



Service Manual

Gree Intelligent Remote System
Service Manual

Safety Notices

Dear users:

Before installation and operation, please read this manual carefully, and install and operate the unit according to the procedures specified in the instruction manual. Please pay attention to the meaning of the marks as below:



This sign indicates that improper operation may cause damage death to people or severe damage.



This sign indicates that improper operation may cause damage to the unit.



1. Be sure to ask professional person to install the unit. Improper installation may result in fire or electric shock.

2. Confirm the power plug is dry after cleaning before inserting it into the socket.

3. Before touch the electrical components, please make sure that the unit is disconnected with the power.

4. Do not touch this unit with wet hands; otherwise, it may cause electric shock.

5. Be sure to use the power cord with specified specifications. Poor contact or improper installation may result in a fire.

6. Power cord is connected reversely or input power is beyond the allowable range, it may lead to fire, and cause damage to the device.

7. Please be sure to install this unit at the indoor locked electrical control cabinet which is difficult to reach.

8. Please install the unit at the place where is not affected by electromagnetic interference or there's no dust.



1. Please make sure the specification of the power adapter; otherwise, the unit will not work properly or even be damaged.

2. Make sure that the device is assembled at the right place; otherwise it will cause

communication failures.

3. Make sure that the communication lines are connected to the correct interface; otherwise it will cause communication failures.

4. Once wires are connected, protect them with insulating tapes to prevent lest oxidation and short circuit.

5. The normal working environmental requirements of the Controller:

(1) temperature: - 20 ~ + 60 °C.

(2) the humidity is less than or equal to 85% ,except frosting.

(3) installed in indoor electrical control cabinet, avoid direct sunlight, rain, snow and so on.

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1 Summary

Intelligent Remote Eudemon System is composed of Intelligent Remote Eudemon and Intelligent Controller, to realize the intelligent remote Eudemon system to monitor and control VRF.

Through Intelligent Remote Eudemon System, it can conduct data collection, monitor and control to the operation status of GMV air conditioner in long distance and timely give an alarm once malfunction occur. The air conditioning maintenance staffs do not need to conduct setting and management to every unit on site in person, instead, they can check the operation status, start and operation, and have temperature setting of building air conditioning system by just sitting in front of the computer, which not only greatly enhances work efficiency, but also decreases human cost and lower management cost.

Detailed models applicable for this system include: GMV5(3PH), GMV5C(3PH), GMV5 MAX(3PH), GMV5 HR(3PH), GMV5 SLIM(3PH), GMV5 MINI(3PH),GMV6.

1.1 Components

This system shall use the components as shown below. Please check before installation.

Component name	Quantity	Availability
Intelligent Remote Eudemon	1 set	Standard
Router	Several	Self-equipped
ME20-24/D1(T)	Several	Standard

1.2 Network Topological Diagram

One set of Gree Intelligent Remote System consists of one Intelligent Remote Eudemon (computer software), 32 controllers in maximum. One controller can be connected to 32 systems and 255 indoor units in maximum. User can determine the number of controller in a Remote system according to the number of units in a project.

Network Topological Structure of Gree Intelligent Remote System is as follows:

Instructions of network topological diagram:

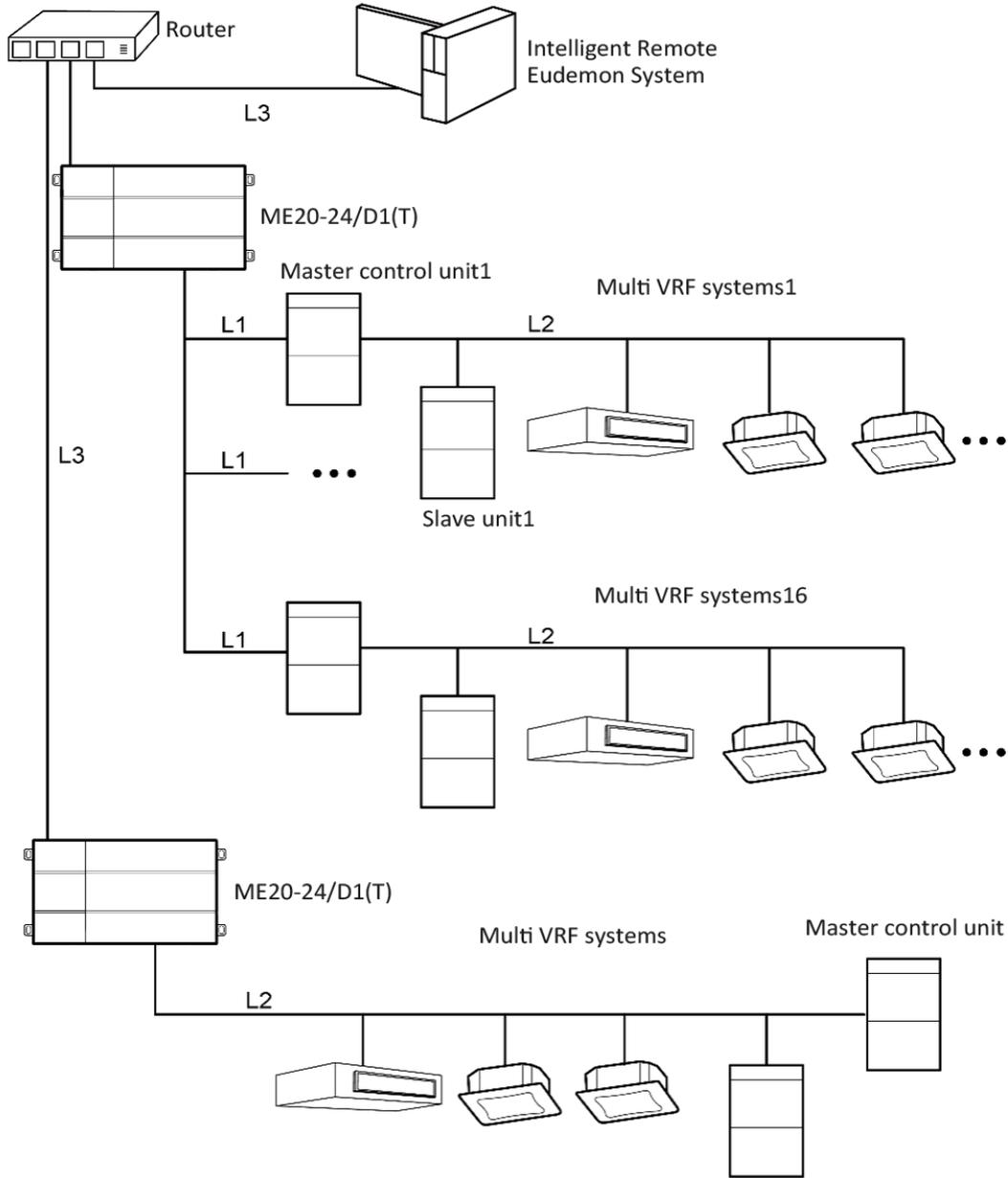


Fig. 1.1 Network topology

topological graph statement:

CAN2 bus network: L1 shown in Fig. 1.1 is CAN2 bus, which consists of controller and master outdoor unit of system; one CAN2 network can connect to 16 sets of outdoor units and 255 sets of indoor units. When the quantity of outdoor units exceeds 16 or the quantity of indoor units exceeds 255, it should be divided into two CAN2 networks.

CAN1 bus network: L2 shown in Fig. 1.1 is CAN1 bus, which consists of network and all the outdoor units and indoor units of system; one CAN1 network can connect to 80 sets of indoor units at most.

Network table: L3 shown in Fig. 1.1 is general network cable, the controller can connect to

Intelligent Remote Eudemon via the network cable.

System: one system consists of one set of outdoor units (one set of outdoor unit is a module set, can consist 1~4 modules, that is, 1~4 sets of outdoor units) and its indoor units.

Quantity of units can be connected to Intelligent Controller: one Intelligent Controller supports one CAN2 network, can connect to 16 sets of systems or 255 sets of indoor units.

