

Intelligent Communication Management Machine

Installation instruction V1.14

DECLARATION

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1 Overview

1.1 Product Overview

This series of intelligent communication management machine is a computer platform with embedded hardware, with multiple downlink communication interfaces and one or more uplink network interfaces. It is used to collect and summarize communication data of all intelligent monitoring/protection devices in a target area, upload it to the master station system in real time, and complete energy data acquisition functions such as remote communication and telemetry.

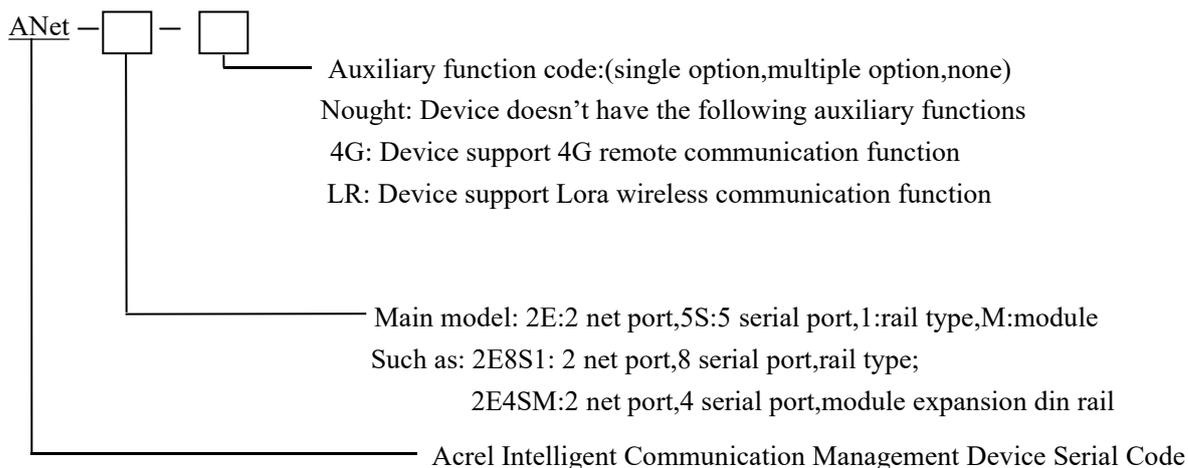
Meanwhile, this series of intelligent communication management machine supports to receive the command issued by the superior master station system, and send it to the intelligent series unit in the target area, to complete the on/off remote control of the switch equipment in the station or device parameter setting, to achieve remote control and remote adjustment function, to realize the remote output dispatching command target.

This series of intelligent communication management machine provides rich protocol library to support/realize the interconnection of intelligent devices from different secondary equipment suppliers. As a communication interface device between automation system network and monitoring equipment, this series of intelligent communication management machine has realized three functions: protocol conversion, interface matching and data conversion.

This series intelligent communication manager provides an RS485 communication port. Each port supports a maximum of 32 instrumentation devices (for low-voltage comprehensive protection, users are advised to connect no more than four devices to each port). The number of devices carried by each communication port can be determined according to the communication baud rate, communication line length and customer's requirement for the refresh speed of communication data.

This series of intelligent communication management machine real-time parallel multitasking processing and access to the third party equipment and the upper system connection communication, support software configuration. Special configuration management software enables you to select different communication protocols for devices mounted on different channels, and you can change the number and data information of instruments connected to the communication manager by changing the configuration file without changing the software program.

1.2 Type Description



The specific model is located on the product label on the device side.

The current list of models involved is as follows:

4 Serial port Series: ANet-2E4S1 (Iron case)

8 Serial port Series: ANet-2E8S1 (Iron case)

2 Serial port series: ANet-1E2S1, Anet-1E2S1-4G, ANet-1E1S1, Anet-1e1S1-4G (iron case)

Modular series: ANet-2E4SM, Anet-2E4SM-LR, ANet-M4G, ANet-M485 (plastic case), ANet-MCAN,

ANet-MIO, ANet-MSE, ANet-MBUS, ANet-MALIBUS

ANet-1E2SM series: ANet-1E1SM (plastic case)、ANet-1E1SM-4G (plastic case)、ANet-1E1SM-4G/LR/K (plastic case)、ANet-1E2SM (plastic case)、ANet-1E2SM-4G (plastic case)、ANet-1E2SM-4G/LR/K (plastic case)

1.3 Technical Parameter

1.3.1 Public Technical Indicators

Technical Parameter		Indicator
Source Frequency and Consumption		45~65Hz , Consumption ≤ 10W
Safety	Electromagnetic compatibility	ESD L4, EFT L4, SURGE L4, EMI L3
	Power frequency withstand voltage	Duration of 1min between power supply and communication terminal: 2kV (220V equipment), 1.5kV (24V equipment)
	Insulation resistance	Under general test atmospheric conditions, the input and output end to the housing > 100 m Ω
Mean fault-free operating time		≥ 30000 h
Environment		Operating temperature: -20℃ ~ +55℃
		Storage and transportation temperature: -25℃ to +70℃
		Relative humidity: ≤ 95% (+25℃)
		Altitude: ≤ 2500m
External storage		1 channel SD card port, 8GB electronic hard disk (excluding TF card interface)

1.3.2 8 Serial Port Series

Technical parameter	Indicator
Source voltage	AC/DC 220V (85-265V)
Processor	ARM32 bit Cortex-A7 core, 528MHz
Storage	256MB DDR3
Electronic hard disk	256MB NAND Flash
RS485	8-way optical coupling isolation
RS232(Debugging port)	1 channel
USB HOST	1 Channel, USB 2.0 High Speed

Ethernet	2 channels 10/100M Adaptive
-----------------	-----------------------------

1.3.3.2 Serial Series

Technical Parameter	Indicator
Power Source	AC/DC 220V (85–265V)
Processor	ARM32 bit i.MX280 core,454MHz
Storage	64MB DDR2
Electronic hard disk	128MB NAND Flash
RS485	2-way optical coupling isolation
Ethernet	1 channel 10/100M adaptive
Internation Version/Full Netcom Version/4 template 4G	1 channel(4G models include this function)

1.3.4 4 Serial Port Series

Technical Parameter	Indicator
Power Source	AC/DC 220V (85–265V)
Processor	ARM32 bit Cortex-A7 core, 528MHz
Storage	256MB DDR3
Electronic hard disk	256MB NAND Flash
RS485	4 channels optical coupling isolation
RS232(Debugging port)	1 channel
USB HOST	1 channel,USB2.0 High speed
Ethernet	2 channels 10/100M adaptive

1.3.5 Modular Series

Technical Parameter	Indicator
Power Source	DC 12V (9–36V)
Processor	ARM32 bit Cortex-A7 core, 528MHz
Storage	256MB DDR3
Electronic hard disk	256MB NAND Flash
RS485	4 channels Optical Coupling Isolation
RS232(Debugging port)	1 channel, for debugging only
USB HOST	1 way, USB2.0 high speed, support access to U disk or wireless wifi network card
Ethernet	2 channels 10/100M adaptive

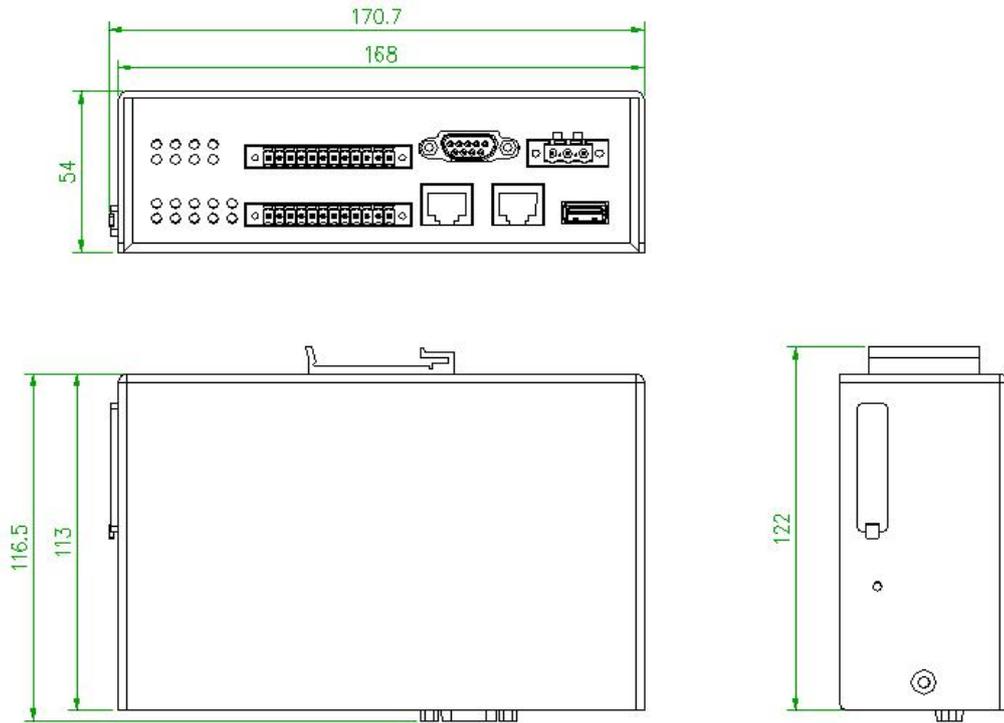
DI Acquisition	8 channels Passive Dry Contact Switches are collected
Lora Wireless	1 channel, carrier frequency 410MHz~525MHz, Lora modulation mode
TF card interface	Support for plug and play of TF memory cards up to 16G
RST Key	Hold down for 2-5 seconds to restart the device, and hold down for more than 5 seconds to restore the factory default Settings
ANet-M485	4 channels optical coupling isolation 485 Serial Port Submodule,the main module connects to a maximum of 3 M485
ANet-MCAN	CAN expansion module extends 1 channel CAN BUS
ANet-MIO	IO expansion module: expands 8 DI channels, 4 DO channels, and 4 AI channels
ANet-MSE	Encryption extension module to expand hardware encryption function
ANet-MBUS	MBUS expansion module: expands 1 MBUS BUS
ANet-MALIBUS	ALIBUS expansion module,expand 1 channel ALIBUS BUS
ANet-M4G	4G sub-module,after access to support the international version/7 mode full Netcom version/4 template 4G

1.3.6 ANet-1E2SM Series

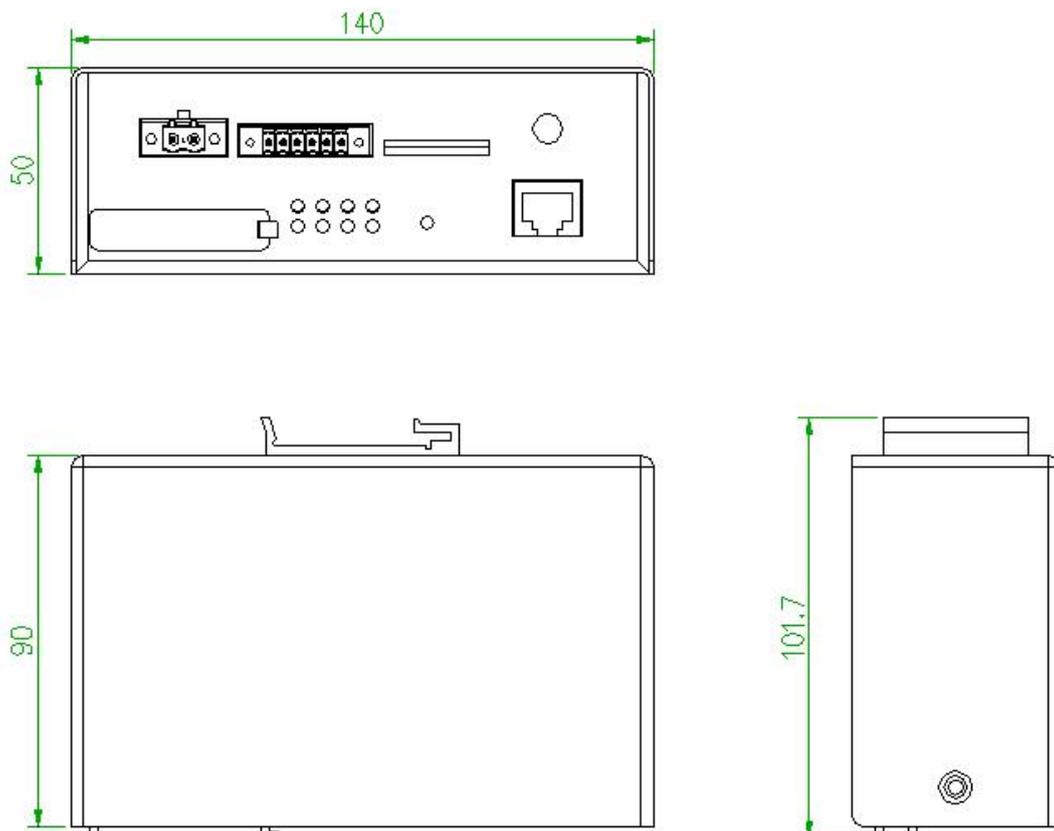
Technical Parameter	Indicator
Power Source	DC 12V (9~36V)
Processor	ARM32 bit ARM9 core, 804MHz
Electronic hard disk	128MB DDR2
Electronic hard disk	256MB SPI NAND Flash
RS485	2 channels Optical Coupling Isolation
USB Type-C (Debugging port)	1 channel
Ethernet	2 channels 10/100M adaptive
IO	6 channelsDI, 4 channelsDO

1.4 Dimensions

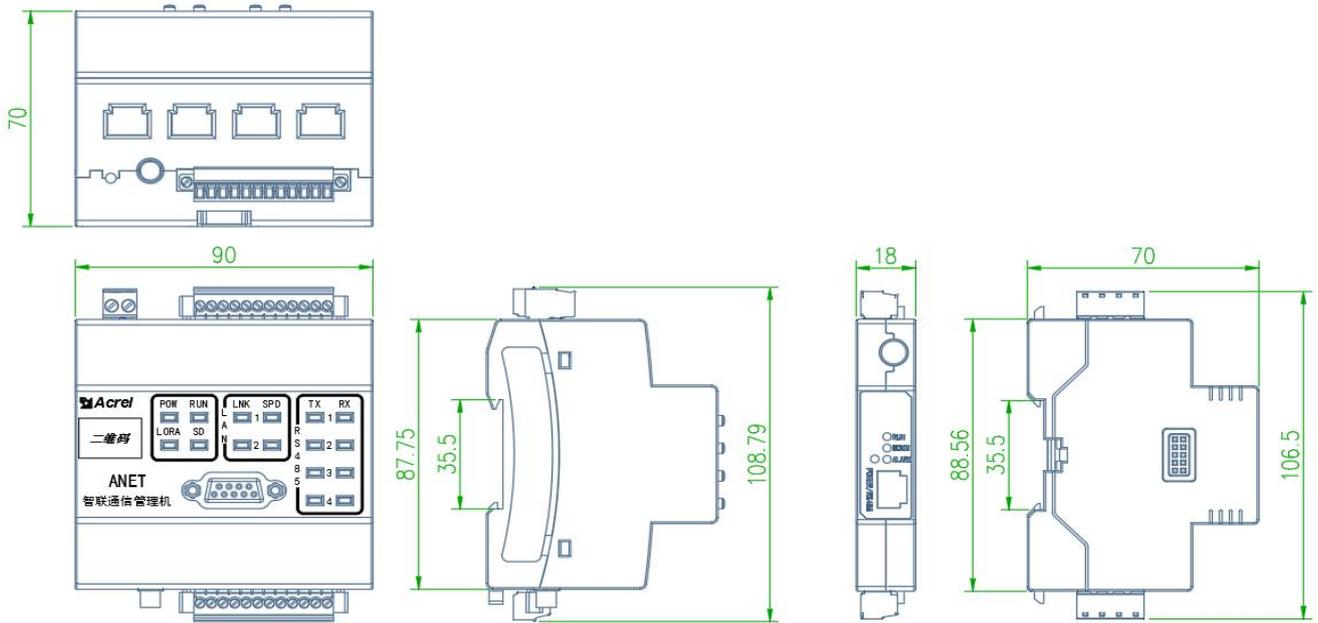
1.4.1 8 Serial Port Series、4 Serial Port Series



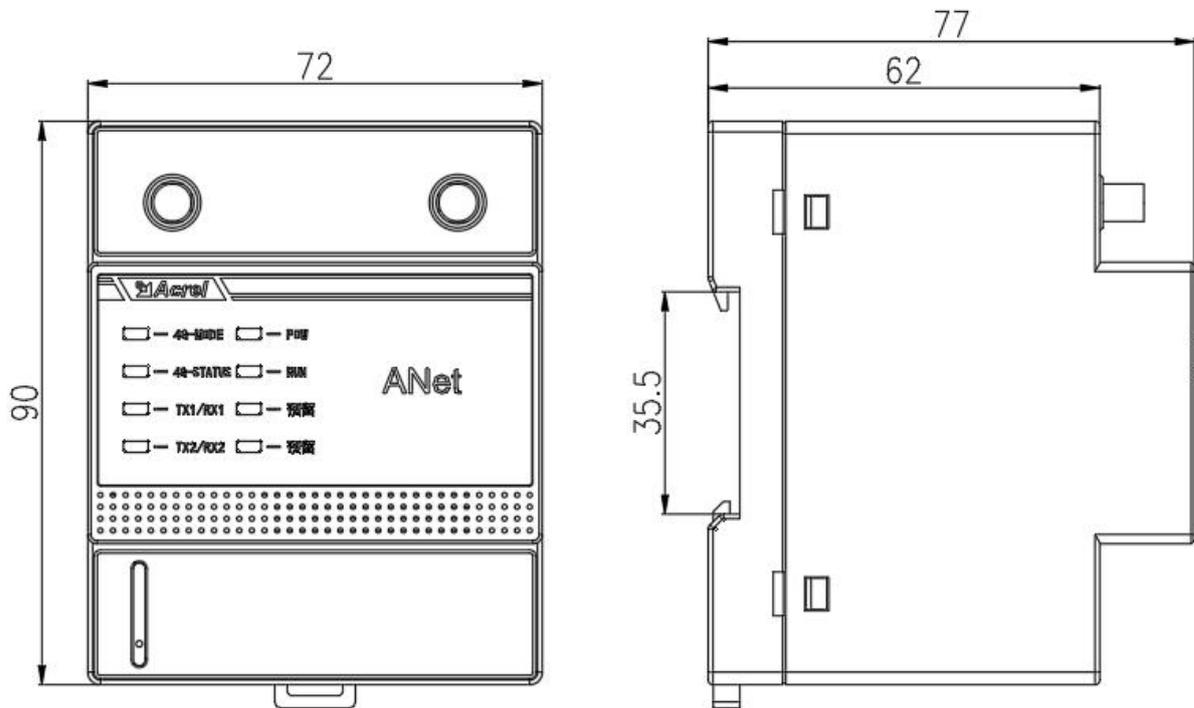
1.4.2 2 Serial Port Series

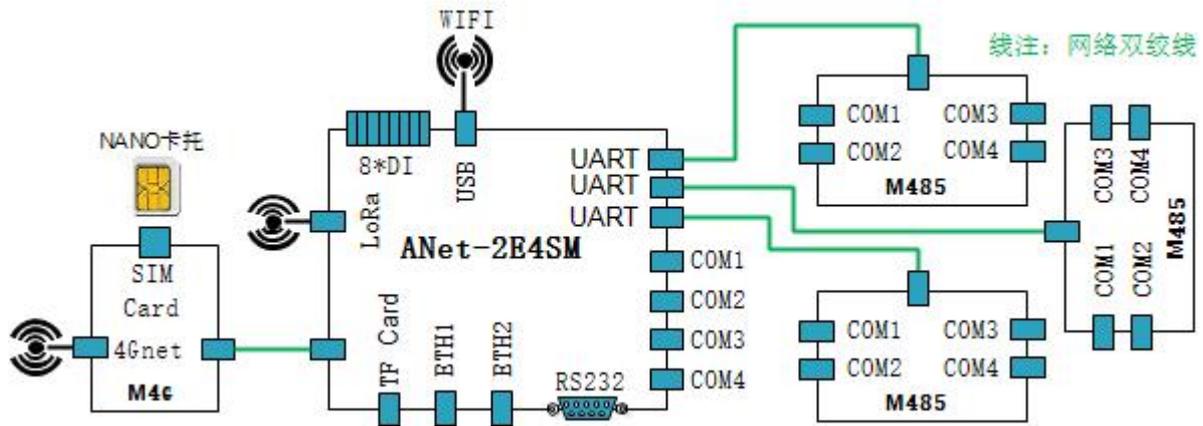


1.4.3 Modular Series



1.4.4 ANet-1E2SM Series





1.5 Wiring and Installation

This series of intelligent communication management machine adopts 35mm standard guide rail installation.

