Smart   IoT   Gateway

Installation and Operation Instructions V1.7

Statement

We reserve the right to modify the specifications described in this manual without further notice. Before ordering, please consult your local agent for the latest specifications.

Catalogue

1 Overview

1.1 Product overview

This series of Smart IoT Gateway is an embedded computer hardware platform, with multiple downward communication interfaces and one or more uplink network interfaces, which is used to collect all of the communication data that monitoring or protection devices generated in the target area, then uploads these real-time data to the master station system, thus completing the remote communication, remote sensing and other energy data acquisition functions.

At the same time, this series Smart IoT Gateway can receive control commands of the superior master station system and forwarding the commands to an intelligent unit within the target area, such as control the switch on or off, complete device parameters setting, realize remote control and remote adjustable function to achieve the remote scheduling command output goals.

This series of Smart IoT Gateway provides a protocol library which contains various kinds of protocols to realize the interconnection of intelligent devices of different secondary suppliers. As the communication interface equipment between the automatic system network and the monitoring equipment, this series of intelligent communication management machine has realized three functions: protocol conversion, interface matching, data conversion.

This series of Smart IoT Gateway provides RS485 communication port, each port can carry a maximum of 32 instrument devices (for low voltage integrated protection, it is recommended that each port should be connected with no more than 10); The number of devices carried on each communication port can be finally determined by the communication baud rate, communication line length and customer's requirement for the refresh rate of communication data.

This series of Smart IoT Gateway is capable of real-time parallel multi-task processing, access to third-party devices and communication with host system, and supports software configuration. Through special configuration management software, different communication protocols can be selected for different channel mount devices, and the number of instrument devices connected to the communication manager and data information can be changed by changing the configuration file, without changing the software program.

1.2 **Technical Parameter**

1.2.1 Common technical indicator

Technical Parameter		Indicator
Power frequency & device power consumption		45～65Hz ,Power consumption≤10W
Security	Electromagnetic compatibility	ESD L4，EFT L4，SURGE L4，EMI L3
	Power frequency withstand voltage	1min duration between power supply and communication terminal: 2kV (220V equipment), 1.5kv (24V equipment)
	Insulation resistance	In the general test atmosphere, the input and output terminals to device shell >100MΩ
Mean time between failures		≥30000 h
Environment		Operating temperature:-20℃～+55℃
		Storage and transportation temperature：-25℃～+70℃
		Relative humidity：≤95%（+25℃）
		Altitude：≤2500m
External storage		SD card interface 1 channel, built-in 8GB electronic hard disk

1.2.2 8 serial port series

Technical parameter	Indicator
Power supply voltage	AC/DC 220V（85-265V） DC 24V（12-36V）(reverse connection protection should be illustrated when ordering)
Processor	Arm32-bit cortex-a7 kernel, 528MHz
Internal storage	256MB DDR3
Electronic hard disk	256MB NAND Flash
RS485	8-channel opt coupler isolation
RS232(debugging port)	1 channel
USB HOST	1-channel, USB2.0 high speed

Ethernet	2-channel 10/100m self-adaptive

1.2.3 2 serial port series

Technical parameter	Indicator
Power supply voltage	AC/DC 220V（85-265V） DC 24V（12-36V）(reverse connection protection should be illustrated when ordering)
Processor	Arm32-bit i.MX280 kernel, 454MHz
Internal storage	64MB DDR2
Electronic hard disk	128MB NAND Flash
RS485	2-channel opt coupler isolation
Ethernet	1- channel 10/100m self-adaptive
7 module note	1-channel (this function is included in the 4G model)

1.2.4 4 serial port series

Technical parameter	Indicator
Power supply voltage	AC/DC 220V（85-265V） DC 24V（12-36V） (reverse connection protection should be illustrated when ordering)
Processor	Arm32-bit cortex-a7 kernel, 528MHz
Internal storage	256MB DDR3
Electronic hard disk	256MB NAND Flash
RS485	4-channel opto-isolator isolation
RS232(debugging port)	1 channel
USB HOST	1 channel，USB2.0 high speed
Ethernet	2 -channel 10/100m self-adaptive

1.3 Dimension

1.3.1 8 serial port, 4 serial port (Unit: mm)
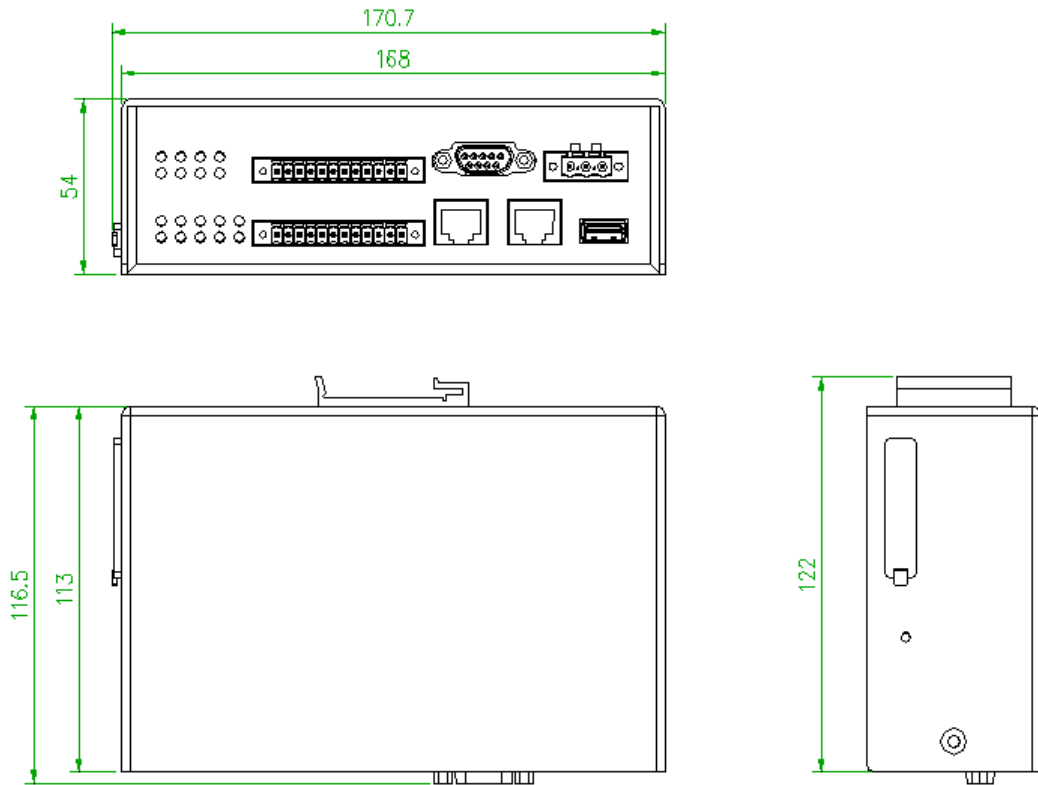
1.3.2 2 serial port series（Unit :mm）
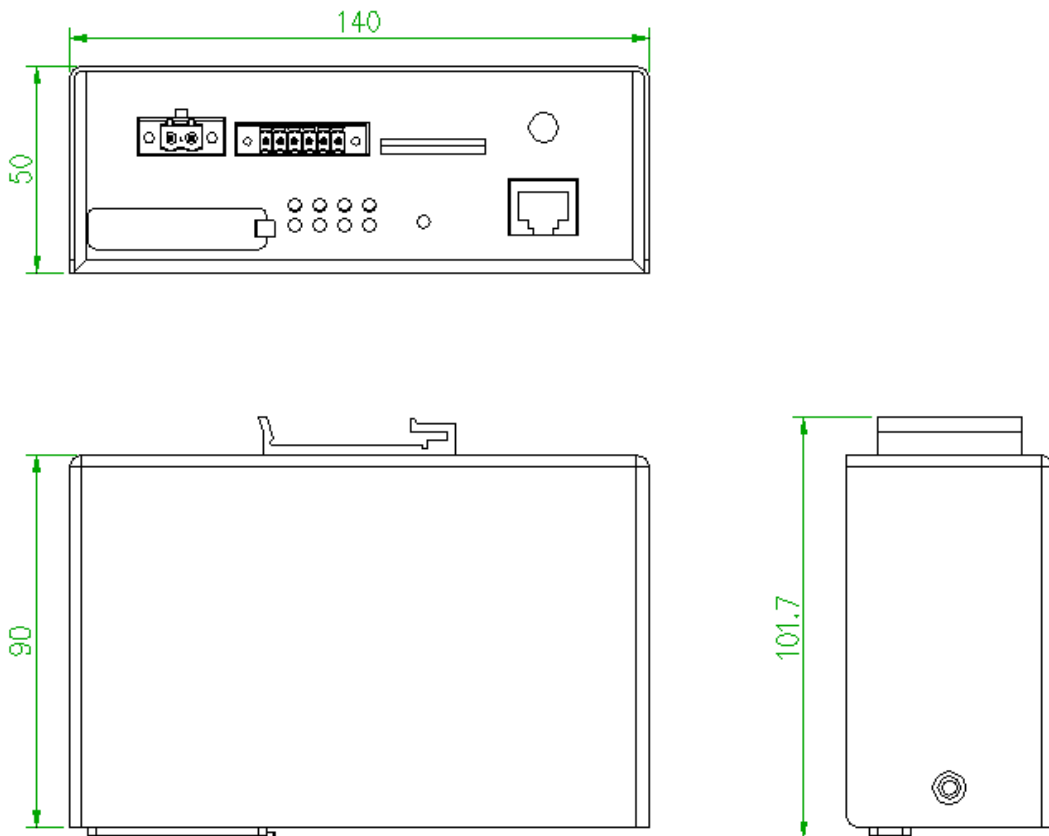
1.4 Wiring and installation

This series of Smart IoT Gateway adopts 35mm standard guide rail installation mode.

1.4.1 8 serial port, 4 serial port

The LINK green light will light up after the 8 serial port series is connected with the network cable, flicker when there is data, and the SPEED yellow light will often light up at 100Mb/s, and turn off at 10Mb/s; RS485 receiving data RX red light flashes, sending data TX green light flashes.

Guide rail clamp can be installed on the rear plate and bottom plate.

1.4.2 2 serial port series

The green light will light up after the 2 serial port series is connected with the network cable, flicker when there is data, and the SPEED yellow light will often light up at 100Mb/s, and turn off at 10Mb/s; RS485 has data transmission receiving data RX red light flashes, sending data TX green light flashes.

The single model does not offer SIM wireless, and the 4G interface is sealed with a rubber plug. The 4G model provides SIM wireless function and external 7-mode special antenna.

The 4G light of 4G model is off for 4 seconds and on for 1 second when it is not working, and flashes when there is data.

Guide rail clamp can be installed on the rear plate and bottom plate.

