCP function.
Gateway IP:
192.168.10.1
Mask:
255.255.255.0
DHCP Start:
100
IP Number:
150
DNS IP:
DHCP Lease:
86400
Lease:(1~200000)
DHCP Service:
OFF
Note : Gateway IP and DHCP Settings must be in the same network.
Save
Revert

Appendix 4: Use VNC and SINAPACK 200 to Access and Control Devices Remotely

VNC is the abbreviation of Virtual Network Console. It is a kind of excellent remote control software, and it includes two parts: client software (vncviewer) and server software (vncserver). Vncserver runs on the remote master device, and vncviewer runs on the local pc (or mobile phone), and vncviewer connects to device that runs vncserver and displays the desktop remotely. The basic mechanism of VNC is just like those remote control software that run on windows: first vncviewer establishes connection with vncserver, and then vncserver displays it's desktop to vncviewer, and allows the remote control of its desktop, thus implements remote control of device.

VNC supports multiple OSs, including Windows, Linux, MAC OS, and Android; and it is platform independent, i.e. we can use Windows PC running VNC to control device that runs Linux or MAC OS, or use Android mobile to control touchscreen that runs Linux.

Customers' devices, for example, touchscreens, is located on the remote places. It requires that PC or mobile phone can remote control the touchscreen, with vncserver running the touchscreen, and vncviewer running on the PC (or mobile). PC and mobile can access Internet, but cannot access the touchscreen, because there is no network access in the place of touchscreen, or: although the touchscreen can access Internet, it does not have public network IP, and PC (or mobile) still cannot access the touchscreen remotely. SINAPACK 200 and together with SINAPACK 200 cloud server, offer an effective and convenient solution to control the far-end touchscreen remotely via PC or mobile. Below are details of the solution.

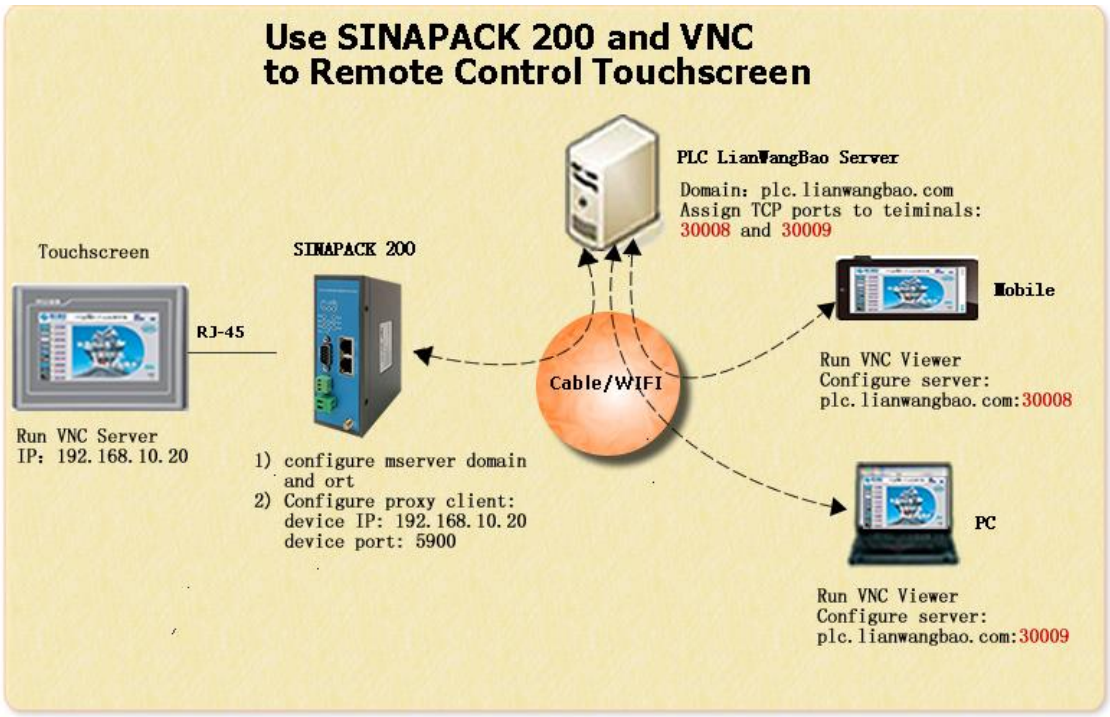


Figure Appendix 4-1: Use SINAPACK 200 an VNC to remote control touchscreen

1. Install and run vncserver on the touchscreen, and run vncviewer on PC or mobile, and PC (or mobile) can access Internet;

2. Configure touchscreen IP address: set the IP address to be in the same IP range as SINAPACK 200's LAN IP, for example 192.168.10.20. Check SINAPACK 200's LAN IP range in its web configuration page, by default 192.168.10.* , as shown in the figure below:

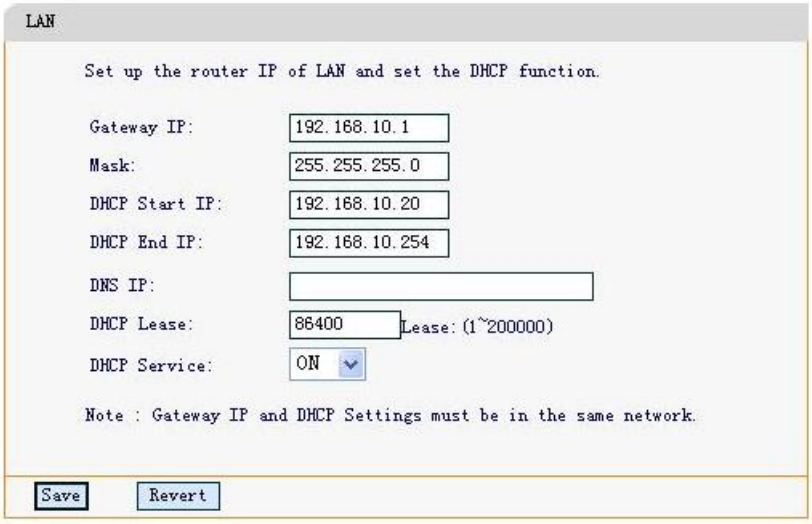


Figure Appendix 4-2: Configure SINAPACK 200 LAN IP – 1

Modify SINAPACK 200 LAN IP as required, click Save and reboot SINAPACK

200.

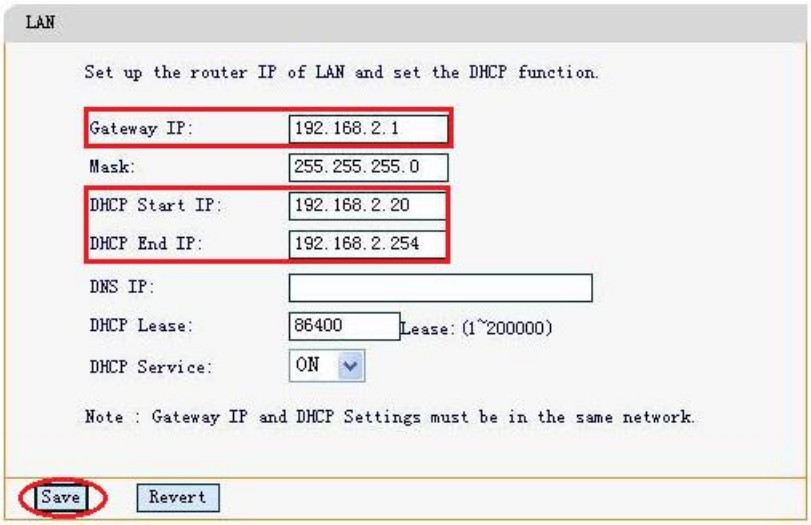


Figure Appendix 4-3: Configure SINAPACK 200 LAN IP – 2

3. Configure agent client on SINAPACK 200

Login SINAPACK 200 web configuration page, choose "Agent Client" , mServer DN or IP is plc.lianwangbao.com and mServer port is 8080 by default, that is eTung mServer, normally use the default settings, until customer builds its own mServer. Then configure device information, including touchscreen's IP (for example, 192.168.10.20) and vncserver's listening port (for example, 5900), and tick "Enable", press Save and reboot SINAPACK 200.