1.5.1 8 Serial Port Series、4 Serial Port Series

8 Serial port series and 4 Serial port series after connecting the network cable, the LINK green indicator is on and blinks when there is data. The SPEED yellow indicator is always on when it is 100 MB /s and off when it is 10Mb/s. The RS485 data transmission Receiving data RX red indicator blinks, and the transmitting data TX green indicator blinks.

Guide rails can be installed on the rear plate and bottom plate.

1.5.2 2 Serial Port Series

When 2 serial port series is connected to the network cable, the green indicator is on and blinks when data is available. The SPEED yellow indicator is always on when the serial port series is connected to the network cable and turns off when the serial port series is connected to the network cable. The RS485 data transmission Receiving data RX red indicator blinks, and the transmitting data TX green indicator blinks.

The single model does not offer SIM wireless, and the 4G port is sealed with a rubber plug.

The 4G model offers SIM wireless capability and an external 7-mode dedicated antenna.

4G model The 4G indicator is off for 4 seconds when it is not working. It is on for 1 second and blinks when data is available.

Guide rails can be installed on the rear plate and bottom plate.

This series of intelligent communication management machine all terminals are on the front panel.

1.5.3 Modular series

The LED lights of 2E4SM device are in the upper panel, all red, and the data processing display blinks. If no data is processed, the LED lights will be off.

ANet-M4G module, SIM card, and ANet-M485 module do not support hot swap. They can work properly only after power off and all LED lights are off.

1.5.4 ANet-1E2SM Modular series

The LED lights of the 1E2SM device are all red on the upper panel, with flashing data processing display and off when there is no data processing.

2 Device Management

2.1 Maximum Number of Device Connection

8 serial port series provides 8 RS485 serial ports, each serial port supports and connects to 32 devices, a maximum of 256 instrumentation devices can be installed at full load, the recommended total number of information data points is 18000.

4 Serial Port Series Provides 4 RS485 serial ports.,each serial port supports and connects to 32 devices, 128 instrumentation devices at full load.,the recommended total number of data points is 12,000.

2 Serial Port Series The serial port provides two RS485 serial ports. Each serial port supports and connects to 32 instrumentation devices. A maximum of 64 instrumentation devices can be installed at full load.

The modular series provides 16 RS 485 serial ports and Lora wireless and other physical interfaces. It is suggested that the total number of information data points is 24,000.

During the configuration of the dedicated management software, the information points of the current project will be displayed in the status bar. If the number of information points turns red, it indicates that the number has exceeded the recommended value. If the number of information points is too many to save during the saving of the project, the number has exceeded the limit.

2.2 Terminal Device Management

The default factory IP address of the management computer network port is LAN1:192.168.1.136.
LAN2:192.168.2.136

You can use the SSH or telnet software (such as SecureCRT) provided by the configuration management software to manage and configure basic device information. After connecting the computer to the RJ45 port of the serial port 2 device using a network cable, you can use the terminal console software to connect the SSH or Telnet service provided by the device. After the connection is successful, login: is displayed. You need to enter the user name and password to login. Console management user name: admin; Password: admin. The user name and password cannot be changed.

2.2.1 Terminal Login Page

In order to ensure that users have a good visual environment in different terminal interfaces, users need to select the text color of the operating environment. At this time, users input the numbers 0-6 corresponding to the color, and then press Enter to obtain the text color they want, as shown in the figure below:

```
Welcome to use This shell, please type "help" to known more.  
 0:Black 1:Red 2:Green 3:Yellow 4:Bule 5:Purple 6:White Other:Default  
Please select the fonts color:2  
CMD > █
```

2.2.2 Serial Port Command Prompt

The command prompt is CMD >. , the user in >; Type the command and press Enter to execute the command.

The command line supports the up or down keys on the keyboard to select historical commands.

The user does not know the specific command. Can you enter it? "Or" help."

2.2.3 Command Introduction

Command: ? or help

Function: Display a list of all commands

Grammar: ?[Enter] or help [Enter]

For example:

```
CMD > ?

Usage:
? | help      ---- console command help
ping <DST>    ---- check network
reboot        ---- reboot System
showip        ---- show ip and status
clr           ---- clear screen
quit | exit   ---- login out System
defgw         ---- show or set gateway, and argment "--help" for help
setip <dev> <IP> ---- set ip address
checkport <IP> <port> ---- check a port of the remote host
```

Command: ping

Function: Network connectivity test

Grammar: ping Target IP address[Enter]

For example:

```
CMD > ping 192.168.1.100

Target_host is alive.
```

Command: reboot

Function: Soft restart of the device

Grammar: reboot[Enter]

For example: (omission)

Command: showip

Function: View all network adapter settings

Grammar: showip[Enter]

Add: eth0 corresponds to network port "LAN1" (or LAN) on the device;

Eth1 corresponds to network port "LAN2" on the device;

Lo port is the return loop port.

For example:

```
CMD > showip
```

```
eth0      Link encap:Ethernet  HWaddr 00:14:97:29:F7:F6
          inet addr:192.168.1.136  Bcast:192.168.1.255  Mask:255.255.255.0
          inet6 addr: fe80::214:97ff:fe29:f7f6%1995653120/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:785 errors:0 dropped:0 overruns:0 frame:0
          TX packets:42 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:61696 (60.2 KiB)  TX bytes:4838 (4.7 KiB)

eth1      Link encap:Ethernet  HWaddr 00:14:97:29:F7:F5
          inet addr:192.168.2.136  Bcast:192.168.2.255  Mask:255.255.255.0
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1%1995653120/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:4 errors:0 dropped:0 overruns:0 frame:0
          TX packets:4 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:344 (344.0 B)  TX bytes:344 (344.0 B)
```

Command: clr

Function: Clear the course console information

Grammar: clr[Enter]

Command: quit or exit

Function: exit the current login

Grammar: quit[Enter] or exit[Enter]

Command: defgw

Function 1: view the current network route

Grammar 1: defgw[Enter]

For example:

```
CMD > defgw
```

```
Kernel IP routing table
Destination      Gateway          Genmask         Flags Metric Ref    Use Iface
192.168.1.0      0.0.0.0         255.255.255.0  U        0      0      0 eth0
192.168.2.0      0.0.0.0         255.255.255.0  U        0      0      0 eth1
```

Function 2: Configure the default route on the current network;

Grammar 2: defgw add default gw gateway IP[Enter]

For example:

```
CMD > defgw add default gw 192.168.1.1
```

```
CMD > defgw
```

```
Kernel IP routing table
Destination      Gateway          Genmask         Flags Metric Ref    Use Iface
0.0.0.0          192.168.1.1     0.0.0.0         UG        0      0      0 eth0
192.168.1.0      0.0.0.0         255.255.255.0  U        0      0      0 eth0
192.168.2.0      0.0.0.0         255.255.255.0  U        0      0      0 eth1
```

Function 3: delete the current network default route

Grammar 3: defgw del default gw gateway IP[Enter]

For example:

```
CMD > defgw del default gw 192.168.1.1
```

```
CMD > defgw
```

Kernel IP routing table

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
192.168.1.0	0.0.0.0	255.255.255.0	U	0	0	0	eth0
192.168.2.0	0.0.0.0	255.255.255.0	U	0	0	0	eth1

Command: setip

Function: set the IP address of the network port

Grammar: setip Network port name IP address to be configured[Enter]

```
CMD > setip eth1 192.168.2.125
```

```
CMD > showip
```

```
eth0      Link encap:Ethernet  HWaddr 00:14:97:29:F7:F6
          inet addr:192.168.1.136  Bcast:192.168.1.255  Mask:255.255.255.0
          inet6 addr: fe80::214:97ff:fe29:f7f6%1996038144/64  Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1622 errors:0 dropped:0 overruns:0 frame:0
          TX packets:209 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:130645 (127.5 KiB)  TX bytes:24736 (24.1 KiB)

eth1      Link encap:Ethernet  HWaddr 00:14:97:29:F7:F5
          inet addr:192.168.2.125  Bcast:192.168.2.255  Mask:255.255.255.0
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1%1996038144/128  Scope:Host
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:4 errors:0 dropped:0 overruns:0 frame:0
          TX packets:4 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:344 (344.0 B)  TX bytes:344 (344.0 B)
```

Important addition:

This configuration mode is only temporary. After the device is restarted, the system restores to the original configuration. To permanently configure the IP address of the device, use the management software. For details, see Network Port Settings in 4.2.1 Channel Configuration Description.

Command: checkport

Function: check whether the specified port monitoring function is enabled on the remote device and whether the local device can access the peer port

Grammar: checkport IP address specifies the checkport[Enter]

For example:

```

CMD > checkport 114.114.114.114 53

Scanning 114.114.114.114 ports 53 to 53
Port  Proto  State  Service
  53   tcp    open   domain
0 closed, 1 open, 0 timed out (or blocked) ports
CMD > checkport 114.114.114.114 54

Scanning 114.114.114.114 ports 54 to 54
Port  Proto  State  Service
0 closed, 0 open, 1 timed out (or blocked) ports

```

2.3 Special Management Software

Configuration management software (hereinafter referred to as the software) configures and manages the intelligent communication management machine. This software is mainly for professional configuration management personnel. Non-professionals are not allowed to use it without permission.

Software has a certain professional, need to understand some electrical industry knowledge and have the operation experience of related software.

2.4 Software Installation

Installation package file: setup.exe (The file name is subject to the version provided. If there is any change without prior notice)

Installation: All default Settings until the installation is complete

2.5 Software Function Introduction

Software functions are divided into two parts: project file configuration and management machine monitoring. When using the communication manager, first need to configure a project file, and then update the configuration into the communication manager system, in order to complete the communication manager data acquisition and data upload function. The communication management machine system can be used for real-time data monitoring and system control.

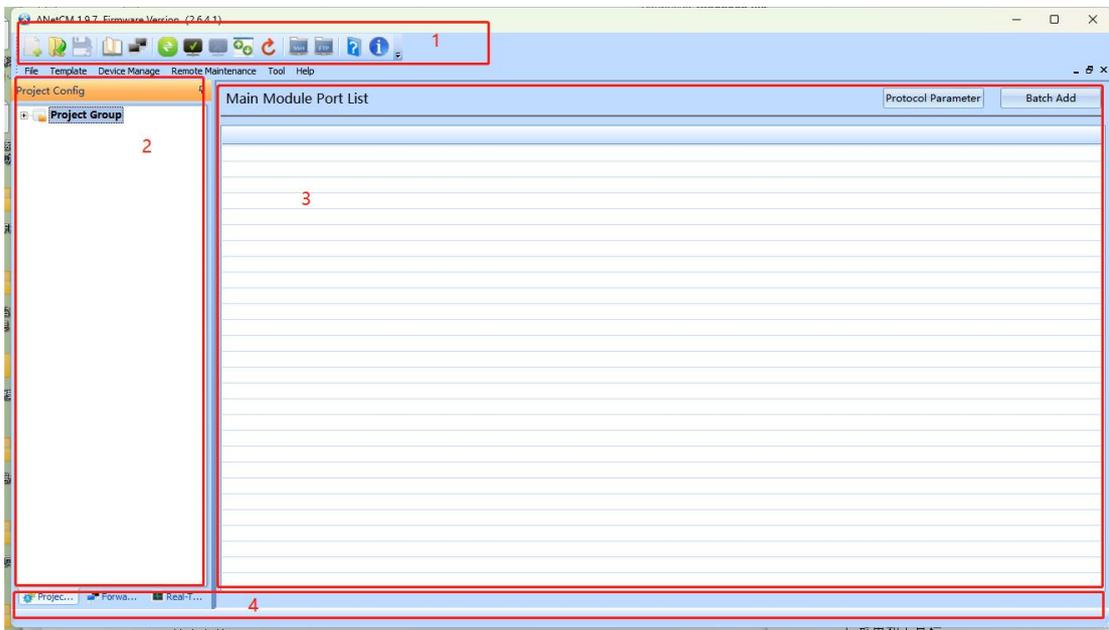
Regarding the configuration of project files, the main configuration items include channel type, protocol, protocol parameters, channel parameters, instrument parameters, point configuration, forwarding scheme, etc.

- Channel types are divided into a serial port,Lora and front-end ports,channel parameters configuration and different depending on the type of channel;
- Code is divided into the main side and device side two types,supports modbus,modbustcp,dlt-645 and iec 104 etc;Some common protocol templates are available;The protocol template can be configured and modified.
- Instrument parameters are consistent with actual situation,after completion of the the configuration can be repeated calls to export template, template may continue to configuration changes instrument;
- The point configuration for gathering data sets,to match with the function of the equipment,and support secondary calculation about Edge calculation.
- Some device templates are provided at the beginning. You can modify and configure them by yourself. For details, refer the template section below.
- To forward data,you need to configure a forwarding scheme.Refer to the forwarding scheme section below.

Real-time data monitoring allows you to view current communication packets and real-time data. Communication messages can be viewed in a channel or a meter to send detailed messages; Real-time data must be a specified meter.

In addition, the software also integrates third-party open source software for the convenience of users -- SSH and FTP, and self-developed tools such as LAN scanning.

2.6 Software Layout



1 Menu and toolbar

2 In the left operation area, there are three operation types: project configuration, forwarding scheme, and real-time monitoring

3 Right operation area, corresponding to the left operation area: select on the left, display and modify on the right

4 Information status bar, displays prompt information and network connection status

3 Management Software Operation Description

3.1 Project Group

Concept of project team:

The software will put all the cm.ini files created and opened by users in a certain general directory for unified management. The software uses a directory tree structure similar to that of windows system "Explorer" to describe this project management mode. Users only need to care about the configuration of the project itself, and do not need to worry about file storage errors and search. When searching, you can use win to search for files, which is convenient for operation and management of the project.

After installation, the software creates a blank "project team" as the management unit of the overall project engineering files.

"Project team" corresponds to multiple projects of the configuration management of this computer, each project corresponds to multiple devices, and each device corresponds to a unique project project file.

When configuring the cm.ini file for a specific device, project configuration personnel need to create the project name and then create the project file under the project.

