Service Manual

VRF Protocol Gateway

Contents

User Notice

Dear customer:

Please read this manual carefully prior to installation and operation and strictly observe all installation and operation instructions covered in the manual.

Special attentions shall be paid to the following marks:

⚠WARNING!	This mark indicates operation, which if improperly performed, might lead to the death or serious injury of the users.
ⓘCAUTION!	This mark indicates operation, which if improperly performed, might possibly result in damage to the device.

⚠WARNING!
(1)   Installation shall be performed by the qualified personnel; otherwise it would result in a fire hazard or electric shock.
(2)   Do not place the plug of the power supply into the socket before it is dried and cleaned.
(3)   Cut off the power supply before touching the electric element.
(4)   Do not touch this device with wet hands; otherwise it would result in electric shock.
(5)   Do use the power cable specified in this manual; otherwise it would result in a fire hazard.
(6)   When the power cable is reversely connected or the power supply is beyond the rated range, it would result in a fire hazard or even damages to this device.
(7)   For PLUGGABLE EQUIPMENT, the socket-outlet shall be installed near the equipment and shall be easily accessible.
(8)   Do install this device inside the electric control cabinet which is located indoor and then is locked.
(9)   Do install this device where it will not be subject to the electromagnetic interference or heavy dust.
ⓘCAUTION!
(1)   Be sure the specified adaptor is used; otherwise this device would work improperly or even be damaged.
(2)   Be sure this device is setup in place; otherwise it would result in communication fault.
(3)   Be sure the communication line is connected to the correct interface; otherwise it would result in communication fault.
(4)   After connection, lines should be protected with insulating tape to avoid oxidation and short circuits.
(5)   Risk of explosion if battery is replaced by an incorrect type, dispose of used batteries according to the instructions.
(6)   Normal working conditions for Gateway：   ①Temperature : -20 ～ 60℃;   ②Humidity: less than 85%,except for the condensation of dew;   ③Location: indoor (it is highly recommended to install this product in the electric control cabinet), not subject to direct sunlight, rain and snow etc.
(7)   Graphics in the instruction manual are for reference only.

Chapter 1 Installation

1 Introduction to System

Gree VRF Protocol Gateway ME30-24/D1(BM) can realize the data exchange between air conditioner and Building Management System (the following refers to BMS), providing standard Modbus RTU, Modbus TCP and BACnet/IP building interfaces.

Through the gateway, administrator can conduct data collection, monitor and control of operating status of multi VRF air conditioner in long distance, and can give out alarm of errors of air conditioner in time. Moreover, it can provide protocol interfaces of Modbus RTU, Modbus TCP or BACnet/IP to connect BMS. There is no need for maintenance personnel to set and manage each set of units on the spot, they just need to sit in front of the computer to perform operation management such as viewing the operating status of building air-conditioning system, ON and OFF status of unit, setting of temperature and humidity, etc., which not only greatly improves work efficiency, but also reduces labor costs and management costs.

The gateway is applicable to GMV5S all DC inverter multi VRF unit, GMV5 DC inverter multi VRF unit, GMV water source heat pump DC inverter multi VRF unit, GMV ES DC inverter multi VRF unit, GMV Tops residential multi VRF unit, GMV Star residential multi VRF unit, GMV6 multi VRF unit.

Note: Later the Gree VRF Protocol Gateway ME30-24/D1(BM) is called gateway for short.

Internet topological graph:
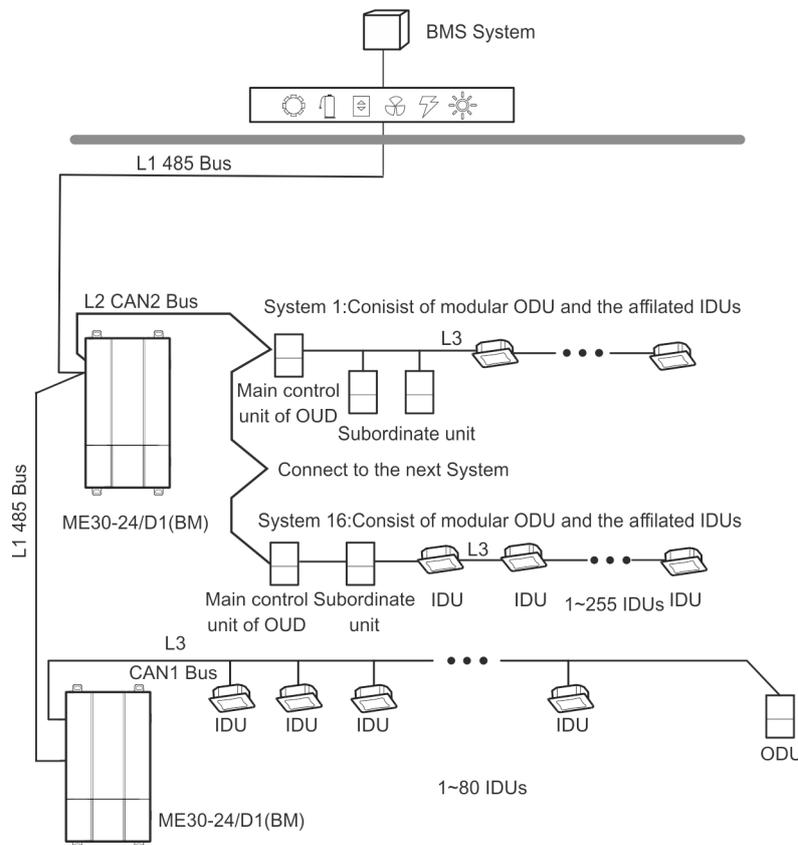
Fig. 1 Network topology for communication method of Modbus RTU
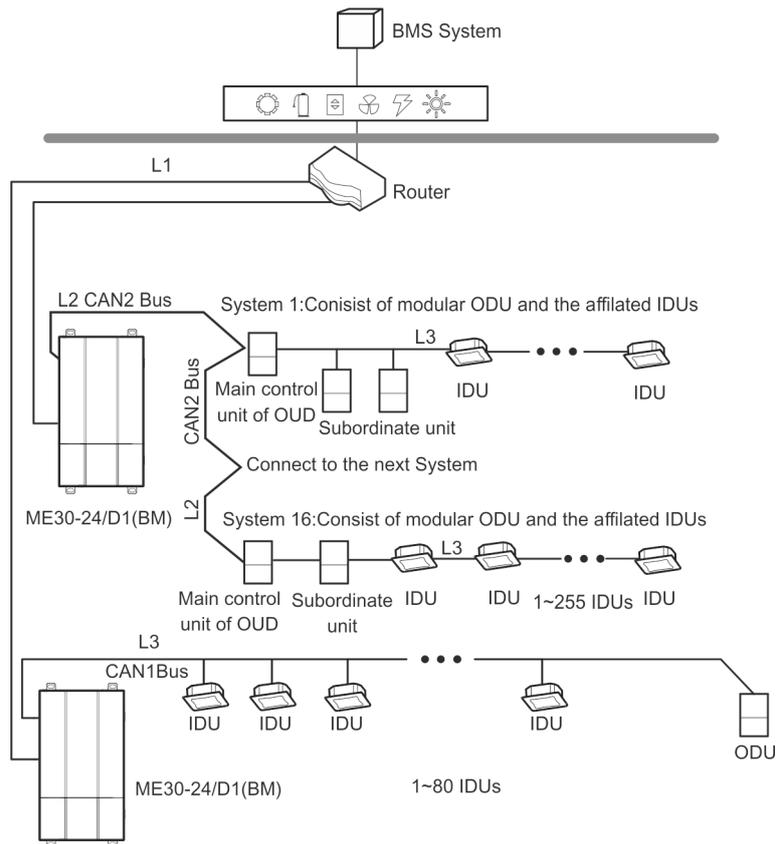
Fig.2　Communication method of BACnet and communication method network topology of Modbus TCP

Internet topological graph statement:

485 bus: L1 shown in Fig. 1 is 485 bus, one 485 bus can connect to 254 gateways at most.

