BMS(Modbus) Protocol (V1.2) for Gree Multi VRF System(CAN Mode)

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Thanks for your purchase of the long-distance monitoring Modbus Gateway of GREE Center air conditioners. In order to seamlessly interface it to the Building Management System (BMS), please read this manual carefully before installation and use and keep it in a handy place for future reference.

Contents

Preface

This protocol specifies the communication format and also the data format for the communication of the multi VRF system.

This protocol is applicable to the Multi VRF System(CAN Mode).

Please pay particular attention to the following three points before the development of the BMS software.

1） Make sure you have read the section 6 "*Precautions before the Use of the Communication Module*".

2） Make sure you have read all parts which are about the precautions before the development to the BMS interface of each unit, like 5.1.2 "*Precautions before the Development to the BMS Interface of Multi VRF System(CAN Mode)*"

3） Please contact GREE technicians to confirm the compatibility of the BMS system.

1. Terms and Definitions

1.1 Modbus Communication

Modbus protocol is such a protocol as is used for industrial communication and distributed control system. Modbus network is a master-slave network, allowable for the communication between one master unit and multiple slave units through data interchange. The Modbus communication is realized in the request-response way, that is, each request sent by the master unit is corresponding to a response replied by the slave unit.

1.2 ASCII Mode

Under this mode, as for the communication via the Modbus, eight bits in one piece of information can be transmitted as two ASCII characters.

1.3 RTU Mode

Under this mode, eight bits can be divided into two four-bit hexadecimal characters. The advantage of the RTU mode is that with the same baud rate the transmitted character density is higher than that in the ASCII mode. Each piece of information should be transmitted continuously.

1.4 Master Unit

It indicates the device which sends out the request to Modbus, like a PC.

1.5 Slave Unit

It indicates such a device as is capable of responding to the request sent by the master unit, like a Modbus Gateway which is taken as an example in this protocol.

1.6 Coil

It is expressed by one bit, like the switch bit, failure bit etc. The coil is a universal express way of the Modbus protocol and actually it is a one-bit data value, namely Boolean, switching value.

1.7 Register

It is expressed by two bytes (16 bits), like temperature, mode etc. The register is a universal express way of the Modbus protocol and actually it is a word (16 bits), or an analog value.

1.8 Device Address

It indicates the address of the Modbus Gateway, through which the master unit can identify each Modbus Gateway in the network. Address range: 1～255. “0” is the address of the broadcast (it can be received by all Modbus Gateways).

1.9 Broadcast

When the master unit sends out a control frame, then all slave units in the network can receive it and then all perform this control action (but no reply is given). The device address for the broadcast frame is 0

1.10 Function Code

It is used to identify the function of the communication frame. See the following table for the function codes covered in this protocol.

Table 1 Function Code

Description	Function Code
Read Multiple Coils	0x01
Read Multiple Registers	0x03
Write Multiple Coils	0x0f
Write Multiple Registers	0x10

1.11 Starting Address

It indicates the starting address of the register (coil: bit address; register: word address). The data translation starts from the high-order eight bits to the low-order eight bits.

1.12 Data Size

It indicates the operated data count starting from the starting address (coil: bit count, register: word count). The data translation starts from the high-order eight bits to the low-order eight bits.

1.13 Byte Count

It indicates the count of the effective bytes during the data transmission.

1.14 Effective Data

It indicates the control data, status data etc.

1.15 Alarm Code

It indicates the error type which is detected by the Modbus Gateway when the master unit is sending the request frame.

1.16 CRC

It indicates the cyclic redundancy code consisting of two bytes. The data translation starts from the low eight bits to the high-order eight bits. See Annex A for more details of its calculation.

1.17 Request Frame

It is the request sent by the master unit to the Modbus Gateway.

1.18 Response Frame

It is the response replied by the Modbus Gateway to the request frame sent by the master unit.

1.19 Communication Frame

It is the collection of continuously transmitted bytes during the communication.

1.20 BMS

Its full name is building management system

2. Brief Introduction to the BMS System

1） The Modbus monitoring system is capable of controlling more than 256 sets of outdoor units and 1024 indoor units at the same time.

2） The interface RS485 of Modbus communication protocol, provided by the long-distance monitoring system, can be directly connected with the BMS system or Gree long-distance monitoring system, that is, control more than 256 sets of outdoor units and 1024 indoor units and display their running status at the same time. The control function of the BMS system is equal to that of the long-distance monitoring system. However, the command sent later takes the priority.