All terminals of this series of intelligent communication management machine are on the front panel.

2 Device management

2.1 Recommended maximum number of device connections

8 serial ports provide 8 RS485 serial ports, each serial port supports and connects to 32 instrument devices, and the full load is 256 instrument devices. The theoretical limit of information data nodes is 10,240. Considering the redundancy of system resources, it is suggested that the user should configure no more than 5,120 total information points.

4 serial port series provides 4 RS485 serial ports, each serial port supports and connects to 32 instrument devices, the full load is 128 instrument devices, the theoretical limit of information data nodes is 10,240, considering the system resource redundancy, it is recommended that the user configure not more than 5,120 total information points.

2 serial port series provides 2 RS485 serial ports, each serial port supports and connects 32 instrument devices, the full load is 64 instrument devices, the theoretical limit of information data nodes is 2048, considering the system resource redundancy, it is recommended that the user configure not more than 1024 total information points.

2.2 Terminal device management

The default delivery IP address of the network interface of the management machine is: LAN1:192.168.1.136; LAN2:192.168.2.136

Users can use SSH or Telnet software provided by configuration management software (such as SecureCRT) terminal for basic information management and configuration operation of the device. After connecting the computer with RJ45 interface of 2 serial devices by network cable, users can connect SSH or Telnet services provided by the device in terminal console software. After successful connection, the interface displays "login:". At this time, the user needs to enter the user name and password to login. User name: **admin**, Password: **admin**. The user name and password are not modified.

2.2.1 Terminal login interface

In order to ensure the user has a good visual environment in different terminal interfaces, the user needs to select the text color of the operating environment. At this point, the user enters the corresponding number 0-6, and then presses enter to obtain the desired text color, 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 command prompt

The command prompt of the interface is CMD >. The user enters the command after > and presses enter to execute.

Command line support keyboard keys to make history command selection.

Users do not know the specific command, can enter "?" for help.

2.2.3 Command introduction

Command:? or help
Function: Display a list of all commands
Grammar:?[Enter]   or   help[Enter]
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
```

Command: ping
Function: Network connectivity testing
Grammar：ping target IP address[Enter]
Example

```
CMD > ping 192.168.1.100

Target_host is alive.
```

Command:reboot
Function: device soft restart
Grammar：reboot[Enter]
Example:Omit

Command：showip

Function:check all network card Settings

Grammar: showip[Enter]

Supplement: The corresponding marking of eth0 on device is "LAN1" Ethernet port（or"LAN"）；

The corresponding marking of eth1 on device is "LAN2" Ethernet port

Lo is the loopback port

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 current console information

Grammar: clr [Enter]

Command: quit or exit

Function: exit the current login

Grammar：quit[Enter] or exit[Enter]

Command:defgw

Function 1: check the current router

Grammar：defgw[Enter]

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 current network default router

Grammar2: defgw add default gw gateway IP[Enter]

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:Remove the current network default router

Grammar: defgw del default gw gateway IP[Enter]

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 need to be configured[Enter]

Example

```
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 supplement:

        This configuration mode, only temporary configuration, after the device restart will be restored to the original configuration of the system. If you want to permanently configure device IP, please use

the management software Settings, refer to the "network port Settings" interface in 4.2.1 channel configuration instructions.

2.3 Special management software

The supporting management of the Smart IoT Gateway is configured and managed by the configuration management software (hereinafter referred to as the software) provided separately. The software is mainly provided to relevant professional configuration management personnel, and non-professional personnel are not allowed to use it without permission.

Software has a certain degree of professionalism, need to know some knowledge of the electrical industry and have relevant software operation experience.

2.4 Software installation

Installation package file: setup.exe (The file name shall be subject to the actual version provided and shall be modified 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. In the use of the communication manager, the first need to configure a project file, and then into the communication manager system to specify the path, to complete the communication manager data collection and data upload functions. Real-time data monitoring and system control can be carried out when the communication manager system is running.

As for project file configuration, the main configuration items include channel type, protocol, channel parameters, device model, device parameters, device data, data forwarding, etc.

➢ Channel types are divided into serial port and ethernet port. Channel parameters vary according to channel type configuration;

➢ Protocol is divided into two types: main station side and equipment side, supporting modbus, modbustcp, DLT -645, iec 103, etc. Some common protocol templates are available; Specification templates can be configured and modified to save;

➢ The device model is specified by the manufacturer; The parameters of the device should be consistent with the actual situation, which may involve some functional configuration. Please refer to the device configuration section below;

➢ Device data is the data set that needs to be collected to match the functions supported by the device;

➢ At the beginning, some equipment templates are provided, which can be modified and configured by ourselves. Please refer to the following template for detailed operation;

➢ Forwarding of data requires configuration of forwarding scheme. Please refer to the forwarding scheme section below.

For real-time data monitoring, you can view the current communication message and real-time data. Communication message can view the detailed message of a certain channel or a certain device; The real-time data must be a specified device.

In addition, the software also integrates third-party open source software for users to use - SSH and FTP.

2.6 Software layout
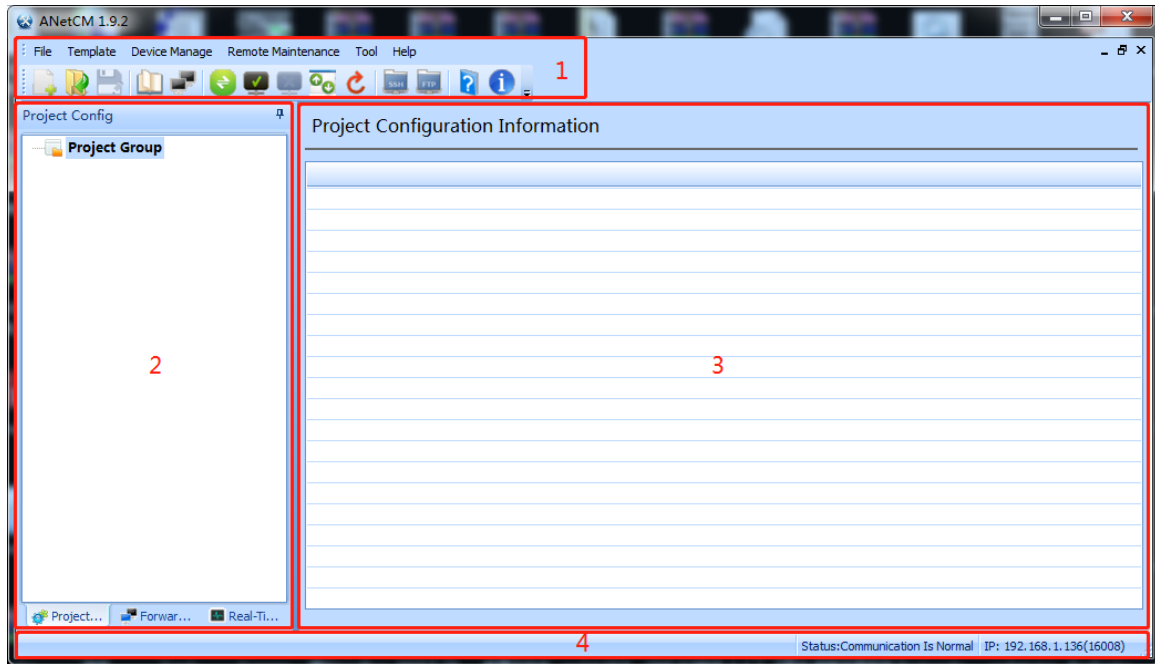
1: Menus and toolbars.

2: Left operation area, there are three types of operation: project configuration, forwarding scheme and real-time monitoring.

3: Right operation area, corresponding to left operation area: left selection, right display and operation modification.

4: Information status bar, display prompt message and network connection status.

3 Management software operation instructions

3.1 Project group

Project group concept：

Software will centrally place all cm.ini files **Created** and **Opened** by users in a certain directory for unified management, software use "explorer" similar to the Windows system directory tree structure mode to describe the project management mode, users only need to be concerned with the configuration of the project itself, and don't need to worry about file storage errors and finding, convenient operation and management.

After installation, the software will create a blank "project group" as the management unit of the overall project files.

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

When configuring the cm.ini file for a specific device, the engineer creates the name of the project and then creates the project file under the project.

3.2 File management

3.2.1 New

Select "project group" in the "project configuration" bar, right click "new" or click "file" in the menu bar "new" to display the "new project" dialog box:
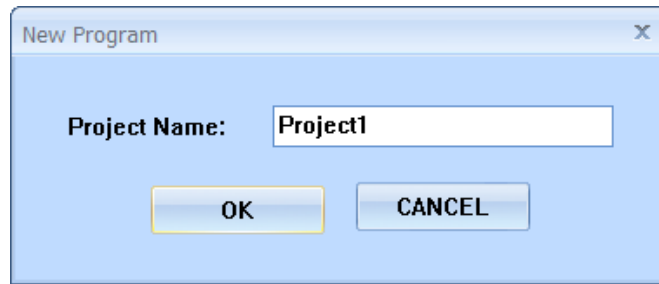
Click the Confirm button, display:
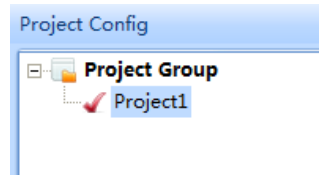
After selecting "project 1", right click "create" or click "file" "new" in the menu bar above to display the "NewProject" dialog box:
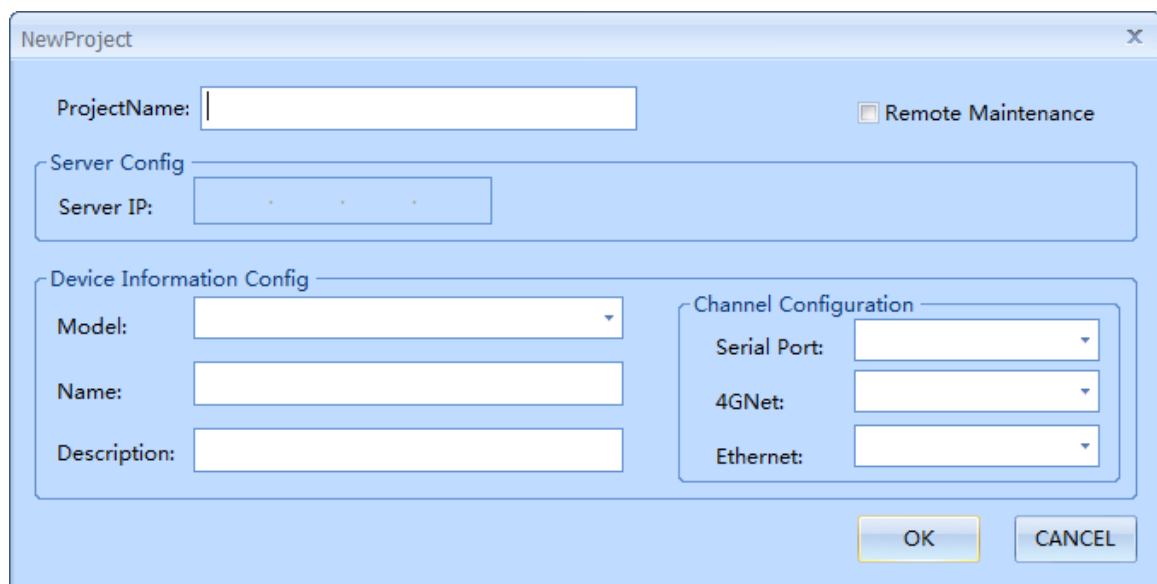
◇ Project Name: enter the name of the current project. It cannot be empty