Network table: L1 shown in Fig. 2 is general network cable, the gateway can connect to BMS via the network cable.

CAN1 network: L3 shown in Fig. 1 and Fig. 2 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.

CAN2 network: L2 shown in Fig. 1 and Fig. 2 is CAN2 bus, which consists of gateway 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.

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

Connectable quantity of units of gateway: One gateway can connect to 16 sets of outdoor units and 255 sets of indoor units at most.

Remarks:

（1） One 485 bus can connect to 254 gateways at most, if there a re other 485 equipment in the 485 bus, the connectable gateway should reduce accordingly.

（2） It is recommended that the connecting quantity of gateway of 485 bus n is less or equal to 16.

2 Introduction to Parts

2.1 Parts List

S=standard fittings; O=prepared by user; P=purchased by user

Name	Model	Material Code	Remarks	Supply Range
VRF Protocol Gateway kit	Gateway components ME30-24/D1(BM)	NC20000160	- Can connect to BMS - Protocol interfaces: Modbus protocol, CAN protocol, BACnet protocol - Hardware interface: RS485, CAN, Ethernet 485 communication baud rate 9600, start bit 1 bit, data bit 8 bits, no parity bit, stop bit 1 bit - TCP communication: gateway Modbus TCP fixed interface: 502 - UDP port in BACnet/IP mode: BAC0 - Major components: gateway, instruction manual	S
Optical isolation relay	Optical isolation relay RS485	LN02200010	The total distance of the communication cable needs to add a relay every time it exceeds 800 meters, and it needs to add a relay every time the quantity of Modbus gateway exceeds 30. It needs to be adopted when the conditions are met.	P
Optical isolation convertor	Optical isolation convertor GD01	LN02200020	Only when BMS dopts RS232 method should the convertor be adopted	P
Centralized control cabinet	Prepared by user	-	-	O

2.2 Gateway ME30-24/D1(BM)

2.2.1 Introduction of Functions

Gree multi VRF protocol gateway ME30-24/D1(BM) can realize data exchange between air conditioner and BMS, providing standard Modbus RTU, Modbus TCP and BACnet/IP building interfaces. The gateway is applicable to the Gree multi VRF unit model that adopts CAN protocol.

2.2.2 Phicture of Gateway and Interfaces
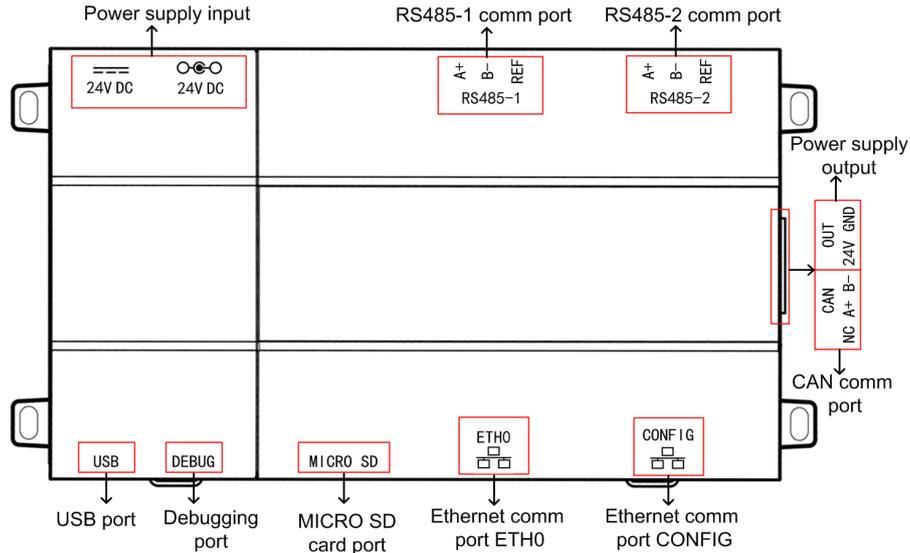
2.2.3 Components

Gree VRF protocol gateway kit ME30-24/D1(BM) includes the following components:

VRF protocol gateway	One set
Instruction manual	One

2.2.4 Interface

（1） Power

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 gateway.

（2） Communication Interface

CAN comm port: connect it to the AC unit through the 2-core communication line to realize the communication between Gateway and the AC which adopts CAN protocol.

RS485-1 comm port: connect to the BMS terminal through a two-core communication line to realize the communication connection between the gateway and the BMS terminal or the connection between adjacent gateways.

RS485-2 comm port: this device will not use this communication interface temporarily.

USB and SD card port: this device will not use this interface temporarily.

Ethernet comm port ETH0: realize communication through network cable and BMS.

Ethernet comm port CONFIG: this device will not use this interface temporarily.

2.3 Introduction to optical isolation convertor

2.3.1 Introduction to functions

The role of the optical isolation converter is to convert the RS232 signal of the computer serial port and the signal of the RS485 bus. Only needed when the user's BMS is RS232 communication.

2.3.2 Outline
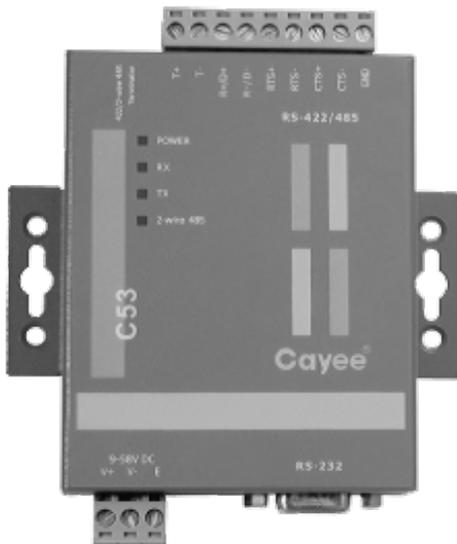
Note: The picture is for reference only.

2.3.3 Instruction of interface and indicator
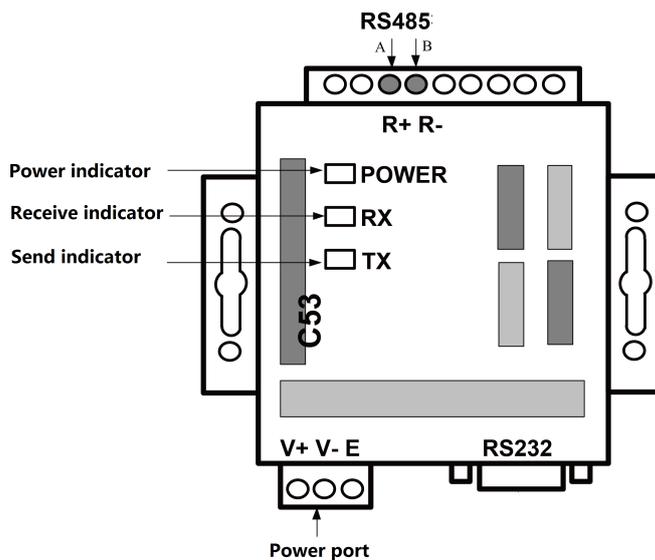
No.	Interface Name	Instruction of Use	Remarks
1	Power interface	Input 12VDC800mA	Self-provided power source of convertor
2	Communication interface	A wire of RS485 connect to 485 terminal R+, B wire connects to R－.	See the instruction manual
3	Power indicator	Constantly on when energized	See the instruction manual
4	Communication indicator	TX and RX indicators flash when the communication is normal	See the instruction manual

2.3.4 Dimension
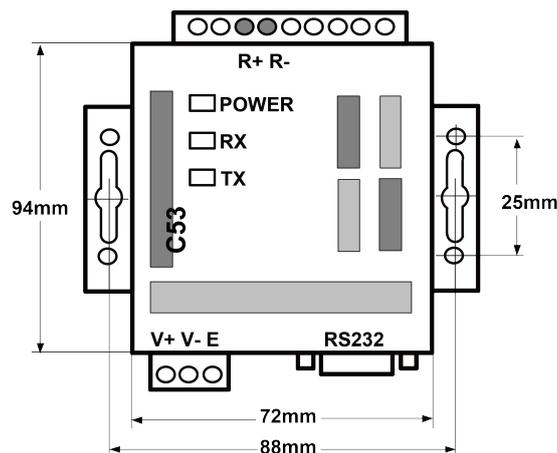
2.3.5 Notices for installation

⚠ **Warning!** It must be fixed indoors to avoid collision, exposure to the sun or rain. It is recommended to place it in the monitoring room with the computer.