3.2 File Management

3.2.1 New

Select "Project Team" in the "Project Configuration" bar, right click "New" or click "File" [New] in the upper menu bar, the "New Project" dialog box will be displayed:



After clicking the OK button, it will display:

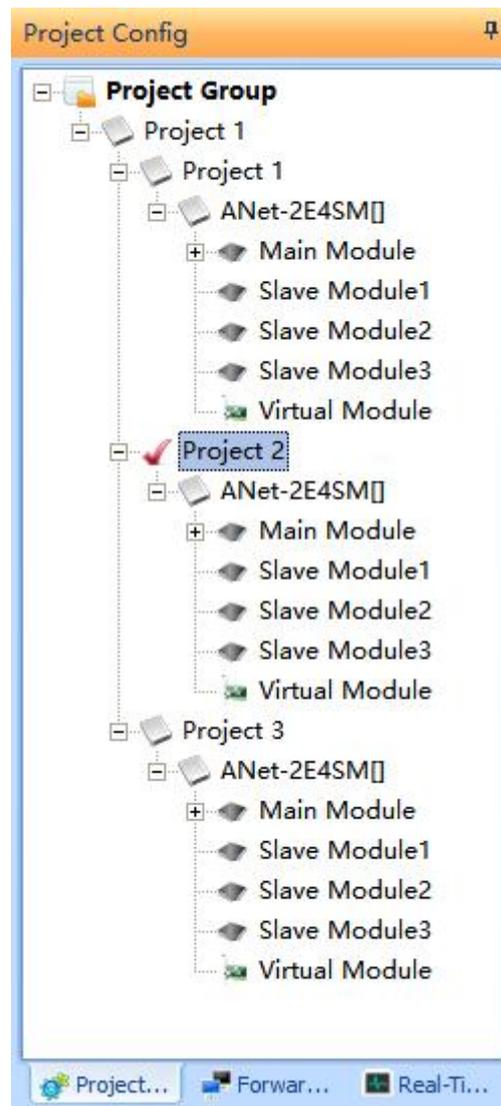


After selecting "Project 1", right-click "New" or click "File" [New] in the upper menu bar to display the "New Project" dialog box:



- ✧ Project name: enter the name of the current project, can not be empty
- ✧ Management model number: have set up several models to choose from,also can enter a name, but can't be empty
- ✧ Channel configuration: according to the actual project need to configure the corresponding number

After performing this operation for several times,the Project Team three result can be obtained in Project Configuration as shown in the following figure:



The Project Team tree supports right-click menus, such as 【 New, delete, move, rename, save as, and open file location. 】

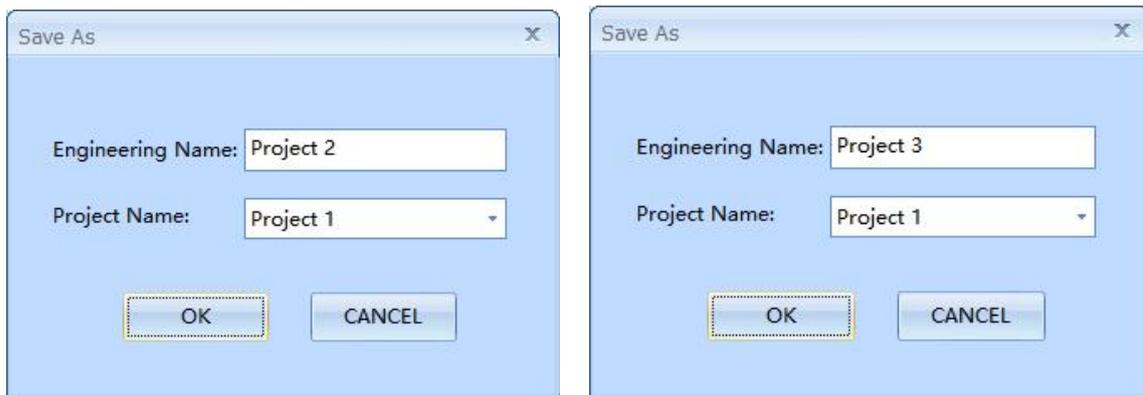
3.2.2 Open

- ✧ Open software installation directory project configuration file within the project folder , automatic positioning to the project node position in the team project.
- ✧ Open software installation directory project engineering configuration file folder,if do not have the same project under unknown,will be automatically saved in the “unknown”.if an unknown project has the same project name,it will be prompted whether to replace it. Click Yes(Y) to replace the existing project with the same name,click No(N) to automatically name it and save it to “Unknown project”
- ✧ Use the mouse to the computer in any position of the cm.ini ,drag into CM software form, can open the file,with reference to the above 2 operating results
- ✧ When you open the original project configuration file outside the Project Team Tree,the software automatically copies the file to the Project Team Tree for unified management.Modification operations in the software do not affect the original file.

3.2.3 Open File Location

- ✧ Select project team under the corresponding project, right click the mouse and select "Open file location", will open the project file is located in the resource manager of the directory.
- ✧ The selected project, software under the most information on the status bar displays the full path to the project file, for users to determine action object is correct.

3.2.4 Save, Save As, Move



- ✧ To save the currently selected project will be the corresponding cm.ini file
- ✧ To the currently selected project "Save As" or "Mobile", can modify the project "Affiliated Project" or "Project Name"
- ✧ "Save As" operation is equivalent to achieve the copy a project(Renameable)to function in other projects.

3.2.5 Rename, Delete

- ✧ Content change of "Project", "Engineering" name.
- ✧ Target will be selected to delete from the current group on the computer in the recycle bin.

3.2.6 Other Internal Function

- ✧ Software can run only one at the same time.
- ✧ Software such as a project configuration information has modified, exit, the software will prompt the user to save.
- ✧ Opened the new project, the software will templates and code template in intelligent learning engineering equipment, software.
- ✧ After the forwarding scheme is configured, the instrument or instrument collection point data on the collection side is modified or deleted. As a result, data matching errors are reported.
- ✧ Update configuration, wait for the selected configuration file location automatically positioning to the currently selected engineering ini file in folder or directory.

3.3 Template

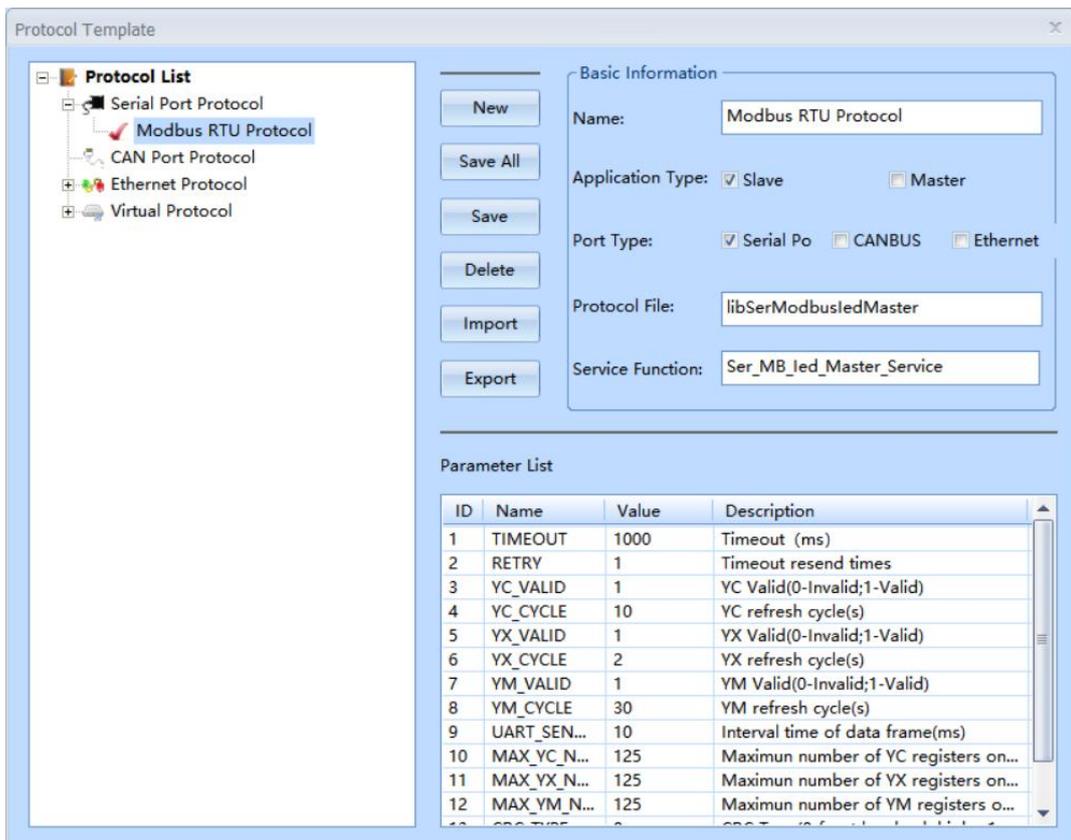
Contains protocol templates  and device templates . Developer will provide the specification template file, and the engineer will directly import the template and save it for use. After training and negotiation, you need to formulate specifications for device templates, and then you can create them by yourself.

Function Introduction:

- ◆ New: used to increase the templates, can be in under a specified channel or manufacturers to create a new template.
- ◆ Save: the current templates list saved to file, available for use
- ◆ Application: content of the current configuration is only temporary and engineering are available, and will disappear after restart the software.
- ◆ Delete: used to delete a template, such as make sure don't need, need to be saved
- ◆ Import: from .ptpl file import configured template, after import will cover the original configuration, and for the template updating
- ◆ Export: existing configuration can be exported to .ptpl file, separate storage and transmission for the template

3.3.1 Protocol Template

◇ **Toolbar button** 



ID	Name	Value	Description
1	TIMEOUT	1000	Timeout (ms)
2	RETRY	1	Timeout resend times
3	YC_VALID	1	YC Valid(0-Invalid;1-Valid)
4	YC_CYCLE	10	YC refresh cycle(s)
5	YX_VALID	1	YX Valid(0-Invalid;1-Valid)
6	YX_CYCLE	2	YX refresh cycle(s)
7	YM_VALID	1	YM Valid(0-Invalid;1-Valid)
8	YM_CYCLE	30	YM refresh cycle(s)
9	UART_SEN...	10	Interval time of data frame(ms)
10	MAX_YC_N...	125	Maximun number of YC registers on...
11	MAX_YX_N...	125	Maximun number of YX registers on...
12	MAX_YM_N...	125	Maximun number of YM registers o...

- ✧ Specification list: display all current specifications template, choose to display the basic information of the template and the parameter list
- ✧ Basic information: contains the basic information of the statute, the developer can not modify.
- ✧ Parameter list: **【 name 】** the developers can not modify, please according to the **【 value 】** **【 description 】** content changes carefully

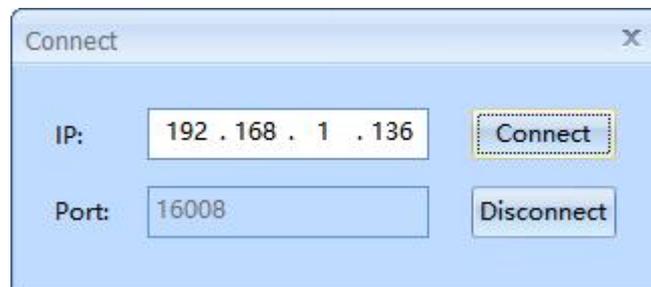
3.3.2 Device Template

- ✧ **Toolbar button** 
- ✧ Device list: show the current template of all the equipment, select the equipment can view the basic information and data configuration of device.
- ✧ Equipment basic information: the classification, convenient to identify and choice
- ✧ Equipment data: need engineers reference equipment operating instructions carefully to complete the configuration, please refer to the detailed configuration method 3.3 to set device parameter

3.4 Device Management

3.4.1 Communication Setup

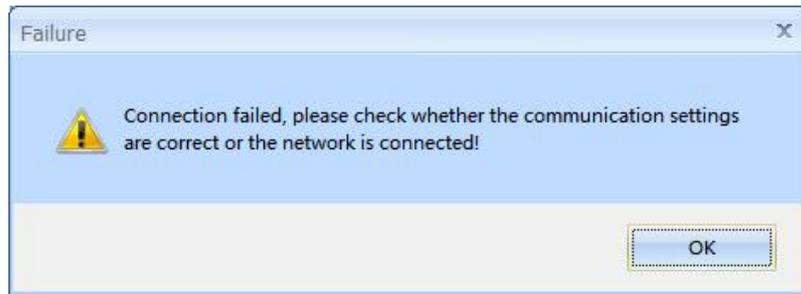
- ✧ **Toolbar button** 



- ✧ IP: the IP address of the normal operation of the communication management machine
- ✧ Port: default, immutable
- ✧ If the connection is successful can be judged by the status bar shows:

Connect successfully: 状态: 通信正常 IP: 192.168.1.150(16008) 2016-10-26 09:09:51

Connection failed or disconnected: 状态: ??? 未连接 2016-10-26 09:11:11



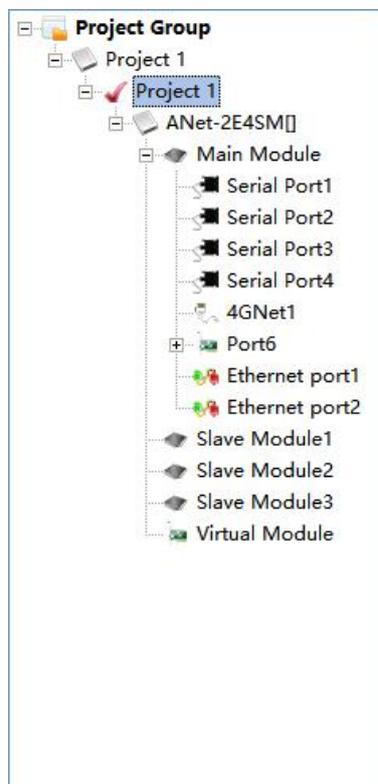
3.4.2 Start Monitoring

✧ **Toolbar button** 

【Communication setting】 should be performed before 【Start monitoring】, and real-time data monitoring can be performed only after the connection is successful. If you confirm that the communication management machine corresponding to the set IP address is running properly, you can directly 【Start listening】 without 【Connect】 operation.

After listening, you can view 【Message】 and 【Real-time database】. The two modes can be switched at any time.

The operation is as follows:

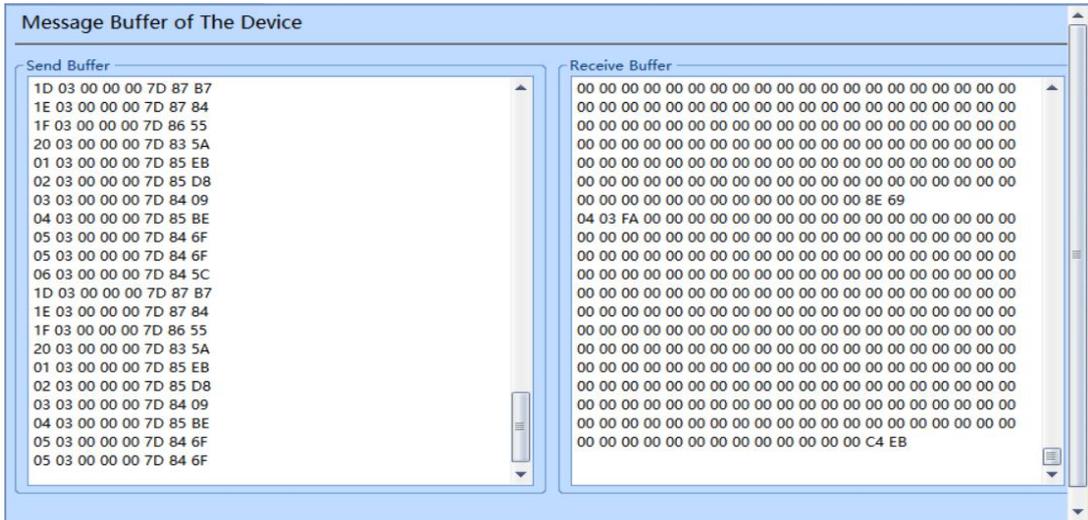


◆ 【Message】

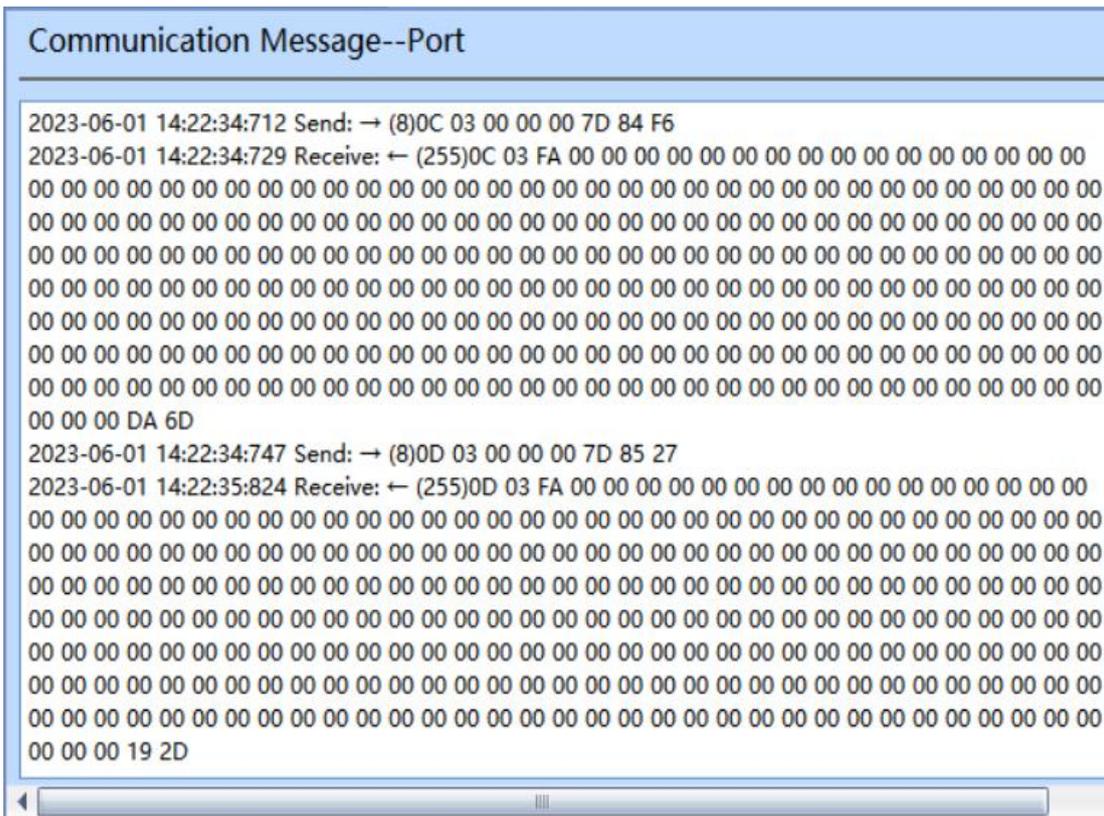
Messages can be displayed in 2 ways: 【Communication buffer】 and 【Communication message】

Note: Send and receive are relative to the communication management machine, please pay attention to this.

- ✧ **【Communication buffer】** :divided into **【Send buffer】** and **【Receive buffer】** ,all messages are all displayed.



- ✧ **【Communication message】**: Packets that are correctly processed and successfully parsed in the buffer are displayed here. Packets that fail to be parsed are not displayed.



【Real-time database】

【Real-time Database】 displays all data for all types of data for the currently selected device. Here are some ways to determine whether the data is valid:

- ✧ First, because the communication management machine has the function of saving historical data, so check **【update time】** , if it matches the current time, it means that the current data is the latest read data

- ◇ Second, see **【Name】** corresponding **【current value】** and **【original value】**, as if with the actual value, is effective

The real-time database of device:2--real-time data list

ID	Name	Group N...	Serial Nu...	Current V...	Original ...	Quality	Update Time
1	Telemetering1	0	1	0.0000	0	0	2023-06-01 14:27:06.0
2	Telemetering2	0	2	0.0000	0	0	2023-06-01 14:27:06.0
3	Telemetering3	0	3	0.0000	0	0	2023-06-01 14:27:06.0
4	Telemetering4	0	4	0.0000	0	0	2023-06-01 14:27:06.0
5	Telemetering5	0	5	0.0000	0	0	2023-06-01 14:27:06.0
6	Telemetering6	0	6	0.0000	0	0	2023-06-01 14:27:06.0
7	Telemetering7	0	7	0.0000	0	0	2023-06-01 14:27:06.0
8	Telemetering8	0	8	0.0000	0	0	2023-06-01 14:27:06.0
9	Telemetering9	0	9	0.0000	0	0	2023-06-01 14:27:06.0

3.4.3 Stop Monitoring

After the monitoring is stopped, the network connection will be disconnected. Therefore, data update will be stopped

3.4.4 Update Configuration

Select an ini file and upload it to the device. After the file is automatically updated, the system restarts. After the startup fails, the system automatically recovers to the state before the update. When the system displays a message indicating ini update failure, the configuration content is incorrect. After connecting CM to the management machine, click **【management machine】** **【Display Log】** and click the **【Update】** button in the dialog box. Check whether there is a specific error message, if so, refer to the error message prompt to correct the configuration.