Note: L3 in Fig. 1.1 is standard netting twine, L1 and L2 are twisted-pairs.

2 Details of Gree Intelligent Remote System

2.1 Controller

2.1.1 Diagram of Ports

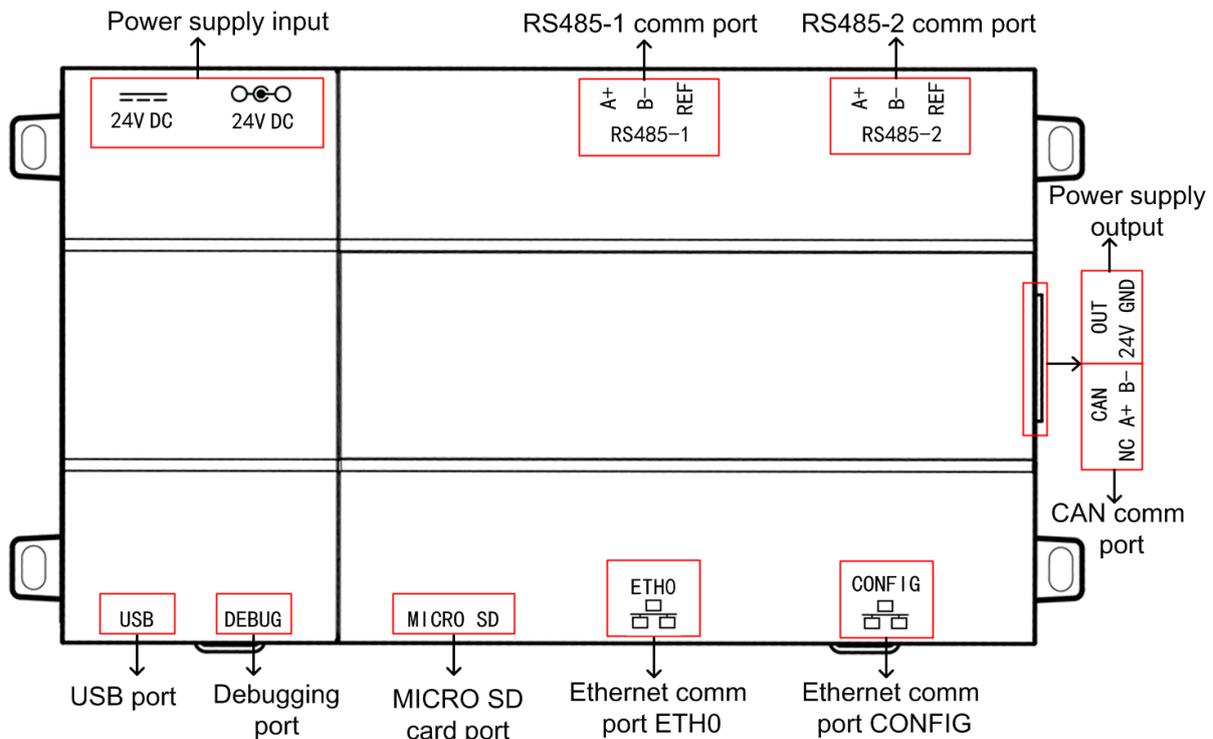


Fig. 2.1 Schematic of interfaces

2.1.2 Power Supply

The input power supply is 24V DC, there are two power supply input interfaces, only one is needed during operation; the power supply output is not applicable in this device, please do not connect to electric appliance, otherwise it may cause malfunction of Controller.

2.1.3 Communication Port

CAN communication port: Connect to air conditioners via two-core communication cable to obtain data from air conditioners.

RS485-1 communication port: currently not available for this device.

RS485-2 communication port: currently not available for this device.

USB, DEBUG, MICRO SD card ports: currently not available for this device.

Ethernet port ETH0: Connect via network cable to the computer that is installed with Intelligent Remote Eudemon.

Ethernet port CONFIG: currently not available for this device.

2.1.4 LED

As shown in the picture below, open the black transparent front panel.

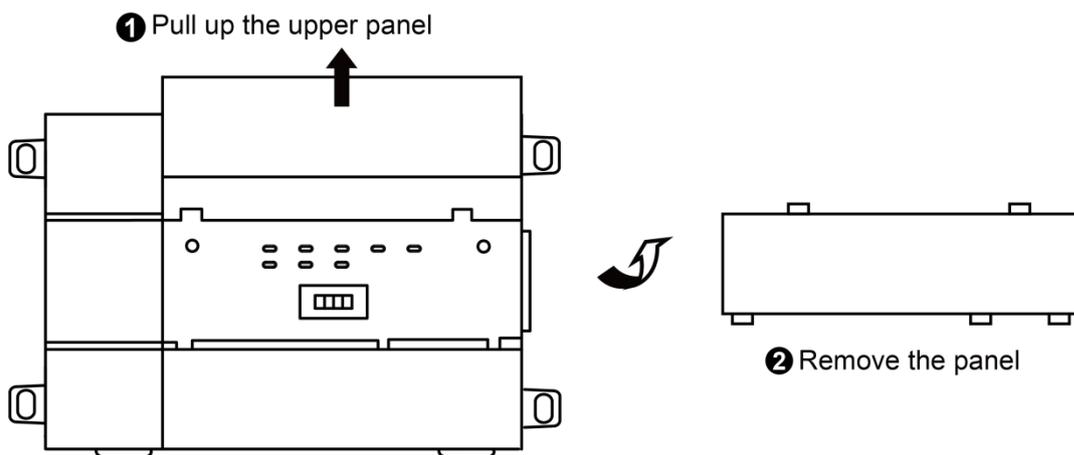
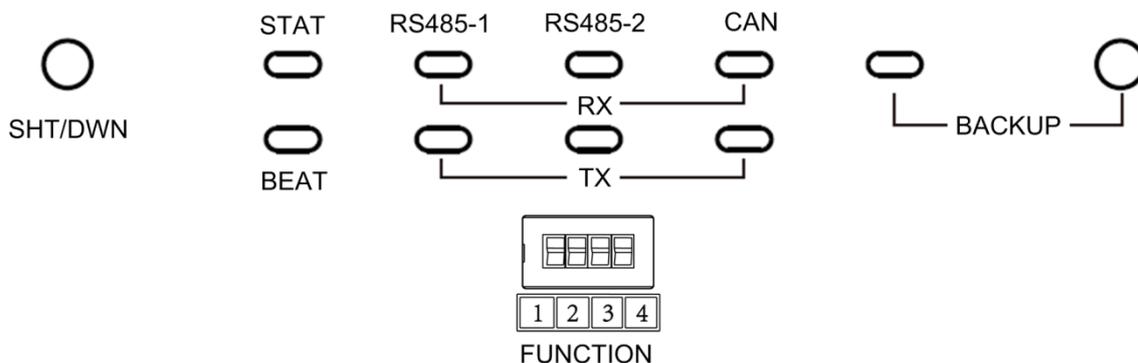


Fig 2.2 Schematic diagram of opening the black transparent board

Indicators, buttons and DIP switch are as shown below.



CAN	RX	When data is received, this LED indicator will be flickering.
	TX	When data is sent, this LED indicator will be flickering.
RS485-1	RX	currently not available for this device.
	TX	currently not available for this device.
RS485-2	RX	This LED display is not applicable to this device.
	TX	This LED display is not applicable to this device.
STAT		If power supply of controller is normal, this indicator will be on.
BEAT		If controller is operating normally, this indicator will be flickering.
BACKUP		This LED display is not applicable to this device.

2.1.5 Button

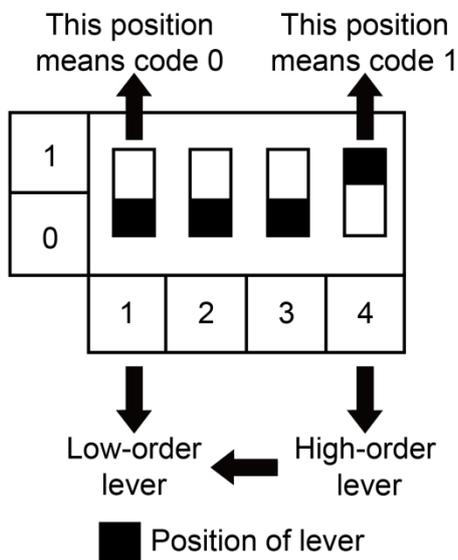
SHT/DWN	When the fourth digit of DIP switch code is "1", hold the button for 5s and all indicators will be on. Reset the Controller controller.
BACKUP	Not use this button for this device temporarily.