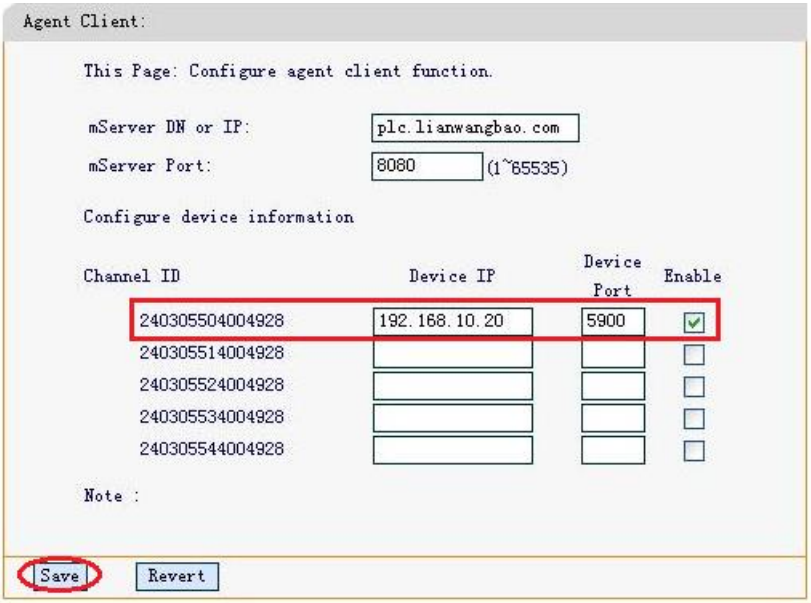


Figure Appendix 4-4: Configure agent client

SINAPACK 200 supports multiple vncviewers' remote access from different PCs (or mobiles). This can be done by supporting multiple channels on agent client functionality. Configure multiple lines in agent client configuration, and enable

all of them. For example, configure two channels as shown in the figure below, each channel has touchscreen's IP as device IP, and vncserver's listening port as device port. This allows two PCs (or mobile phones) to remote control the touchscreen at the same time, thus implements device remote control in different locations. SINAPACK 200support at most 5 channels, and each channel has a 15-byte channel ID. The channel ID is derived from SINAPACK 200's IMEI. For example, SINAPACK 200's IMEI is 240305001234567, then the agent clients' channel ID is 2403055X1234567, and X can be 0~4, to represent one of the five channels.

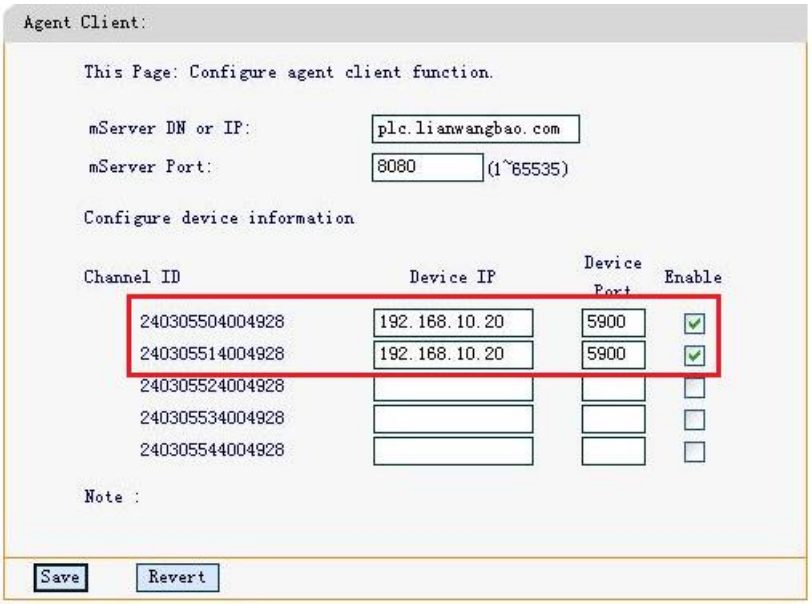


Figure Appendix 4-5: Configure multi-channel agent client

4. Connect SINAPACK 200 and touchscreen with RJ45 net cable, plug SIM card in SINAPACK 200, tighten the antenna, and power on SINAPACK 200.

5. Assign TCP port for terminals on SINAPACK 200 server
Open browser on PC, visit SINAPACK 200 server's web page: plc.SINAPACK 200.com. First register a user and enable it, and then login with username and password;