⚠ **Warning!** The original equipment of the manufacturer must be used, and it is not allowed to purchase alternative products of other models or brands.

⚠ **Warning!** An independent power supply is required, and sufficient 220V AC outlet must be installed to supply power.

2.4 Introduction to optical isolation relay

2.4.1 Introduction to functions

Function of optical isolation relay:

（3） When the distance of the entire communication network node exceeds 800 meters, the optical isolation relay is to ensure the signal integrity and prevent the signal from attenuating in the case of long-distance communication.

（4） At present, the general optical isolation relay can support the integrity of the communication signal of 32 nodes. When the number of communication nodes in the network exceeds 32, the communication signal will be incomplete. In order to ensure the reliable transmission of signals, we require that when the number of nodes in the network exceeds 30, a relay must be used to transmit the signal to ensure the integrity of the communication signal.

Up to 30 Gateways can be connected between two relays

The accumulated length of communication cable
between two relays cannot exceed 800m
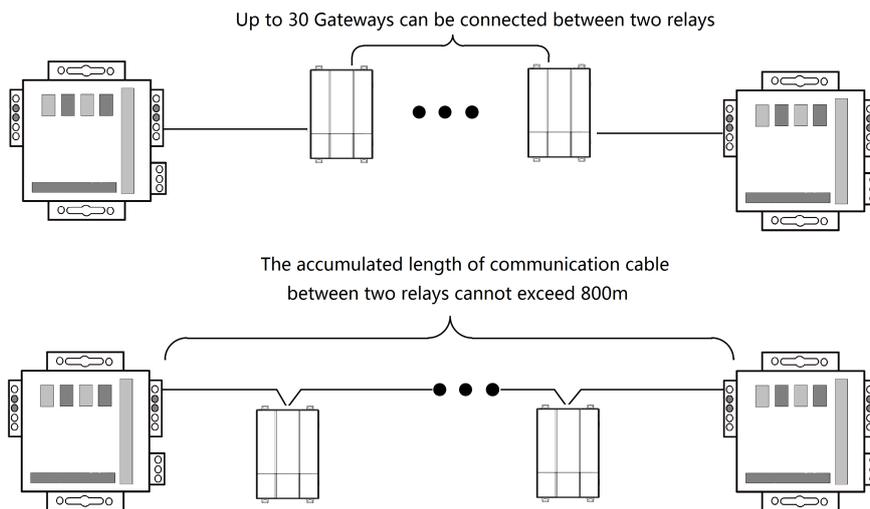
2.4.2 Outline
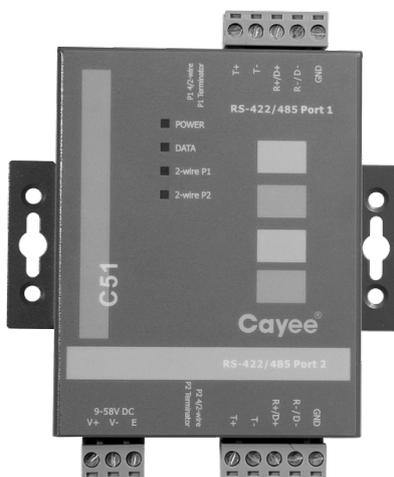
Note: The picture is for reference only.

2.4.3 Instruction of interface and indicator

No.	Interface Name	Instruction of Use	Remarks
1	Power interface	Input 12VDC/800mA	Self-provided power source of relay
2	Communication interface	A wire of RS485 connect to 485 terminal R+	See the instruction manual
3	Power indicator	Constantly on when energized	See the instruction manual
4	Communication indicator	Data indicator flashes when the communication is normal	See the instruction manual

2.4.4 Dimension

2.4.5 Notices for installation

⚠ It must be fixed indoors to avoid collision, exposure to the sun or rain. It is recommended to place it in the monitoring room with the computer.

⚠ The original equipment of the manufacturer must be used, and it is not allowed to purchase alternative products of other models or brands. An independent power supply is required, and sufficient 220V AC outlet must be installed to supply power.

3 Product Installation

3.1 Product Size

119   Unit: mm

61

229

87

219
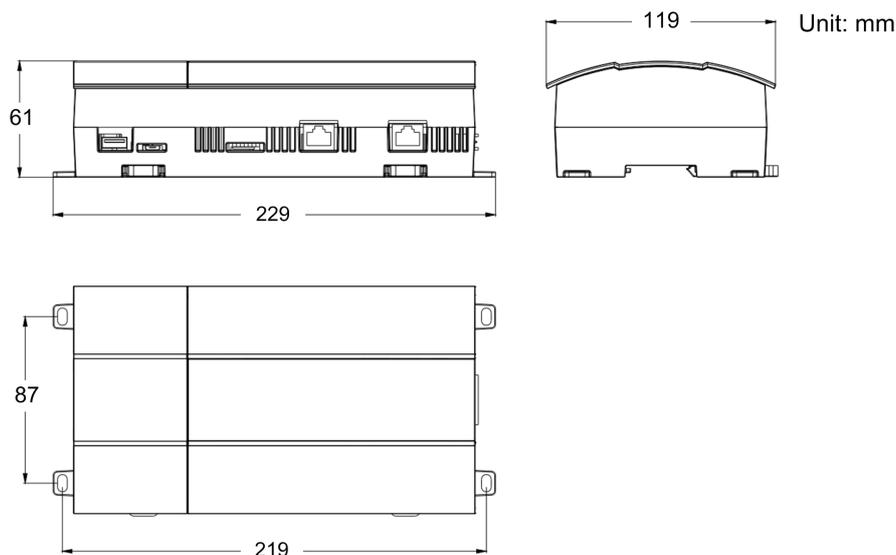
3.2 Spatial Size for Electric Control Cabinet Installation

Gateway shall be installed in electric control cabinet; the front of gateway shall be hung upward and fixed with 4 screws. See the following fig (for reference).

Electric Control Cabinet

Switch Power Supply

Wire Slot

Power cord

Guide Rail
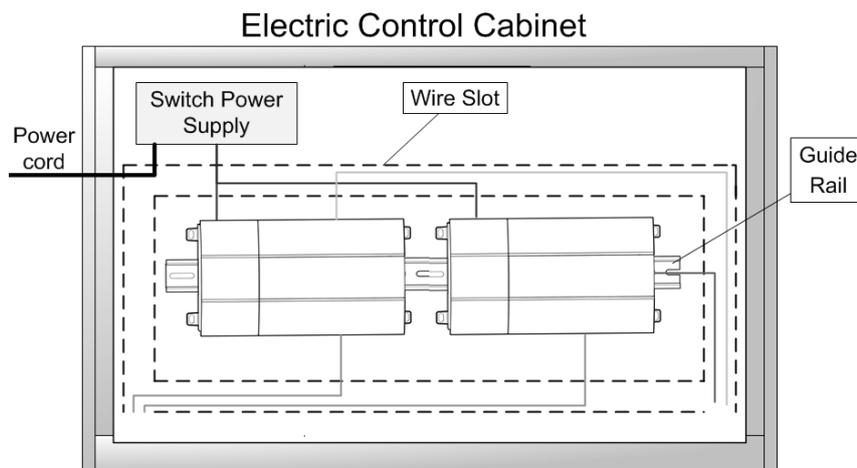
⚠**WARNING!** Power cord and communication line of Gateway must conduct routing separately (the distance shall be over 15cm); otherwise, it might lead to Gateway communication malfunction!

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.