2.1.6 DIP Switch

※Before using this device, set the DIP switch first. otherwise the device will not work.

Controller DIP switch code setting area is composed of function DIP switch code.

2.1.6.1 Diagram of DIP Switch



2.1.6.2 The 1st Lever of Functional DIP Switch—CAN2 Bus Matched Resistance Setting

The master outdoor unit or controller at the beginning or ending place of CAN2 bus must be set with matched resistance. otherwise communication will not work!

※CAN2 bus: please refer to 1.2 Network Topological Diagram for its specific meaning.

The 1st level of the functional DIP switch is used for setting matched resistance for controller in CAN2 bus.

If controller is at the beginning / ending place of CAN2 bus, it should be set with matched resistance, which means the 1st level should be switched to 1.

If the controller is not at the beginning / ending place of CAN2 bus, it should be set without matched resistance, which means the 1st level should be switched to 0.

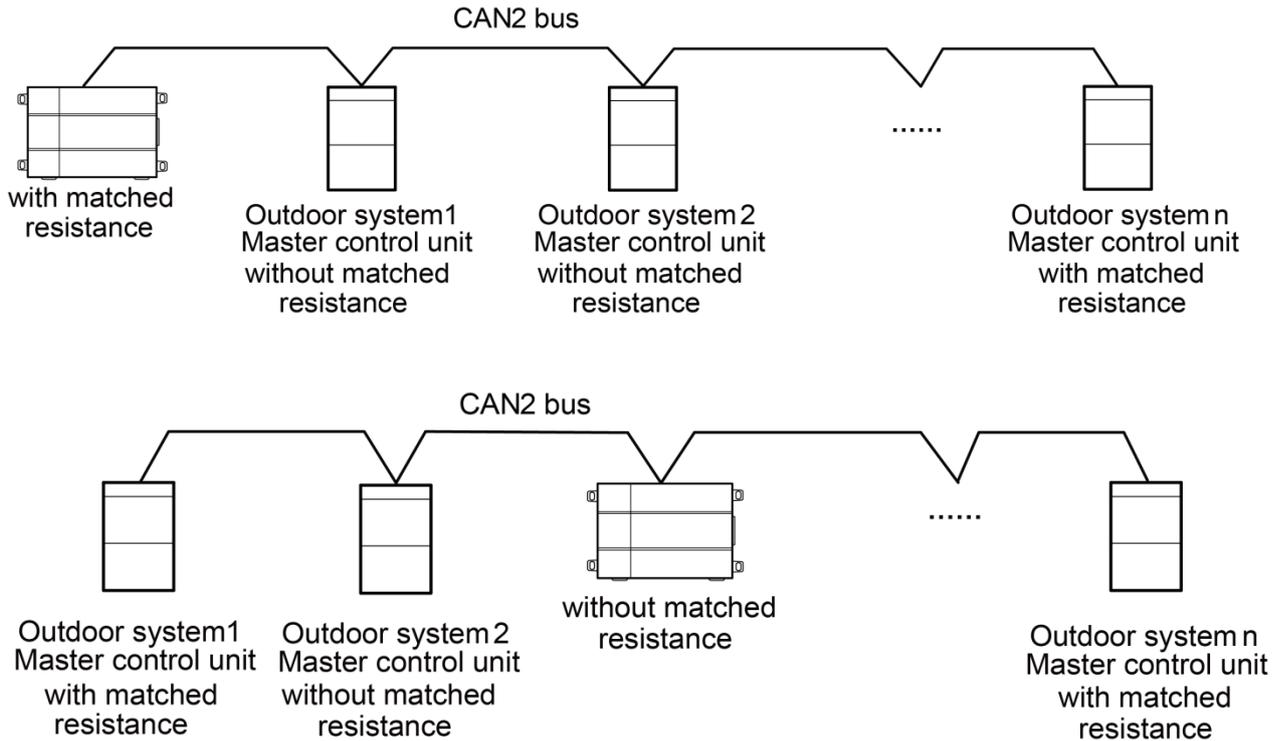


Fig. 2.3 Controller access CAN2 network matching resistance setting

n refers to the number of outdoor systems, $n \leq 16$.

Diagram of Matched Resistance DIP Switch:

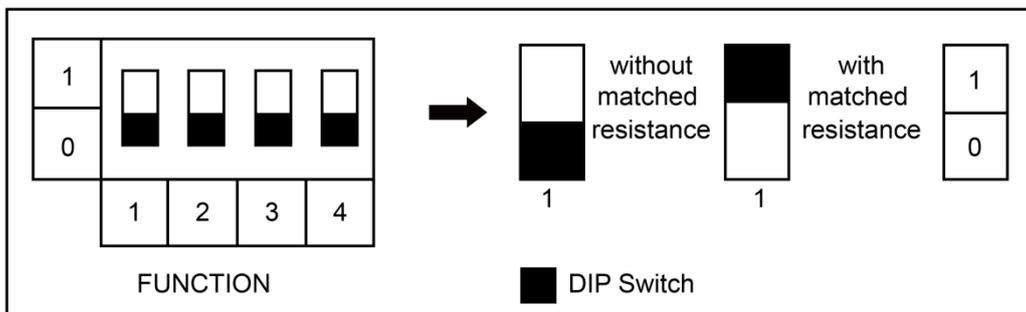


Fig. 2.4 Schematic of dial code

2.1.6.3 The 4th Lever of Functional DIP Switch—Controller Reset Selection Bits

When there's an error in configuring Controller IP address, subnet mask, default Controller,

Controller name or Controller ID from the webpage, and the webpage can't be accessed, user can reset the Controller to restore factory default information. Dial the fourth digit of the DIP switch code to "1", hold SHT/DWN button for 5s to restore the default information of factory setting of the Controller.

2.2 Router

In Gree Intelligent Remote System, router is necessary to realize the communication between controller and computer software, so as to ensure normal operation of Gree Intelligent Remote System.

2.2.1 Selection of Router

The router shall be selected according to the situation of the project. It shall be made by a well-known brand with high reliability. The router must have DHCP function and can be configured and bound into MAC address. Controller and the computer that is installed with Intelligent Remote Eudemon must be connected to router's LAN ports. Detailed specifications are as follows:

- (1) Router type: Enterprise router, industrial router;
- (2) Supported protocol (includes but not limited to): TCP/IP, DHCP, ICMP, HTTP, UpnP;
- (3) Quantity of LAN port: Purchased according to actual demands;
- (4) Transmission rate: $\geq 100\text{Mbps}$;
- (5) Supported quantity of user: More than 16 sets;
- (6) Configuration way: WEB management.