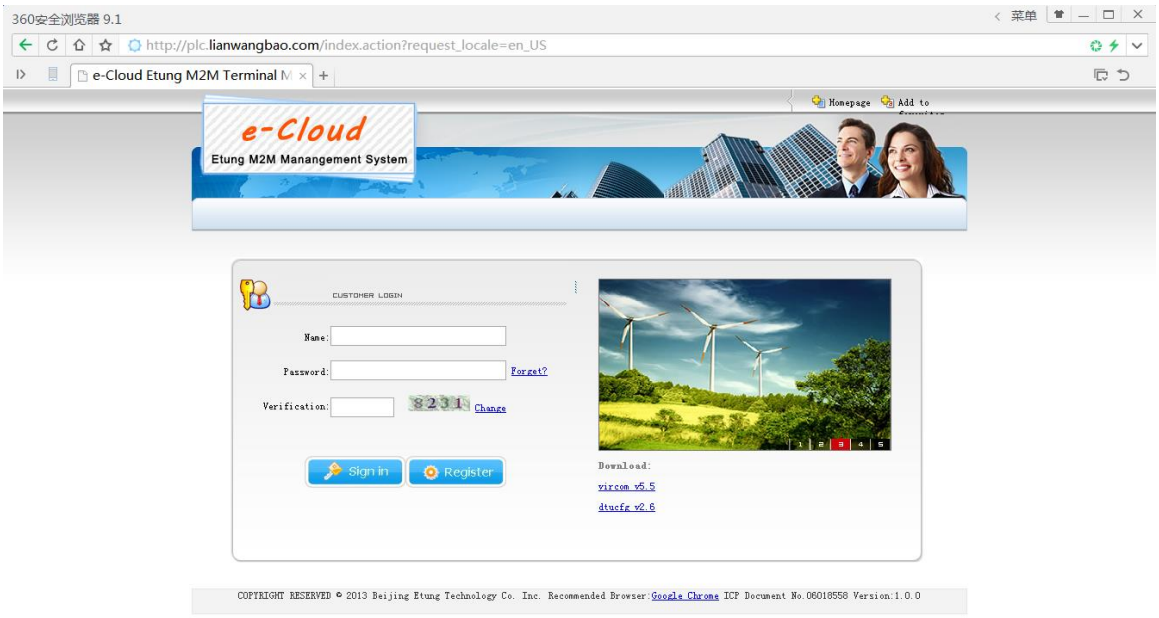


Figure Appendix 4-6: Login SINAPACK 200 server

Click “Terminal Control” -> “Add Terminal”,

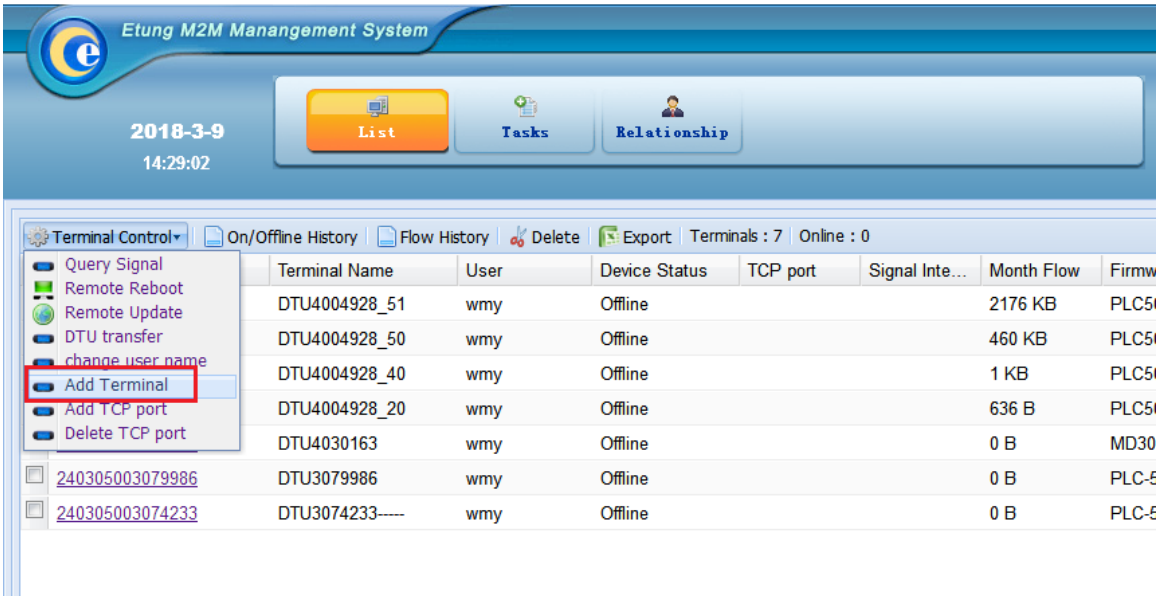
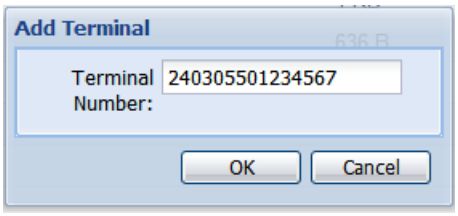


Figure Appendix 4-7: Add terminal

Input the channel ID corresponding to the agent client, for example: 240305501234567:



Attention: terminal can be added only when it is online. If it fails to add terminal, make sure SINAPACK 200 has connected online in SINAPACK 200 server, or ask eTung technical support for help.

After terminal is added, assign TCP port for the terminal: Click the terminal in terminal list, then click "Terminal Control" -> "Add TCP port". System prompts: "Add TCP port command has been submitted successfully!" Then in the terminal list it can be seen the terminal has been assigned a TCP port, as shown in the figure below:

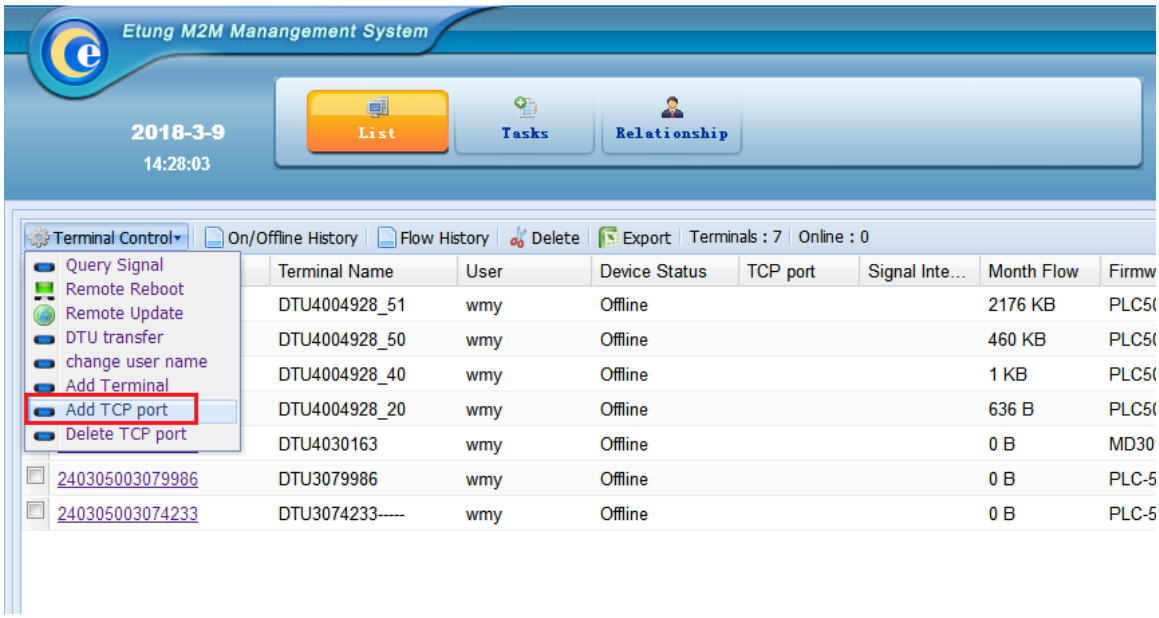
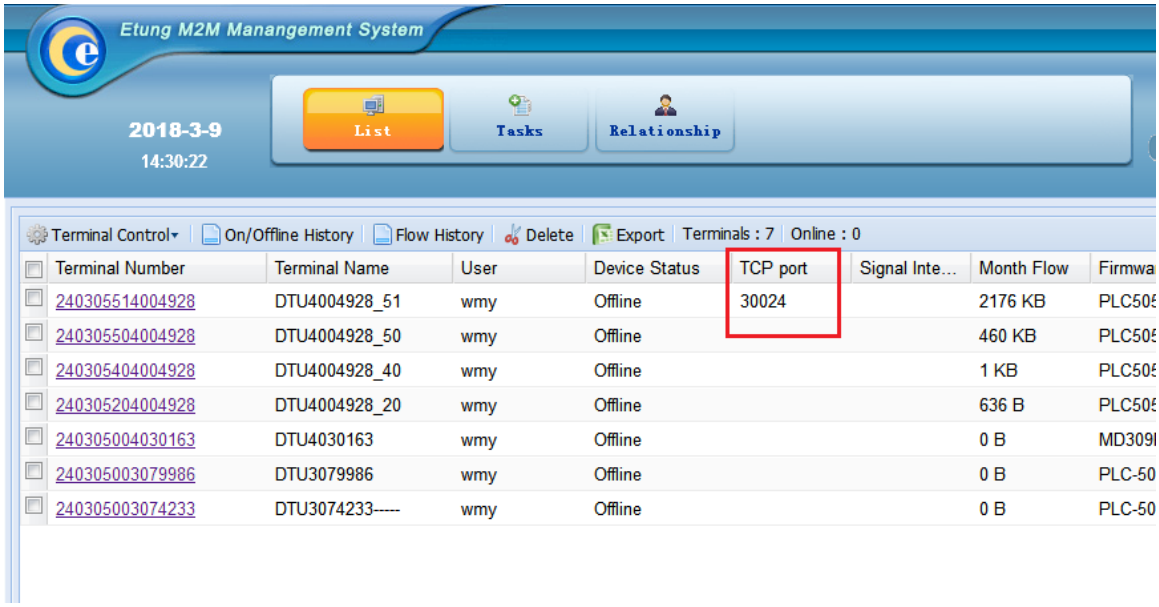