◇ Model: several models have been set to choose from, or you can enter your own name, but cannot be empty

◇ Channel configuration: It is ok to configure the corresponding quantity according to the actual project needs

After performing this operation for several times, the "Project Group" tree results as shown in the following figure can be obtained in the "project configuration":
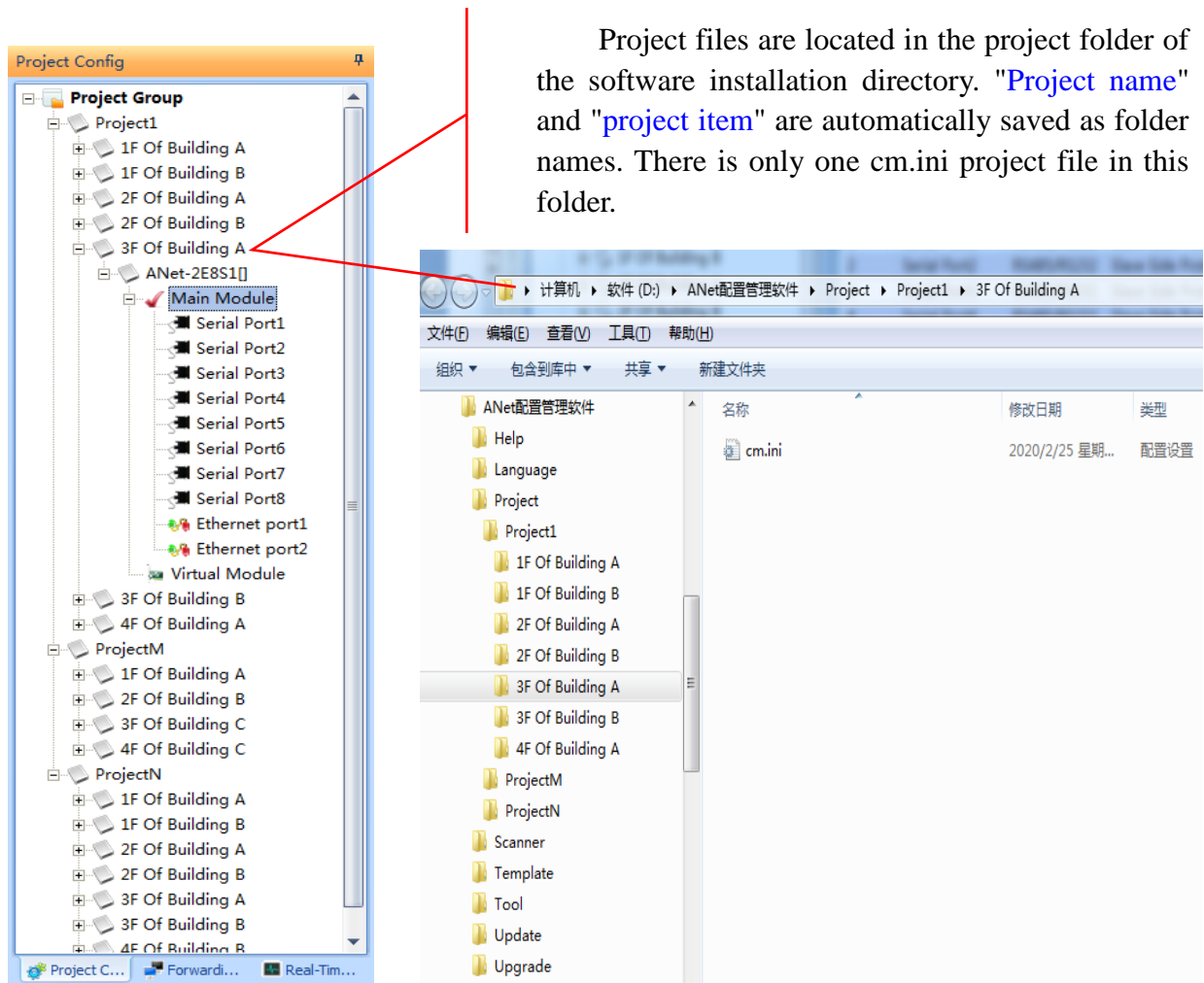
Project files are located in the project folder of the software installation directory. "Project name" and "project item" are automatically saved as folder names. There is only one cm.ini project file in this folder.

"Project group" tree support right-click menu, such as new, delete, move, rename, save as, open file location etc.

3.2.2 Open

✧ When you open the project configuration file in the project folder of the software installation directory, it will automatically locate the project node location of the project in the project group.

✧ When you open a project configuration file outside the project folder of the software installation directory, it will be automatically saved to the unknown project if there is no same project name under the unknown project. If there is the same project name under the unknown project, it will prompt whether to replace, click "yes (Y)"to replace the existing project with the same name, and click "no (N)"will automatically save the name to the "unknown project".

✧ Use the mouse to drag and drop the cm.ini file anywhere in your computer into the cm software form to open the file.

✧ When the project configuration files outside the project folder of the software installation directory are opened, the files will be automatically copied to the project directory of the installation location for unified management.

3.2.3 Open file location

✧ Select the corresponding project under the project group, right-click the mouse, and select "open file location" from the menu to open the directory where the project file is located in the resource manager

✧ When the project is selected, the full path of the project file will be displayed in the
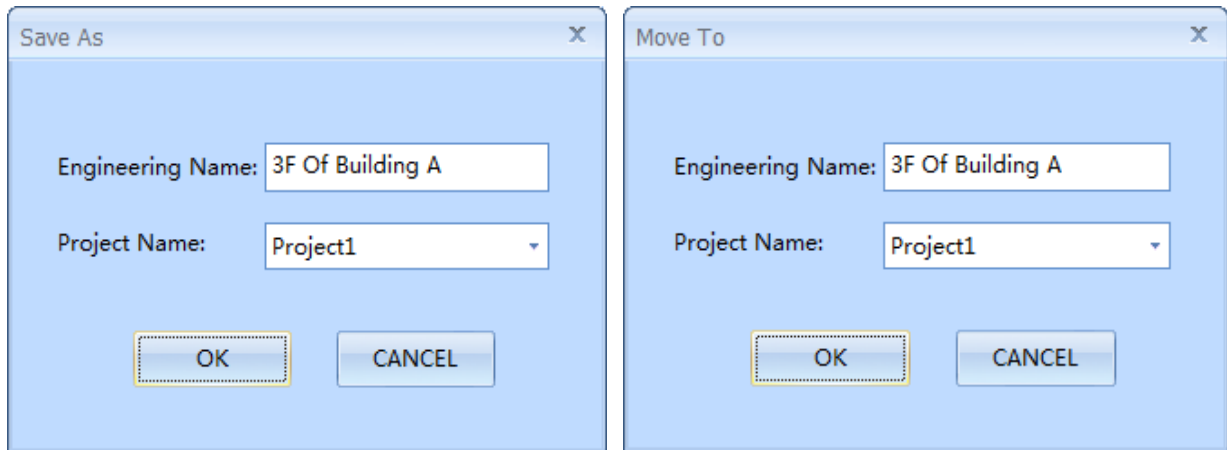
information status bar at the bottom of the software, so that the user can judge whether the operation object is correct.

3.2.4   Save, save as, and move

✧ "Save" saves the cm.ini file for the currently selected project

✧ When you save or move the currently selected project, you can change the project or project name.

✧ The "Save as "operation implements the ability to copy a project (which can be renamed) into another project.

3.2.5   Rename, delete

✧ Change project name, project item name.

✧ Removes the selected target from the current group to the computer's recycle bin.

3.2.6   Other internal functions

✧ Only one Software can run at a time.

✧ If a project configuration information is modified in the software, the user will be prompted to save it one by one when the software exits.

✧ When opening a new project, the software will intelligently learn the device template in the project, where the "function code + offset address" will be learned.

✧ After the forwarding scheme is configured, the meter or meter collection point data on the acquisition side is modified or deleted, which will result in data matching error

✧ When updating the configuration, the location of the configuration file to be selected will be automatically located in the folder or directory where the currently selected project's ini file is located.

3.3 Template

Protocol templates   and device templates   are included. The developer provides the specification template file, and the engineer imports the template directly and saves it for use. Equipment templates need to be standardized after training and consultation and can then be created by the engineers themselves

Function introduction：

◆ Newly create: used to add templates, you can create a new template under the specified channel or manufacturer

◆ Save: saves the list of current templates to a file that you can use all the time

◆ Application: the current configuration is only temporarily available with the project. It will disappear after restarting the software

◆ Delete: used to delete the template, if you want to make sure not to need, need to save

◆ Import: you can import the already configured template from the. ptpl file. After import, the original configuration will be overwritten for updating and adding the template

◆ Export: an existing configuration can be exported to a.ptpl file for separate storage and delivery of templates