2.3 Intelligent Remote Eudemon

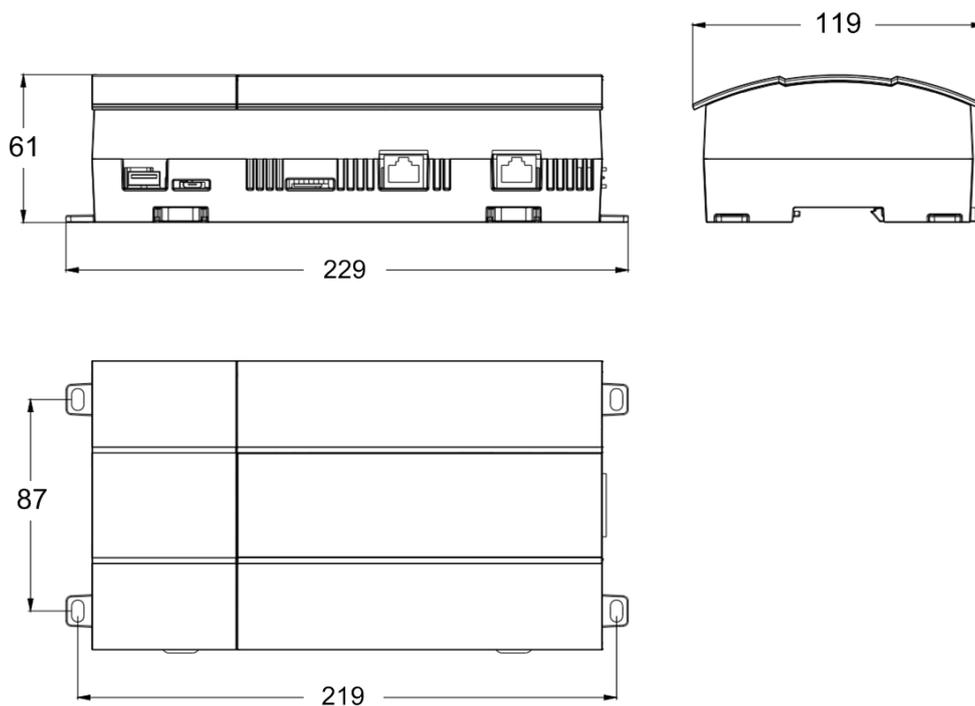
For more details, please refer to the user's manual of Intelligent Remote Eudemon.

3 Product Installation

3.1 Controller Dimensions and Installation Dimensions for Electric Control Cabinet

3.1.1 Controller Dimensions

Unit:mm



Length×Width× Height: 229×119×61 (mm)

3.1.2 Installation Dimensions for Electric Control Cabinet of the controller

The controller should be installed in the electric control cabinet. The guide rail should be horizontally fixed with multiple screws. The controller is installed on the guide rail parallel in front side. The installation is shown in the figure as below (for reference only).

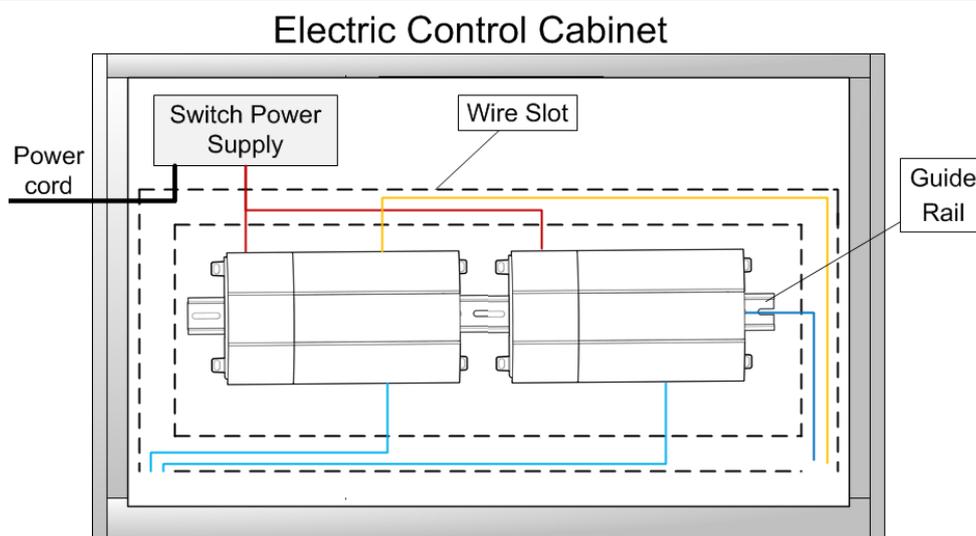


Fig. 3.1 Controller installation guide

The thin real line shown in the figure is communication wire and weak current wire, the thick real line is strong current wire. Above lines are only for reference.

! NOTE!

- (1) Ensure the specification of power input. Otherwise, Controller can't work normally or even be damaged.
- (2) Ensure the dial code setting of Controller is correct. Otherwise, there will be communication malfunction.
- (3) Ensure that the communication cord has connected to the correct interface. Otherwise, there will be communication malfunction.
- (4) Do not place Controller in direct sunlight or high-temperature and humid environment. Place it in the central control cabinet.

3.2 Installation and Configuration of Router

3.2.1 Installation of Router

Please refer to the installation instruction manual of specific router for the installation of router.

3.2.2 Configuration of Router

To ensure reliable operation of Gree Intelligent Remote System, the router shall be configured. The purpose of configuration is to allocate a reliable and solid IP address to controller and the computer that is installed with Intelligent Remote Eudemon. Please refer to the following steps to set the static IP of controller and software in router. For detailed operation, please refer to the instruction manual of router.

- (1) Connect ETH0 internet port of controller and computer into LAN port of router with cable. Make sure the router is energized and is operating normally;
- (2) Open the web browser of computer and input the login address of router (see the backside of router);
- (3) Input username and password in login interface;
- (4) Enter the client list and view the status of devices which are connected to this router. Confirm the corresponding MAC address of controller and computer;
- (5) After confirming MAC address, enter "Static Address Allocation" and bind MAC address to a workable IP;
- (6) Click save after finishing setting and then restart the router to make it valid.

3.3 Installation of Intelligent Remote Eudemon

Make sure the computer comply with the following requirements before installing Intelligent Remote Eudemon.

Description	Minimum configuration	Recommended configuration
Internet Information Server	8.0 version	8.0 version or above
Message queue	/	/
Memory	4GB and above	8GB or above
Hard disk	500 GB or more free space	1TB or more free space
CPU	Intel i5 or higher	Intel i7 or higher
Operation system	Windows 7 English Version (64 bits, Professional\Ultimate) Windows 10 English Version(64 bits, Professional)	Windows 7 English Version (64 bits, Professional\Ultimate) Windows 10 English Version(64 bits, Professional)

Please refer to the installation instruction manual of Intelligent Remote Eudemon for the installation.

3.4 Communication Connection

The system is consisted of several components. Each component must communicate effectively for normal operation. Communication connection includes:

- (1) Communication between controller and the computer that is installed with Intelligent Remote Eudemon;
- (2) Communication between controller and air conditioners;

3.4.1 Selection of Communication Cord Materials

- (1) Select communication cord for controller and air conditioners.

Cord type	Comm cord between controller and air conditioners L(m)	Cord size(mm ²)	Cord standard	Remark
Shielding light/general PVC sleeve twisted pair copper core soft wire	$L \leq 500$	$\geq 2 \times 0.75$	IEC 60227-5:2007	Total length of communication cable should not exceed 500m.

- (2) Select standard Ethernet communication cord to realize the communication between controller and the computer that is installed with Intelligent Remote Eudemon.

3.4.2 Installation Notices of Communication Cord

- (1) Make sure each communication cord is conducting properly and pass conduction test.
- (2) Communication cord and other high-frequency heavy current wire or high-frequency signal wire shall not be placed in the same wire groove or shall not be bound together for wiring. The distance between communication cord and high-frequency heavy current wire shall be more than 15cm. For the distance between communication cord and other high-frequency signal wire, the minimum distance shall be calculated according to the frequency and voltage of signal. If the communication cord is parallel with high-interference signal wire, shielded steel pipe must be applied by the constructor.
- (3) The communication wire shall go through along refrigerant pipeline in specialized wire groove.