Figure Appendix 4-8: Add TCP port



If multiple channels are configured in SINAPACK 200's agent client, then add terminal for each independent channel and assign TCP port for the terminal accordingly. As shown in the figure below, two terminals and corresponding TCP ports are added:

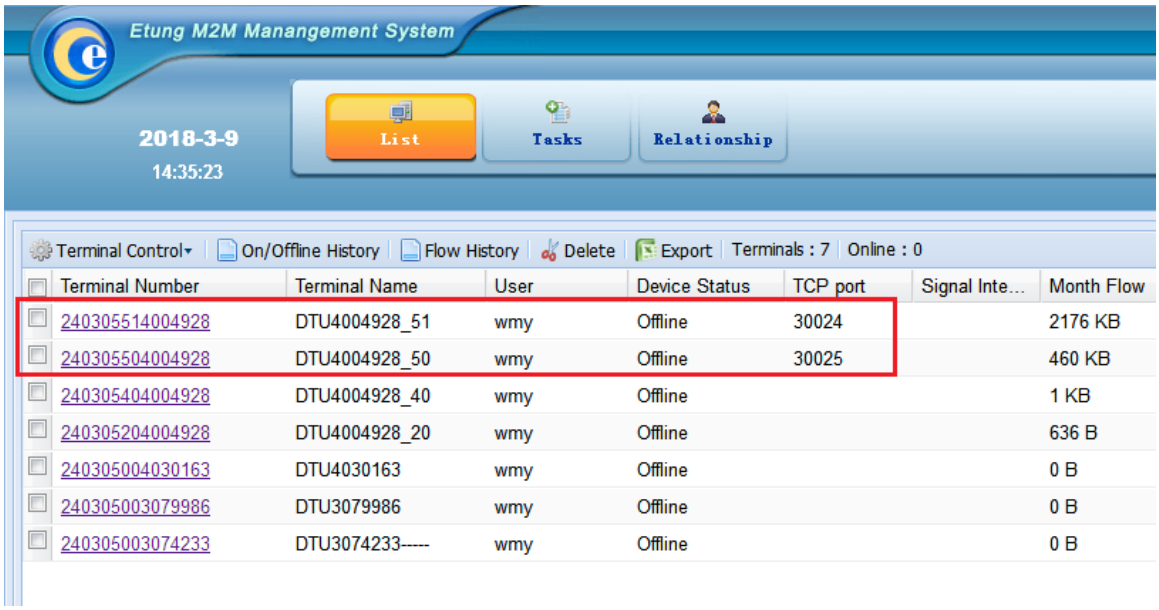


Figure Appendix 4-9: Add TCP port for each terminal

6. Use vncviewer on PC or mobile to remote control touchscreen
   Run vncviewer in PC or mobile, input server information as LianWangBao server's domain plus the TCP port assigned in step 5, as shown in the figure below:

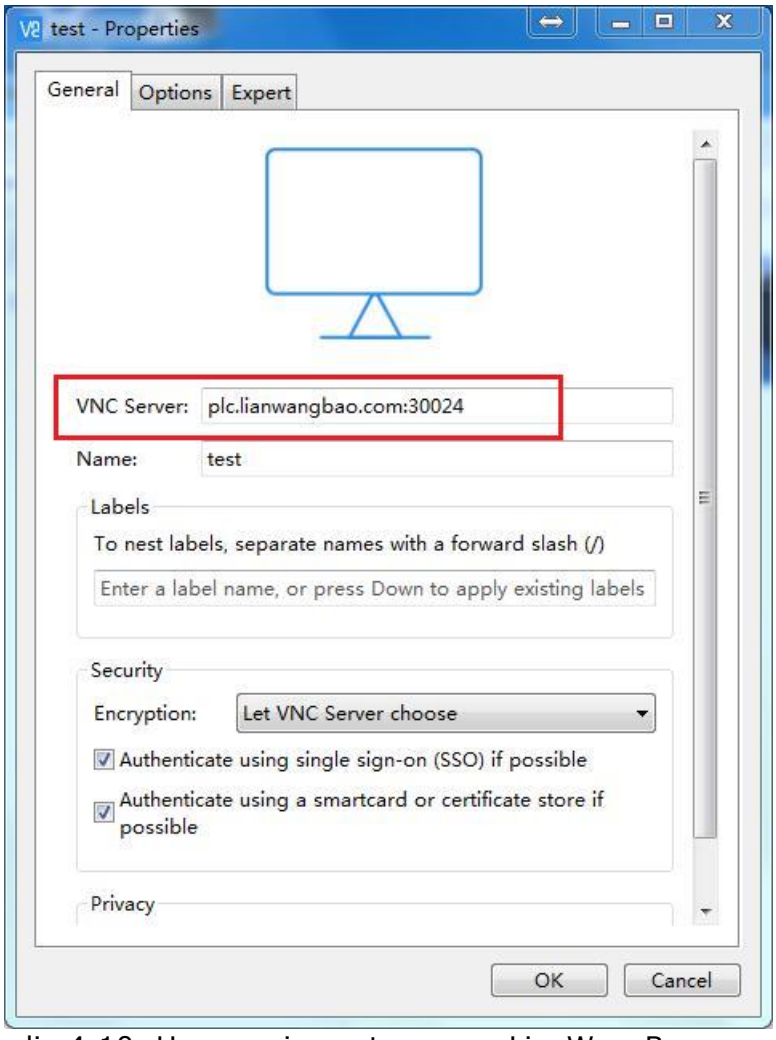


Figure Appendix 4-10: Use vncviewer to access LianWangBao server's TCP port

Click "OK", then there will be a warning dialog, and then prompts the password dialog. Input the password to verify, then the remote touchscreen's desktop will be shown on PC (or mobile).