3.3.1 Protocol template

✧ ⬛ Toolbar button
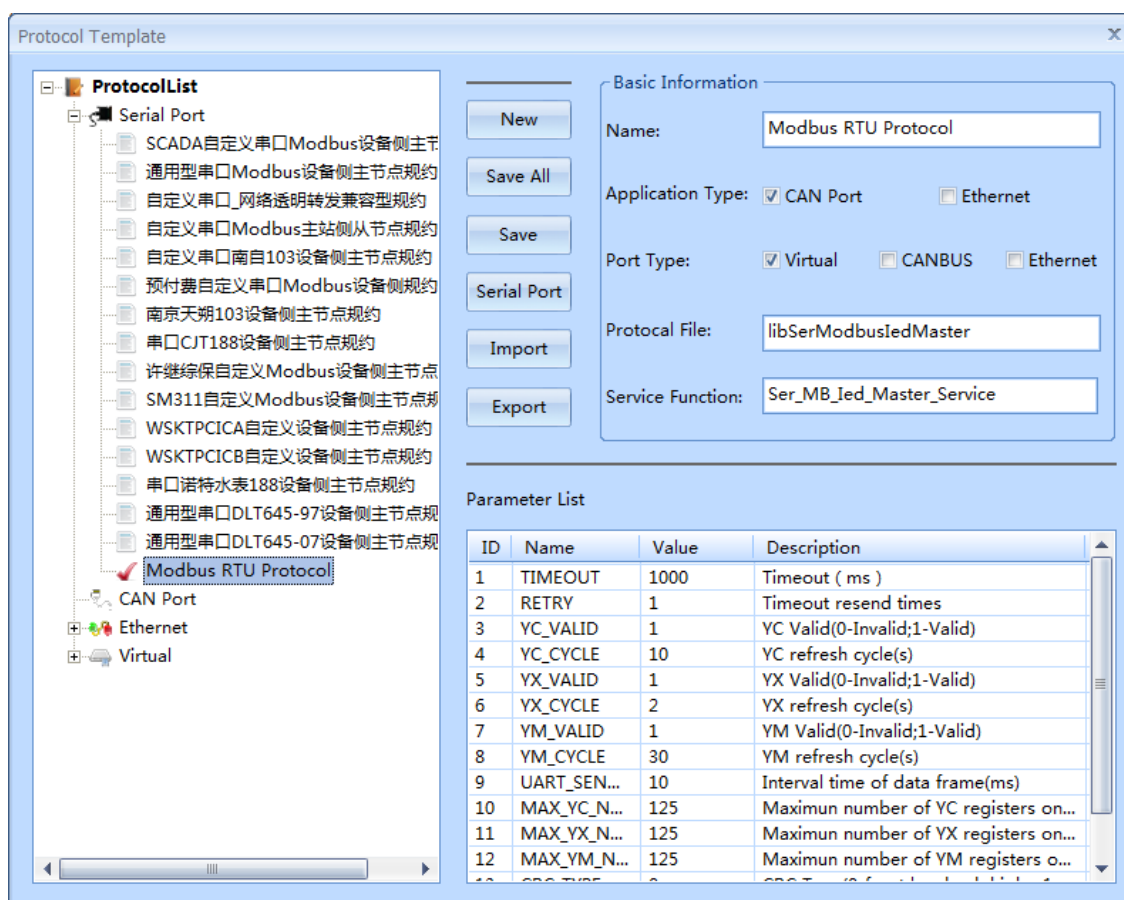
✧ Protocol list: displays all current protocol templates, and the basic information and parameter list of the template can be displayed after selection

✧ Basic information: contains the basic information of the specification and cannot be modified by non-developers

✧ Parameter list: "name" non-developer cannot modify, 【value】 please modify carefully according to "description"

3.3.2 Device template

✧ Toolbar button

✧ Device list: displays all current device templates. Select device to view basic device information and device data configuration

✧ Device basic information: classification, easy identification and selection

◇ Device data: engineers need to carefully refer to the operation manual of the device to complete the configuration. For detailed configuration method, please refer to 4.4 device data configuration

3.4 Manage the device

3.4.1 Device Ethernet port address configuration

Refer to 4.2.1 channel configuration to configure the network port channel

3.4.2 Communication setting

◇ Toolbar button
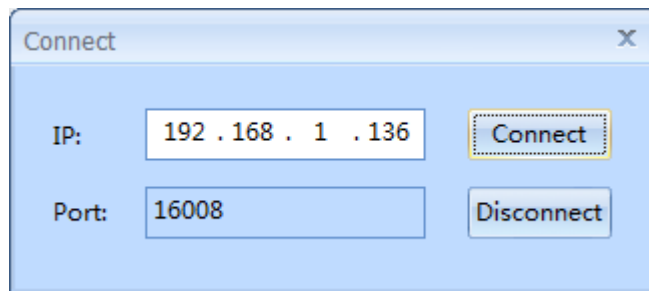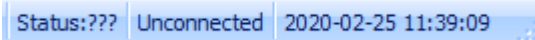
◇ IP: the IP address of the communication manager that has been running normally. The management computer can ping the IP address.
◇ Port: default, immutable
◇ Whether the connection succeed or not, it can be judged by the status bar display:

Connect successfully:

Failed to connect or not connected：
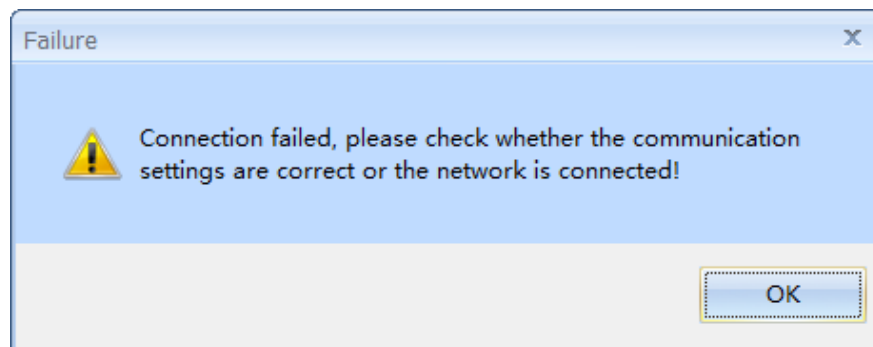
3.4.3 Start monitoring

◇ Toolbar button

Before "start monitoring", "communication setting" should be carried out. After successful connection, real-time data monitoring can be carried out. If you confirm that the IP corresponding communication management machine is running normally, you can directly "start monitoring", without "connection" operation.

After listening, you can view "message" and "real-time database", and the two modes can be switched at any time.

Operation is as follows:
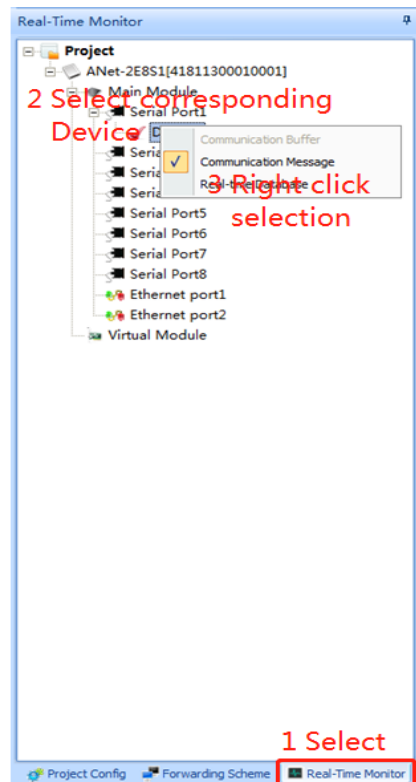
◆ "message"

Message has two display modes: "communication buffer" and "communication message".

Note: both sending and receiving are relative to the communication management device. Please note this.

✦ "Message Buffer of the Manager": divided into "send buffer" and "receive buffer", all messages are displayed.
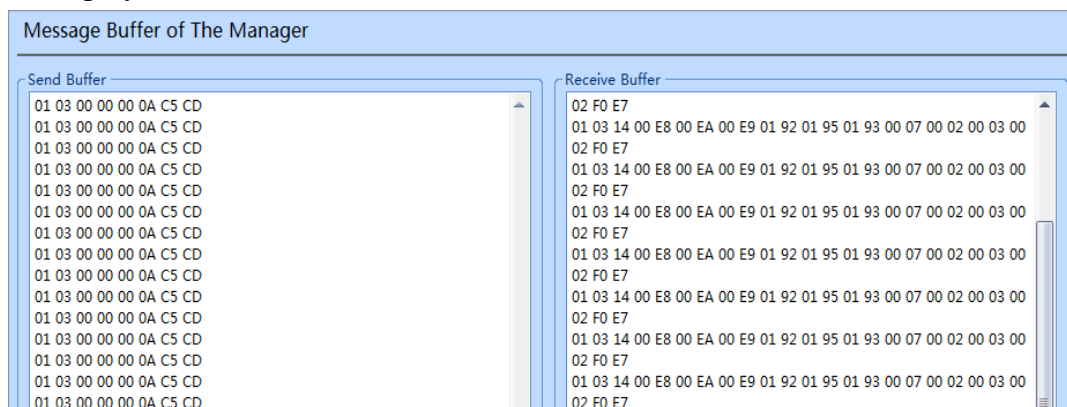
✦ "Communication message": the message in the buffer will be displayed after correct processing and successful parsing. If the parsing fails, it will not be display.

Communication Message--Device

```
2020-02-27 19:05:22 Send: → (8)01 03 00 00 00 0A C5 CD
2020-02-27 19:05:23 Receive: ← (25)01 03 14 00 E8 00 EA 00 E9 01 92 01 95 01 93 00 07 00 02 00 03 00 02 F0 E7
2020-02-27 19:05:33 Send: → (8)01 03 00 00 00 0A C5 CD
2020-02-27 19:05:33 Receive: ← (25)01 03 14 00 E8 00 EA 00 E9 01 92 01 95 01 93 00 07 00 02 00 03 00 02 F0 E7
2020-02-27 19:05:43 Send: → (8)01 03 00 00 00 0A C5 CD
2020-02-27 19:05:43 Receive: ← (25)01 03 14 00 E8 00 EA 00 E9 01 92 01 95 01 93 00 07 00 02 00 03 00 02 F0 E7
2020-02-27 19:05:53 Send: → (8)01 03 00 00 00 0A C5 CD
2020-02-27 19:05:53 Receive: ← (25)01 03 14 00 E8 00 EA 00 E9 01 92 01 95 01 93 00 07 00 02 00 03 00 02 F0 E7
2020-02-27 19:06:02 Send: → (8)01 03 00 00 00 0A C5 CD
2020-02-27 19:06:02 Receive: ← (25)01 03 14 00 E8 00 EA 00 E9 01 92 01 95 01 93 00 07 00 02 00 03 00 02 F0 E7
2020-02-27 19:06:12 Send: → (8)01 03 00 00 00 0A C5 CD
2020-02-27 19:06:12 Receive: ← (25)01 03 14 00 E8 00 EA 00 E9 01 92 01 95 01 93 00 07 00 02 00 03 00 02 F0 E7
2020-02-27 19:06:22 Send: → (8)01 03 00 00 00 0A C5 CD
2020-02-27 19:06:22 Receive: ← (25)01 03 14 00 E8 00 EA 00 E9 01 92 01 95 01 93 00 07 00 02 00 03 00 02 F0 E7
2020-02-27 19:06:32 Send: → (8)01 03 00 00 00 0A C5 CD
2020-02-27 19:06:32 Receive: ← (25)01 03 14 00 E8 00 EA 00 E9 01 92 01 95 01 93 00 07 00 02 00 03 00 02 F0 E7
2020-02-27 19:06:43 Send: → (8)01 03 00 00 00 0A C5 CD
2020-02-27 19:06:43 Receive: ← (25)01 03 14 00 E8 00 EA 00 E9 01 92 01 95 01 93 00 07 00 02 00 03 00 02 F0 E7
```

◆ "Real-time database"

"Real-time database" displays all data for all types of data for the currently selected device. Here are some methods to judge whether the data is valid:

◇ First, because the communication management machine has the function of saving historical data, so, see "update time", if the current time matches it, it means that the current data is the latest reading data.