If the IP address of the management network port has been changed, reconfigure the IP address in 3.4.1 **【Communication Settings】**.

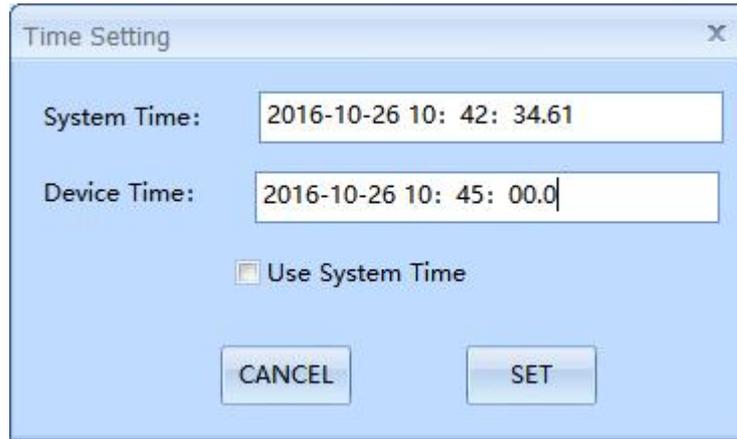
During device production, the device ID information is stored in the device. When the cm.ini file is updated, the system checks whether the device ID information in the ini file is consistent with the device. The purpose of this algorithm is to remind the user whether **【Communication Settings】** is connected to the correct device to which the ini file will be applied, so as to prevent the user from misdirecting the ini file of device A to device B.

By default, the “Device ID” field in the ini file created in the cm software is empty. After it is updated to the device, the “Device ID” information is automatically filled into the cm.ini file.

If the cm.ini file is copied and downloaded from device A, the cm.ini file contains the “Device ID” of device A. If the cm.ini file is modified and updated to device B, the CM detects that the “Device ID” of the ini file is inconsistent with that of device B and sends warning message. Once confirmed by the user, the uploaded ini file with the “Device ID” of Device A is automatically changed to the “device ID” of device B.

Therefore, this is an alarm prevention message and does not affect the execution of the ini file. In this case, make sure that the connection IP address is correct.

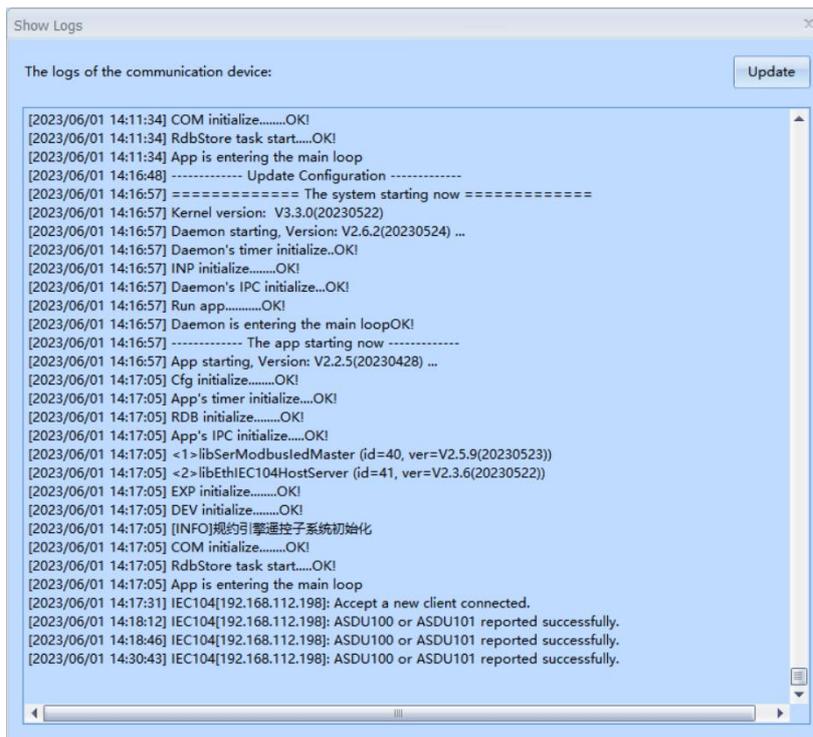
3.4.5 Set Clock



【Management Machine Time】: after connecting to the management machine, you can obtain the clock time of the current management time.

【Settings】: The system time is used to set the management machine time.

3.4.6 Log Display



Click 【Update】 to update the log information recorded in the communication management machine. Logs Record system running logs. Sometimes, the system reports some error messages. This section provides more detailed error information for reference.

3.4.7 Factory Data Reset

Check the IP address of the device whose factory Settings are to be restored, use 3.5.3 LAN Scan to confirm. Then execute 3.4.1 Communication Settings to connect the IP address. After the connection is successful, you can execute the menu command, as shown in the figure:



After you select “Yes”, the device automatically restores to factory Settings, and the IP addresses of the device are changed to 192.168.1.136 (LAN1) and 192.168.2.136 (LAN2). You need to configure and manage the device again.

Note: After restoring factory Settings, use 3.4.3 LAN Scan (Repeat the scan button) to confirm that the device has been restarted before performing subsequent operations on the device.

3.4.8 Local Upgrade

Enter the correct IP address of the device and select the firmware upgrade package (the upgrade package uses the uniform filename update.tgz).

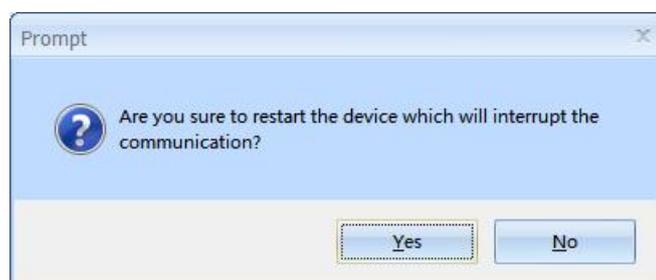
Device update is over, start reconnecting device, please wait...

After waiting for some time in this screen, CM will automatically reconnect the device and display the upgrade results in the upgrade log.

3.4.9 Restart

✧ Toolbar button 

【Restart】 is generally used after 【Downloading】 the project configuration file from the local PC to the communication manager.



3.4.10 Lay Out (New vision has deleted it)

Please be careful 【Exit system】! Because after exiting the system, the software will not be able to connect and control communication management. The way to restart the system is to power back on the communication manager.

3.5 Tool

3.5.1 SSH

◇ Toolbar button 

The third party tool, which is more demanding to users, is used for the system operation of the communication management machine.

3.5.2 FTP

◇ Toolbar button 

A third-party tool used to manage files inside the communication manager, usually for uploading or downloading files.

3.5.3 LAN Scanning

Scan the IP addresses of all communication management devices on the LAN, regardless of whether they are on the same network segment.

If you do not know the IP address of the device to be connected, you can use this method to obtain the IP address of the entire LAN device, and then obtain the IP address of the device according to the device ID, which is unique on the device nameplate.

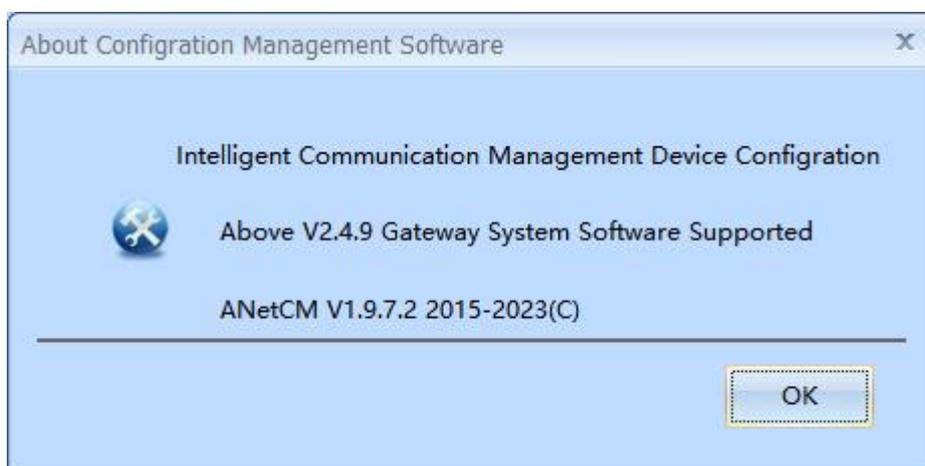
In the scan result, right-click a device and choose Reset IP to restore the device IP address to factory Settings. After the device is restarted, the device IP address can be restored to the cm.ini Settings.

3.6 Help

3.6.1 Help

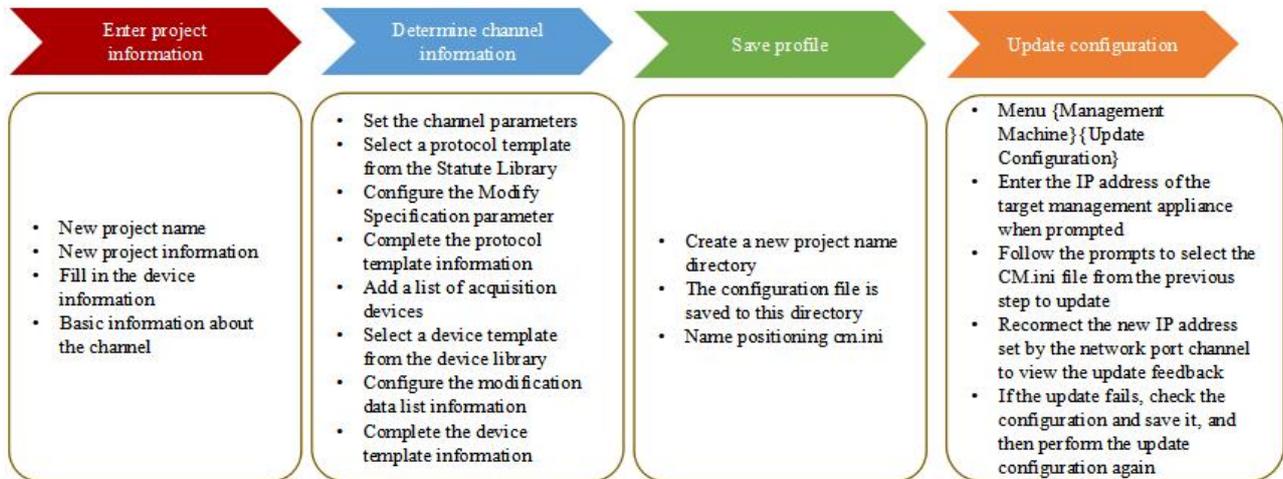
Including **【Operation Instruction】**、**【Language Selection】**

3.6.2 About



4 Project Engineering Configuration Description

4.1 General Project Configuration Process Strategy Recommendation



After the configuration is updated, check whether the current device time is correct. For details, see Section 3.3.6.

4.2 Project Configuration

In the second part of the software layout is displayed in the project structure information tree, after fully expanded you can clearly see how many serial ports, network ports and how many devices under the serial port information; The detailed configuration information is shown in Part 3 of the software layout.

4.2.1 Channel Configuration Description

Main Module Port List									Protocol Parameter	Batch Add
ID	Port Name	Port Type	Protocol Type	Protocol Name	Forwarding Scheme	Device Number	Port Parameter	Protocol Parameter		
1	Serial Port1	RS485/RS232	Slave Side Protocol	Modbus RTU Protocol		2	COM1(9600,8,1,0)	1000,1,1,10,1,2,1,30,10,125,125...		
2	Serial Port2	RS485/RS232	Slave Side Protocol	Modbus RTU Protocol		1	COM2(9600,8,1,0)	1000,1,1,10,1,2,1,30,10,125,125...		
3	Serial Port3	RS485/RS232	Slave Side Protocol	Modbus RTU Protocol		1	COM3(9600,8,1,0)	1000,1,1,10,1,2,1,30,10,125,125...		
4	Serial Port4	RS485/RS232	Slave Side Protocol	Modbus RTU Protocol		1	COM4(9600,8,1,0)	1000,1,1,10,1,2,1,30,10,125,125...		
6	Ethernet port1	Ethernet	Master Side Proto...			0	ETH1(192.168.1.136,255.255.25...			
7	Ethernet port2	Ethernet	Master Side Proto...	IEC104 Host Server Protocol	Scheme1[104 Forward ...	0	ETH2(192.168.2.136,255.255.25...	1,127.0.0.1,127.0.0.1,127.0.0.1,1...		

After selecting main module in the project structure tree, you can modify the configuration information of all physical channel.

The **Protocol Parameter** button in the upper right corner is not used here in Section 4.2.2. The **Add** button can add a row to the end of the current list.

【ID】 : A unique identifier of the channel that cannot be modified

【Channel name】 : This parameter can be customized

【Channel type】 : The options are RS485/RS232, Ethernet, 4Gnet, and Virtual Port

【Protocol type】 : Optional device side (collection), host side (upload)

【Protocol name】 : Protocols that meet the conditions are dynamically selected from the current protocol template library based on **【channel type】** and **【Protocol type】**. If there is no protocol that meets the conditions, it is empty

【Forwarding Scheme】 : This parameter can be selected only on the master site. However, a forwarding scheme must be created first. For details, see 3.2 Forwarding Scheme

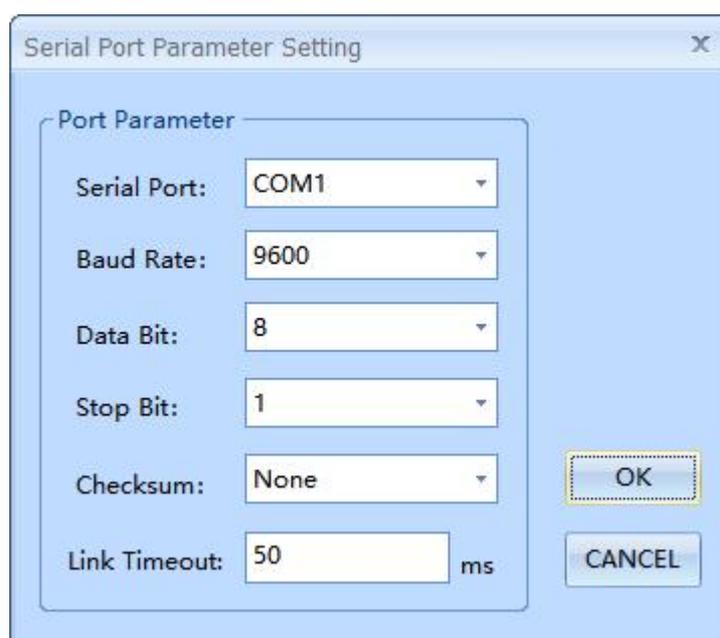
【Number of devices】 : indicates the number of devices on the current channel

【Protocol Parameter】 : According to the selected **【Protocol name】** , the protocol template is automatically imported here. You can double-click the cell to modify it

【Channel parameters】 : The channels are classified into RS485 serial ports, ETH network ports, 4GNet network ports, wifi wireless, LoRa wireless, DI channels

Each channel type has its own interface for configuring channel parameters.

Serial port channel parameter Settings:



【Serial port number】 : indicates the serial port number of the management machine.

【Baud rate】 : 300/600/1200/2400/4800/9600/19.2k/38.4k/57.6k / 115.2k/230.4K/460.8/921.6 Kbps

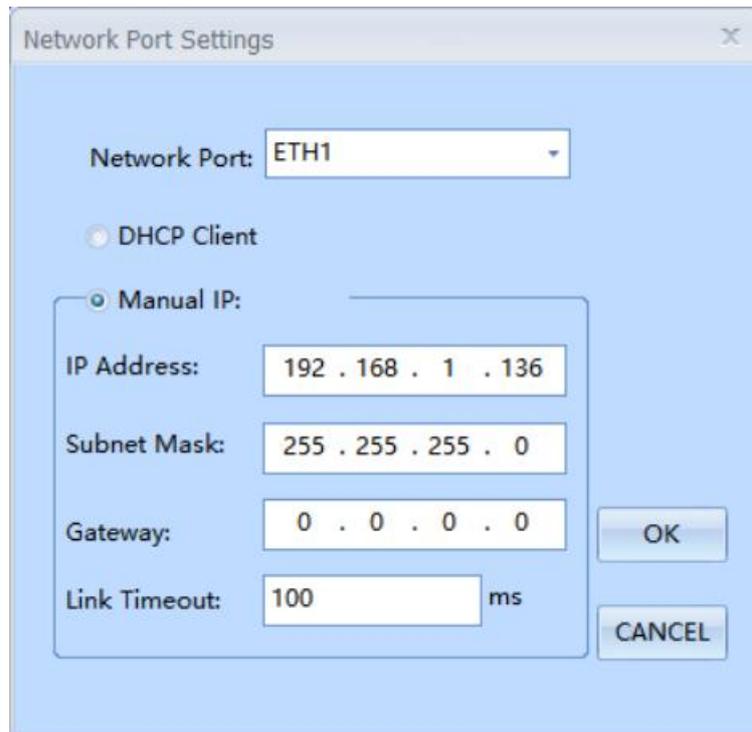
【Stop bit】 : 1, 1.5, 2 bits

【Data bits】 : 5, 6, 7, 8 bits

【Check bit】 : None/odd/even check. MARK check is implemented using "no check + stop bit 2 bit". SPACE check hardware does not support space check

【Link timeout】 : After receiving a packet, the serial port waits for this period of time before reading the entire buffer packet. If the packet sending rate of the meter is low, the value can be increased appropriately. If the packet is truncated because the data is too small, the program automatically performs packet consolidation, but the transparent protocol does not automatically perform packet consolidation.