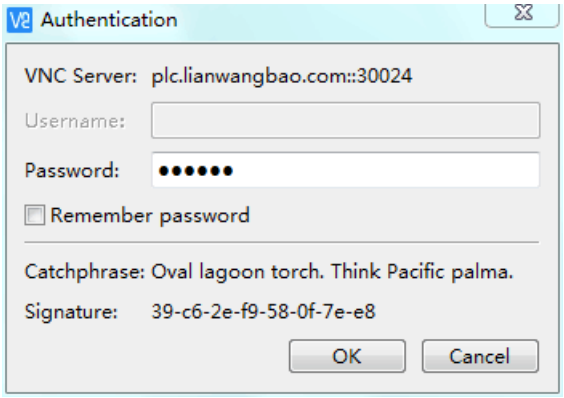


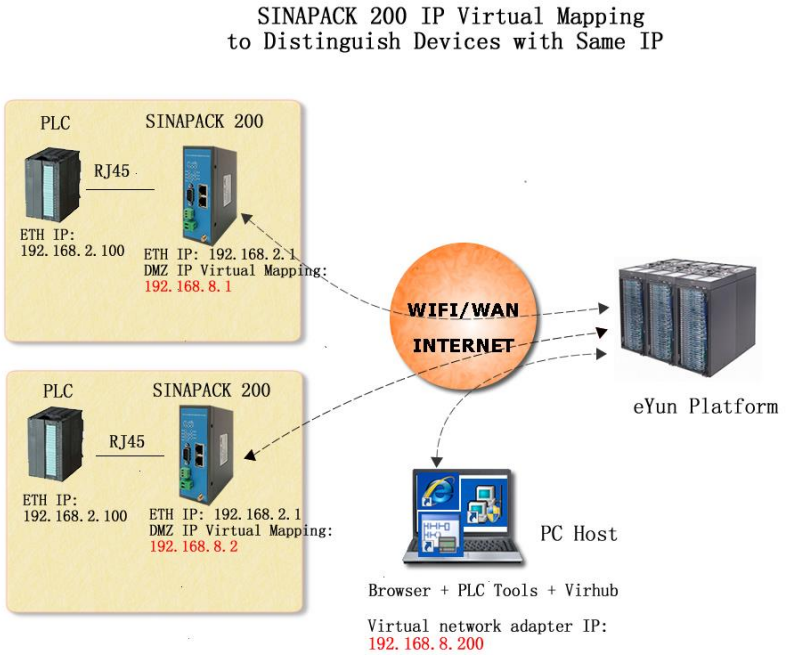
Figure Appendix 4-11: Input password

Attention:

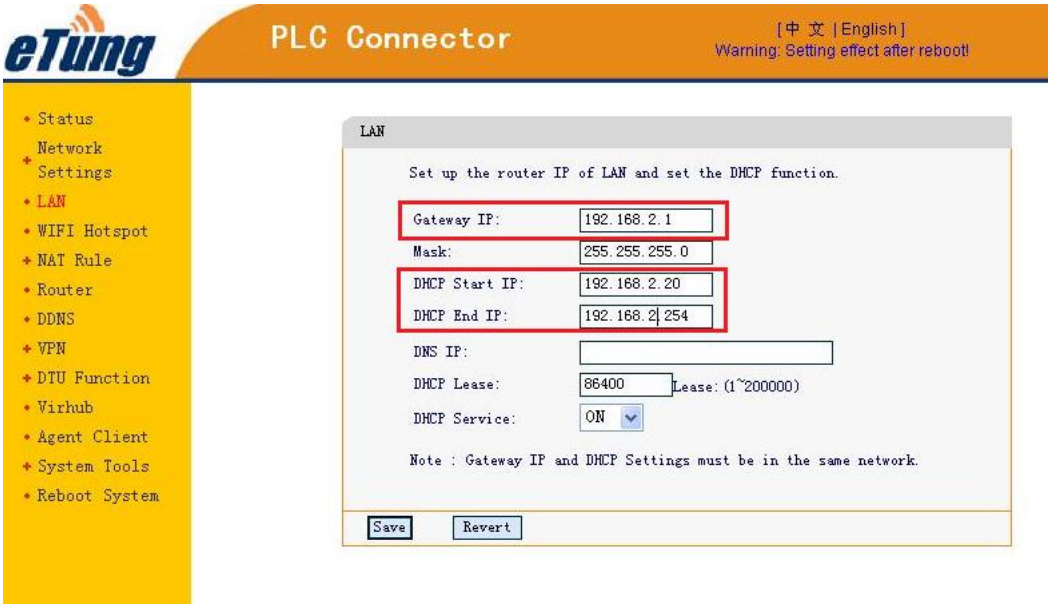
1) If multiple PCs (or mobile phones) access touchscreen at the same time, make sure each PC use an independent channel, i.e. in vncviewer's server information use different TCP port for different channels, otherwise the connections will be lost and PCs cannot work correctly.
2) The solution above is just one of device remote access solutions. In fact, to support PCs' remote access on touchscreen, Virhub + VNC is another effective solution. Please refer to Appendix 1 for details on how to use Virhub.

Appendix 5: Use SINAPACK 200 IP Virtual Mapping together with Virhub to Distinguish Devices with Same IP

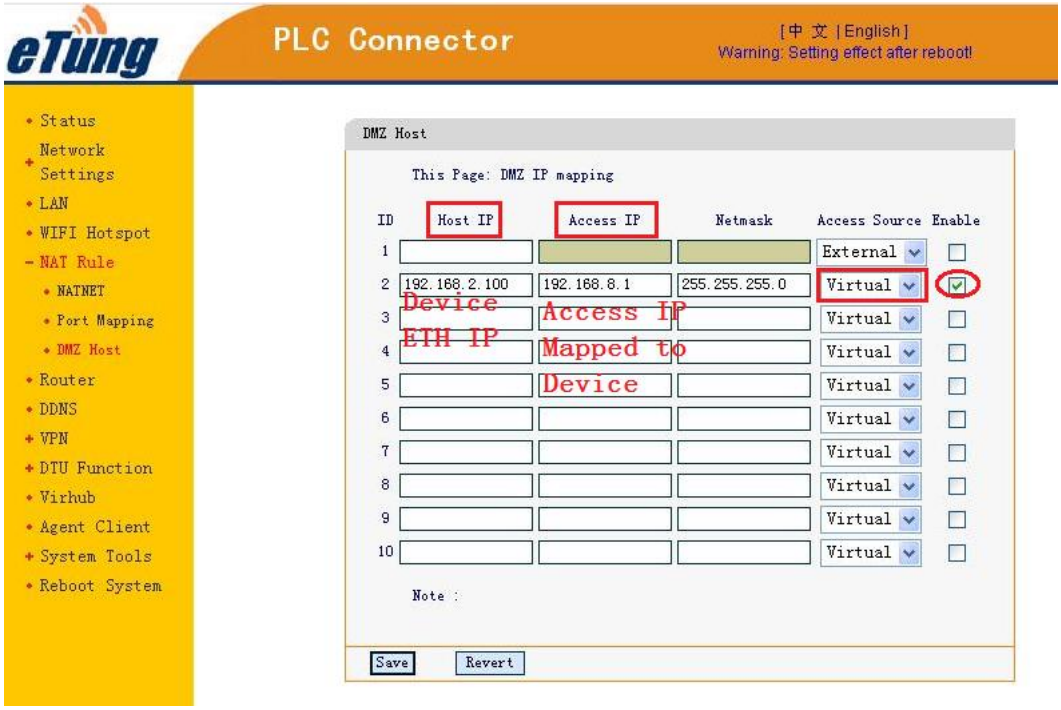
Some projects have devices, i.e. PLCs, with a fixed IP address by default. SINAPACK 200 is used to implement devices' remote access. However, the devices are configured with the same default IP, and the monitoring center cannot distinguish them with IP. Virhub together with SINAPACK 200 IP virtual mapping can solve this problem.