4 Gateway and BMS adopt Modbus RTU communication connecting method

Gateway communication system include:

（1） The communication between the gateway and BMS;

（2） The communication between the gateway and air conditioner.

4.1 Selection of communication material

Communication system	Cable material	Communication cable L(m)	Cable diameter (mm^2)	Material standard	Remark
The communication between gateway and BMS via Modbus bus	Shielding light/general PVC sleeve twisted pair copper core cord	L≤800	≥2x0.75	IEC 60227- 5:2007	When the communication distance is over 800m

4.2 Connecting method of communication between gateway and air conditioner

⚠ **Caution!** Communication connecting wire of gateway must adopt string connection, rather than star connection.
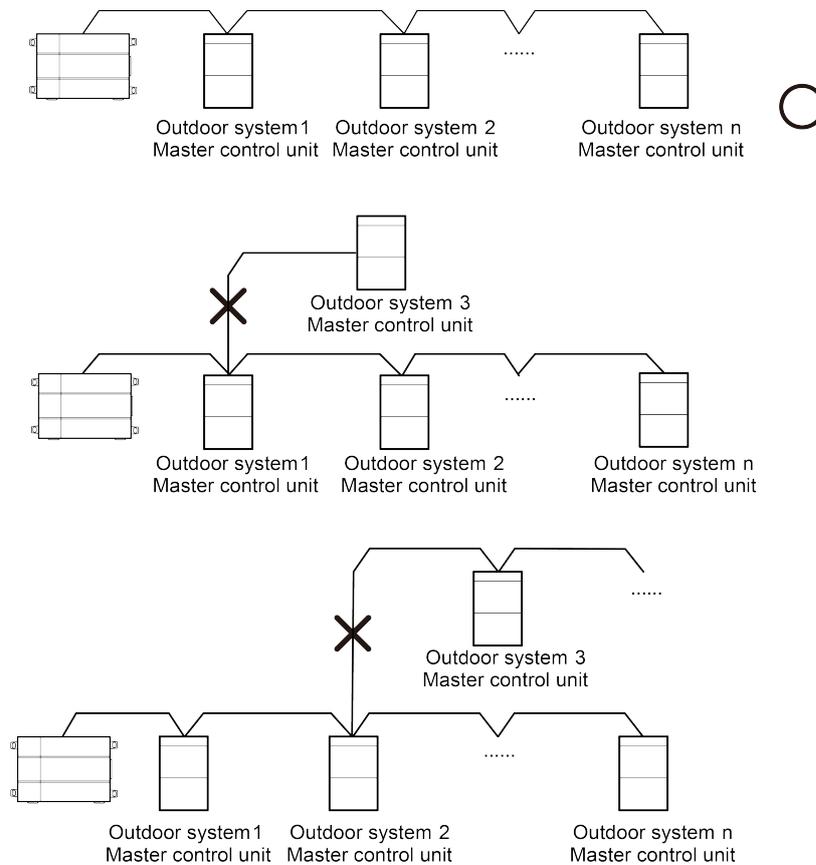
NOTICE! In the Modbus, when the quantity of connected gateway exceeds 30 or the communication distance exceeds 800m, one more PV isolation relay should be added, and connect the R+ and R- terminals of PV isolation relay to the RS485-1 communication interfaces R+ and R- of the adjacent gateway.

Up to 30 Gateways can be connected between two relays

The accumulated length of communication cable
between two relays cannot exceed 800m
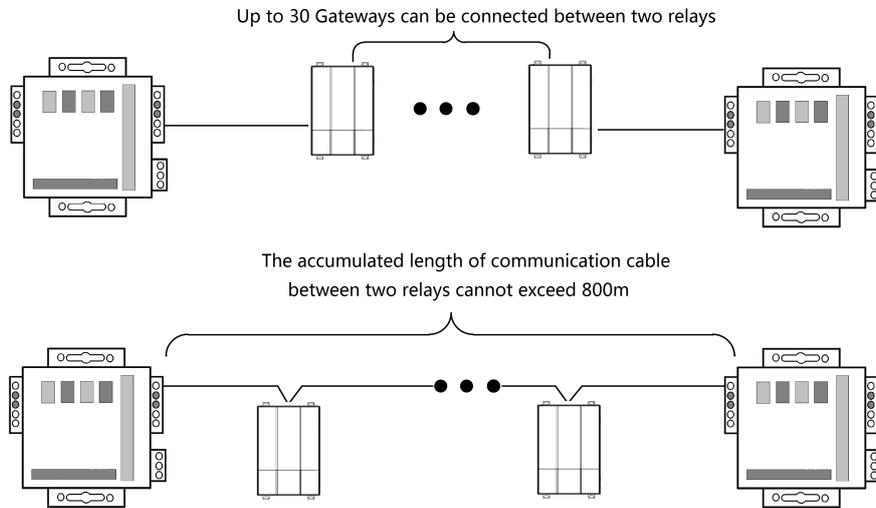
4.3 Setting of communication connection
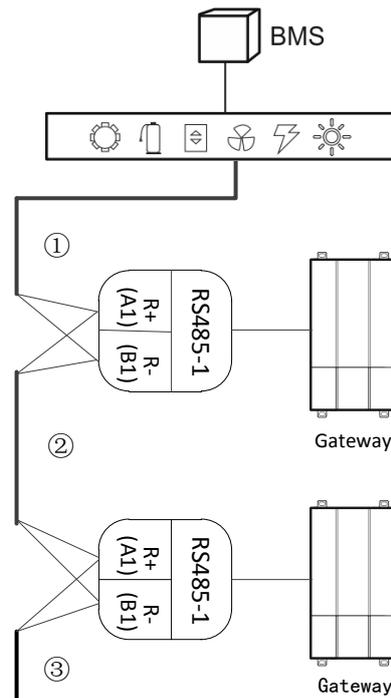
Step 1: Ensure the first gateway that should connect to BMS terminal, connect the RS485-1 communication interfaces R+ and R- of the gateway to the BMS terminal with communication cable; as shown in Step ① in the figure.

Step 2: Connect the RS485-1 communication interfaces R+ and R- of the gateway to the RS485-1 communication interfaces R+ and R- of the second gateway with communication cable; as shown in Step ② in the figure.

Step 3: Connect other gateways in turn; as shown in Step ③ in the figure.

5 Gateway and BMS adopt Modbus TCP or BACnet protocol communication connecting method

Gateway communication system includes:

（1） Communication between gateway and BMS;

（2） Communication between gateway and air conditioner.

5.1 Selection of communication cable material

Communication system	Type of material	Communication wire between gateway and air conditioner L(m)	Cable diamter (mm²)	Material standard	Remark
Communication between gateway and BMS via network cable	10BMSE-T or 100BMSE-TX interleaving network cable or 100BMSE-TX parallel network cable	L≤80	-	-	● If the gateway directly connects to PC, it needs interleaving network cable. ● If the gateway connects to PC via router, it adopts parallel network cable.
Communication between gateway and air conditioner	Shielding light/general PVC sleeve twisted pair copper core cord	L≤500	≥2×0.75	IEC 60227-5:2007	Total communication length should not be over 500m

5.2 Communication Connection Method

（1） Communication connection between Gateway and BMS
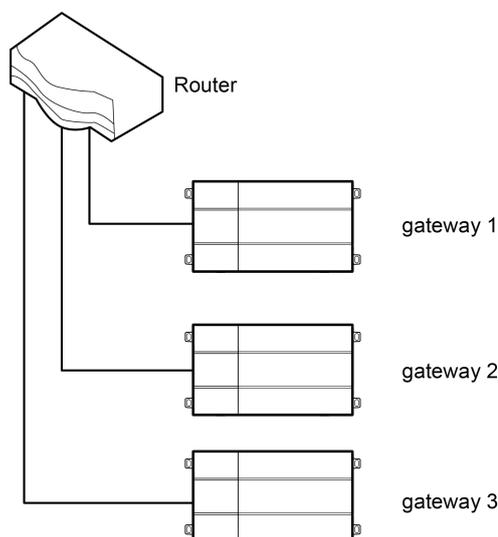
（2） Communication connection between Gateway and AC units (n is the quantity of ODU system, n ≤ 16)

Outdoor system1
Master control unit

Outdoor system 2
Master control unit

......