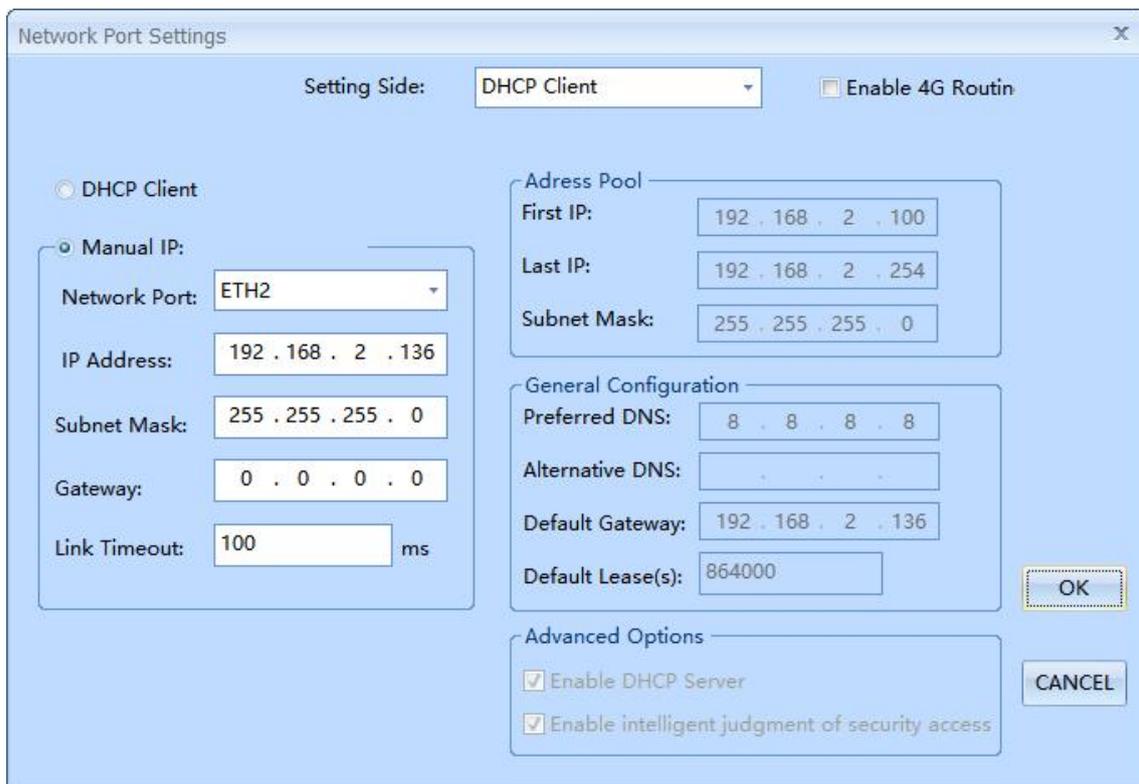
✧ Network port channel parameter setting without 4G channel device



If there is no 4G channel configured in the current project, the channel parameters of the network port in the project support setting the network port to automatically obtain IP and fixed IP address, and ETH1 corresponds to the device network port LAN1 or LAN.

- Not allow two network ports to configure the same subnet address
 - Not allow for both net ports configured gateways
 - The gateway must be configured on the network port corresponding to the IP address on the same subnet
- ✧ Network channel parameter Settings to 4G channel device

Tip: If a protocol is configured for a 4Gnet channel, it indicates that the 4G wireless network channel is enabled. Otherwise, the 4G network is not enabled. When the 4Gnet channel is enabled, you do not need to configure the automatic dial-up connection network, and the LAN network port of the device cannot be configured with gateway.



If a 4G channel is configured in the current project, the network port channel parameters in the project can be set to the DHCP client mode or the DHCP server mode. If the network port channel parameters are set to the DHCP server mode, the network port channel parameters can be set to the address pool and advanced function items.

【Select Device】 DHCP client mode and DHCP server mode are provided

【DHCP client mode】 , the network port can automatically obtain an IP address or a fixed IP address

【DHCP server mode】 , the network port must have a fixed IP address. The following functions are enabled:

【Enable 4G routing function】 ,provides the routed network access function from network ports to 4G wireless networks. This function is valid only for the 4Gnet channel configuration protocol

【Address Pool Assignment】 and **【Public Configuration】** , which provide IP address assignment information for other DHCP clients

【Enable intelligent judgment for security access】 , Gray indicates that this function cannot be enabled. Details of this feature are as follows:

- "open security access the DHCP server" only accept communication management machine DHCP client application;
- The communication manager automatically receives the address feedback of the DHCP server with security access enabled.
- Intelligent communication management machine can judge the environment there is no "open security access to the DHCP server" and automatically accept other DHCP server address feedback;

➤ Close this but to open, open the DHCP service] [4 g device so will implement standard DHCP server functions, the PC computer can obtain IP address and the routing through 4 gnet open access external network.

【Note】 : The channel configuration should be consistent with the actual project site situation, develop the habit of removing the useless channel protocol.

4.2.2 Device Configuration Description

Serial Port1Device List									Protocol Parameter	Batch Add
ID	Name	Type	Model	Address	Forward	Forward Address	CPU Number	Device Parameter		
3	Device3	Physical Device		3	YES	3	0			
4	Device4	Physical Device		4	YES	4	0			
5	Device5	Physical Device		5	YES	5	0			
6	Device6	Physical Device		6	YES	6	0			

【ID】 : unique ID of the device and cannot be modified

【Name】 : Users can customize

【Type】 : default

【Model】 : you can select the model of the device in the device template library

【Address】 : communication address of the device on the link

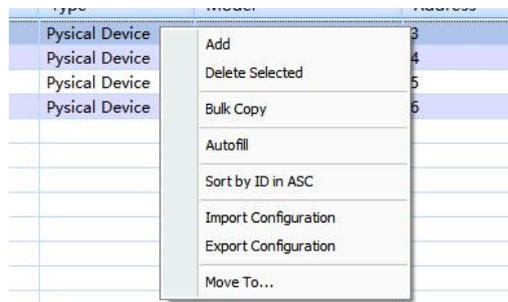
【Forward】 : Related to the forwarding scheme, identifying whether device data can be used as the data source of the forwarding scheme

【Forward Address】 : Device address defined during forwarding

【CPU number】 : Enter this parameter as required. It is usually empty

【Device parameter】 : Enter this parameter as required. It is usually empty

【Note】 : Select one or more lines in the list, and the following menu items will appear after right clicking



【Add】 : You can add a line to the front of the selected item

【Delete selected】 : Deletes all selected rows

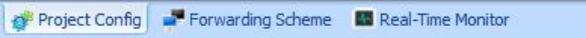
【Import Configuration】 : You can import device data configuration from the xxx.dtpl device template file

【Export Configuration】 : You can write the device data configuration in the first line of the selected item to the xxx.dtpl device template file and save it

【Move to】 : You can move the device in the first row of the selected item to another channel

4.3 Forwarding Scheme

4.3.1 Add Forwarding Scheme

Select 【Forwarding Scheme】 at the bottom of 2 , then right-click 【Add】 in 3 to add a new scheme. Then select 【Scheme】 in 2, and right-click 【Add】 in 3, that is, add a 【virtual device】 .

ID	Device Name	Device Address	Device Parameter	Forward Address
1	VrtDev1	1		
2	VrtDev2	2		

【Virtual Device】 : "New device" from all devices that have been configured and select "Yes" to 【Forward】 device data.

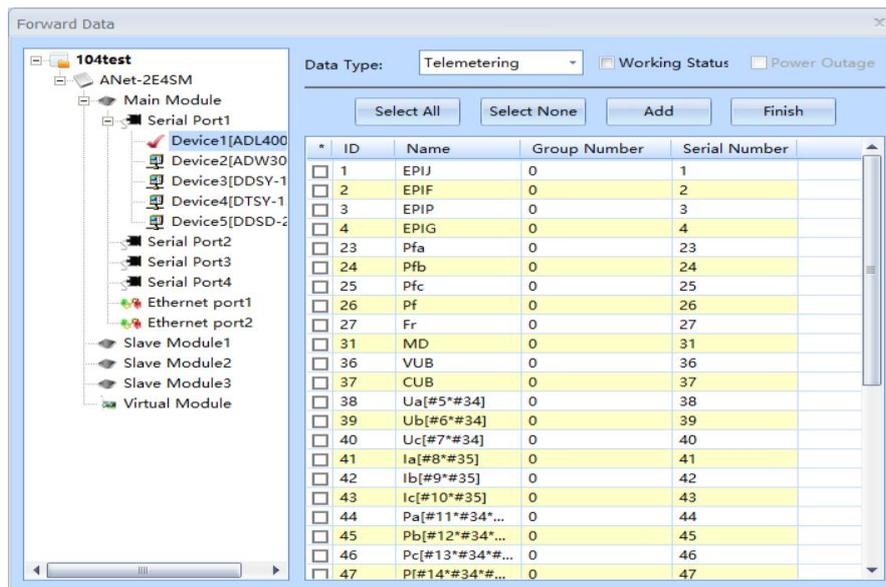
【Device Address】 : indicates the address of the virtual device

【Device parameter】 : You can leave it out according to the situation

【Forward Address】 : Device address defined during forwarding

4.3.2 Add Forwarding Data

Select 【Virtual Device】 in 2 and right-click 【Add】 in 3, as shown below:



Select the data to be forwarded in the configuration: Select → Add → End

4.4 Device Data Configuration

Telemetry		Telesignalisation		Remote Pulse		Telecontrol		Teleregulation								
ID	Name	Type	Unit	Gro...	Seri...	CC1	Max	Zero Value	Limits...	Limited Value	Data Type	Data...	F...	Forward Add...	Function Code	Offset Address
1	Ua	Voltage	V	0	1	0.100000	9999.000	0.000000	None	0.001000	UINT16		1		3	20
2	Ub	Voltage	V	0	2	0.100000	9999.000	0.000000	None	0.001000	UINT16		1		3	21
3	Uc	Voltage	V	0	3	0.100000	9999.000	0.000000	None	0.001000	UINT16		1		3	22
4	Uab	Voltage	V	0	4	0.100000	9999.000	0.000000	None	0.001000	UINT16		1		3	23
5	Ubc	Voltage	V	0	5	0.100000	9999.000	0.000000	None	0.001000	UINT16		1		3	24
6	Uca	Voltage	V	0	6	0.100000	9999.000	0.000000	None	0.001000	UINT16		1		3	25
7	Ia	Voltage	V	0	7	0.010000	9999.000	0.000000	None	0.001000	UINT16		1		3	26
8	Ib	Voltage	V	0	8	0.010000	9999.000	0.000000	None	0.001000	UINT16		1		3	27
9	Ic	Voltage	V	0	9	0.010000	9999.000	0.000000	None	0.001000	UINT16		1		3	28
10	Pa	Voltage	V	0	10	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	30
11	Pb	Voltage	V	0	11	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	32
12	Pc	Voltage	V	0	12	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	34
13	P	Voltage	V	0	13	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	36
14	Qa	Voltage	V	0	14	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	38
15	Qb	Voltage	V	0	15	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	40
16	Qc	Voltage	V	0	16	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	42
17	Q	Voltage	V	0	17	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	44
18	Sa	Voltage	V	0	18	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	46
19	Sb	Voltage	V	0	19	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	48
20	Sc	Voltage	V	0	20	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	50
21	S	Voltage	V	0	21	0.001000	9999.000	0.000000	None	0.001000	UINT32		1		3	52
22	Pfa	Voltage	V	0	22	0.001000	9999.000	0.000000	None	0.001000	UINT16		1		3	54
23	Pfb	Voltage	V	0	23	0.001000	9999.000	0.000000	None	0.001000	UINT16		1		3	55
24	Pfc	Voltage	V	0	24	0.001000	9999.000	0.000000	None	0.001000	UINT16		1		3	56
25	Pf	Voltage	V	0	25	0.001000	9999.000	0.000000	None	0.001000	UINT16		1		3	57
26	Fr	Voltage	V	0	26	0.010000	9999.000	0.000000	None	0.001000	UINT16		1		3	59
27	EPI	Voltage	V	0	27	0.010000	9999.000	0.000000	None	0.001000	UINT32		1		3	62
28	EPE	Voltage	V	0	28	0.010000	9999.000	0.000000	None	0.001000	UINT32		1		3	64
29	EQL	Voltage	V	0	29	0.010000	9999.000	0.000000	None	0.001000	UINT32		1		3	66
30	EQC	Voltage	V	0	30	0.010000	9999.000	0.000000	None	0.001000	UINT32		1		3	68

【CC1】 : variable ratio or coefficient. Since there are decimals in CC1 values, telemetry data is automatically converted to floating point numbers.

【Max】 : The maximum value. When the actual value is exceeded, the 【quality factor】 will be 4096, and the normal value is 0

【Limit value】 : It is divided into absolute value and percentage, which is used to calculate the limit value

【Minimum value】 : that is, the upper limit of data fluctuation. If the upper limit is exceeded, the situation of 【Exceeding the limit】 will occur

For example:

Suppose the mode of limit is absolute value, and

[The data currently collected is in the real-time database]>"Minimum Value"

Then there will be a "limit", real-time library will be added to the corresponding information;

Suppose the limit is in the form of 【Percentage】 , and

$$\frac{\text{Real-time collected data}}{\text{Data in the real-time library}} \times 100\% > \text{"Minimum value"}$$

Then there will be a "limit", real-time library will be added to the corresponding information;

【Data type】 : indicates the data type supported by the device

【Data byte order】 : When data is stored, the byte order of a certain data in some instruments needs to be set separately

【Forward】 : Whether this data can be forwarded to the main station

【Forwarding address】 : This forwarding address is related to the protocol of Nanzi 103 master station, and does not need to be filled in

4.5 Secondary calculation of Data

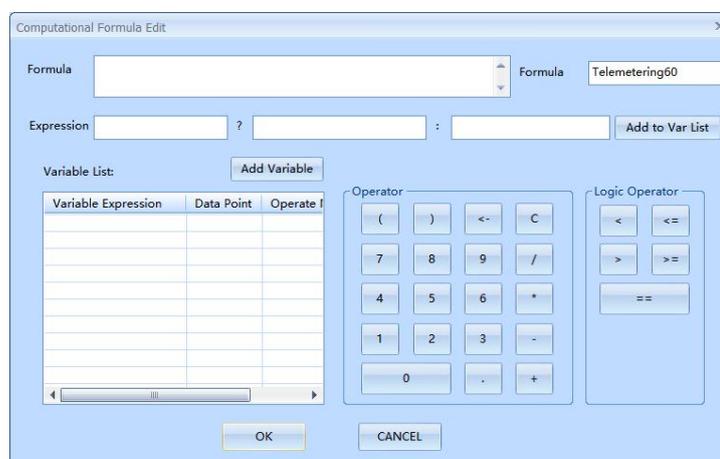
When using telemetry data of MODBUS series protocols, the device provides support for secondary calculation, adding a new ID to the device data list for calculation of the operand, the operand does not take up collection time and can be used by other operand. As shown in the picture below:

ID	Name	Type	Unit	Gro...	Seri...	CC1	Max	Zero Value	Limite...	Limited Value	Data ...	Data B...	Fo...	Forwar...	Function Code	Offset Address
32	EPE_t	Voltage	V	0	32	0.001000	9999.000	0.000000	None	0.001000	UINT32	0		3	65	
33	EQL_t	Voltage	V	0	33	0.001000	9999.000	0.000000	None	0.001000	UINT32	0		3	67	
34	EQC_t	Voltage	V	0	34	0.001000	9999.000	0.000000	None	0.001000	UINT32	0		3	69	
35	DPT[#3H8]	Voltage	V	0	35	1.000000	9999.000	0.000000	None	0.001000	FLOAT	0				
36	DCT[#3L8]	Voltage	V	0	36	1.000000	9999.000	0.000000	None	0.001000	FLOAT	0				
37	DPQ[#4H8]	Voltage	V	0	37	1.000000	9999.000	0.000000	None	0.001000	FLOAT	0				
38	Ua[#5*(10^(#35-4))]	Voltage	V	0	38	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
39	Ub[#6*(10^(#35-4))]	Voltage	V	0	39	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
40	Uc[#7*(10^(#35-4))]	Voltage	V	0	40	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
41	Uab[#8*(10^(#35-4))]	Voltage	V	0	41	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
42	Ubc[#9*(10^(#35-4))]	Voltage	V	0	42	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
43	Uca[#10*(10^(#35-4))]	Voltage	V	0	43	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
44	Ia[#11*(10^(#36-4))]	Voltage	V	0	44	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
45	Ib[#12*(10^(#36-4))]	Voltage	V	0	45	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
46	Ic[#13*(10^(#36-4))]	Voltage	V	0	46	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
47	Pa[#14*(10^(#37-4))*(#4b0)]	Voltage	V	0	47	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
48	Pb[#15*(10^(#37-4))*(#4b1)]	Voltage	V	0	48	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
49	Pc[#16*(10^(#37-4))*(#4b2)]	Voltage	V	0	49	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
50	P[#17*(10^(#37-4))*(#4b3)]	Voltage	V	0	50	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
51	Qa[#18*(10^(#37-4))*(#4b4)]	Voltage	V	0	51	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
52	Qb[#19*(10^(#37-4))*(#4b5)]	Voltage	V	0	52	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
53	Qc[#20*(10^(#37-4))*(#4b6)]	Voltage	V	0	53	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
54	Q[#21*(10^(#37-4))*(#4b7)]	Voltage	V	0	54	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
55	Sa[#26*(10^(#37-4))]	Voltage	V	0	55	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
56	Sb[#27*(10^(#37-4))]	Voltage	V	0	56	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
57	Sc[#28*(10^(#37-4))]	Voltage	V	0	57	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
58	S[#29*(10^(#37-4))]	Voltage	V	0	58	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
59	EPI[#31*#1*#2]	Voltage	V	0	59	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
60	EPE[#32*#1*#2]	Voltage	V	0	60	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
61	EQL[#33*#1*#2]	Voltage	V	0	61	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				
62	EQC[#34*#1*#2]	Voltage	V	0	62	1.000000	9999.000	0.000000	None	0.001000	FLOAT	1				

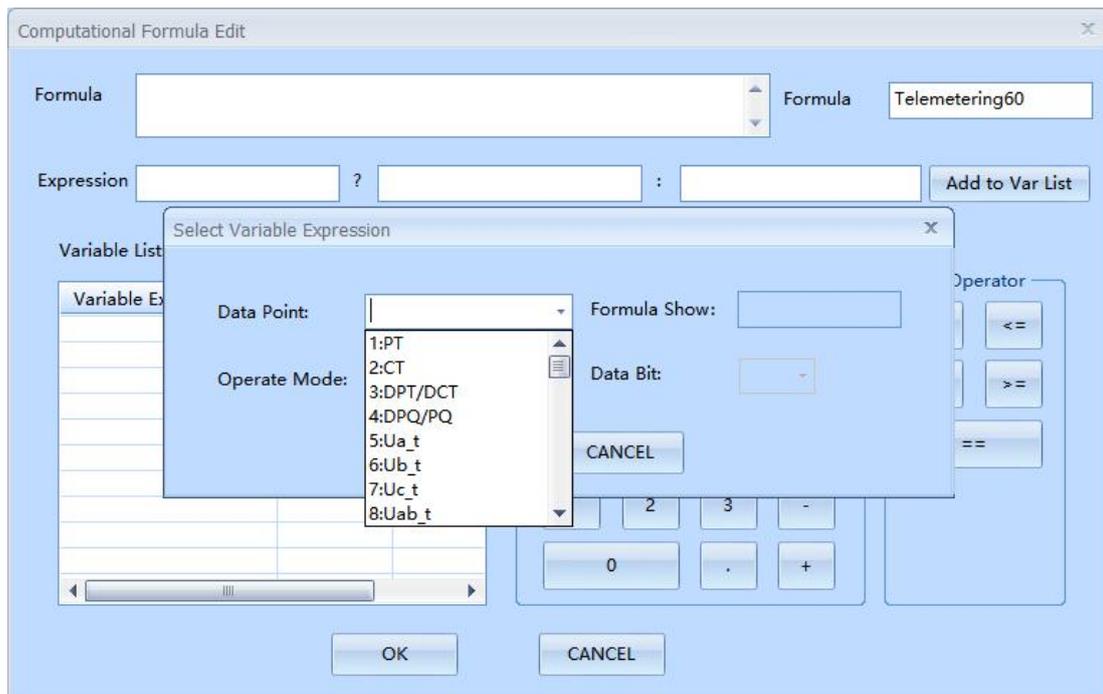
Tip: ID47 uses the same sequence number to get the value of ID32 without entering [#32].