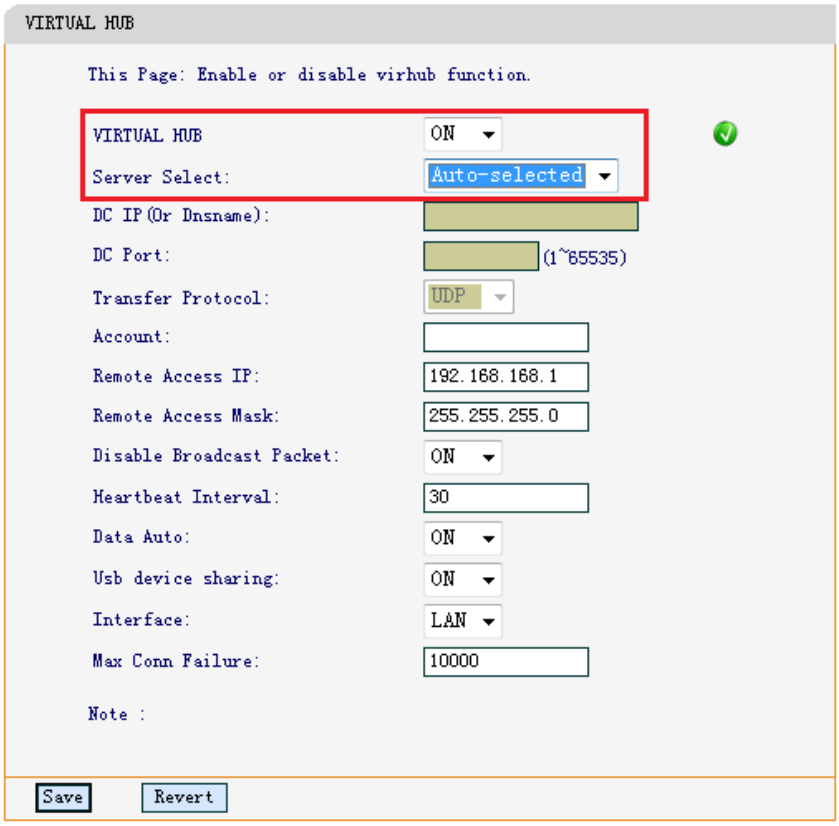
1. Use Ethernet cable to connect device with SINAPACK 200;
2. Configure SINAPACK 200 Ethernet IP to be in the same IP range as device Ethernet IP, for example: 192.168.2.*;



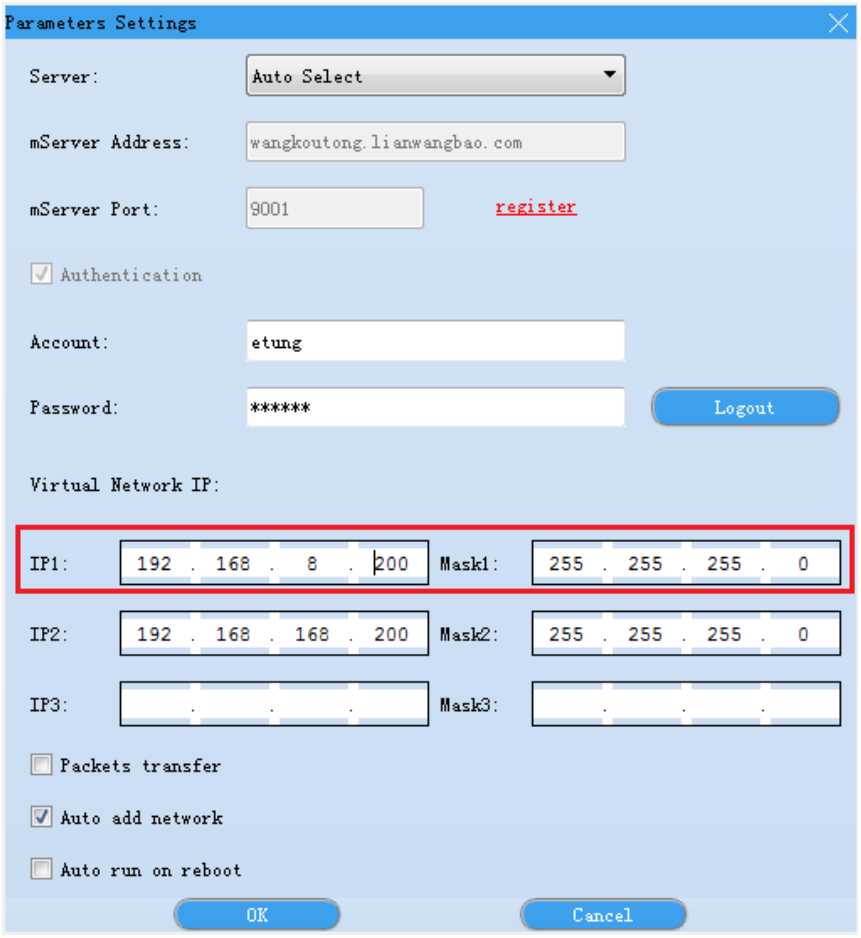
3. Configure IP virtual mapping, map the device's IP to some IP (Access IP) in a different IP range, for example: 192.168.8.1, and make sure different devices are assigned to different IPs;



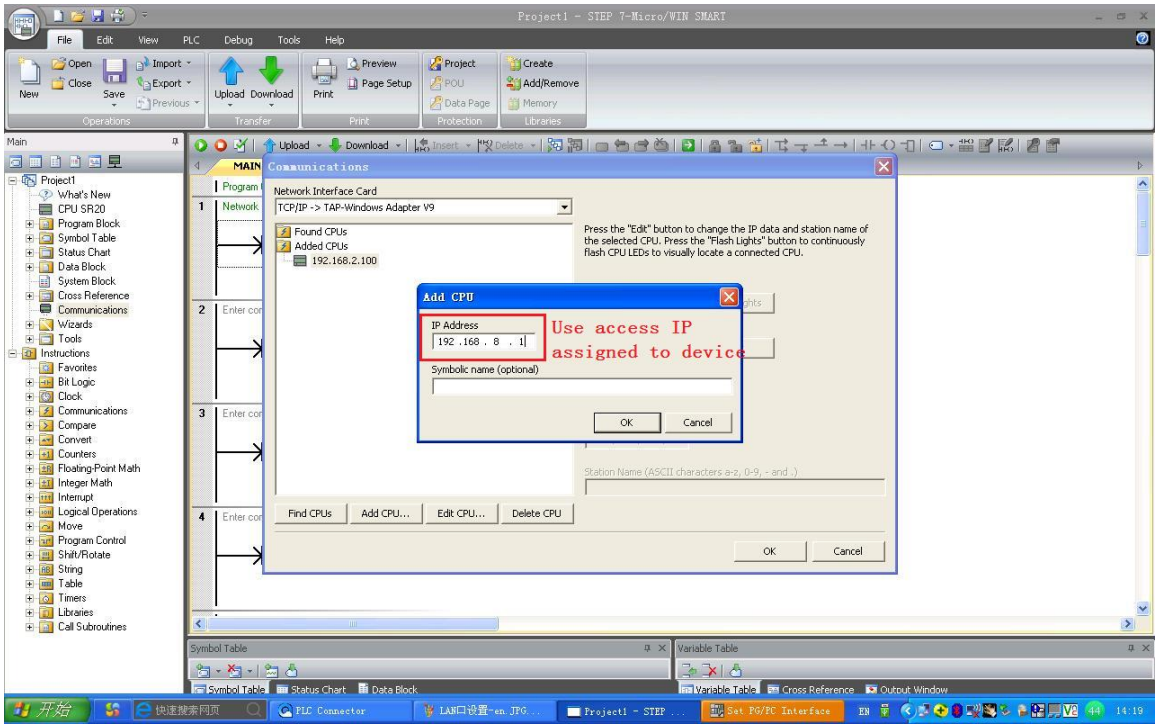
4. Enable Virhub in SINAPACK 200;