Outdoor system n
Master control unit

Outdoor system 3
Master control unit

Outdoor system1
Master control unit

Outdoor system 2
Master control unit

......

Outdoor system n
Master control unit

Outdoor system 3
Master control unit

......

Outdoor system1
Master control unit

Outdoor system 2
Master control unit

......

Outdoor system n
Master control unit

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

5.3 Communication Connection Configuration

（1） Communication line connection between Gateway and PC:

Connection diagram between Gateway and PC user side:

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

10BASE-T or 100BASE-TX cross network cable
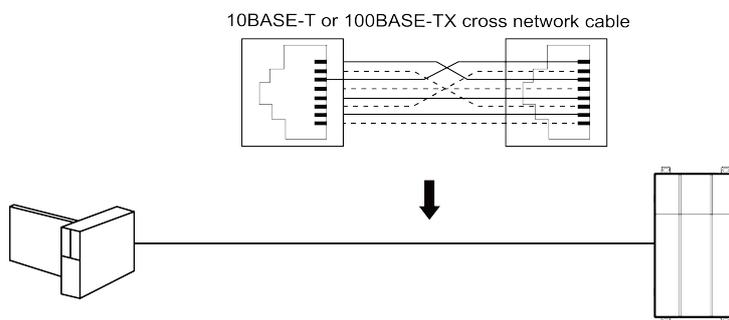
2) Adopt parallel network cable, Gateway shall go through router to connect to PC.

10BASE-T or 100BASE-TX parallel network cable
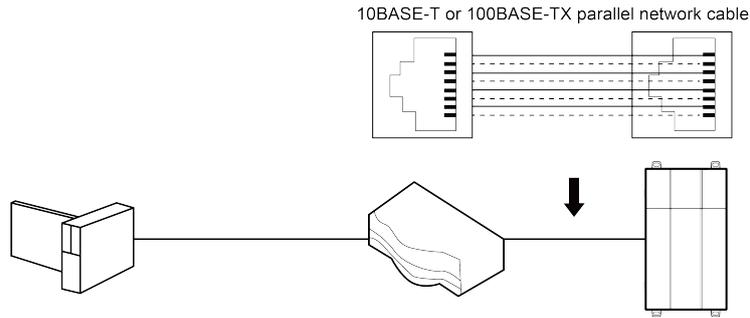
（2） Communication line connection between Gateway and AC units:

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

D1D2⊗G1G2

CAN
G1
G2

ON ON

1   2

Subordinate   ......   Main control
Unit of ODU   Unit of ODU
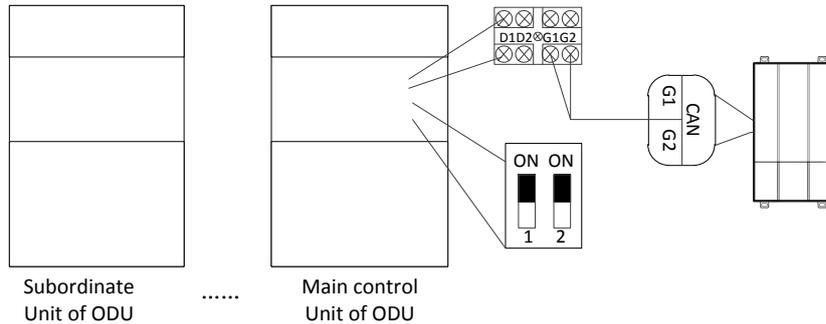
5.4 Gateway configuration:

One gateway connects to 16 sets of systems and 255 sets of indoor units simultaneously. After installation, the parameters of gateway should be set. Before setting the parameters of gateway, please set the IP address of PC as the same with the IP address in the same network segment of gateway, as refer to appendix A; and then open the browser (IE10 and above version, Firefox or Google), input the default IP address of gateway: http://192.168.1.150, default user name: config, password: config; as shown below.

Log in

👤 Username

🛉 Password

version 2.0.0

Setting of gateway protocol functions:

After inputting user name and password, click the arrow to enter the setting interface, as shown in Fig. 7.12, 7.13, and 7.14; in the setting interface 1, you can select the protocol function; in the setting interface 2, you can set the IP parameters of gateway; in the setting interface 3, you can set the equipment information.

Note: When the gateway is energized, it will conduct default Modbus protocol function, when select to reset the gateway and log on the gateway setting interface again, the protocol option of interface 1 is blank, you can select according to demand.

Setup

| Protocol | DeviceIP | Device information |

Connect to the device protocol of the access gateway

○ BACnet
⊙ Modbus

→

Computer time:2020-06-29 16:59:44

Version 2.0.0

Setup

| Protocol | DeviceIP | Device information |

Configuire IP address,netmask,and default gateway of the gateway device.

←   →

IP address :   192   .168   .1   .150

Netmask :   255   . 255   . 255   .0

Gateway :   192   .168   . 1   .1

Version 2.0.0

Setup

| Protocol | DeviceIP | Device information |

View the gateway device MAC;configure device name and device ID

←   →

Device   ID：   1

Device Mac：   40:06:a0:e0:59:ac

Device Name：   VRF Protocol Gateway

Version 2.0.0

The settable parameters: IP address of gateway (in which setting of IP address: master unit number should not be 0, all 0 refers to the whole network, such as 192.168.1.0; master unit number should not be all 1, all 1 refers to broadcast address, such as 192.168.1.255; it is not recommended to set the address by user, otherwise it may cause problems such as the network is not accessible), subnet mask of gateway, default gateway, gateway name, gateway ID. 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 gateway to make the setting come into effect? Click yes and then the gateway is restarted.

192.168.1.150 says
Save succeeded.Restart the gateway for valid operation?

OK   Cancel
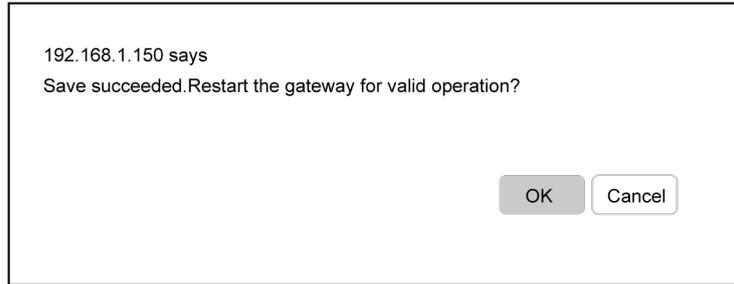
Chapter 2 Commissioning Operation

1 Commissioning of hardware

1.1 DIP Switch

NOTICE!

Before using this device, please conduct DIP switch setting first, otherwise the unit will not function normally!

Gateway dial-up setting area is consisting of function DIP switch code.

（1） Diagram of Dial-up Machine
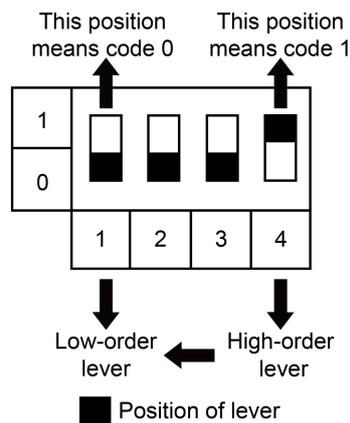
（2） The 1st Lever of Functional DIP Switch—CAN2 Bus Matched Resistance Setting

Main control ODU or gateway at the top/end of CAN2 bus must be with matched resistance; otherwise the communication might be wrong!

※ CAN2 bus: Specific meaning shall refer to the specification in Fig Internet topological graph.

The No.1 dial-up button in function dial-up machine shall be used in the setting in the matched

resistance of CAN2 bus in this gateway.

When the gateway is at the top/end of CAN2 bus, the gateway shall be with the matched resistance, then dial the No.1 function dial-up machine to 1.