◇ Second, see the same row of "current value" and "original value", if they are the same as the actual value, it is valid.

The real-time database of manager--Please select the device

ID	Name	Group Number	Serial Number	Current Value	Original Value	Quality	Update Time
1	Telemetering1	0	1	232.0000	232	0	2020-02-27 16:37:26.0
2	Telemetering2	0	2	234.0000	234	0	2020-02-27 16:37:26.0
3	Telemetering3	0	3	233.0000	233	0	2020-02-27 16:37:26.0
4	Telemetering4	0	4	402.0000	402	0	2020-02-27 16:37:26.0
5	Telemetering5	0	5	405.0000	405	0	2020-02-27 16:37:26.0
6	Telemetering6	0	6	403.0000	403	0	2020-02-27 16:37:26.0
7	Telemetering7	0	7	7.0000	7	0	2020-02-27 16:37:26.0
8	Telemetering8	0	8	2.0000	2	0	2020-02-27 16:37:26.0
9	Telemetering9	0	9	3.0000	3	0	2020-02-27 16:37:26.0
10	Telemetering10	0	10	2.0000	2	0	2020-02-27 16:37:26.0

Tabs: Telemetering | Telesignalisation | Remote Pulse | Measurement | Constant Zone | Constant Value | Clamping Plate | Wave Record | Working Status | SOE

3.4.4 Stop monitoring

The network connection will be disconnected after the monitoring is stopped, so the update of the data will be stopped

3.4.5 Update configuration

Select an ini file to upload to the device and automatically update and restart the system. When the system prompts ini to update failed, there is an error in the configuration. After connecting CM to the hypervisor, click "management device" "show logs" and click "update" button in the dialog box. To see if there are specific error messages, refer to the error message prompt to correct the configuration.

If the IP address of the management network is modified in the configuration, please reconfigure the IP address of 3.4.1 "communication Settings".

The device ID information is stored in the device during production, and when the cm.ini file is updated, it is determined whether the device ID information in the device ini file is consistent with the device. The purpose of the algorithm is to alert the user whether "communication Settings" are connected to the correct device to which the ini file will be applied, so as to prevent the user from

misleading device A's ini file into device B.

By default, the "device ID" field in the newly created ini file in CM software is empty. After updating to the device, the "device ID" information in the device will be automatically filled into the cm.ini file.

If the cm.ini file is copied and downloaded from device A, it will contain the "device ID" information of device a. if the cm.ini file is modified and updated to device B, cm will recognize that the "device ID" information of the file is not consistent with the "device ID" information of device B, thus providing A warning message.

Once confirmed by the user, the ini file uploaded with device A's device ID will be automatically rewritten to device B's device ID. So this is an alert message that doesn't affect the execution of the ini file itself. In this case, just make sure the connection IP is correct.

3.4.6 Time setting
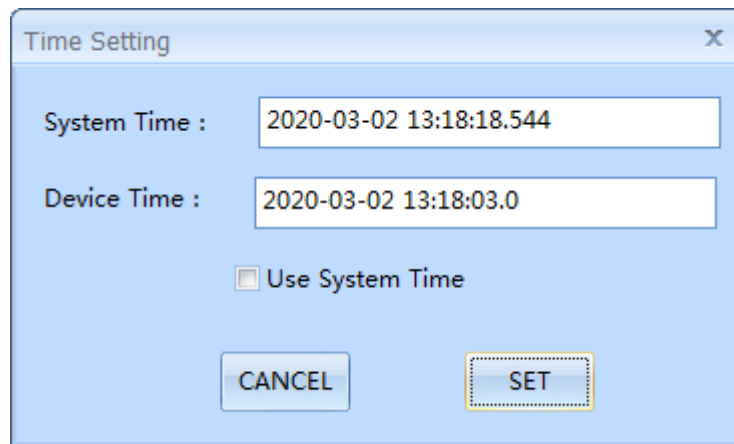
Device time: after connecting to the management device, the clock time of the current management device can be obtained.

SET: Tick the "Use system time", set the time of the management device as the system time; uncheck to set the device time as the time string of the textbox of "Device time".

3.4.7　Display the logs
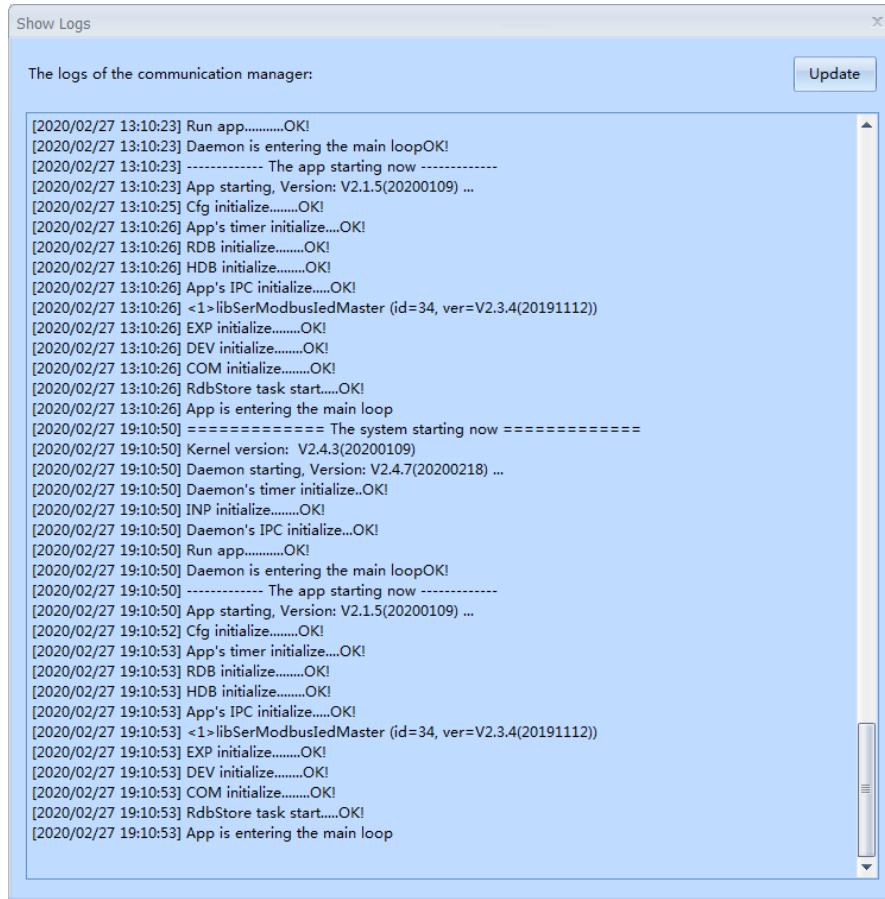
Click "update" to update the log information recorded in the communication managing device. The log mainly records the system running log, sometimes the system reports some error message, here will have more detailed error information for reference.

3.4.8　Restore factory Settings

First, confirm the IP address of the device that needs to be restored to factory Settings, which can be confirmed by using 3.5.3 LAN scan. Then 3.4.1 communication setting is performed to connect the IP address. After the connection is successful, the menu command can be executed, as shown in the figure:
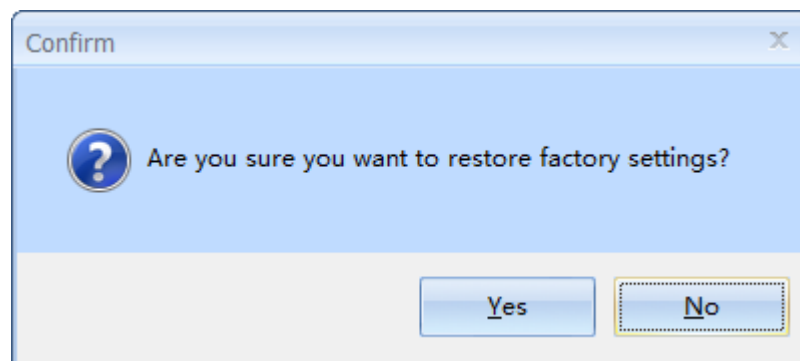
After the execution of "yes", the device will automatically restore to the factory setting state, at which time the IP address of the device will be changed to 192.168.1.136 (LAN1) and 192.168.2.136 (LAN2), requiring the configuration management of the device to be redone.

Attention: after the factory Settings are restored, use the 3.4.3 LAN scan (repeat the scan button) to confirm that the device has been restarted successfully, and then perform subsequent operations on the device.

3.4.9 Local upgrade

Enter the correct device IP address and select the firmware upgrade pack that needs to be upgraded (the upgrade pack USES the uniform file name update.tgz).

Device update is over, reconnect the equipment, please wait...

Wait a while on this screen, CM will automatically reconnect to the device, and the upgrade results will be displayed in the upgrade log.

3.4.10 Restart

◇ Toolbar button Toolbar button

"Restart" is generally used after the project configuration file is "downloaded" from the local PC to the communication manager.
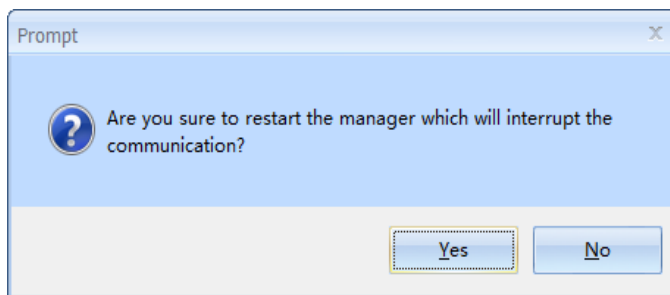
3.4.11 Exit the system

Attention to "exit the system"! Because after exiting the system, this software will not be able to connect and control the communication management. You want to restart the system by recharging the communication manager.

3.5 Tools

3.5.1 SSH

◇ Toolbar button

Third party tools, the user requirements are higher, for the communication management device system operation.

3.5.2 FTP

Toolbar button

A third party tool for internal file management, usually for uploading or downloading files.

3.5.3 LAN scanning

Used to scan the IP addresses of all communication management devices in a LAN, whether they are in the same network segment or not.

If you don't know the IP address of the device you want to connect to, you can use this method to get the IP address of the entire LAN device and then get the IP address of the device based on the device ID (the device ID is on the device nameplate label and is a unique value).

You can right-click a line of devices in the scan results and select "reset IP" to temporarily restore the device IP to the factory configuration. After restarting the device, it can be restored to the configuration in cm.ini.

3.6 Help

3.6.1 Help

Open this document《configuration management software instructions V1.6》

3.6.2 About

4 Project engineering configuration description

4.1 Project configuration

In the second part of the software layout, the project structure information tree is displayed. After being fully expanded, you can clearly see how many serial ports, how many network ports and how many devices are connected to each serial port. Detailed configuration information is shown in part 3 of the software layout.