5. Run Virhub software on host PC, and set virtual network adapter IP as in the same IP range as the access IPs mapped to devices;



6. Use the access IPs to communicate with devices.


Project1 - STEP 7-Micro/WIN SMART
Communications
Network Interface Card
TCP/IP -> TAP-Windows Adapter V9
Found CPUs
Added CPUs
192.168.2.100
Press the "Edit" button to change the IP data and station name of the selected CPU. Press the "Flash Lights" button to continuously flash CPU LEDs to visually locate a connected CPU.
Add CPU
IP Address
192 .168 . 8 . 1
Use access IP assigned to device
Symbolic name (optional)
OK
Cancel
Find CPUs
Add CPU...
Edit CPU...
Delete CPU
Station Name (ASCII characters a-z, 0-9, - and _)
Symbol Table
Variable Table

Appendix 6: SINAPACK 200's MODBUS TCP Interface Description

SINAPACK 200 has built-in MODBUS TCP protocol, and as MODBUS TCP slave, MODBUS TCP client can get system time, SINAPACK 200 current status, signal strength, SINAPACK 200 serial ID, etc. Below is the brief description of SINAPACK 200's MODBUS TCP interface.

- ✓ MODBUS device address: 0x01
- ✓ MODBUS TCP port: 502
- ✓ Max connections: 32
- ✓ Protocol addresses base 0
- ✓ 16-bit high first
- ✓ 32-bit low first

Function	Description	Variable Address Offset	Variable Datatype	Variable Description
03	Read Holding Register	1~6	Int16	System time: Year, Month, Day, Hour, Minute, and Second.
		7	Int16	Signal strength
		8	Int16	Current network: 0: No connection 1: Cable 2: WIFI
		9~12		Reserved
		13	Int16	SINAPACK 200 current status 0: Running 1: Breakdown
		14	Int16	CPU usage, with value 0~100
		15	Int16	Memory usage, with value 0~100
		16	Int16	Positioning status, 0: Invalid, 1: Valid
		17~18	Float32	Running time, unit: hour
		19~20		Reserved

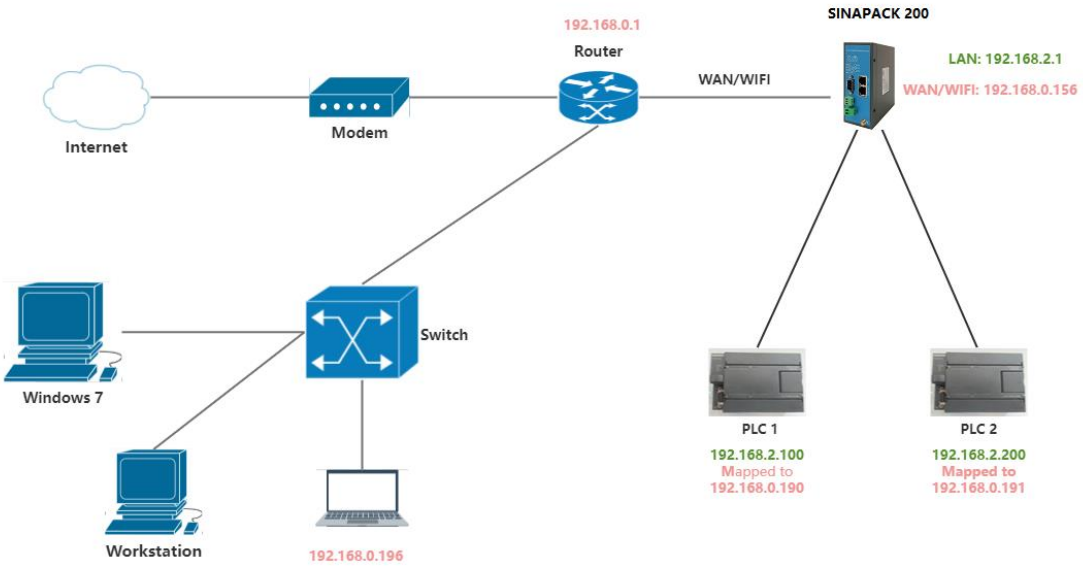
		21~35	Int16	SINAPACK 200 serial ID, 15 digits, encoding with BCD
		36		Reserved

Appendix 7: SINAPACK 200's Enhanced DMZ Function

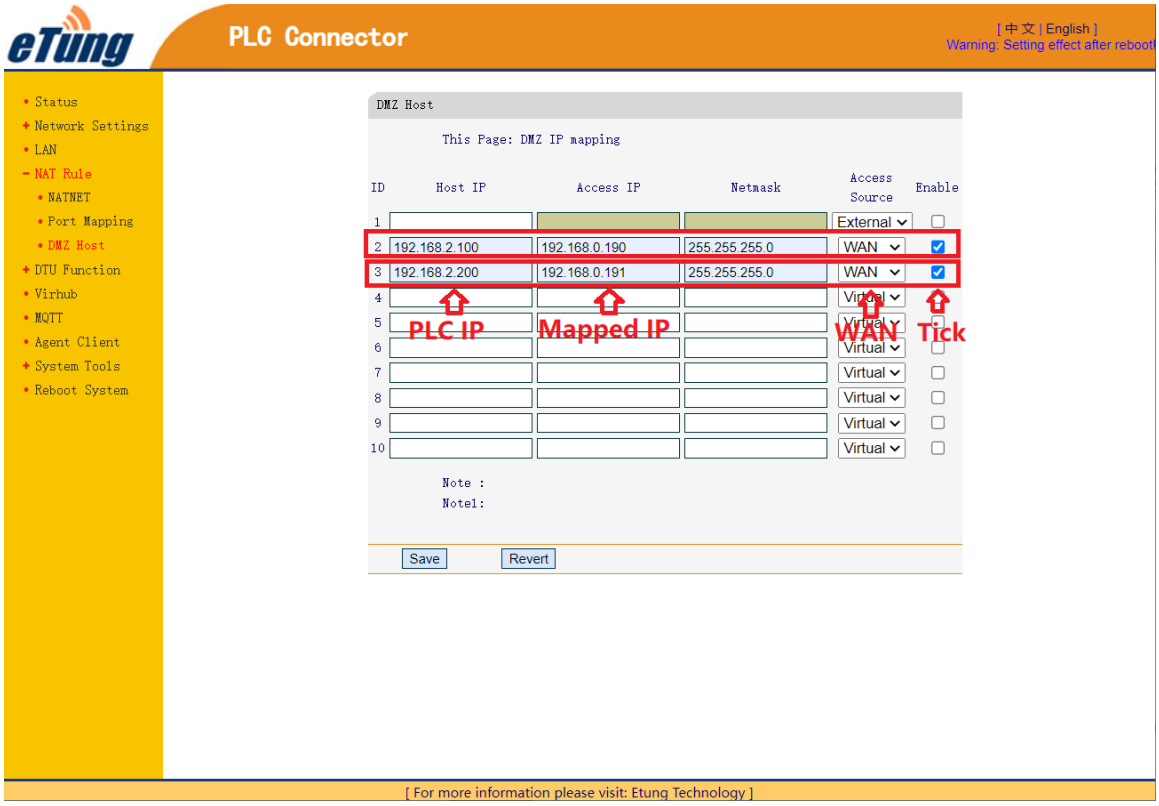
In case SINAPACK 200 chooses WAN or WIFI network, if some PC in the same WAN/WIFI network needs to connect to devices under SINAPACK 200, the enhanced DMZ function can be enabled.