When the gateway is not at the top/end of CAN2 bus, the gateway is not with the matched resistance, then dial it to 0.
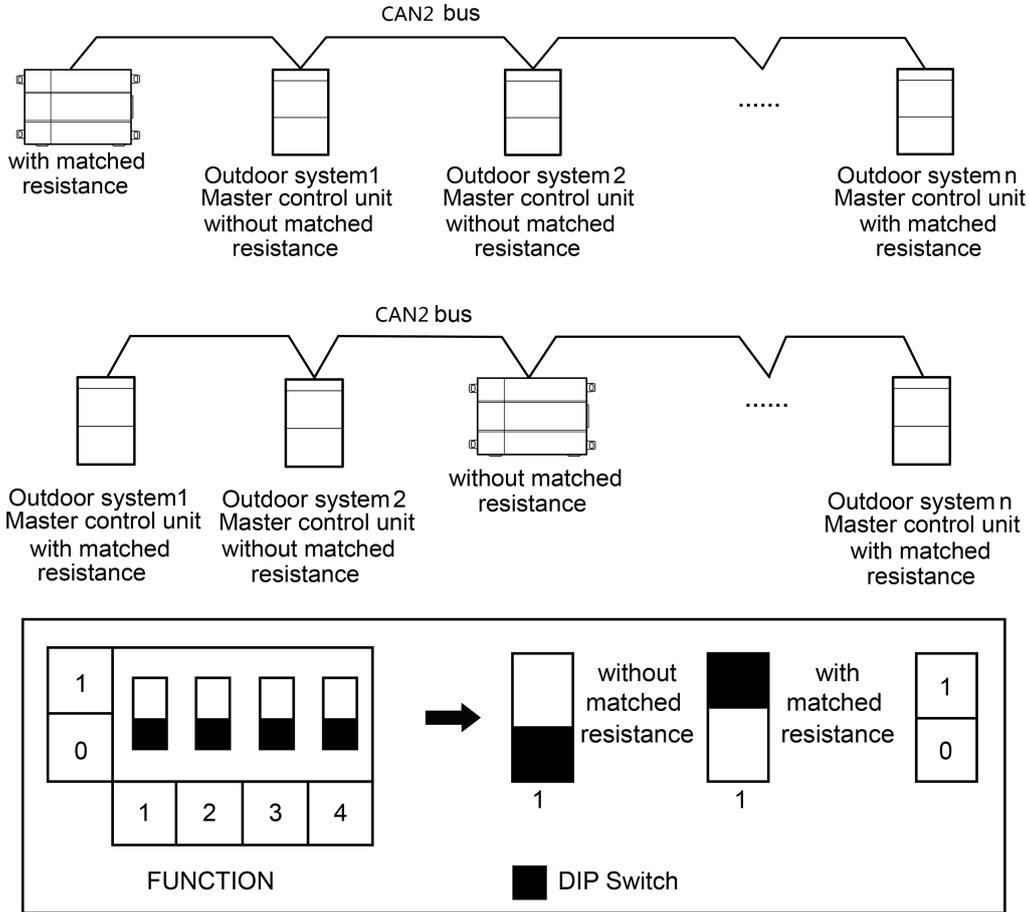
（3） The 2st Lever of Functional DIP Switch—485 Bus Matched Resistance Setting

The 2nd dial code of the function dialer is used for setting the matching resistance of the gateway of 485 bus.

When the controller is at the beginning/end of the 485 bus, the controller needs to be set to be with matching resistance, then the second bit of function dialer is set to 1; when the controller is not at the beginning/end of the 485 bus, set the controller to be without matching resistance, and set the dial code to 0.
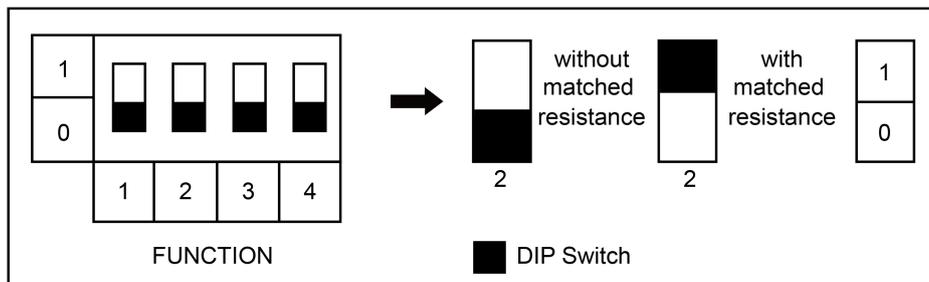
（4） The 4st Lever of Functional DIP Switch—Gateway Reset Selection Bits

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

gateway name or gateway ID from the webpage, and the webpage can't be accessed, user can reset the gateway 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 gateway.

1.2 LED Display
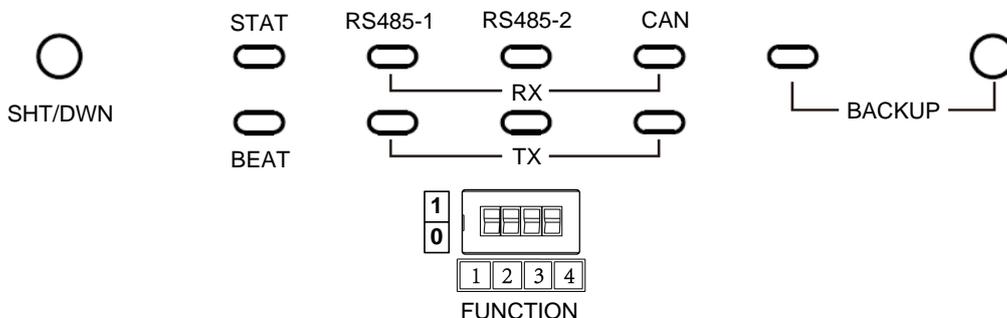
The above LED indicator is mainly consist of two parts: status indicator (run, power) and communication indicator (CAN and RS485). The following table is the working status of each indicator.

CAN	RX	When receiving the data of equipment (eg. AC unit) which connects to gateway, it blinks.
	TX	When transmitting data to the equipment (eg. AC unit) which connects to gateway, it blinks.
RS485-1	RX	When the gateway receives data on the 485 bus, it blinks.
	TX	When the gateway sends data to the 485 bus, it blinks.
RS485-2	RX	This device does not use this LED indicator.
	TX	This device does not use this LED indicator.
STAT		When power supply of Gateway is normal, it is on.
BEAT		When Gateway is running normally, it blinks.
BACKUP		This device does not use this LED indicator.

1.3 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 gateway controller.
BACKUP	Not use this button for this device temporarily.