4.5.1 Operation Procedure

- ✧ Configured first all register patch; Then right-click in the bottom blank and execute the menu 【Add data points for secondary calculation】 ;



- ✧ In the name of "Formula" box type in the name of the point which a custom, used for forwarding
- ✧ Use 【Add variable】 button selection formula used in the data source and the way of operation



Direct participation calculation: Direct value

Take sign bit: If the bit in "Data bit" is 0, return 1; if it is 1, return -1. Refer to parameter b

Bit: Enter the bit value in Data Bit and return it. For details, Refer to parameter B

Take high 8 bits: Return the high byte value of the current value, refer to the H parameter

Take the lower 8 bits: Return the lower byte value of the current value, refer to the L parameter

- ✧ Double-click Variable in the "Formula variable list", click the operator in the "formula "Symbols in the" Formula "in the editor
- ✧ According to the following the introduction of the content, appropriate to add parentheses to standardize formula editor
- ✧ After editing and confirming the calculation formula, click **【OK】** to submit the current formula and generate telemetry points in the data list.

4.5.2 Input Specification

- ✧ Secondary calculation formula in the name of the gathering information, the calculation formula to [] (English characters) enclosed, program to recognize characters are saved as name at the beginning, once identified to "[" began to do formula parsing, until, after the "]" are still kept as name add another character.
- ✧ Name can not have more than 2 "[" there, otherwise there will be a mistake.
- ✧ Only support English half-width symbols: + - * / (). And the custom symbol \hat{e} b B H L # Z/z Y/y C/X/M
- ✧ Support ternary operators: ?:, and supports the logical operator: > < >= <= ==
- ✧ Negative numbers are represented by (0-negative); for example, #1*-1 must be configured as #1*(0-1) or

(0-1)*#1

- ✧ Add any error message in the middle, basically can be filtered, such as the name:
 - EP[#2&22*#4^(#55-10)]I
 - The calculation is automatically parsed as: [#2*#4^(#55-10)] (&22 will be filtered out)
 - Name of real-time database and forwarded automatically parsing process is: EPI
- ✧ All calculation formula must be placed at the bottom of the other information point data record
- ✧ Currently only MODBUS series protocol telemetry data (including General ModbusIedMaster, XJModbusIedMaster, SM311ModbusIedMaster, SCADAModbusIedMaster, ModbustcpIedClient).
- ✧ Function code and offset address can be left blank (refer to the figure above).

4.5.3 Instruction for Formula Using

- ✧ The precedence of all operators is determined by parentheses, multiplication, division, addition and subtraction
- ✧ # represents the value of an ID information point collected by the device. If the ID does not exist, the value of the position is 0
- ✧ ^ represents a number to the n power, the input is N^M (N, M represents a number, the same below), such as 2 times 10 to the second power, the input is $2*(10^2)$; For example, the square root of 9 would be $9^{(1/2)}$ or $9^{0.5}$
- ✧ e stands for e base x, the input is NeM , such as 3 times e to the fifth power, the input method is $3e5$
- ✧ ^ and e symbols are followed by the recommended use of () to make the exponent explicit and follow the * operator to understand its precedence (see example).
- ✧ b represents a certain bit content of the current value to determine the positive and negative sign, b0 represents the bit0 bit, b15 represents the bit15 bit, the input method is #IDb bit number, that is, #NbM, the bit value if 0 represents the return value of 1, the bit value if is 1 represents the return value of -1, if the register is not so defined (on the contrary), You just type $((0-1)*(\#NbM))$
 - To use the b symbol, the content of #NbM needs to be wrapped in () alone, and then the value of the symbol to be added to *,
 - For example, $\#2*(\#16b3)$ means adding positive and negative signs to the data of #2, and the positive and negative signs look at the bit3 bit content of the value of #16.
- ✧ B represents a bit of the current value, and its value will only return 0 or 1, B0 represents the bit0, B15 represents the bit15, the input method is #NBM, such as the value of #2 is 43656 (1010 1010 1000 1000), then #2B3 returns the value of 1.
- ✧ H stands for the high 8-bit data of the current value, the input method is #IDH8, that is, #NH8, and the return value is a floating point number

- ✧ **L** stands for the lower 8 bits of the current value, the input method is #IDL8, that is, #NL8, and the return value is a floating point number
 - For example, a 16-bit binary number 1010 1010 1000 1000 of a register is converted to a decimal number 43656:
 - Then 43656H8=170.000000 (1010 1010), 43656L8=136.000000 (1000 1000)
- ✧ **Z** or **z** represents the incremental calculation value of the current value, the input method is #IDz or #IDZ, and the return value is a floating point number. The calculation can not be included in other calculations, which is an independent collection point calculation
 - For example, if the input is #lz, the last value of #l is 100.12, and the current value is 112.36, then the value at this position is 12.24
- ✧ **C/X/M**, representing the current value from the meter telemetry C/ remote signal X/ remote pulse M corresponding point data, input mode #IDC/#IDX/#IDM.
- ✧ **Y** or **y** represents the incremental total value, the input method is #IDY or #IDy, and the return value is a floating point number. The calculation cannot be included in other calculations, and it is an **independent collection point calculation**. #ID value is the instrument acquisition value, this point will automatically calculate the incremental total value, and will implicitly store a base value, incremental total value = base value + instrument acquisition value, when the instrument acquisition value is zero, will automatically correct the base value = incremental total value before zero.

Collect Value	Base Value	Second calculation of point value (incremental total value)
15	0	15
36	0	36
10	36	46

4.5.4 Formula Example

The collection point is calculated as $[(\#3+\#2)*(\#4b2)*(\#6^{(\#1-4)})e(\#5-2)]$

Description: (ID3 value + ID2 value) * ID4 value of the second corresponding to the positive and negative * ID6 value (ID1 value - 4) power * e (ID5 value - 2) power

The formula for calculating the point position of telecommunication logic is: $[\#1C>200]$

Note: If the ID1 value of telemetry is greater than 200, the remote signal point position value is 1, otherwise it is 0

4.5.5 Ternary Operator

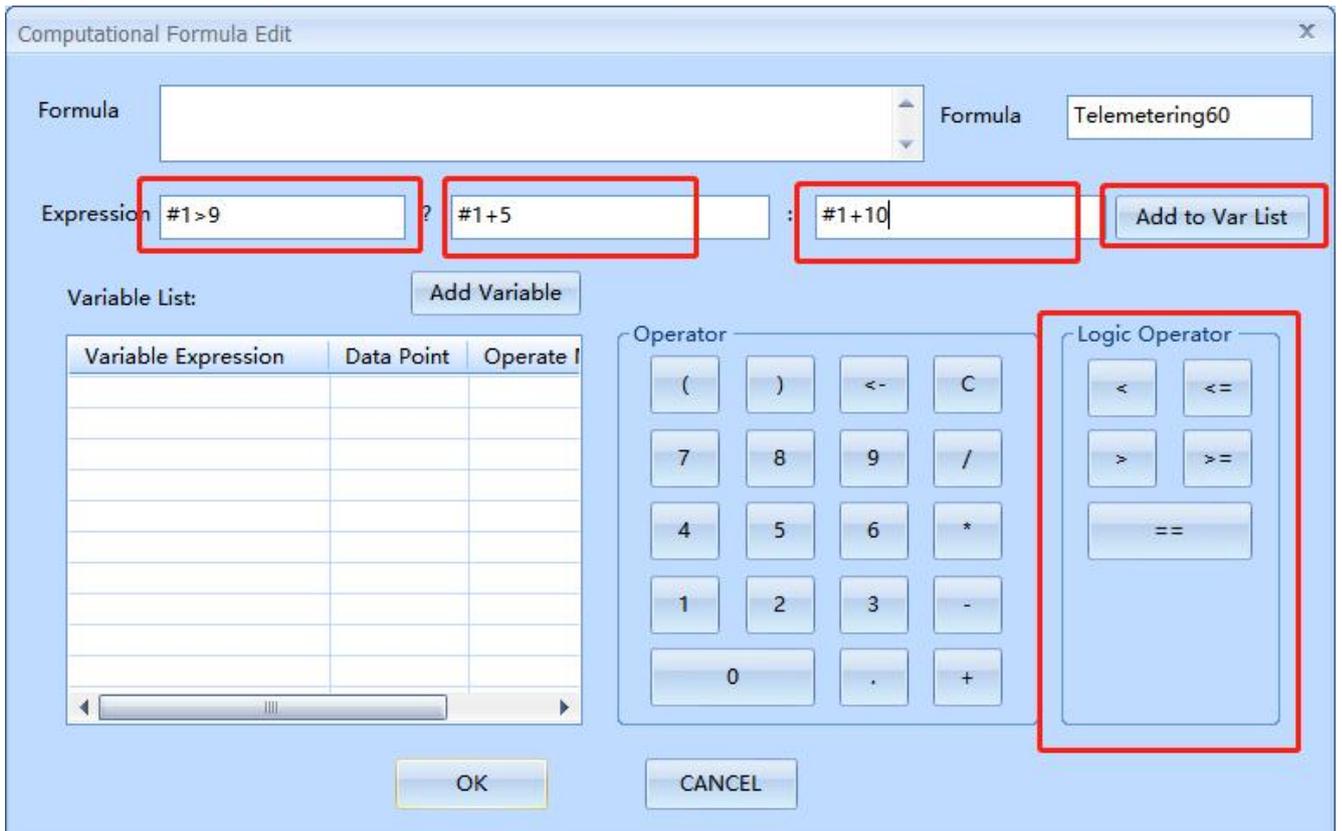
- ✧ **?:** represents the ternary operator, entered as (expression 1)? (Expression 2):(expression 3), form a ternary operation formula
 - All expressions should be used () parentheses protection, the protection will automatically add operation interface in CM, there is no manual configuration
 - Negative (0 - negative) on behalf of, such as > -2 must be set to > (0-2)
 - If results of the expression 1 is true, then formula return value for expression 2
 - If result of expression is false, the formula return value for the expression 3
 - Expression 1 supports logical operators: > < >= <= ==
 - Expression 2 or 3 support new ternary computation formula, to implement the nested computation, the calculation method: (a)? ((b)? (c) : (d)) : ((e)? (f) : (g)) Make a logical judgment on a first, and then make a logical judgment on e when it is false (instead of making a logical judgment on e first)
 - Expression 2 or 3 support in addition to the independent patch formula of other formula unary operator (+ - * / etc.)
 - Example: (#1 >= 3)? ((#1 > 9)? (#1+5) : (#1+10)) : ((#1 < (0-2)) ? (#1+2) : (#1))

Set ID1 value =#1	Formula result
#1 > 9	#1 + 5
3 <= #1 <= 9	#1 + 10
-2 <= #1 < 3	#1
#1 < -2	#1 + 2

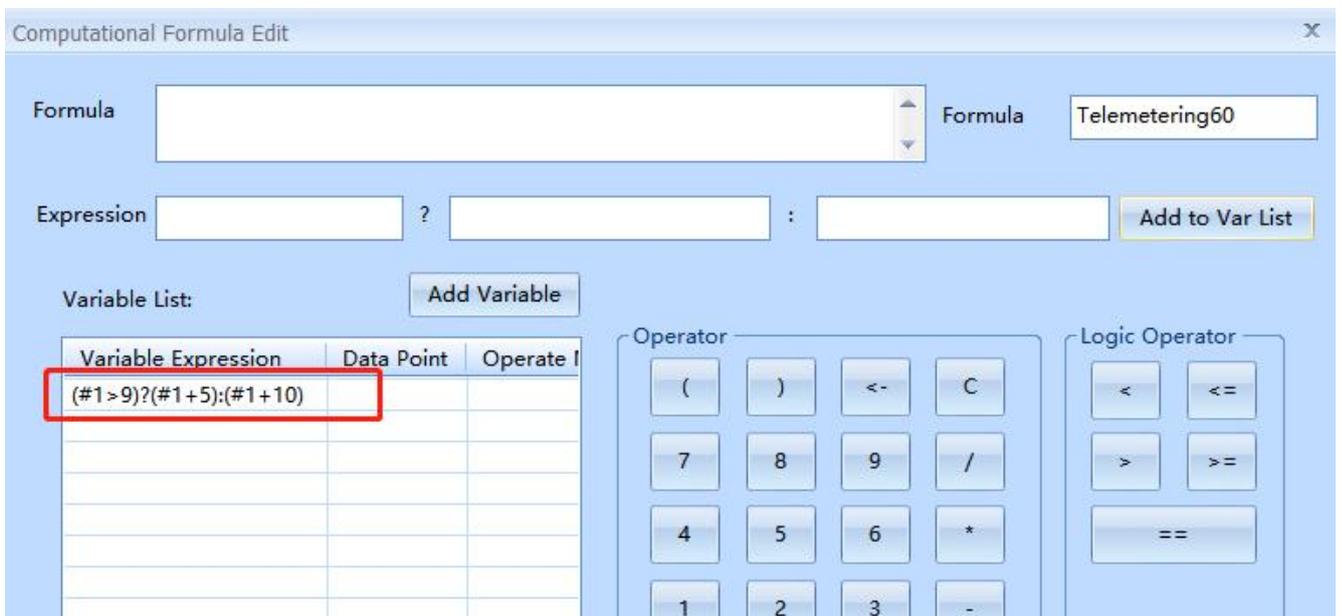
#1 < (0-2): there is a symbol < before -2, so -2 is (0-2)