By default, only one host can be specified for DMZ host. The enhanced DMZ allows multiple hosts.

As shown in the figure below, SINAPACK 200 connects to network via WAN/WIFI, and gets IP address 192.168.0.*. PLC 1 and PLC 2 connects to SINAPACK 200, with IP address 192.168.2.100 and 192.168.2.200. One PC in the same WAN network has IP 192.168.0.196, and the PC needs to connect to PLC 1 and PLC 2.



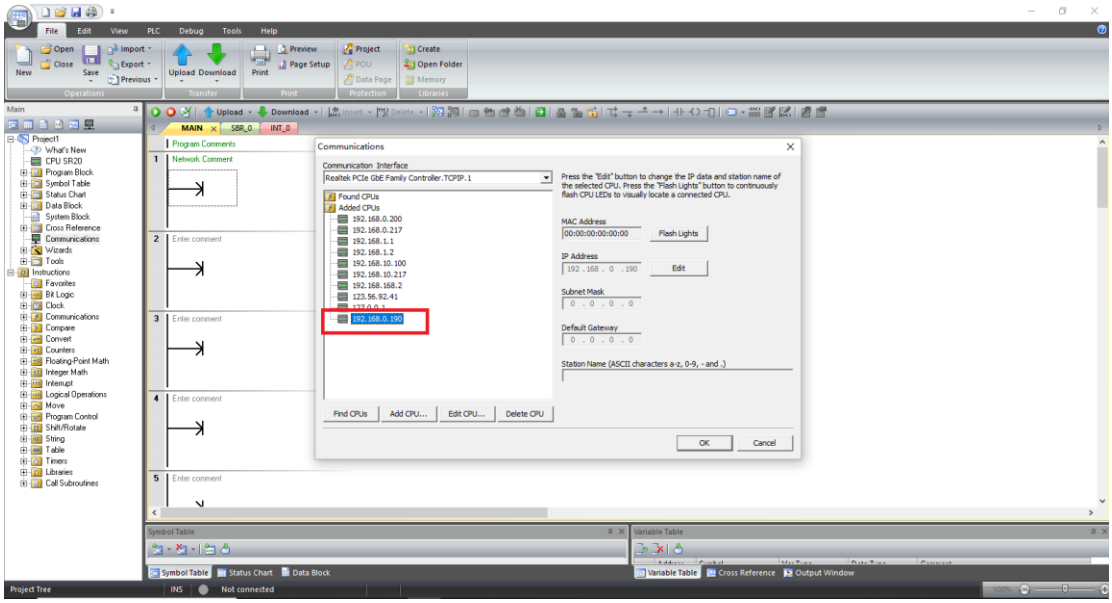
To implement this, configure two rules in DMZ, as shown in the figure below:



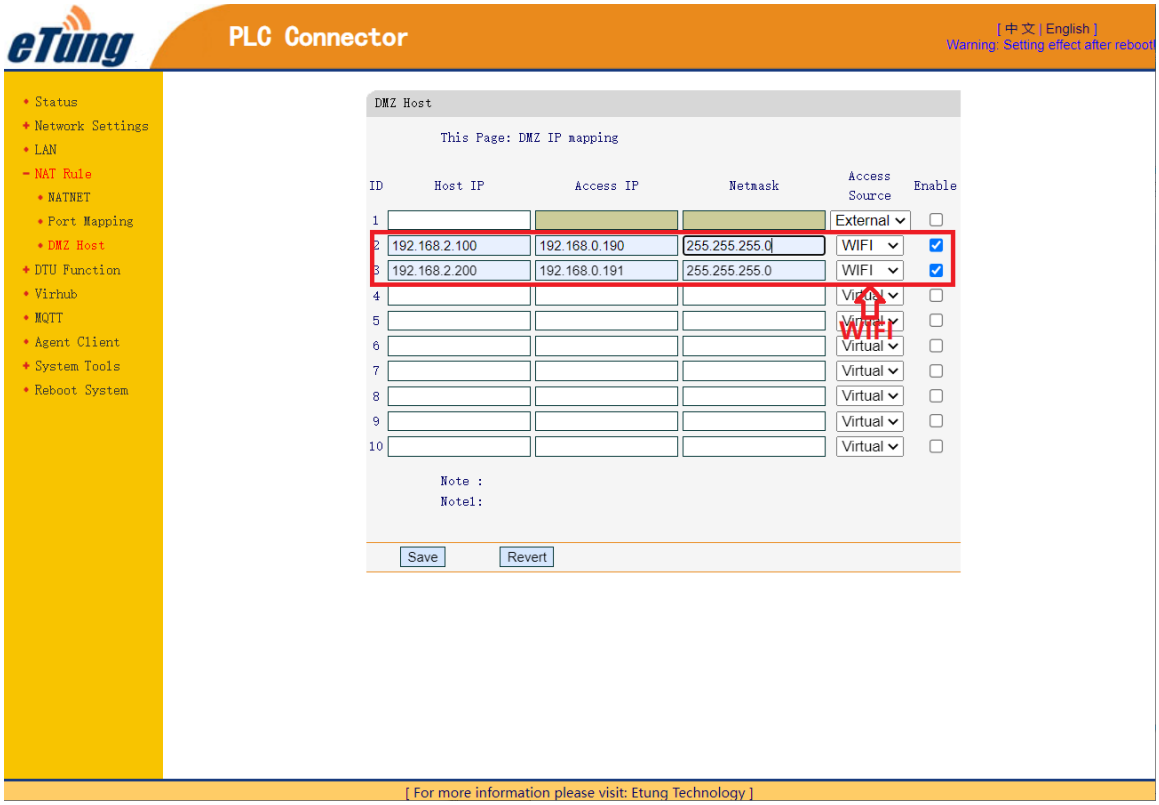
After configuration, save and reboot SINAPACK 200.

Then, PC in the WAN network can access PLC 1 via IP: 192.168.0.190, and PLC 2 with IP: 192.168.0.191.

For example, to download/upload PLC program:



Similarly, in case SINAPACK 200 connects to WIFI network, the DMZ rules are configured below:



Attention:

In case WAN is specified in the rules, please enable WAN network; and in case WIFI is specified in the rules, please enable WIFI network. Go to Network Settings --> Network Select, and choose WAN or WIFI to enable the corresponding network.

FCC Statement:

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

After connecting to WIFI, the device can be used.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.