3. Network Topology

3.1. General

1） As shown in Fig. 1, it can be seen that the whole network consists of two parts: units network and Modbus network, which are connected through the Modbus Gateway by which the communication data can be interchanged.

3.2. Topological Structure

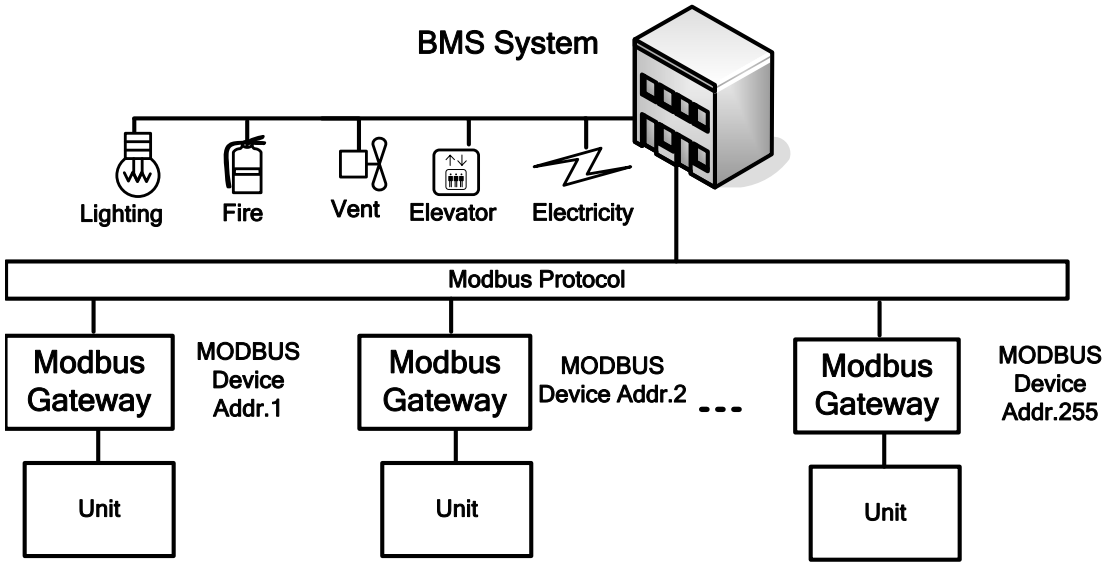

Fig.1：Topological Structure

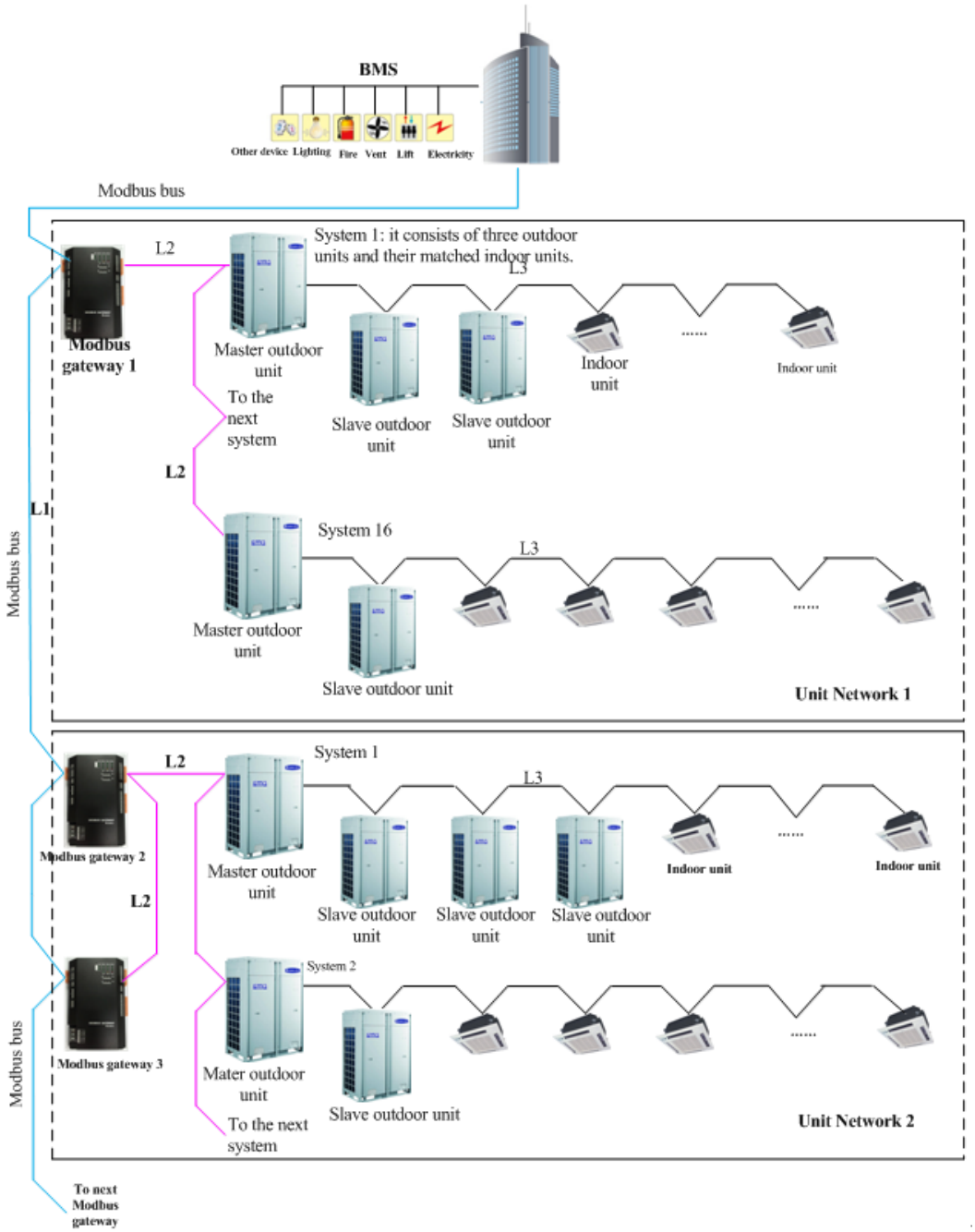

Fig.2 Detailed Network Diagram

Notes:

One modbus bus can support up to 255 Modbus gateways. The address of Modbus gateway is not allowed to be repeated, otherwise communication would fail.

4. 4. MODBUS Protocol Format

4.1. General

Modbus actually has become the industrial communication standard because it is not only fully opened and used widely but also simple and can be debugged flexibly. Besides, as for the communication of multiple units, it can be developed fast and also can be conveniently connected with the devices which support this protocol. There are two communication modes, RTU and ASCII. The former one is adopted for the BMS interface.

4.2. Protocol Interface

The protocol interface is the Modbus RTU protocol.

4.3. Hardware Interface

1) Communication Interface：RS485
2) Communication Mode：Baud Rate：9600 bit/s