3.4.3 Communication Connection Method

- (1) Communication connection between Controller and Intelligent Remote Eudemon system:

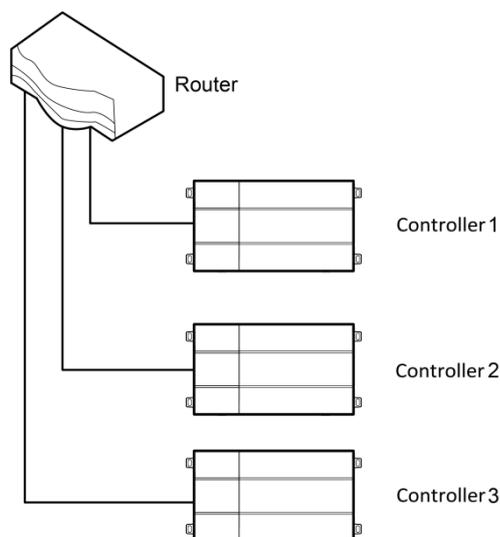


Fig. 3.2 Connecting method between Controller and router

(2) Communication connection between Controller and AC units (n is the quantity of ODU system, $n \leq 16$)

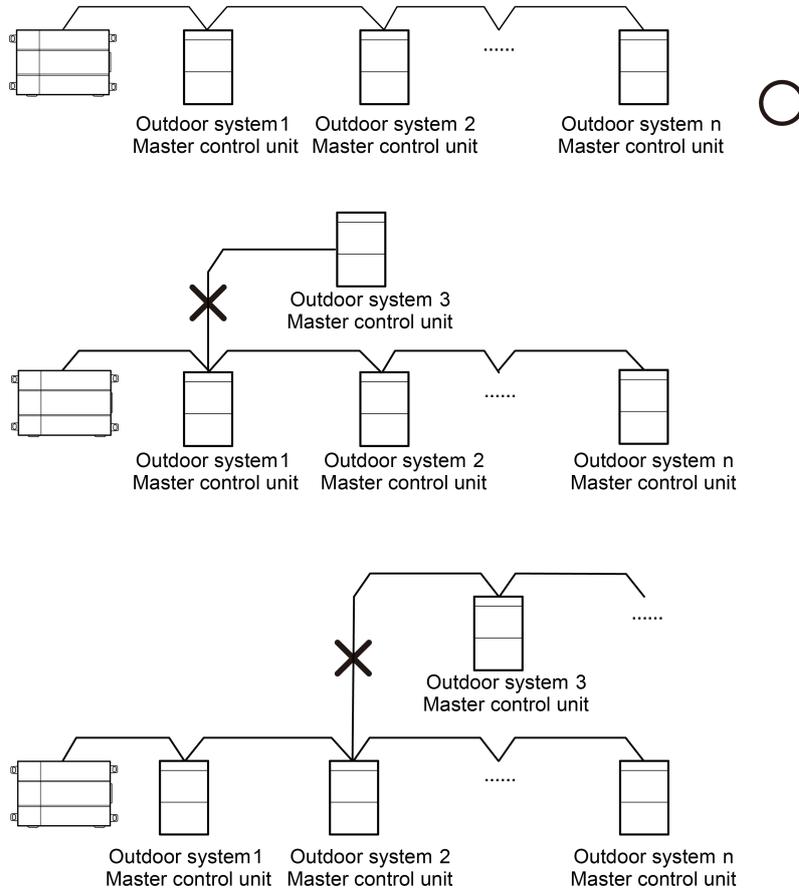


Fig. 3.3 Connecting method of Controller

NOTE! All communication connection lines under Controller must be in series connection, star connection shall not be adopted.

3.5 Communication Connection Configuration

(1) Communication line connection between Controller and PC:

Connection diagram between Controller and PC user side:

1) Adopt cross connection network cable, Controller shall directly connect to PC.

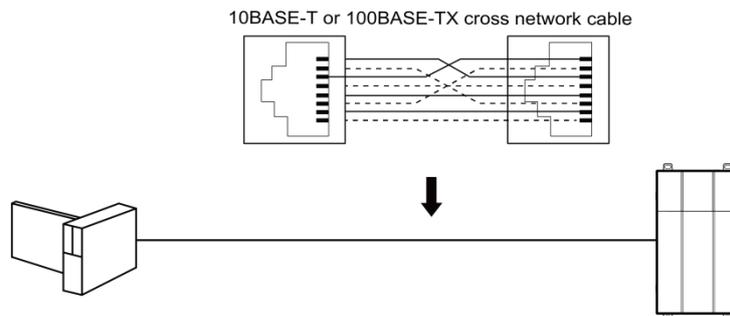


Fig. 3.4 Controller connects to personal computer directly

2) Adopt parallel network cable, Controller shall go through router to connect to PC.

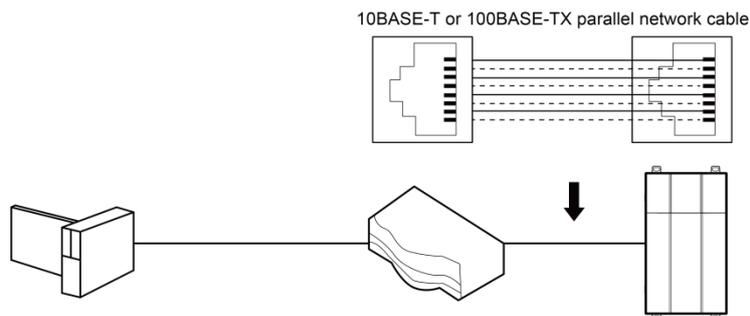


Fig. 3.5 Controller connects to personal computer via router

(2) Communication line connection between Controller and AC units:

When Controller is connected to main control unit of ODU, ODU with the address dial-up of 0 must be connected.

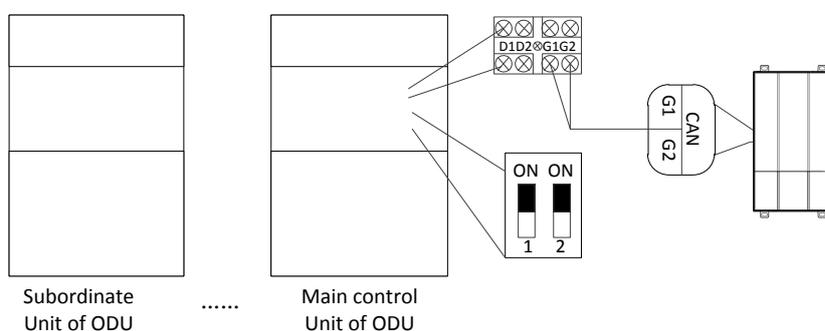


Fig. 3.6 Communication connection between Controller and unit

4 Product Debugging Instruction

Gree Intelligent Remote System is a comprehensive engineering system, involving the logical interaction and data exchange of three modules of unit, controller and software. Its debugging is difficult which needs comprehensive knowledge and technologies. Please read the following instruction carefully before debugging or arrange debugging under the guidance of professional staff.

! NOTE!

As the debugging course involves heavy current environment, please pay attention of personal safety! Prevent equipment damage or personal injury due to improper operation!

4.1 Debugging of Air Conditioner

Before debugging Gree Intelligent Remote System, please make sure related settings of air conditioning system are done. The following conditions shall be met (including but not limited to):

- (1) All indoor units and outdoor units are energized;
- (2) All units are without indoor unit project code conflict (C5);
- (3) All units are without system code conflict;
- (4) CAN2 bus cannot exceed 500m.

After finishing the debugging of air conditioning system, please set centralized control address and project code according to the following steps.

Step 1: Master control unit setting of single system and centralized control address setting of multiple systems.

- (1) Make sure the DIP switch of master control unit of each refrigeration system is set correctly (for more detailed operation, please refer to the service manual of the unit).
- (2) For the connection of multiple refrigeration systems, make sure the centralized control address DIP switch of each refrigeration system is set correctly, without system code conflict (for more detailed operation, please refer to the service manual of the unit).

Step 2: The setting of deviation of indoor unit project code.

For the first time of engineering installation and debugging, if project code conflict C5 occurs after connecting several systems, please eliminate the malfunction (for more detailed operation, please refer to the service manual of the unit).

4.2 Debugging of Controller

4.2.1 Configuration of Parameters for controller

Before setting the parameters of Controller, please set the IP address of PC as the same with the IP address in the same network segment of Controller, as refer to appendix A; and then open the browser (IE10 and above version, Firefox or Google), input the default IP address of Controller: <http://192.168.1.150>, default user name: config, password: config; as shown below.