4.1.1 Channel configuration instructions

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		1	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		3	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...
5	Ethernet port1	Ethernet	Master Side Proto...	IEC104 Host Server Protocol	Scheme1[104 Forward ...	0	ETH1(192.168.1.136,255.255.25...	0,127.0.0.1,127.0.0.1,127.0.0.1,1...
6	Ethernet port2	Ethernet	Master Side Proto...			0	ETH2(192.168.2.136,255.255.25...	

After selecting "main module" in the project structure tree, the configuration information of all physical channels can be modified.

The "Protocol parameter" button in the upper right corner is not used here in section 4.2.2, and the "add" button can add a line to the end of the current list.

ID: The unique identification of the channel, which cannot be modified.

Port name: Can be customized.

Port type :RS485/RS232、Ethernet、4Gnet、Virtual Port can be selected.

Protocol type: Optional device side (collection), main station side (upload) can be selected.

Protocol name: according to "channel type" and "protocol type", the protocol that meets the criteria will be dynamically screened out from the current protocol template library for selection. If there is no protocol that meets the criteria, it will be empty.

Forwarding scheme: Only the main station can be selected, but the forwarding scheme needs to be created first. Please refer to 3.2 forwarding scheme for details.

Devices Number: the number of existing devices on the current channel.

Port parameter: according to the selected "protocol name", the protocol template is automatically introduced here, and can be modified by double-clicking the cell.

Protocol parameters: three types of serial port, 4GNet, network port configuration, only 4G model supports 4Gnet, and 4Gnet is the automatic dialing mode, no configuration required.

✧ Serial Port parameter setting:
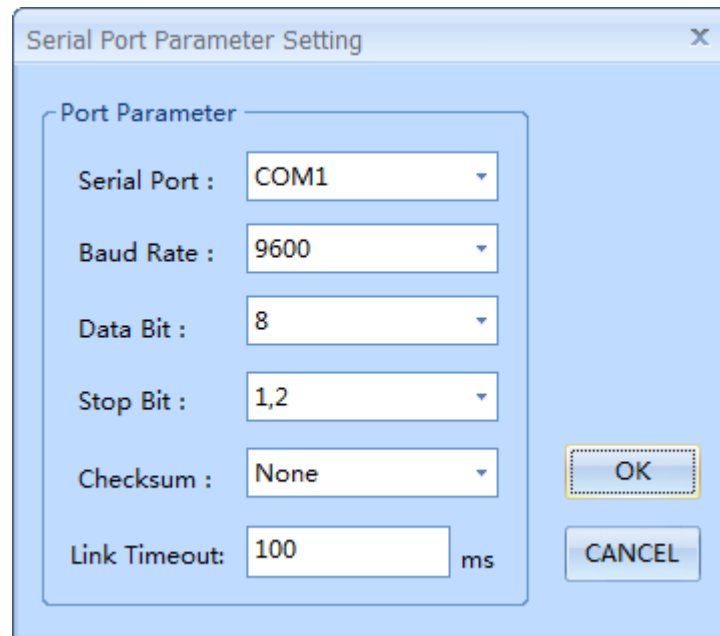
Supports reasonable configuration of serial port parameters, serial port number COM1 corresponds to device rs485-1.

 ✧ Setting parameters of network port channel for non-4G devices:
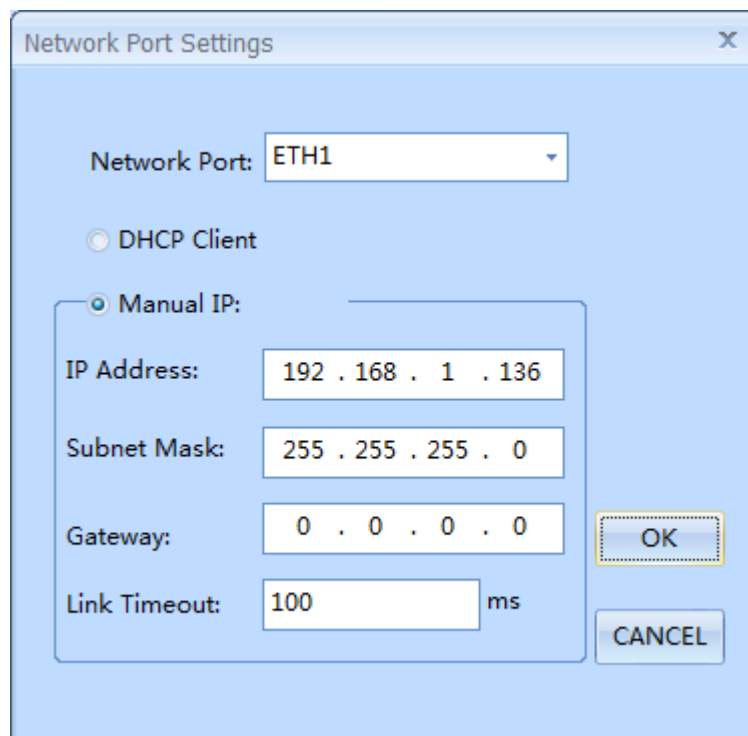
Support to set the network interface to automatically obtain IP and fixed IP address, ETH1 corresponding to the device network interface LAN1 or LAN.

 ➢ Do not allow two network ports to be configured with the same subnet address.

 ➢ It is not allowed to configure gateways for both ports.

 ➢ The gateway must be configured on the port corresponding to the IP address of the same subnet.

 ✧ Setting parameters of network port channel for 4G devices:

4Gnet type: if the 4Gnet type channel is configured with a protocol, it means that 4G wireless network channel is enabled; otherwise, 4G network will not be enabled. The 4Gnet channel automatically dials to the network without configuration when enabled, and the device.

LAN port does not allow gateway configuration.
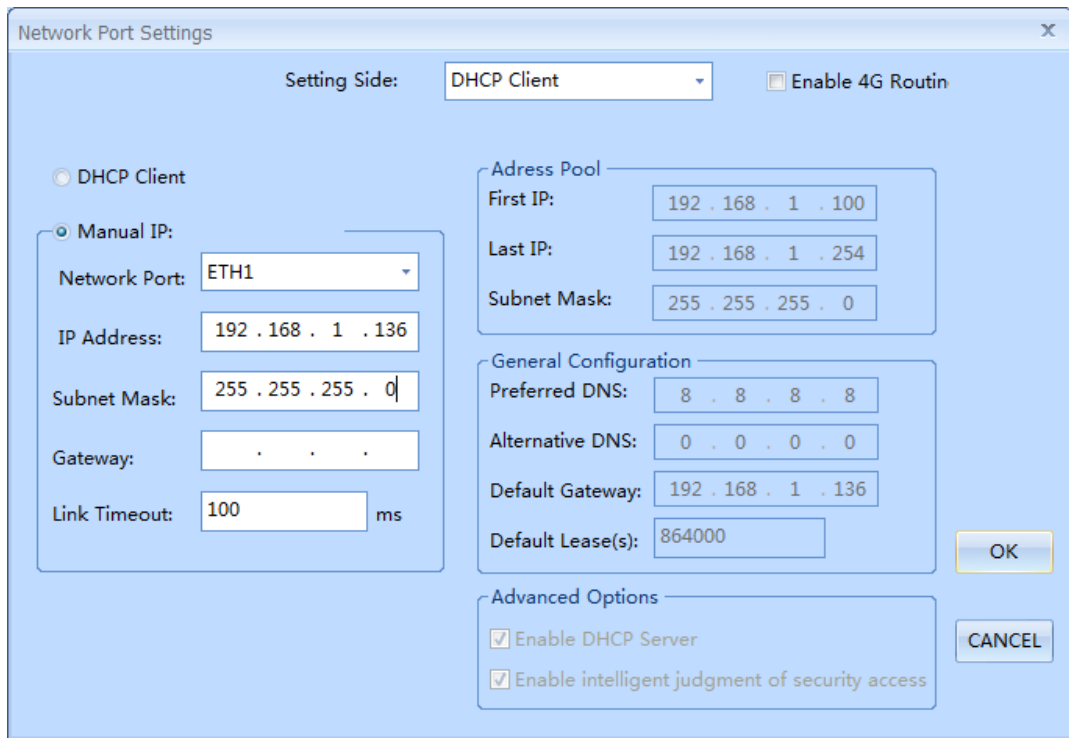
The network port of 4G device can be configured as DHCP client mode and DHCP server mode. When configured as DHCP server mode, address pool and advanced function item configuration are provided.

Setting side: provide DHCP client mode and DHCP server mode

DHCP client: the network port can be configured to automatically obtain IP address or fixed IP address.

DHCP server: the network port must be fixed IP address, and the following functions are enabled:

Enable 4G routing: to provide the routing network function from the network port to 4G wireless, the 4Gnet channel configuration protocol should be effective.

"Address pool" and "General configuration", providing configuration content of IP address allocation information for other DHCP clients.

"Enable intelligent judgment of security access" gray indicates that this function cannot be enabled. The features are as follows:

➢ "Enable DHCP server for security access" only accepts DHCP client application of communication manager;

➢ The communication management device have the priority to automatically receive the address feedback of "open security access DHCP server";

➢ The communication management device can intelligently judge that there is no "open security access DHCP server" in the environment and automatically accept the address feedback of other DHCP serve

➢ When this item is turned off but "DHCP service is enabled" is turned on, the 4G device network port will realize the standard DHCP server function. At this point, PC can obtain the IP address and access the external network through 4GNet under the condition of route opening.

Note: channel configuration should be consistent with the actual situation on the project site. Get into the habit of removing unused channels from the protocol.

4.1.2 Device configuration instructions

ID	Name	Type	Model	Address	Forward	Forward Address	CPU Number	Device Parameter
1	Device1	Pysical Device	AEM96-1.00	1	YES	1	0	
2	Device2	Pysical Device	AEM96-1.00	2	YES	2	0	
3	Device3	Pysical Device	AEM96-1.00	3	YES	3	0	
4	Device4	Pysical Device	AEM96-1.00	4	YES	4	0	
5	Device5	Pysical Device	AEM96-1.00	5	YES	5	0	
6	Device6	Pysical Device	AEM96-1.00	6	YES	6	0	

Serial Port1Device List——Modbus RTU Protocol | Protocal Parameter | Batch Add

ID: is the unique identification of the device and cannot be modified.

Name: user can customize.

Type: default.

Model: device model in the current device template library is available for selection.

Address: the address of the device on the link.

Forward: related to the forwarding scheme, identify whether the device data can be used as the data source of the forwarding scheme.

✧ Forwarding address: the device address defined when forwarding.

CPU number: fill in as required, usually is empty.

Device parameter: fill in as required, usually is empty.