（In some special event, other baud rate also can be selected but the communication mode should be compatible with this protocol）

Start Bit：1
Data Bit：8
Check Bit：None
Stop Bit：1

4.4. Universal Communication Frame Format of Modbus under RTU Mode

Start Time Interval	Add. Code	Function Code	Data Area	CRC	Stop Time Interval
T1-T2-T3-T4	1 Byte	1 Byte	n Bytes	2 Bytes	T1-T2-T3-T4

Under the RTU mode, there is at least 3.5ms dead time before the data transmission, which can be figured out through the adopted baud rate (like T1-T2-T3-T4 listed in the table above) and there is another 3.5 ms dead time after the transmission of the last character. After that, another set of data can be transmitted. The whole set of data should be transmitted continuously, if there is a pause more than 1.5 ms, the receiver will jump to the transmission of next set of data.

If the dead time is less than 3.5 ms, the transmission would fail as the CRC for the information combination is ineffective.

4.5. MODBUS Standard Protocol Format

4.5.1. Coil（Bit）

Table 2: Coils Data

Add.	Corresponding Byte	Values
Bit 0	Byte0.0	1
Bit 1	Byte0.1	0
Bit 2	Byte0.2	1
Bit 3	Byte0.3	0
Bit 4	Byte0.4	1
Bit 5	Byte0.5	0
Bit 6	Byte0.6	1
Bit 7	Byte0.7	0
Bit 8	Byte1.0	1
Bit 9	Byte1.1	0
Bit 10	Byte1.2	1
Bit 11	Byte1.3	0
Bit 12	Byte1.4	1
Bit 13	Byte1.5	0
Bit 14	Byte1.6	1