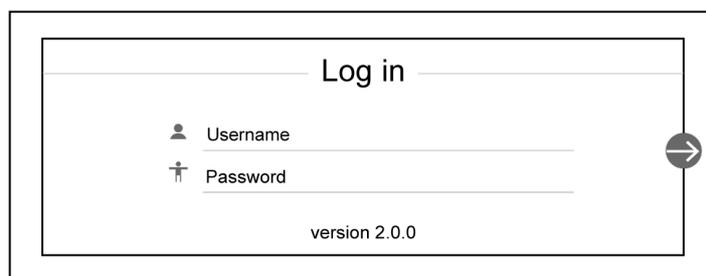


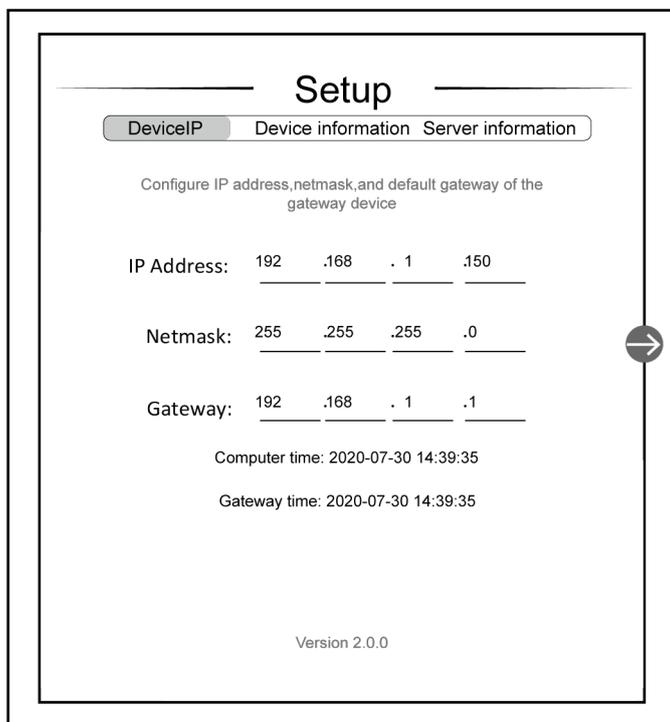
Fig. 4.1 Log on interface

Setting of Controller protocol functions:

After inputting user name and password, click the arrow to enter the setting interface, as shown

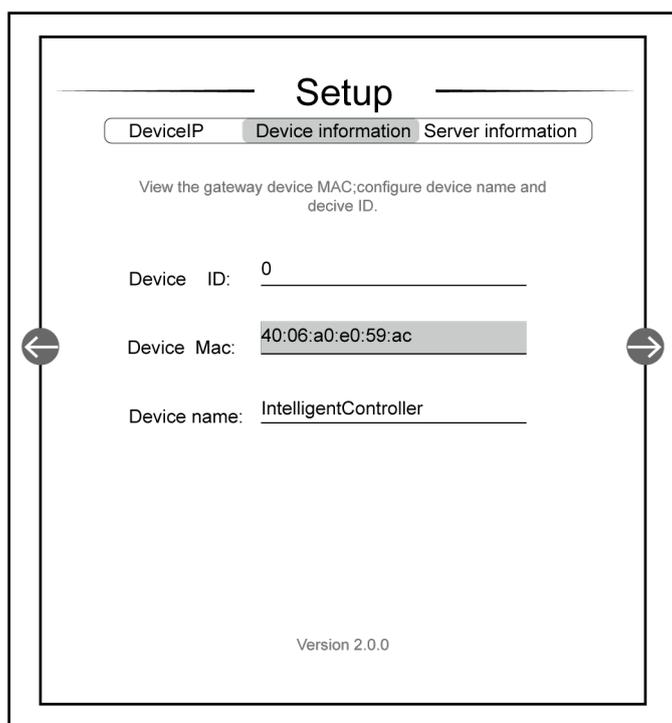
in Fig. 4.2, 4.3, and 4.4; in the setting interface 1, you can set the IP parameters of Controller; in the setting interface 2, you can set the equipment information. in the setting interface 3, you can set the server information.

Note: device ID range: 1~255. The defaulted value for device ID is 0. The ID of the Controllers connected to the same PC should be different.



The screenshot shows a 'Setup' screen with three tabs: 'DeviceIP', 'Device information', and 'Server information'. The 'DeviceIP' tab is selected. Below the tabs, there is a heading: 'Configure IP address, netmask, and default gateway of the gateway device'. The form contains three rows of input fields: 'IP Address' with values 192, .168, .1, .150; 'Netmask' with values 255, .255, .255, .0; and 'Gateway' with values 192, .168, .1, .1. Below these fields, there are two time display fields: 'Computer time: 2020-07-30 14:39:35' and 'Gateway time: 2020-07-30 14:39:35'. At the bottom, it says 'Version 2.0.0'. A right-pointing arrow is visible on the right side of the screen.

Fig. 4.2 Setting interface of network parameters



The screenshot shows a 'Setup' screen with three tabs: 'DeviceIP', 'Device information', and 'Server information'. The 'Device information' tab is selected. Below the tabs, there is a heading: 'View the gateway device MAC; configure device name and device ID.'. The form contains three rows of input fields: 'Device ID' with the value 0; 'Device Mac' with the value 40:06:a0:e0:59:ac; and 'Device name' with the value IntelligentController. At the bottom, it says 'Version 2.0.0'. Left and right-pointing arrows are visible on the left and right sides of the screen, respectively.

Fig. 4.3 Setting interface of equipment information

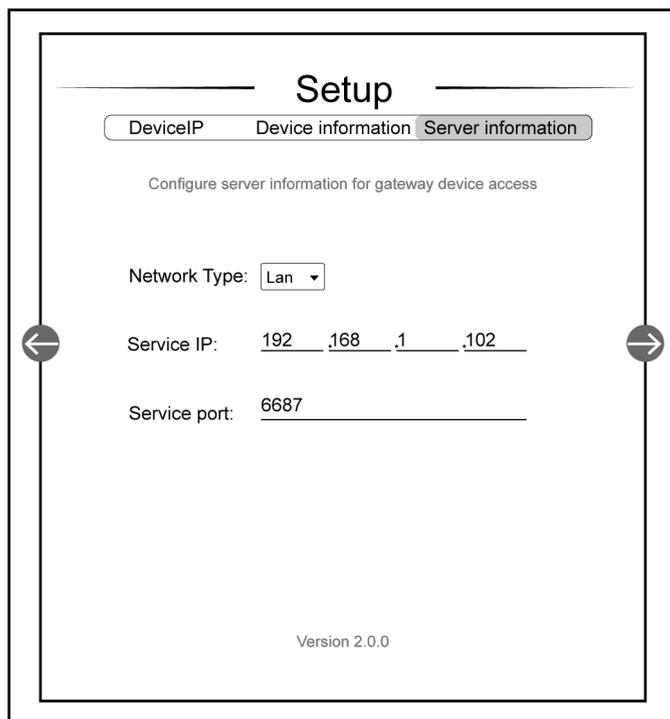


Fig. 4.4 Server setting page

Settable parameters: IP address of controller、 subnet mask of controller、 default gateway、 controller name、 controller ID (0~255)、 network type of server、 service IP、 service port. User can set by himself/herself according to the actual needs. After setting, click the arrow, the interface will pop up a window to ask: Whether to restart the controller to make the setting come into effect? Click OK and then the controller is restarted.

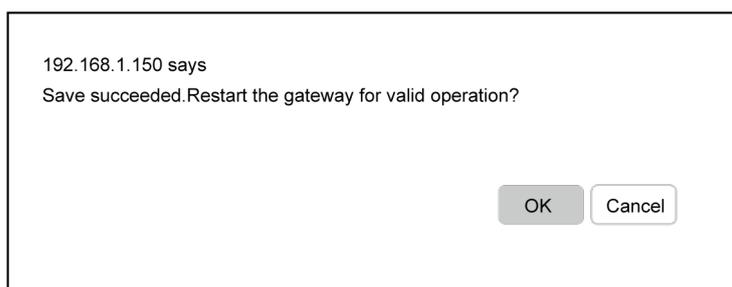


Fig. 4.5 Pop-up window of restart

NOTE!