2 Commissioning of communication

2.1 Communication commissioning with air conditioning equipment

```
                              ┌──────────┐
                              │  Start   │
                              └──────────┘
                                   │
    ┌──────────────────────────────────────────────────────────┐
    │ After the unit connects to multiple systems, the          │
    │ centralized control address of unit and                   │
    │ engineering number of IDU should be set to avoid          │
    │ C5 and CJ error                                           │
    └──────────────────────────────────────────────────────────┘
                                   │
    ┌──────────────────────────────────────────────────────────┐
    │ Check if the installation of gateway,                     │
    │ communication connection, dial code setting are           │
    │ correctly set                                             │
    └──────────────────────────────────────────────────────────┘
                                   │
              ╱╲                                    ┌─────────────────────────┐
             ╱  ╲  Check if the matched    no       │ Correctly set according to│
            ╱    ╲ resistance of CAN bus is ───────▶│ "Chapter 2 1.1 Setting of │
             ╲  ╱  correctly installed             │ dial code"               │
              ╲╱                                     └─────────────────────────┘
               │ YES
    ┌──────────────────────────────────────────────────────────┐
    │ Power failure of air conditioner: power failure of        │
    │ gateway                                                   │
    └──────────────────────────────────────────────────────────┘
                                   │
    ┌──────────────────────────────────────────────────────────┐
    │ Re-energized the air conditioner: re-energize the        │
    │ gateway                                                   │
    └──────────────────────────────────────────────────────────┘
                                   │
              ╱╲                                    ┌─────────────────────────┐
             ╱  ╲  Check if the power      NO       │ Check the supply voltage │
            ╱    ╲ indicator of gateway is ────────▶│ and power cord           │
             ╲  ╱  constantly on                    └─────────────────────────┘
              ╲╱
               │ YES
              ╱╲                                    ┌─────────────────────────┐
             ╱  ╲  Check if the operating  NO       │ The gateway cannot       │
            ╱    ╲ indicator of gateway    ────────▶│ normally work, replace with│
             ╲  ╱  is flashing (flash once           │ other gateway            │
              ╲╱   for every 1 second)               └─────────────────────────┘
               │ YES
              ╱╲                                    ┌─────────────────────────┐
             ╱  ╲  Check if the CAN RX/TX  NO       │ Troubleshooting 1        │
            ╱    ╲ indicator of gateway is ────────▶└─────────────────────────┘
             ╲  ╱  flashing
              ╲╱
               │ YES
    ┌──────────────────────────────────────────────────────────┐
    │ Communication between the gateway and air                 │
    │ conditioner is normal, it can receive the data sent       │
    │ by the air conditioner                                   │
    └──────────────────────────────────────────────────────────┘
                                   │
                              ┌──────────┐
                              │   End    │
                              └──────────┘
```

2.2 Communication commissioning with BMS equipment

For the BMS communication protocol, please apply to the Gree Electric Appliances, Inc. of Zhuhai

2.2.1 Adopt Modbus RTU communication method with BMS

Protocol interface: Modbus RTU protocol

Hardware interface: RS485

Baud rate: 9600

Start bit: 1

Data bit: 8

Parity bit: No

Stop bit: 1

```
                    ┌──────────────────────┐
                    │ CAN indicator of     │
       ┌───────┐    │ gateway flashes, the │
       │ Start ├───▶│ communication with   │
       └───┬───┘    │ the air conditioner  │
           │        │ is normal            │
           ▼        └──────────────────────┘
  ┌──────────────────┐
  │ BMS equipment     │
  │ sent the request  │
  │ frame that meets  │
  │ the Modbus RTU    │
  │ protocol criterion│
  └────────┬─────────┘
           ▼
        ╱────────╲                  ┌──────────────┐
       ╱ RS485-1  ╲      NO          │ Troubleshootin│
      ╱ RX/TX      ╲────────────────▶│ g 2          │
      ╲ indicator  ╱                 └──────────────┘
       ╲ of gateway╱
        ╲ flashes ╱
         ╲───┬───╱
             │ YES
  ┌──────────────────┐
  │ Communication     │
  │ between gateway    │
  │ and BMS equipment  │
  │ is normal          │
  └────────┬─────────┘
           ▼
       ┌───────┐
       │  End  │
       └───────┘
```
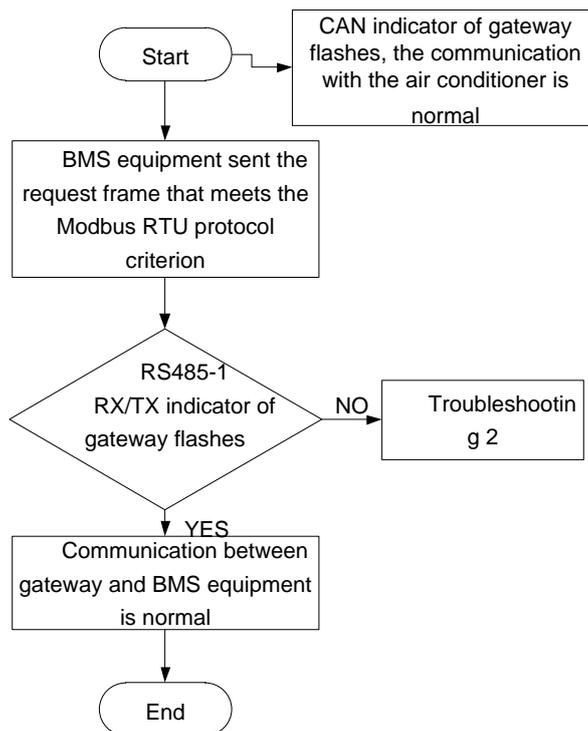
2.2.2 Adopt Modbus TCP or BACnet communication method with BMS

```
                    ┌──────────────────────┐
                    │ CAN RX indicator of  │
       ┌───────┐    │ gateway flashes, the │
       │ Start │◀───│ communication with   │
       └───┬───┘    │ the air conditioner  │
           │        │ is normal            │
           ▼        └──────────────────────┘
  ┌──────────────────┐
  │ BMS equipment     │
  │ sent the request  │
  │ control frame that │
  │ meets the Modbus   │
  │ TCP protocol       │
  │ criterion          │
  └────────┬─────────┘
           ▼
        ╱────────╲                  ┌──────────────┐
       ╱ CAN TX    ╲      NO         │ Troubleshoo  │
      ╱ indicator   ╲───────────────▶│ ting 3       │
      ╲ of gateway  ╱                └──────────────┘
       ╲ flashes   ╱
        ╲───┬────╱
            │ YES
  ┌──────────────────┐
  │ CAN RX indicator  │
  │ of gateway flashes,│
  │ BMS communication  │
  │ is normal          │
  └────────┬─────────┘
           ▼
       ┌───────┐
       │  End  │
       └───────┘
```
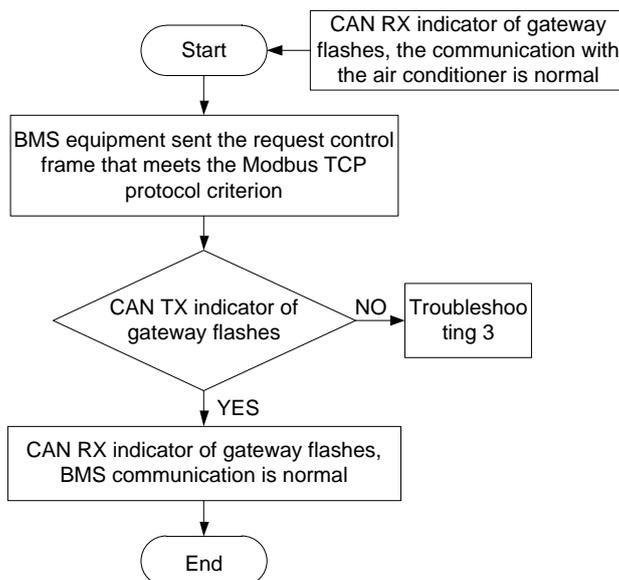
2.3 Troubleshooting

Caution: The troubleshooting provides several possible causes and checking methods under error situation, if the error cannot be solved, please contact related professional of Gree Electric Appliances.

```
                          ┌─────────────────┐
                          │  Troubleshoo    │
                          │  ting 1         │
                          └─────────────────┘
                                  │
                                  ▼
              ┌───────────────────────────────────────┐
              │  CAN RX indicator of gateway is not    │
              │  flashing                              │
              └───────────────────────────────────────┘
                                  │
                                  ▼
              ┌───────────────────────────────────────┐
              │  The gateway cannot receive the        │
              │  data of air conditioner               │
              └───────────────────────────────────────┘
```

Communication cable connection between gateway and BMS is not correct or the communication cable is not conductive	Matched resistances of the nodes in the CAN bus have not been correctly set	Communication distance of CAN bus is over 500m
Check the conductivity of communication cable: refer to 2.1 of Chapter 2, check if the communication connection between the gateway and air conditioner is correct	By referring to 5.4 of Chapter 2, check if there is repeat equipment address of gateway; check if the equipment address of command frame sent by BMS equipment is in consistent with the address of gateway	Reduce the communication distance of CAN bus to 500m or less, it is recommended to install the gateway near the air conditioner

```
                                          ╱ Troubleshoo ╲
                                          ╲   ting 2    ╱
                                                │
                                                ▼
                          ┌─────────────────────────────────────┐
                          │ 485-1 RX/TX indicator of gateway is  │
                          │     not flashing, no retrieval data  │
                          └─────────────────────────────────────┘
                                                │
                                                ▼
                          ┌─────────────────────────────────────┐
                          │  The gateway cannot receive the      │
                          │           data of BMS                │
                          └─────────────────────────────────────┘
```