4.5.6 Ternary Operator Interface Configuration

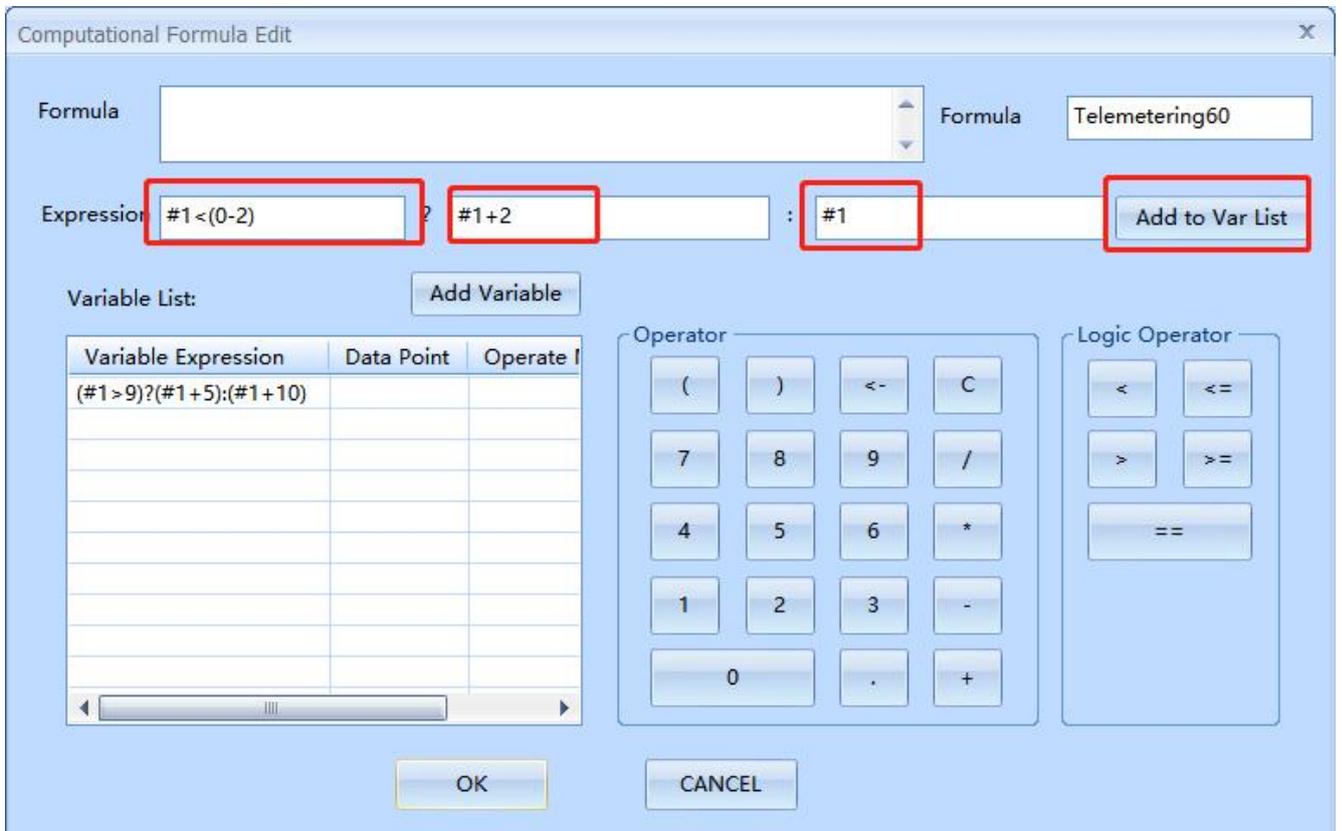
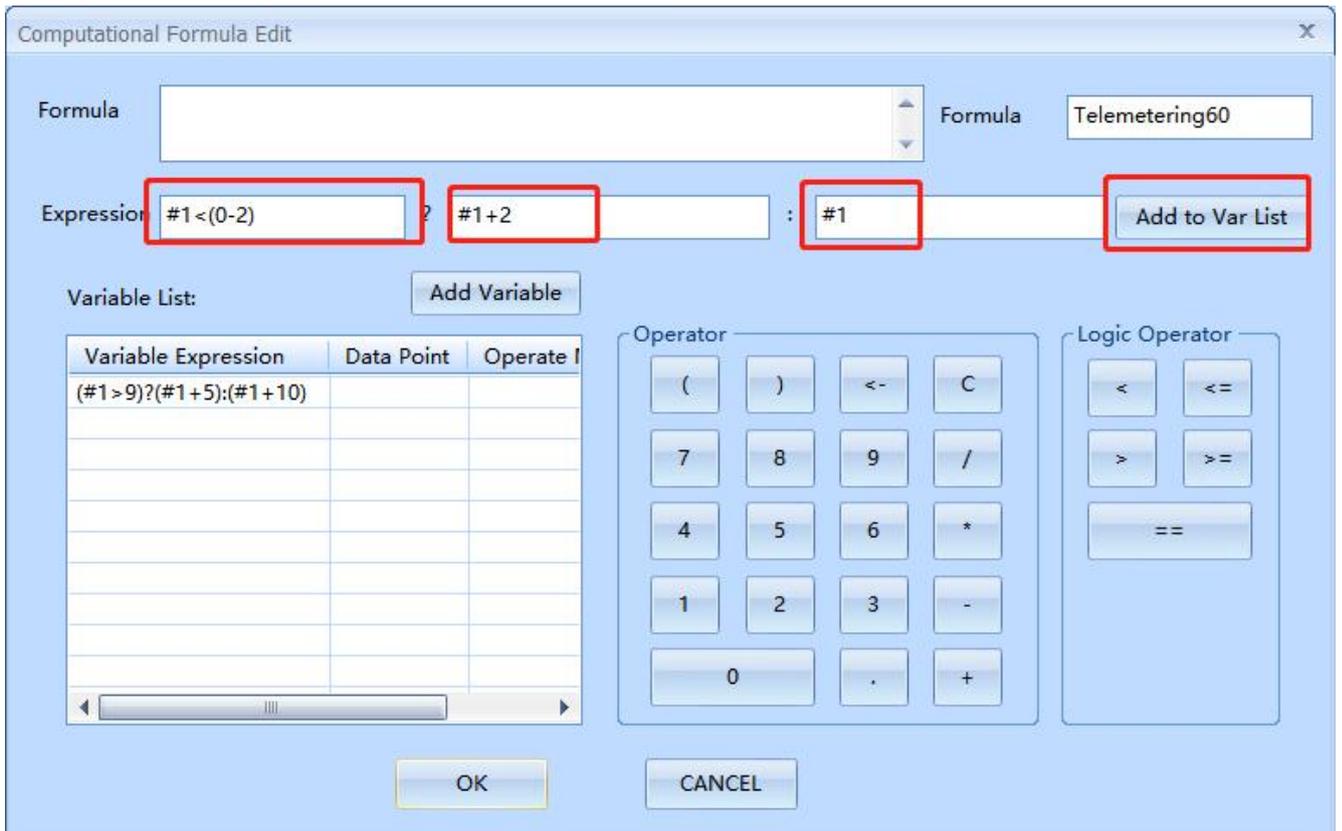
- ✧ Open the **【Quadratic formula editor】** window
- ✧ Configuration expression 2: (#1 > 9)? (#1+5) : (#1+10), click the mouse respectively into the corresponding text box, input the content



✧ Click **【Add to the variables】**

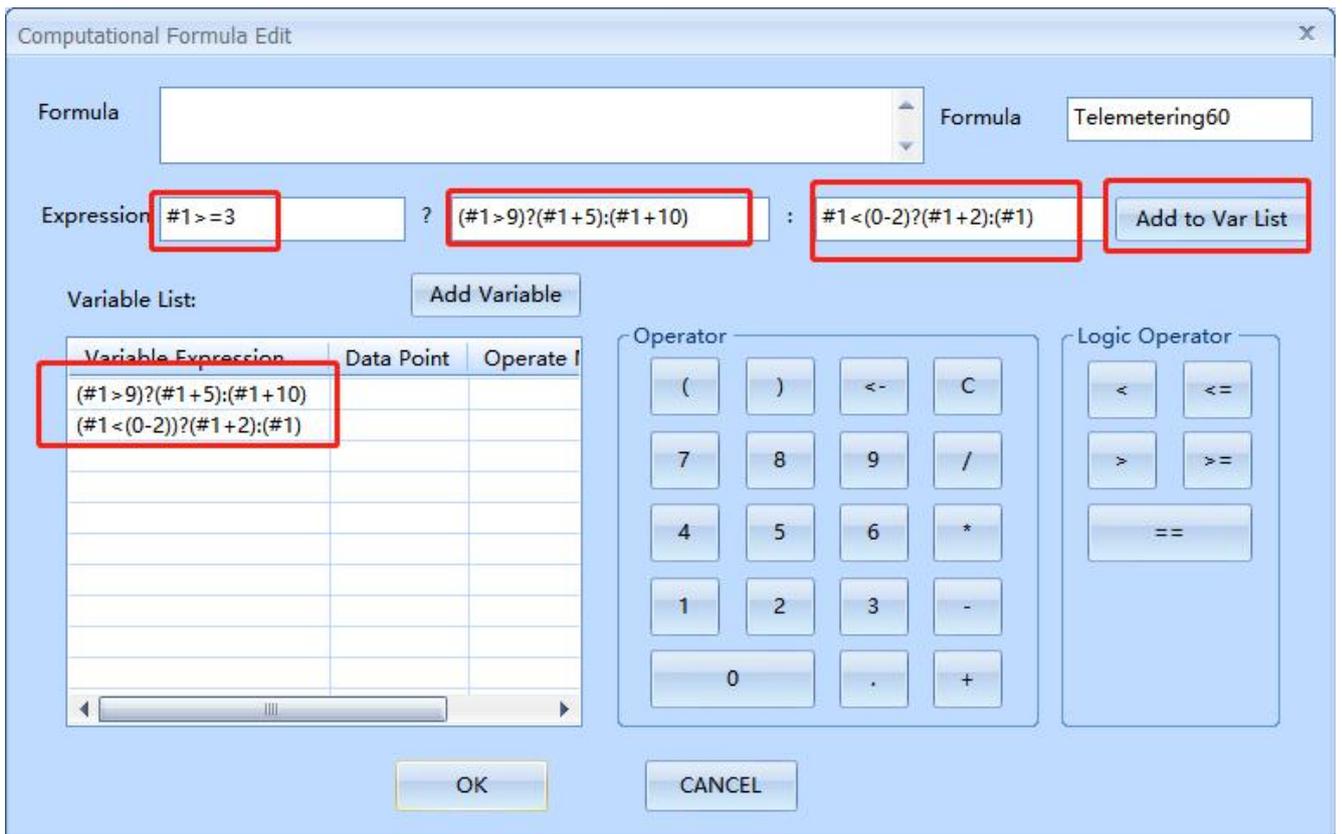


✧ Configuration expression 3: $(\#1 < (0-2)) ? (\#1+2) : (\#1)$, same as configuration expression 2, and click **【Add to Variable Table】**.

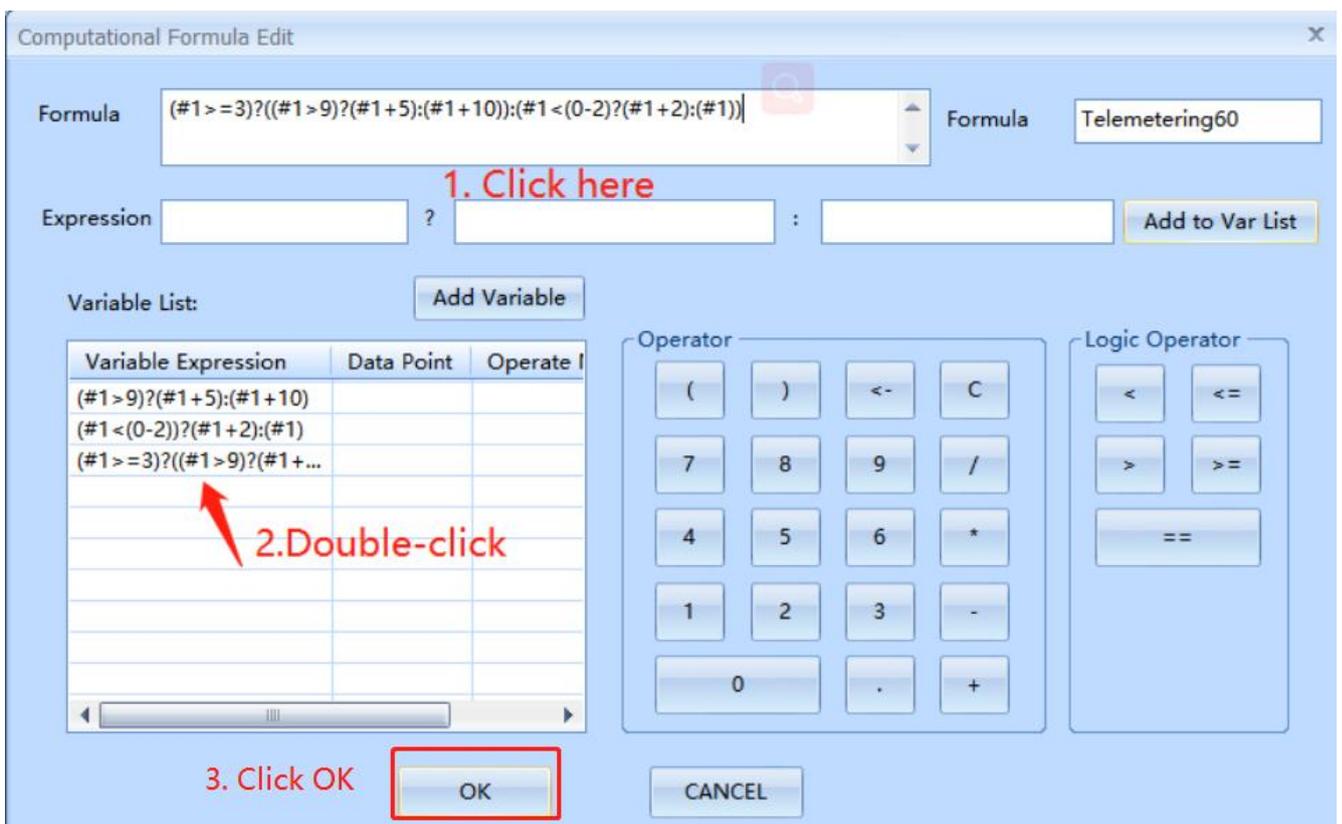


✧ Configure the entire expression: $(\#1 > 3) ? ((\#1 > 9) ? (\#1 + 5) : (\#1 + 10)) : ((\#1 < (0 - 2)) ? (\#1 + 2) : (\#1))$

Click the mouse at the corresponding position to enter the input state, double click "operation variable" to add the existing operation variable, and click **【Add to variable table】**.



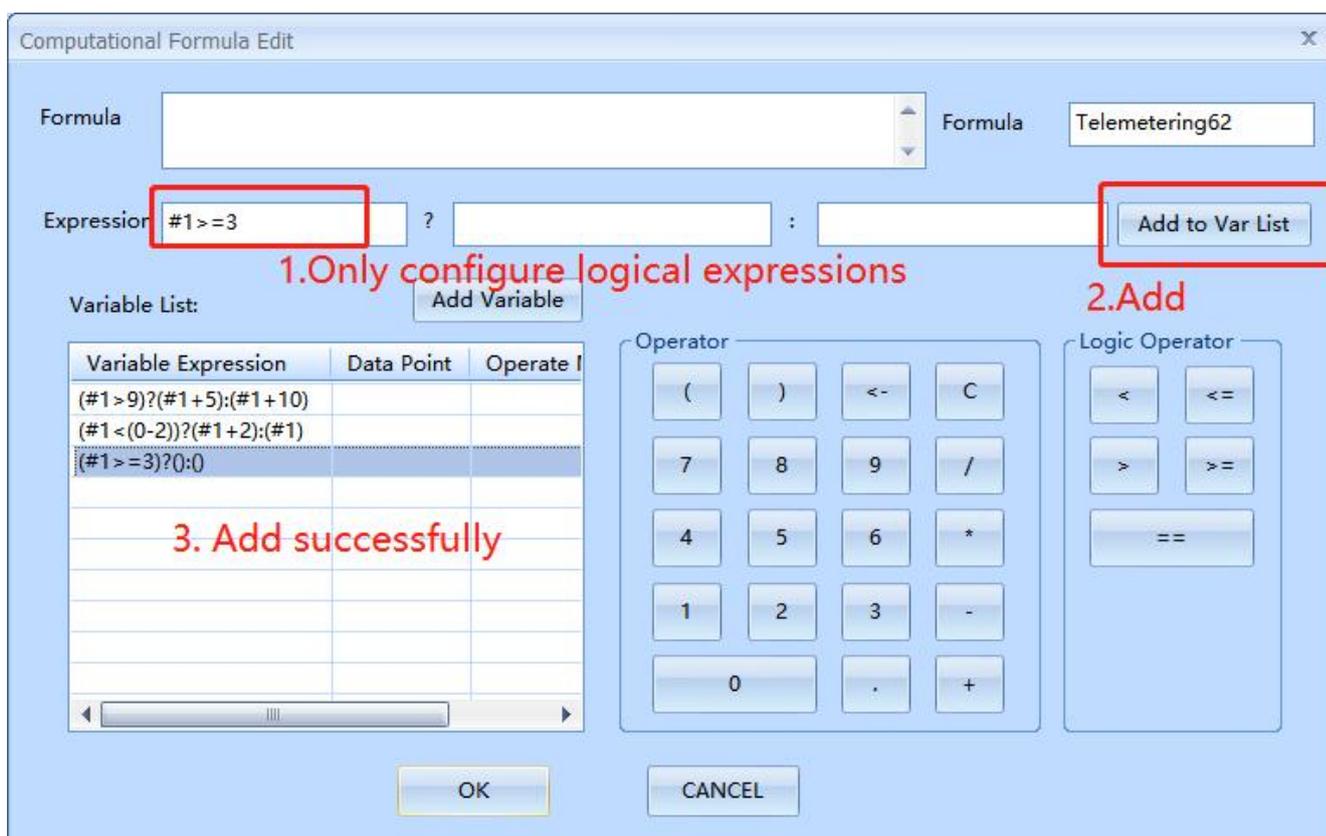
- Click on the **【formula】** text box, double-click the above operation variables, formula will be generated, click on **【OK】** to submit



✧ Click **【sure】** is submitted, formula has been generated can be seen in the interface **【data list】**

ID	Name	Type	Unit	Gro...	Seri...	CC1	Max	Zero Value	Limited ...	Limited Value	Data Type
1	Telemetering1	Voltage	V	0	1	1.000000	9999.000	0.000000	None	0.001000	FLOAT
2	Telemetering2	Voltage	V	0	2	1.000000	9999.000	0.000000	None	0.001000	FLOAT
3	Telemetering3	Voltage	V	0	3	1.000000	9999.000	0.000000	None	0.001000	FLOAT
4	Telemetering5[(#1>=3)?(#1>9)?(#1+5);(#1+10)];((#1<(0-2))?(#1+2);(#1))	Voltage	V	0	4	1.000000	9999.000	0.000000	None	0.001000	FLOAT

✧ Configuration for the convenience of users, to the outermost (#1>=3) conditional, **expression 1** can be added to the **【Variable table】** alone



4.6 Remote Maintenance

4.6.1 Device Remote Maintenance Enabled

Remote maintenance can be implemented only when the device is connected to a remote server.

During the construction of a new project, select the remote maintenance function on the project information configuration screen and enter the IP address of the remote server in the remote maintenance configuration box, as shown in the following figure:



You can also skip the above steps during the construction of the project, and the IP address of the remote server can be directly added and modified in the project configuration information interface later. Double-click the remote parameter cell in the following figure for configuration, as shown below:

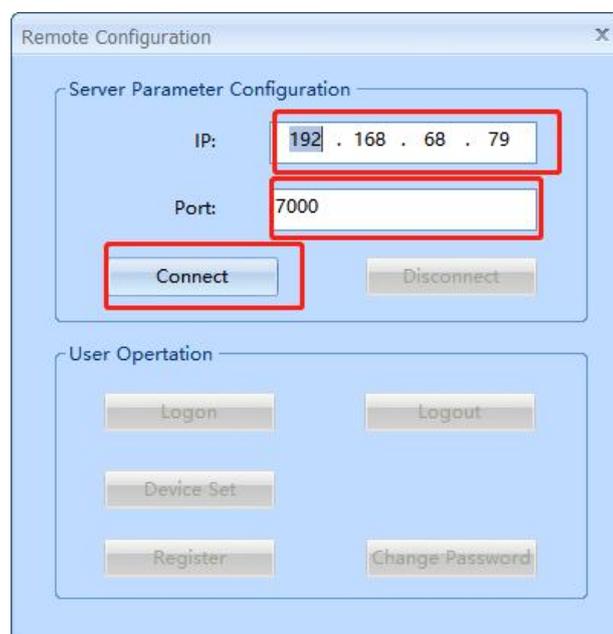
Project Configuration Information									
*	Project Name	Type	Address	Device Name	Description	Remote Parameter	Creation Date	Modified Date	
*	104test	ANet-2E4SM	1			47.114.4.200(8081)	2023-05-26 17:01:50	2023-05-29 09:15:01	

4.6.2. Connect to Remote Server

Open the ANet CM management system software, and execute the menu **【Remote Maintenance】 => 【Remote Configuration】**

If you find that the **【Remote Configuration】** menu is not available, run **【Device Management】 => 【Communication Settings】**, and disconnect the local connection

Note: The server IP and PORT in the following screenshot are not real environment information, and cannot be configured according to them.