Attention: select one or more lines in the list and right click the following menu item.
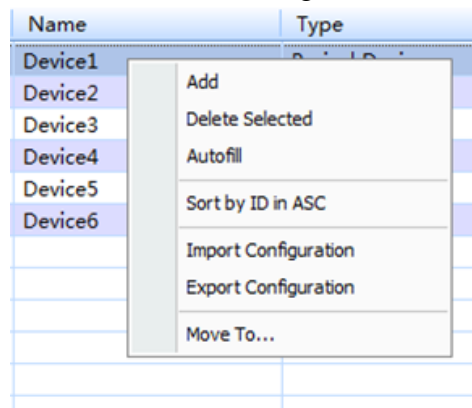
Add: add a row before the selected row.

Delete Selected: delete all selected rows.

Autofill: select multiple rows that need to be edited, filling selected rows according to the first selected row.

Sort by ID in ASC: Sort by ID in ascending order.

Import configuration: the device data configuration can be imported from the XXX. DTPL device template file.

Export configuration: the device data configuration of the first row of the current selection can be written into the XXX. DTPL device template file and saved.

Move to... : you can move the device in the first row of the current selection to another channel

4.2 Forwarding scheme

4.2.1 Increase forwarding scheme

Select "forwarding scheme" at the bottom of 2. Then right click "add" in 3, a new scheme was added; then select " scheme" in 2, and right click "add" in 3, that is, add a "virtual device".
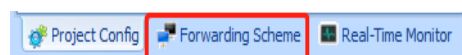
Virtual name: From all currently configured devices, select "new device" that combines the device data of "forward".

Device address: address of the virtual device.

Device parameter: according to the situation, cannot fill in.

Forward address: the device address defined when forwarding.

4.2.2 Add forwarding data

Select "virtual device" in 2, and right click "add" in 3, as shown below:

Select the data to forward in the configuration: select ➔ add ➔ end.

4.3 Device data configuration

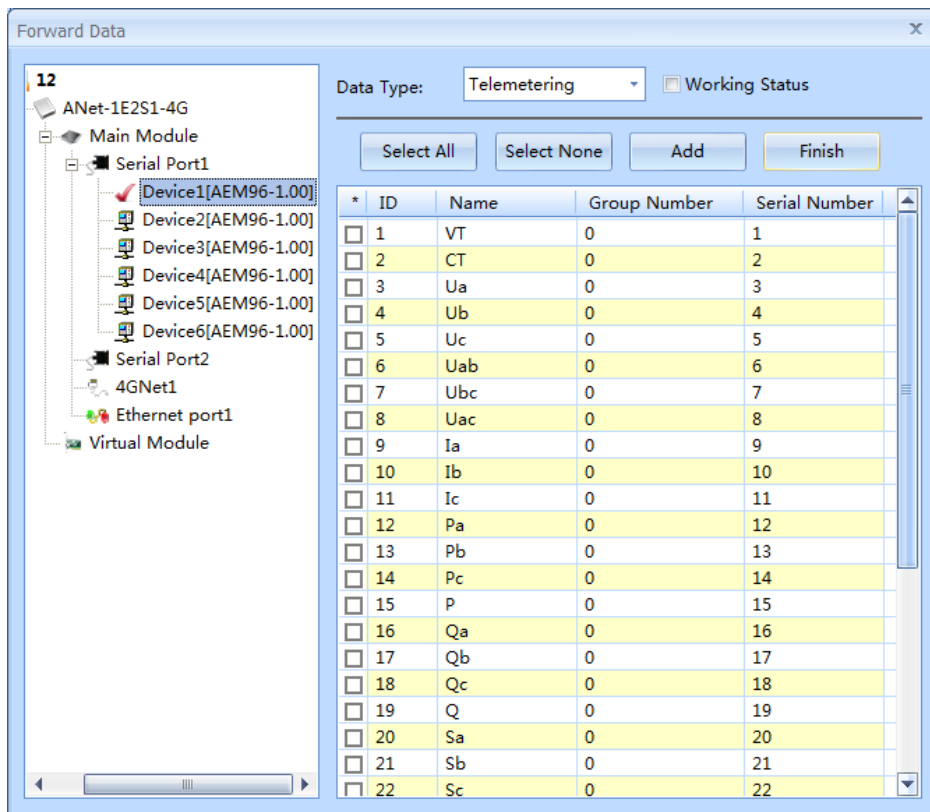| I.	Name	Type	Unit	Group Number	Serial Number	CC1	Max	Zero Value	Limited Mode	Limited Value	Data Type	Data Bit Order	Forward	Forward Address	Function Code	Offset Address
1	VT	Others	V	0	1	0.100000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	4
2	CT	Others	V	0	2	1.000000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	5
3	Ua	Voltage	V	0	3	0.100000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	80
4	Ub	Voltage	V	0	4	0.100000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	81
5	Uc	Voltage	V	0	5	0.100000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	82
6	Uab	Voltage	V	0	6	0.100000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	83
7	Ubc	Voltage	V	0	7	0.100000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	84
8	Uac	Voltage	V	0	8	0.100000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	85
9	Ia	Electri...	A	0	9	0.001000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	86
10	Ib	Electri...	A	0	10	0.001000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	87
11	Ic	Electri...	A	0	11	0.001000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	88
12	Pa	Active ...	V	0	12	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	90
13	Pb	Active ...	V	0	13	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	91
14	Pc	Active ...	V	0	14	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	92
15	P	Active ...	V	0	15	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	93
16	Qa	Reacti...	V	0	16	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	94
17	Qb	Reacti...	V	0	17	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	95
18	Qc	Reacti...	V	0	18	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	96
19	Q	Reacti...	V	0	19	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	97
20	Sa	Others	V	0	20	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	98
21	Sb	Others	V	0	21	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	99
22	Sc	Others	V	0	22	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	100
23	S	Others	V	0	23	0.000100	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	101
24	PFa	Freque...	V	0	24	0.001000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	102
25	PFb	Freque...	V	0	25	0.001000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	103
26	PFc	Freque...	V	0	26	0.001000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	104
27	PF	Freque...	V	0	27	0.001000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	105
28	F	Freque...	V	0	28	0.010000	9999.000	0.000000	Absolute Value	0.001000	INT16		YES		03	107
29	WPP	Voltage	V	0	29	0.010000	9999.000	0.000000	Absolute Value	0.001000	INT32		YES		03	124
30	PowerHigher	Voltage	V	0	30	0.010000	9999.000	0.000000	Absolute Value	0.001000	INT32		YES		03	134
31	PowerHigh	Voltage	V	0	31	0.010000	9999.000	0.000000	Absolute Value	0.001000	INT32		YES		03	136
32	PowerFlat	Voltage	V	0	32	0.010000	9999.000	0.000000	Absolute Value	0.001000	INT32		YES		03	138
33	PowerLow	Voltage	V	0	33	0.010000	9999.000	0.000000	Absolute Value	0.001000	INT32		YES		03	140

CC1: variable ratio or coefficient. Since CC1 values have decimals, telemetry data are uniformly and automatically converted to floating point data storage.

Max: maximum value, when the actual value exceeds, "quality factor" will be equal to 4096, normal is 0.

Limited Mode: divided into absolute value and percentage, which is used to calculate the limit method.

Limited Value: that is, the upper limit of the fluctuation of the data. If the upper limit is exceeded, an "over limit" situation will occur.

Example:

Assuming the limit value is "absolute value", and Data currently collected -Data in the real-time library|>The minimum limit,

Then "over limit" will appear, and corresponding information will be added to the real-time library.

Assuming the limit value is "percentage", and

((Data currently collected -Data in the real-time library) / Data in the real-time library)*100%>The minimum limit.

Then "over limit" will appear, and corresponding information will be added to the real-time library.

Data type: that is, the type of data supported by the device.

Data byte order: during data storage, the byte order of some 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 main station protocol of nanzi 103, and it is not required to fill in any other protocol.

4.4 Quadratic calculation of data

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

	Telemetering	Telesignalisation	Remote Pulse	Telecontrol	Teleregulation	Measurement	SOE	Alarm	Event	Constant Zone	Constant Value	Clamping Plate	Wave Record				

ID	Name	Type	Unit	Group...	Seria...	CC1	Max	Zero Val...	Limit Mode	Minimu...	Data Type	Da...	Forward	F...	Functi...	Offset A...
25	L3	Others	V	0	25	0.010000	9999.000	0.000000	Absolute Value	0.001000	UINT32		YES		03	539
26	空	Others	V	0	26	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT32		YES		03	541
27	PowerRemain	Others	V	0	27	0.010000	9999.000	0.000000	Absolute Value	0.001000	INT32		YES		03	543
28	BuyTimes	Others	V	0	28	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		YES		03	545
29	L1动作/L1上限	Others	V	0	29	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	546
30	L2动作/L2上限	Others	V	0	30	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	547
31	AdmState1	Others	V	0	31	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	548
32	AdmState2	Others	V	0	32	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	549
33	BasePowerRemain	Others	V	0	33	0.010000	9999.000	0.000000	Absolute Value	0.001000	UINT32		NO		03	550
34	年/月	Others	V	0	34	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	552
35	日/星期	Others	V	0	35	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	553
36	时/分	Others	V	0	36	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	554
37	秒/条数	Others	V	0	37	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	555
38	下条地址/L3动作	Others	V	0	38	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	556
39	L3上限/0	Others	V	0	39	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	557
40	0	Others	V	0	40	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	558
41	0	Others	V	0	41	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		NO		03	559
42	LoseTimes1[#29H8]	Voltage	V	0	42	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
43	CommitTimes1[#29L8]	Voltage	V	0	43	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
44	LoseTimes2[#30H8]	Voltage	V	0	44	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
45	CommitTimes2[#30L8]	Voltage	V	0	45	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
46	状态1	Voltage	V	0	31	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		YES			
47	状态2	Voltage	V	0	32	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT16		YES			
48	基础电量剩余	Voltage	V	0	33	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT32		YES			
49	年[#34H8]	Voltage	V	0	49	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
50	月[#34L8]	Voltage	V	0	50	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
51	日[#35H8]	Voltage	V	0	51	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
52	星期[#35L8]	Voltage	V	0	52	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
53	时[#36H8]	Voltage	V	0	53	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
54	分[#36L8]	Voltage	V	0	54	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
55	秒[#37H8]	Voltage	V	0	55	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
56	条数[#37L8]	Voltage	V	0	56	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
57	下条地址[#38H8]	Voltage	V	0	57	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
58	LoseTimes3[#38L8]	Voltage	V	0	58	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			
59	CommitTimes3[#39H8]	Voltage	V	0	59	1.000000	9999.000	0.000000	Absolute Value	0.001000	UINT8		YES			

Tip: ID47 USES the same serial number to get the value of ID32 instead of typing [#32].