Communication cable connection between gateway and BMS is not correct or the communication cable is not conductive	Please check if the form and content of data frame sent by BMS equipment to gateway is correct	Equipment address of gateway is not correctly set	Communication distance is too long

Check the conductivity of communication wire; by referring to 2.1 of Chapter 2, check if the communication connection between the gateway and the air conditioner is correct	By referring to 5.4 of Chapter 2, check if there is repeat equipment address of gateway; check if the equipment address of command frame sent by BMS equipment is in consistent with the address of gateway	Add relay between the gateway and BMS, or reduce the communication distance to be within 800m

Troubleshooting 3

CAN TX indicator of gateway is not flashing, no response data

The gateway cannot receive the data of BMS equipment

Check if the network cable is damaged

Check if the form of data frame sent by BMS equipment is correct

Check if the allocated address of gateway is correct

The communication distance of BMS network is over 80m

Check if the IP address, subnet mask, collocation fittings of gateway are correct

1. If the connection of network cable to PC adopts interleaving connection; 2. If the connection of network cable to PC via router adopts parallel connection

By referring to 5.4 of Chapter 2, check if there is repeat equipment address of gateway; check if the equipment address of data frame sent by BMS equipment is in consistent with the address of gateway

Connect the gateway into local area network or reduce the communication distance to be within 80m

Correctly set by referring to 5.4 of Chapter 1

Chapter 3 Maintenance

1 Troubleshooting for common errors of BMS

Phenomenon	Possible Causes	Troubleshooting
According to the provided protocol, the BMS displays communication error, some or all the units cannot display under operating status, and cannot control	The communication cable is not twisted pair communication cable	Replace with twisted pair communication cable
	The gateway is damaged	Replace the gateway
	The communication cable is broken	Solder the disconnected cable
	The communication cable is short-circuited	Maintain the short-circuited part
	The twisted pair is too close to the power cord (less than 15cm), the interference is to large and cause communication error	Arrange the wires separately, if they cannot be separate for over 15cm, add shielding steel tube
	There is communication interface connection error	Connect according to the instruction of this guidline
The wires are checked to be normal, but some or all of the units cannot display information, there still be communication error in the software	After the chip of outdoor unit is replace or the dial code is reset, the power supply has not been disconnected and re-connected	Energize the unit
	The matched resistance has not been connected	Correctly set the matched resistance
	The serial ports used by communication software is inconsistent with the serial ports of computer	Change the serial ports or alter the serial port setting in the software
	The added unit address in the software is inconsistent with the actual address of unit	Alter the address setting of software
	The unit has not been energized	Energize the unit
	The chip has not been installed in the outdoor unit or indoor unit, or the installing direction of chip is reverse	Recheck and install the chip, install according to the direction of gap in the PCB, and then re-energize the unit
	The address of unit is wrong or repeated	Alter the wrong address setting
The wires, equipment and engineering installation are checked to be normal, but there still be communication error in the software	The display or controller cannot match with the actual unit	Check the model of the controller and remote controller of the current unit, if it is not matched, contact the customer service center to replace
The wires are check to be normal, other equipment layers are normal, only certain equipment layer cannot display information	A relay should be added, or if the relay has been installed, the wire connection of relay may be wrong	Install the relay correctly

Attachment A 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".

（2） Left click "Network & Internet" in the following picture to enter the interface of "Network & Internet". See ① in the picture below.

Windows Settings

Find a setting

Devices
Bluetooth,printers,more

Phone
Link your Android,iPhone

❶
Network&Internet
Wi-Fi,airplane mode,VPN

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

Network&Internet

Status

Wi-Fi

Ethernet

Dial-up

VPN

Airplane mode

Mobile hotspot

Data usage

Proxy

You're connected to the Internet
If you have a limited data plan,you can make this network a metered connection or change other properties.

Change connection properties

Show available networks

Change your network settings

Change adapter options
View network adapters and change connection settings.

Sharing options
For the networks you connect to,decide what you want to share.

Network troubleshooter
Diagnose and fix network problems.

View your network properties

Windows Firewall

Network and Sharing Center **❷**

Network reset

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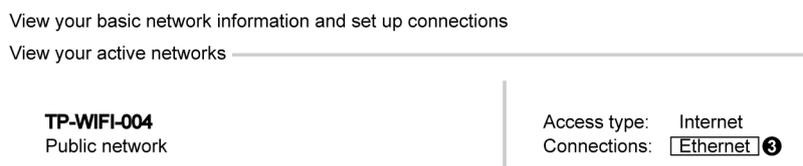
（5） Left click "Properties" in the following picture and enter the interface of "Ethernet Properties". See ④ in the picture below.

Ethernet Status

General

Connection

IPv4 Connectivity：   Internet
IPv4 Connectivity：   No network access
Media State：   Enabled
Duration：   00：11：20
Speed：   100.0 Mbps

Details...

Activity

Sent ———   ——— Received

Bytes: 732，000   878，048

❹

Properties   Disable   Diagnose

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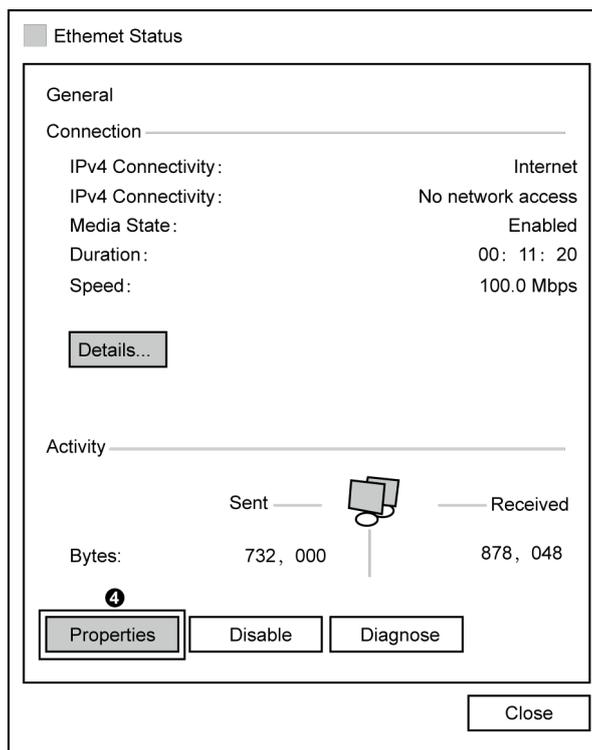
（6） Left click "Internet Protocol Version 4(TCP/IPv4)". See ⑤ in the picture below. Then left click "Properties" as shown in the picture to enter the interface of "Properties of Internet Protocol 4(TCP/IPv4)". See ⑥ in the picture below.

Ethernet Prcperties   ☒

Networking
Connect using:

🖳 Inter(R) Ethernet Connection I217-LM

Configure...

This connection uses the following items:

☑ Client for Microsoft Networks
☑ File and Printer Shang Microsoft Networks
☑ QoS Packet Schcduler
☑ Internet Protocol Version 4(TCP/IPv4) ❺
☐ Link-Layer Topology Discovery Mapper I/O Driver
☑ Microsoft Networks Adapter Multiplexor Protocol
☑ Microsoft LLDP Protaocol Driver

Install...   Uninstall   Properties

Description   ❻
Transmission Control Protocol/Internet Protocol.The default
wide area network protocol that provides communication
across diverse inter connected nerworks.

OK   Cancel

（7） 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 Gateway must be the same as the network address of Gateway ME30-24/D1(BM)). Generally, DNS remains unchanged.

Internet Protocol Version 4(tcp/IPv4)Properies   ☒

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