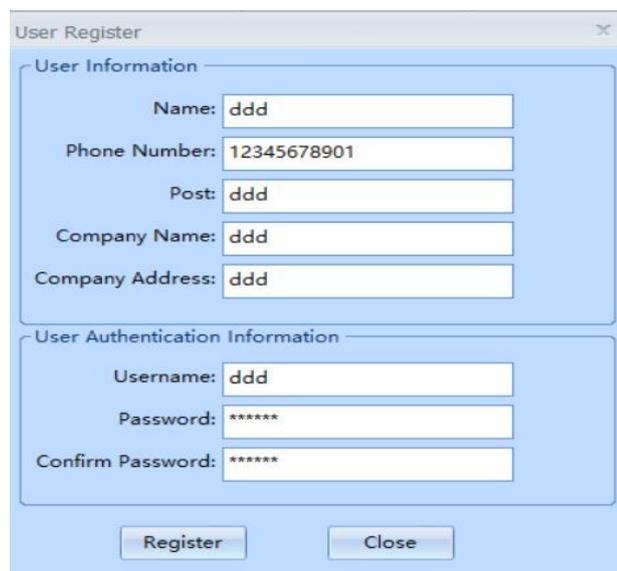
Enter the correct IP address and port number of the remote server, and click Connect. After successful connection, the following dialog box will pop up:



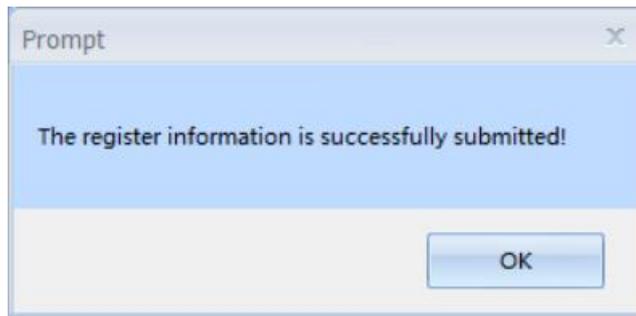
4.6.3 User Registration



Click the **【User Register】** button on the interface



After registration, click the **【Register】** button and operate according to the prompt information. After successful registration, click the **【Close】** button to exit



4.6.4. User Audit

User is audited by the system administrator

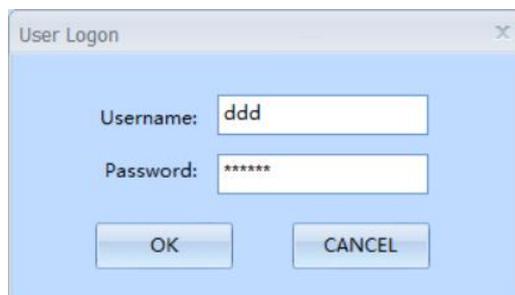
2021071216363187842	ccc	192.168.68.162		12345678901	ccc	ccc	审核通过 审核不通过
---------------------	-----	----------------	--	-------------	-----	-----	--

提示

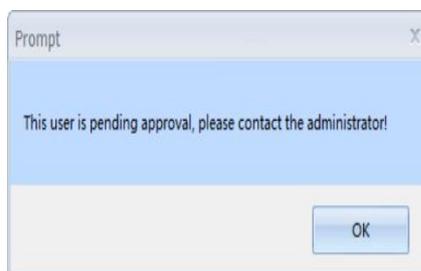
! 确定同意添加ccc用户吗?

取消 确定

4.6.5. User Login



If the user is not approved, click **【OK】** to pop up



If approved, click **【OK】** and it will pop up



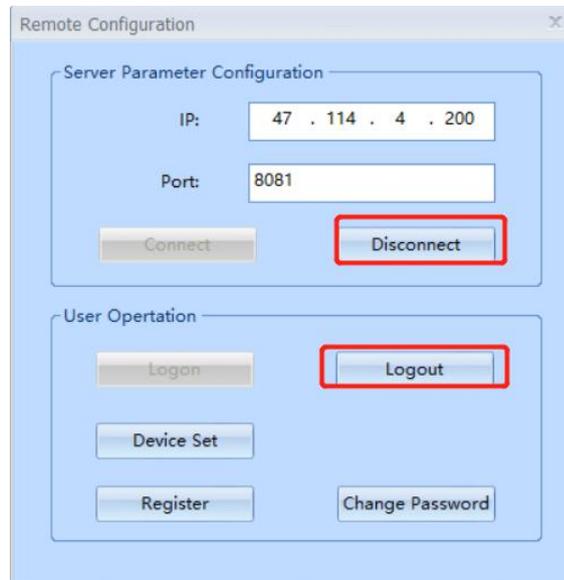
After the login is successful, the remote configuration screen is as follows: The "User Login button" is

unavailable



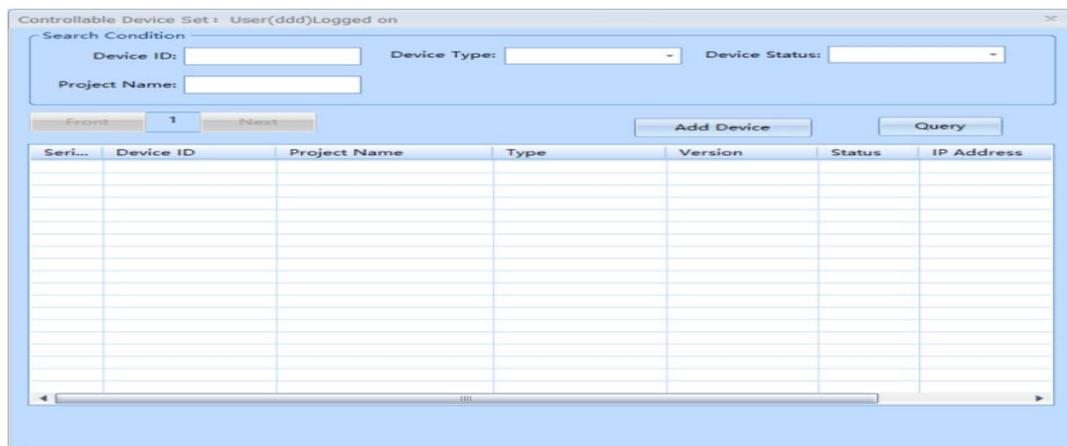
4.6.6. User Layout

【Remote maintenance】=>【login and exit】, or 【Remote maintenance】 => 【Remote configuration】=> 【Log in and log out】 as shown below:



4.6.7. Controllable Device Set

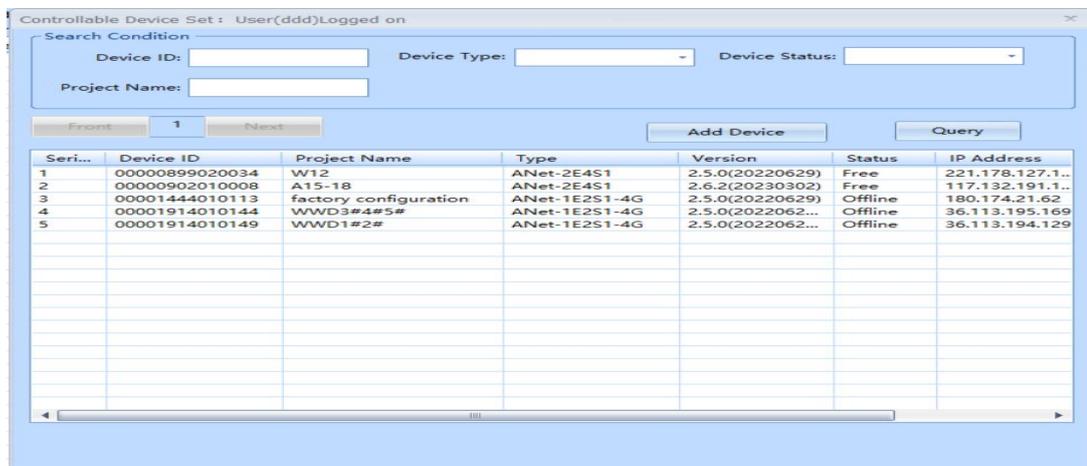
Perform 【Remote maintenance】 => 【Controllable Device Set】 The following interface can be opened:



In this case, the user controllable device set is empty. Add a device by referring to section "[Adding a](#)

Controllable Device Set".

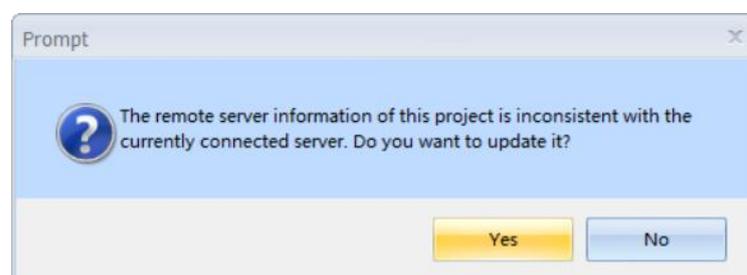
After the controllable device set is added, the above interface will be displayed as follows (click the **【Query】** button in the interface) :



4.6.8. Local Management

Regardless of whether the device is in remote management state, the local wired device has the highest priority for CM management. You can disconnect the remote management connection at any time, which does not affect the local connection management.

- **Important:** if the **【Communication setting】** button is not available, need to exit the remote server connection. No matter whether the device is in the remote management state or not, the local wired connection device has the highest priority for CM management, and the remote management connection can be kicked at any time without affecting the use of local connection management.
- **Important:** When the **【Communication Settings】** button is not available, you need to exit the remote server connection.
- After the user has successfully logged in using CM, if the new project is created or the old project is selected, CM will automatically write the remote server information to the new project or compare with the old project. At this time, the user can execute **【Yes】** to automatically change the remote server information to the project, as shown in the following figure:

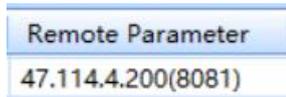


4.6.9 Add Controllable Device Set

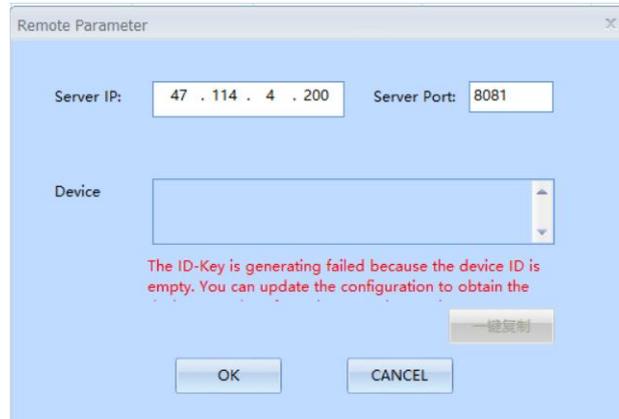
- ① Log in to the remote server in CM according to "[Connect to the Remote Server](#)" and "[User Login](#)", so that CM can automatically learn (confirm) the information of the remote server. The information learned by CM can be used for project configuration as described in "[Local Management](#)".
- ② Set correct remote parameters according to "[Enable Remote Maintenance](#)" or "[Local Management](#)".
- ③ Exit the remote server connection, connect the device locally with CM, and add the project **【Update configuration】** to the device, so that CM can automatically obtain the device ID information of the device;
- ④ Exit the locally connected device, the remote server parameters and device ID in the project file are ready.

⑤ Users log in to the remote server to verify that their user names are valid. For details, see section "[User Login](#)"

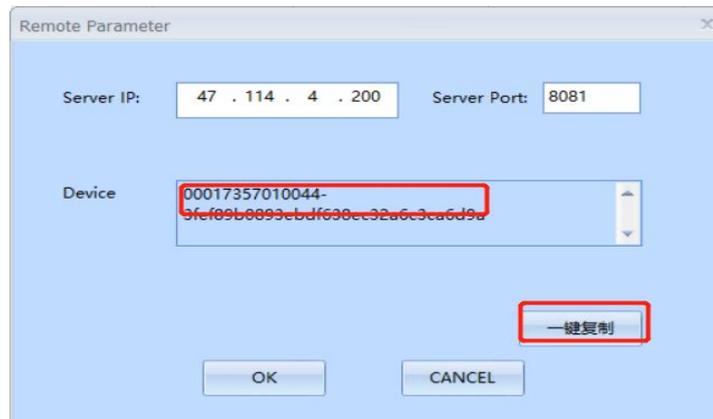
⑥ Double-click the remote parameter cell on the "Project Configuration page" in the following figure



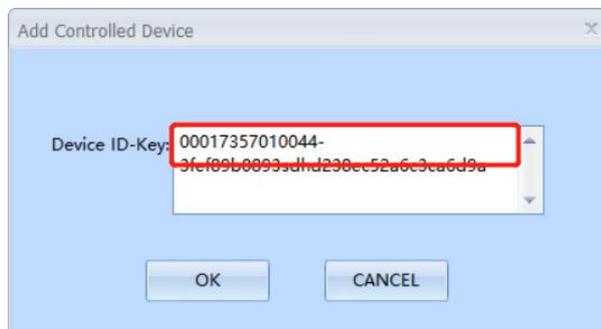
⑦ If there is no device ID in the current project, the following interface will appear. Please perform step 3 in this section



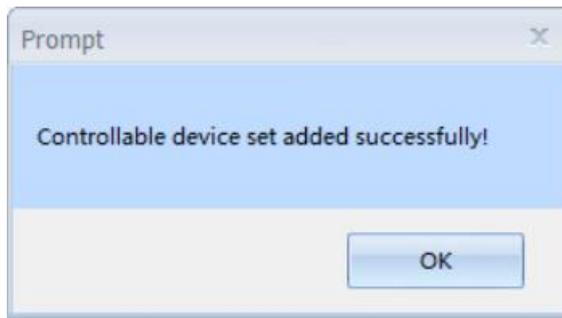
⑧ If the current project has a device ID, the following interface will appear:



⑨ Go to **【Remote Management】** => **【Add controllable device】**, paste and fill in the above information, as shown in the picture below:

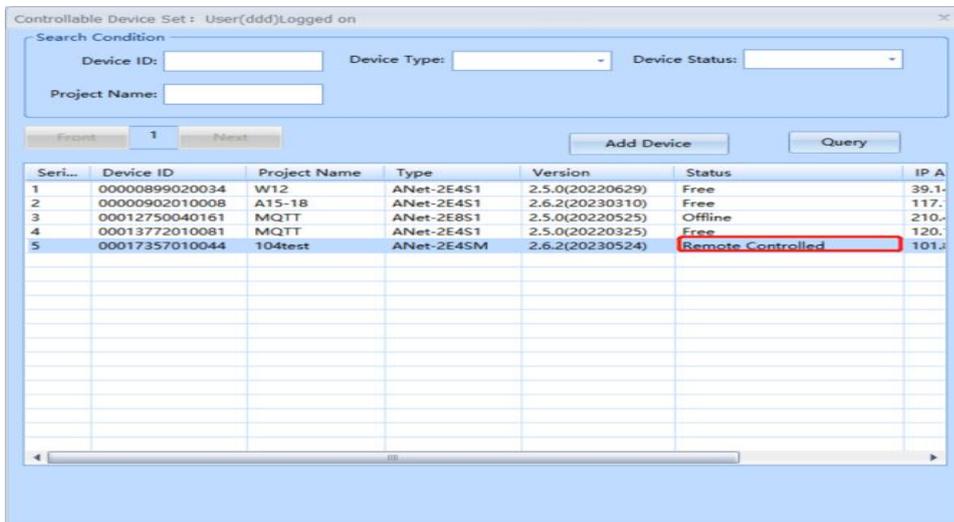


⑩ Click **【OK】** to see the server's feedback



4.6.10.Remote Management

When the device is in the “Free” state, right-click a device and run the 【Application Management】 menu. After the application is successful, the interface is as follows:



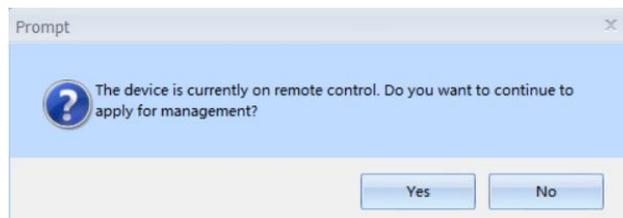
At this time, the status bar at the bottom of CM software displays:



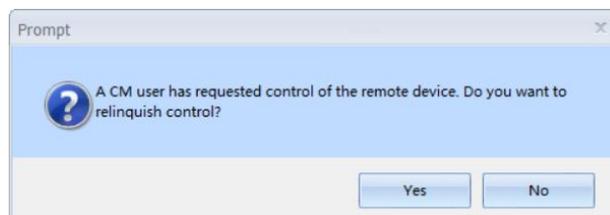
It indicates that the remote management device is successfully connected and users can use the CM management device.

4.6.11.Remote Preemption

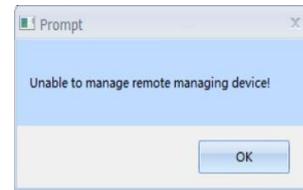
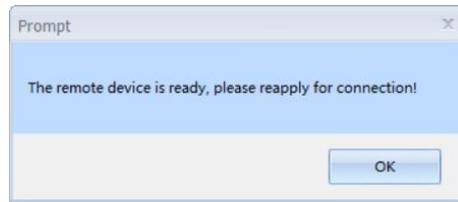
- In controllable devices, such as equipment have been found in the "remote" state (the other users are remote equipment), can also right click on the execution 【application management】 , select 【YES】 in the following pop-up box



At this time, the CM software will pop up



- If the other party clicks **【Yes】** / **【No】**, the CM will pop up the following picture. If the other party does not click any button within 15 seconds, it will be forced to quit, which is equivalent to the other party clicking **【Yes】** :



At this time, click the **【Query】** button, the device state will change to "Free", you can refer to the "[Remote management](#)" content for remote application management.

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