4.4.1 Input specification

✧ The quadratic calculation formula is written into the name of the collected information, and the calculation formula is enclosed by [] (English characters). At the beginning of the program, all characters recognized are saved as names. Once "[" is recognized, the arithmetic parsing begins, and after"] ", the next character is added and saved as a name.

✧ Names must not have more than two "[]" in them, otherwise an error will occur.

✧ Support English half Angle operation symbol: + - * / (). And custom symbol ^ e b b H L #

✧ Add any error information in the middle, basic can be filtered, such as the name:

➢ EP[#2&22*#4^(#55-10)]I

➢ The formula will be automatically resolved to: [#2*#4^(#55-10)] (&22 will be filtered out)

➢ Names in the real-time library and forwarding are automatically resolved to: EPI

✧ All calculations must be placed below the data records of other collection points

✧ At present, only the telemetry data of MODBUS series protocol has been done (including general ModbusIedMaster, XJModbusIedMaster, SM311ModbusIedMaster, SCADAModbusIedMaster, ModbustcpIedClient).

✧ Function code and offset address can be left blank (refer to figure above).

4.4.2 Equation instructions

✧ The precedence of all operators is determined by parentheses, multiplication, division, and

subtraction

✧ # represents the value of an ID information point collected by the device. If the ID does not exist, the value of the location is 0

✧ ^ represent the n power of a certain number, input as N^M(N、 M represent a number, the below are the same),for example, 2 multiply by 2 power of 10,the input is 2*(10^2); for example, the square root of 9, the input method is 9^(1/2) or 9^0.5

✧ e represent the X power of e as the base, input is NeM, for example,3 multiply by 5 power of e, the input method is 3e5

✧ After the symbols of ^ and e, It is recommended to use () to specify the index, Understand the priority by the operator of * (see illustration by examples)

✧ b stands for the determination of positive and negative signs for the bit content of the current value, b0 stands for bit0 bit, b15 stands for bit15 bit, and the input mode is #IDb bit sign, namely #NbM. If the bit value is 0, it means the return value is 1. If the bit value is 1, it means the return value is -1.If the register is not defined this way (or vice versa), just type (-1*(#NbM))

➤ Using the b symbol, we need to include the contents of #NbM separately with (), and then * the value of the symbol to be added,

➤ For example, #2*(#16b3) indicates that the data of #2 should be signed with a plus or minus sign. plus or minus is determined by bit3 bit content of #16

✧ B stands for a bit content with the current value, and its value will only return 0 or 1. B0 stands for bit0 bit, and B15 stands for bit15 bit. The input mode is #NBM. If the value of #2 is 43656 (1010 1010 1000 1000), the return value of #2B3 is 1.

✧ H stands for the 8-bit data taking the current value. The input mode is #IDH8, that is, #NH8, and the return value is floating point

✧ L is the low 8-bit data that takes the current value. The input is #IDL8, or #NL8, and the return value is floating point

➤ For example, the 16-bit binary number of a register 1010 1010 1000 1000 is converted to the decimal number 43656:

➤ Then,43656H8=170.000000（1010 1010）， 43656L8=136.000000（1000 1000）

4.4.3 Formula for example

The collection point formula is [(#3+#2)*(#4b2)*(#6^(#1-4))e(#5-2)]

Explanation：(ID3 value + ID2 value) *(the second bit of ID4 value of the corresponding plus or minus) * (ID6 value (ID1 value - 4)) * (ID5 value - 2) power of e

4.5 Remote maintenance

4.5.1 Project configuration

When the system expands a new project, check the remote maintenance function in the engineering information configuration interface, and fill in the remote server IP in the remote maintenance configuration, as shown in the figure below:
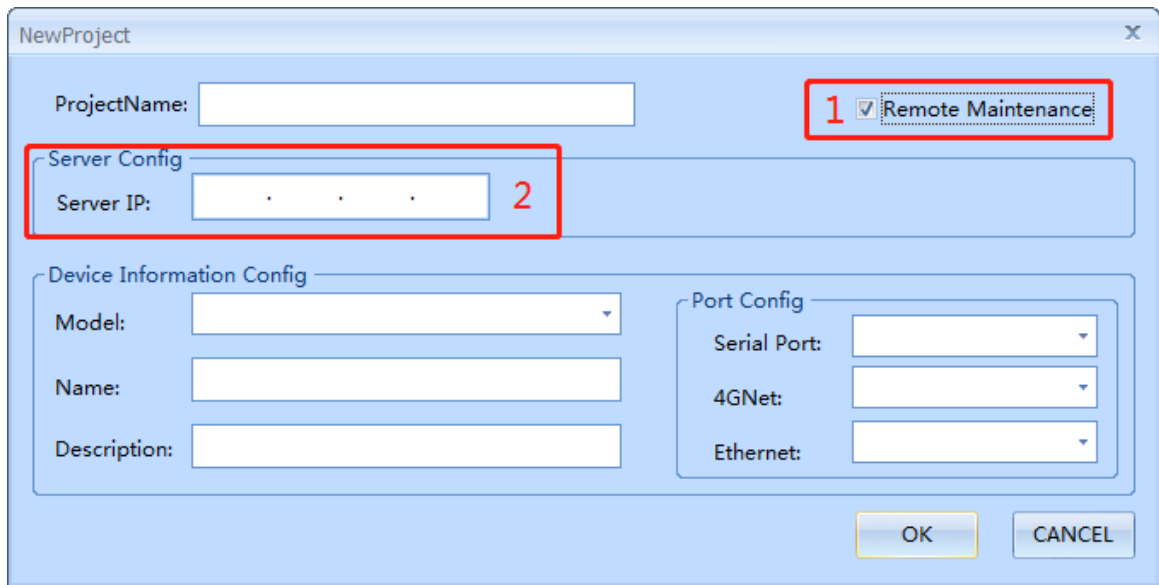
In the process of project construction, the above steps can also be skipped, and the remote server IP can also be added and modified directly in the configuration information interface of the project, as shown in the figure below: (note: no need to fill in the service port, default is 16008)
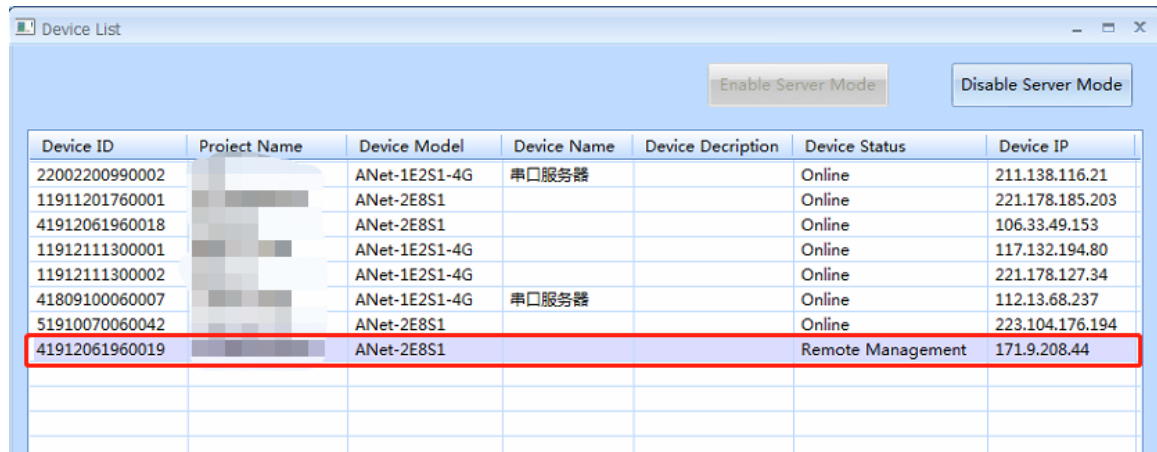

4.5.2 Enable remote maintenance

First, install the software of CM V1.9.1 or above on the remote server, open the software, click "device list" of "remote maintenance", and click "open remote mode", as shown below:
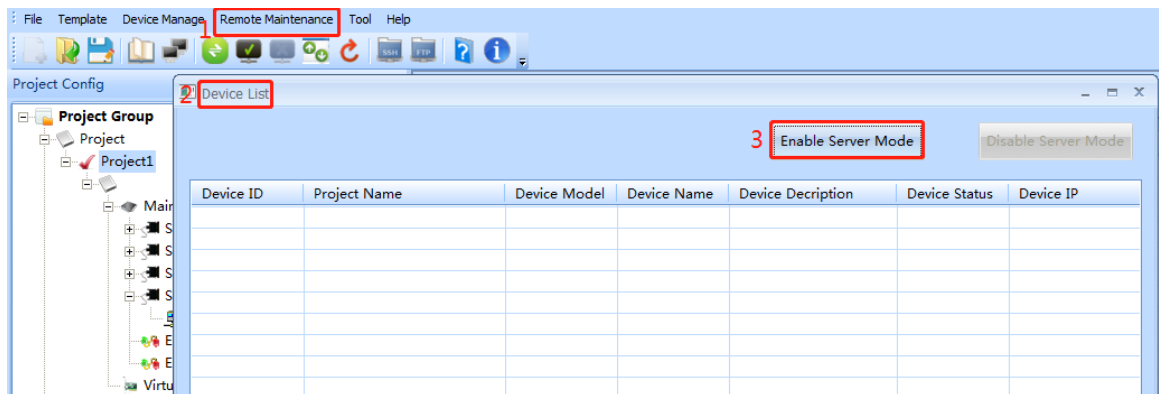
After waiting for about a minute, the management device will automatically establish a link with the remote server and appear in the device list above, as shown below:

Select the remote communication manager in the device list and right click "start management", as shown below: the device enters remote management mode, after which the device list can be closed for remote maintenance (including updating configuration, reading project, setting clock, local upgrade, online monitoring, etc.).To switch devices for remote management, open the device list again, select the device currently being managed remotely in the device list, right click "stop management", and then select the device to be switched for remote management.

Device List						_ □ X
					Enable Server Mode	Disable Server Mode
Device ID	Project Name	Device Model	Device Name	Device Decription	Device Status	Device IP
22002200990002		ANet-1E2S1-4G	串口服务器		Online	211.138.116.21
11911201760001		ANet-2E8S1			Online	221.178.185.203
41912061960018		ANet-2E8S1			Online	106.33.49.153
11912111300001		ANet-1E2S1-4G			Online	117.132.194.80
11912111300002		ANet-1E2S1-4G			Online	221.178.127.34
41809100060007		ANet-1E2S1-4G	串口服务器		Online	112.13.68.237
51910070060042		ANet-2E8S1			Online	223.104.176.194
41912061960019		ANet-2E8S1			Remote Management	171.9.208.44

4.5.3 End remote maintenance

If a communication manager is being managed remotely, select the device in the device list and right - click "stop management". Then click "close remote mode" to finish the remote maintenance.