IP address of controller under the same network (under the same router) can't be repeated. Otherwise, the software can't conduct the communication with the controller.

4.2.2 Debugging of Communication between controller and Air

Conditioners

Step 1: Make sure if the communication cord between controller and unit is connected properly according to “3.5 Communication Connection”.

Step 2: Power off and then power on the air conditioning equipment and controller.

Step 3: Check the status of communication indicators.

Check if the CAN_RX indicator of controller is flickering. If yes, then it's OK. If not, check the master control unit whose centralized control address is 0 and see if its LED G_TX indicator is flickering or lit up. If it is not on, please check the connection of communication cord and the setting of DIP switch, etc.

4.3 Debugging of Software

The debugging and operation instruction of software in this section is applicable when the installation of software is completed. In the interface of software, configure the controller and input the relation between room number and indoor unit and other engineering information according to actual engineering information.

Step 1: Check if software self-test unit information is normal

If software does not self-test the controller information, try the following solutions:

- (1) The controller is still starting up: Controller power up waiting for 2 to 3 minutes after the start of self-test; Multiple self-test each interval of 2 to 3 minutes.
- (2) Computer ping IP address of the controller failed: Restart computers, controllers and routers.
- (3) IP address of the controllers conflict: Set the controllers with the same IP address to be different.

Step 2: Input engineering information

According to engineering list, allocate room number to indoor unit in the software for the convenience of managing air conditioners. For more detailed procedures, please refer to Engineering Information in the section of Engineering Debugging in the instruction manual of software.

Appendix A: COMMON TROUBLESHOOTING OF INTELLIGENT REMOTE EUDEMON SYSTEM

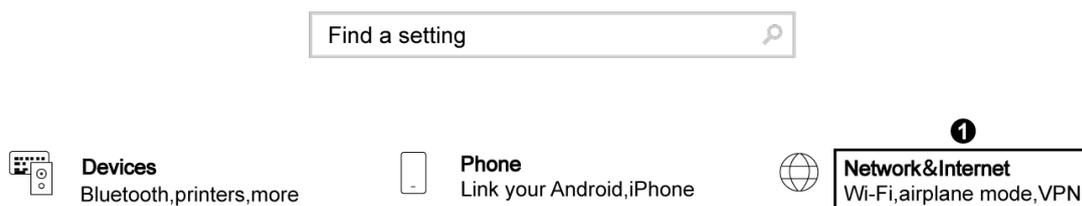
Malfunction	Possible reason	Troubleshooting
According to the protocol provided, Intelligent Remote Eudemon will display communication malfunction warning, but operation status of some or all units cannot be shown, neither conduct any control	Twisted pair communication cord is not used	Change to twisted pair communication cord
	controller is damaged	Replace the controller
	Communication cord is disconnected	Weld the disconnected circuit
	Communication cord short circuit	Maintain the short circuit parts
	The twisted-pair and communication cord is too close (less than 15CM), communication malfunction occur due to disturbance	Conduct separate wiring for these two wires, consider to add shielded steel tube if the separation distance cannot be over 15CM
	Connection of communication interface is wrong	Connect it according to the specification in this manual
Circuit inspection is in good condition, but no information displayed in all or some units, communication malfunction still exists in the software	After replacing the chip or re-dial-up the ODU and before re-energizing the unit, it is not power off.	Re-energize the unit
	Matched resistance is not connected	Conduct correct setting to the matched resistance
	Series port used in communication software is inconsistent with that connected to the computer	Replace series port or change the series port in the software
	Unit address added in the software is inconsistent with that of actual unit	Revise the address setting in software unit
	The unit is not energized	Energize the unit
	Forgot to insert chip in ODU or IDU, or insert direction of chip is opposite with the actual direction	Reinspect the plug-in chip, insert it in the direction of the gap in PCB, and re-energize it.
	Unit address is wrong or repeated	Revise the wrong unit address setting
Circuit, equipment and engineering installation inspection is in good condition, communication malfunction still exists in the software	Displayer or controller which is inconsistent with actual unit is adopted	Check the specification of current controller and wired controller and replace it if not consistent.

Appendix B: TCP/IP Setting

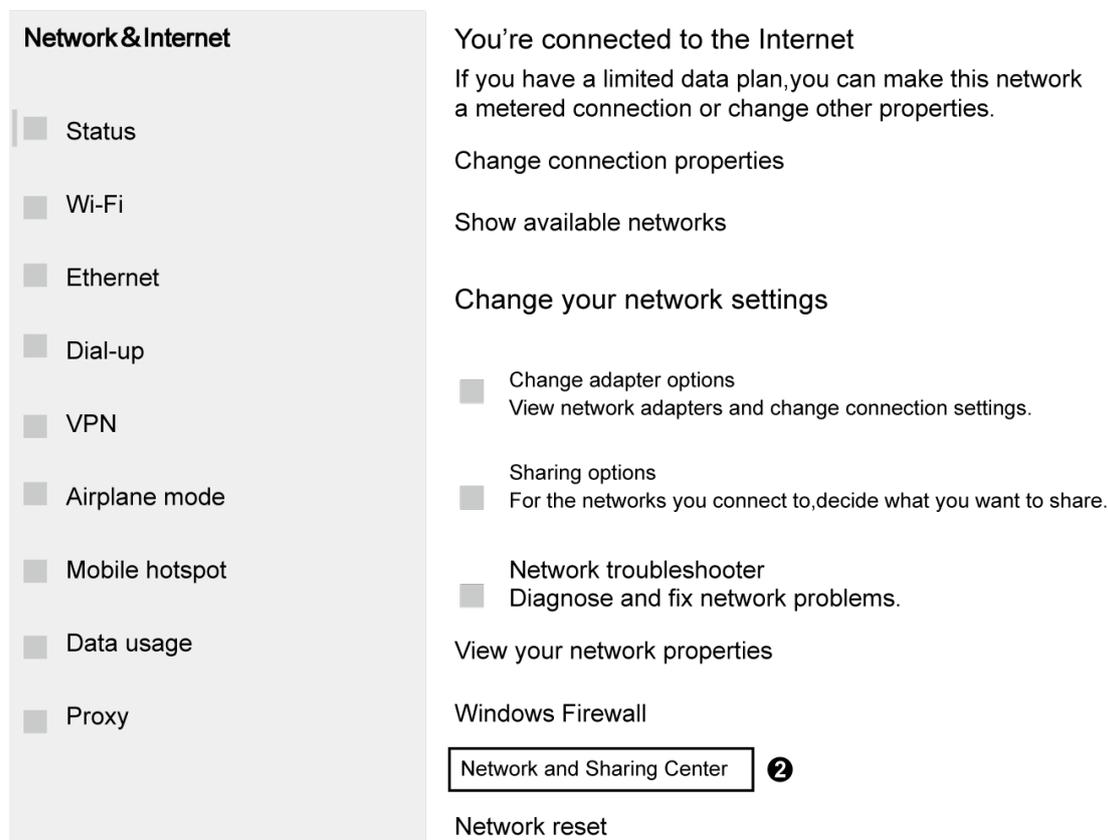
This text takes Windows 10 as example to demonstrate the setting of TCP/IP.

- (1) Left click the icon "Start"  on the computer. When a new window pops up, left click "Settings" to enter "Windows Settings".
- (1) Left click "Network & Internet" in the following picture to enter the interface of "Network & Internet". See ① in the picture below.

Windows Settings



- (2) Left click "Network and Sharing Center" in the following picture. See ② in the picture below.



- (3) Find "Ethernet" in the following picture. Left click "Ethernet" and enter the interface of "Ethernet Status". See ③ in the picture below.

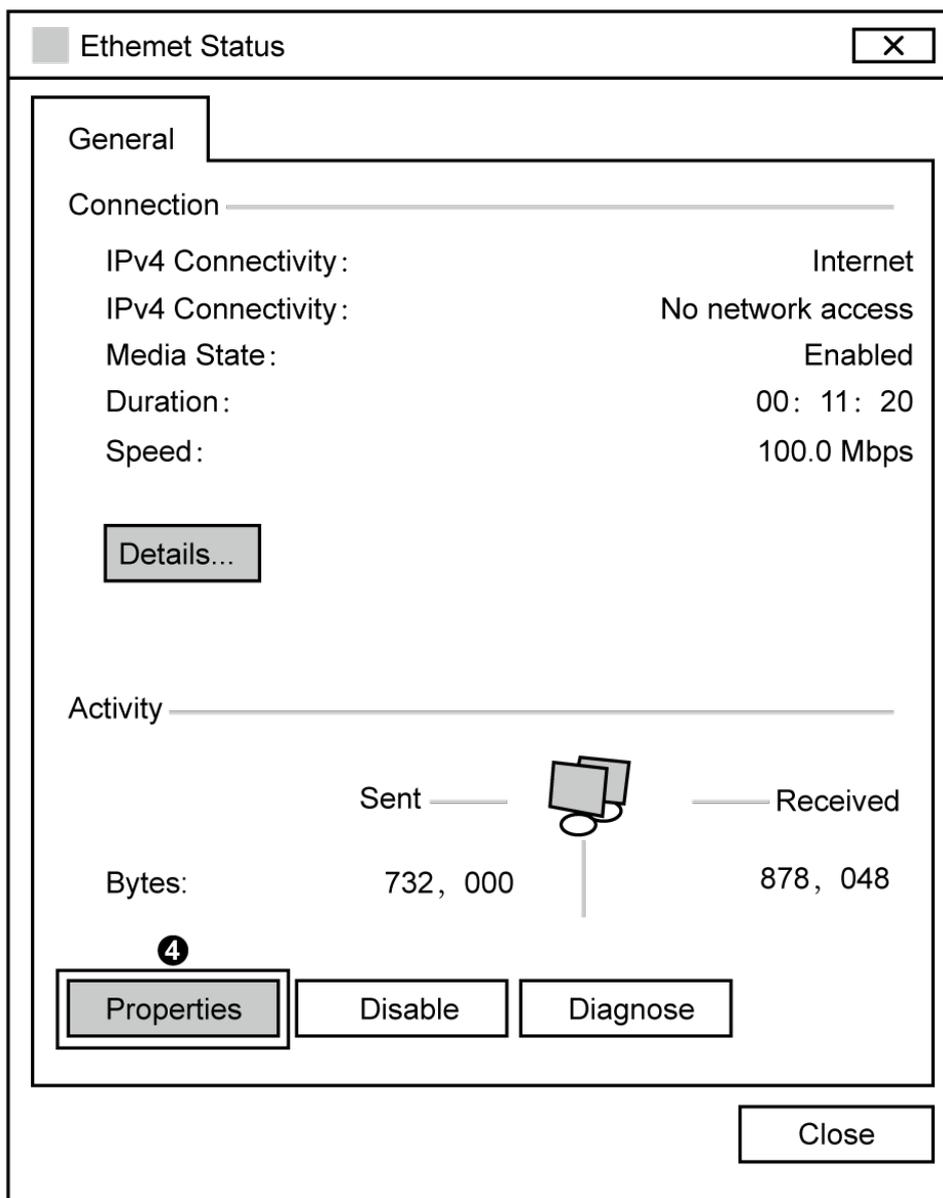
View your basic network information and set up connections

View your active networks

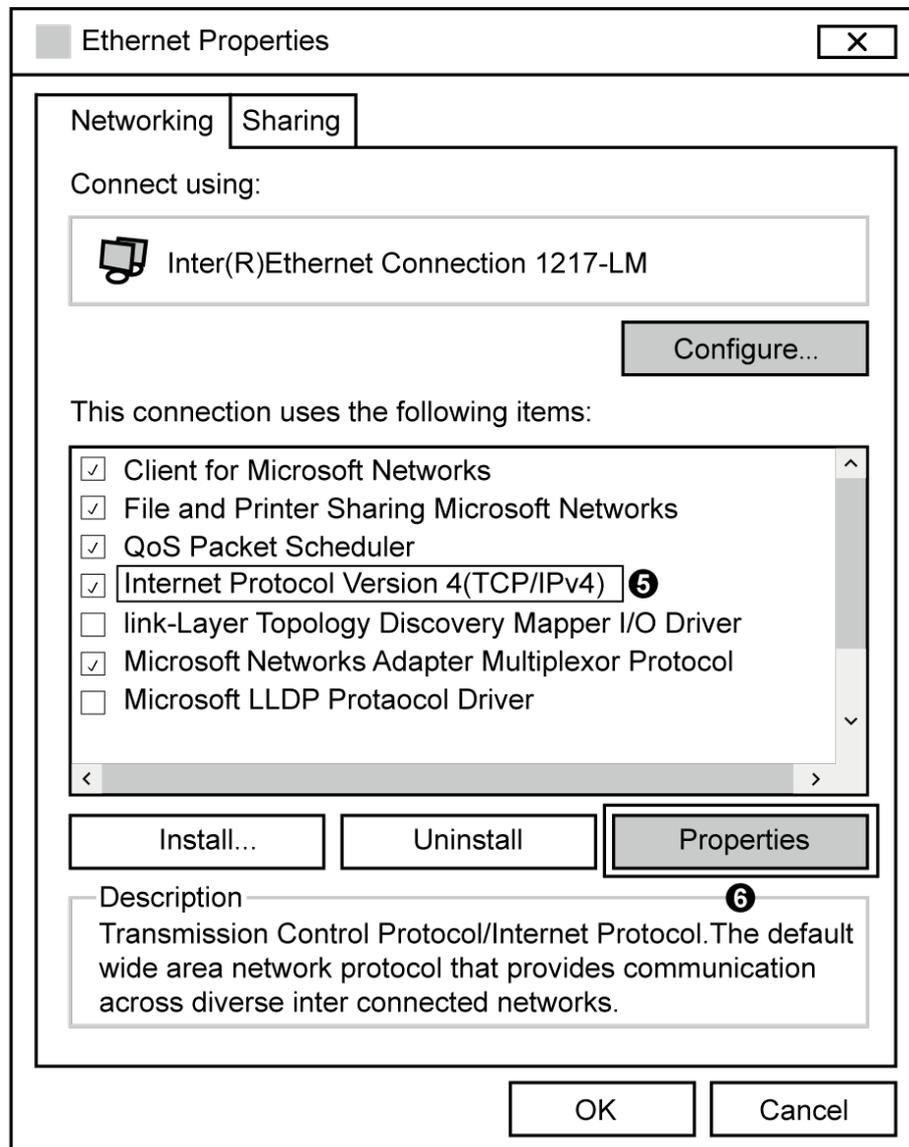
TP-WIFI-004
Public network

Access type: Internet
Connections: **Ethernet** ③

- (4) Left click "Properties" in the following picture and enter the interface of "Ethernet Properties". See ④ in the picture below.



- (5) Left click “Internet Protocol Version 4(TCP/IPv4)”. See ⑤ in the picture below. Then left click “Properties” as shown in the picture to enter the interface of “Properties of Internet Protocol 4(TCP/IPv4)”. See ⑥ in the picture below.



- (6) When you are at the interface of “Properties of Internet Protocol Version 4(TCP/IPv4)” as shown below, change the IP address, subnet mask, default gateway as required (address of network equipment for connecting controller must be the same as the network address of controller). Generally, DNS remains unchanged.

Internet Protocol Version 4(tcp/IPv4)Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

Obtain an IP address automatically

Use the following IP address:

IP address:	192 . 168 . 1 . 207
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	192 . 168 . 1 . 1

Obtain DNS server address automatically

Use the following DNS server addresses:

Preferred DNS server:	10 . 1 . 2 . 223
Alternate DNS server:	10 . 1 . 2 . 224

Validate settings upon exit

Advanced...

OK Cancel



GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI 519070

Add: West Jinji Rd, Qianshan Zhuhai, Guangdong, China

Tel: (+86-756)8522218

Fax: (+86-756)8669426

E-mail: global@cn.gree.com www.gree.com

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