Bit 15	Byte1.7	0
……	……	……

1） “Coil” indicates the data of some flag bit or failure bit etc.
2） The unit of date is bit and each bit has a corresponding address.
3） The data bit exists in the byte of the communication frame and each byte is composed of eight bits. The high-order byte is corresponding to the high-order bit, so is the low-order byte and bit. See Table 2 for more details.
4） The master unit can operate one bit among the communication data or multiple continuous bits at the same time.
5） The bit count which the master unit can read or transmit is less than Byte×8. The ineffective data bit of the last byte should be cleared when transmit or read the effective data of the communication frame. For instance, when nine “1” bits are read or transmitted, then two bytes are need, “1111 1111” and “0000 0001”. For the later byte, the ineffective bits “0” should be cleared.

4.5.2. Register（Word, 16 Bits）

Table 3: Registers Data

Add.	Corresponding Byte	Values
Word 0	Byte 0	AA 55
	Byte 1	
Word 1	Byte 2	AA 55
	Byte 3	
Word 2	Byte 4	55 AA
	Byte 5	
……	……	……
	……	

1） The unit of the register is “word “ which has a corresponding address starting from 0
2） When the master unit reads a word, it needs to read two bytes from the high-order eight bits to the low-order eight bits.
3） When the master unit transmits or read the request frame, it can transmit or read one or multiple continuous words in the data list.

4.5.3. Read Multiple Coils

Note： It can read the coil data but not support the broadcast.

- **Function Code：0x01**

Table 4: Request Frame

Device Add.	Function Code	Starting Add.	Data Size	CRC
1 Byte	1 Byte	2 Bytes	2 Bytes	2 Bytes

Table 5: Response Frame

Device Add.	Function Code	Byte Count	Effective Data	CRC
1 Byte	1 Byte	1 Byte	n Bytes	2 Bytes

- **Starting Address:** it is the starting place where to read a series of bits.
- **Data size：** It indicates the bit count.
- **Case：** Read ten bits from the coil 5 of the device 10(see Table 2 for the coil data), as follows：
- **Request Frame：** 0A(device address)01(function code)00 05(starting address)00 0A(data size)AD 77(CRC）
- **Response Frame：** 0A(device address)01(function code)02(byte count)AA 02(effective data)E3 5C(CRC）.

- The last byte is “0000 0010”，among which the ineffective bits “0” should be cleared.

4.5.4. Write Multiple Coils

Note: The master writes coil data to the Modbus Gateway and also supports the broadcast.

- **Function Code**：0x0F

Table 6: Request Frame

Device Add.	Function Code	Starting Add.	Data Size	Byte Count	Effective Data	CRC
1 Byte	1 Byte	2 Bytes	2 Bytes	1 Byte	n Bytes	2 Bytes

Table 7: Response Frame

Device Add.	Function Code	Starting Add.	Effective Data	CRC
1 Byte	1 Byte	2 Bytes	2 Bytes	2 Bytes
Note: The response frame has the same device address, function code, starting address and data size as the request frame.				

- **Case**: set eleven consecutive bits to “1” from the device 10 and starting at the address 6, as follows:
- **Request Frame:**0A(device address)0F(function code)00 06 (starting address)00 0B(data size)02(byte count) FF 07（effective data)97 A0(CRC)；
- **Response Frame**：0A (device address) 0F (function code) 00 06(starting address) 00 0B (data size) F5 76(CRC)；
- **The last byte is “0000 0010”，among which the ineffective bits “0” should be cleared.**

4.5.5. Read Multiple Registers

Note：Read the register data but do not support the broadcast.

- **Function Code**：0x03

Table 8: Request Frame

Device Add.	Function Code	Starting Add.	Data Size	CRC
1 Byte	1 Byte	2 Bytes	2 Bytes	2 Bytes

Table 9: Response Frame

Device Add.	Function Code	Byte Count	Effective Data	CRC
1 Byte	1 Byte	1 Byte	n Bytes	2 Bytes

- **Starting Add.:** It indicates the starting address to read the block data.
- **Data Size**：It indicates the word count with the maximum of 127 each time.
- **Case:** read two continuous words (see Table 3) from the device 10 starting at the address 1, as follows:
- **Request Frame**：0A (device address) 03 (function code) 00 01(starting address) 00 02(data size)94 B0 (CRC);
- **Response Frame:** 0A (device address) 03 (function code) 04(byte count) AA 55 55 AA (effective data) CE 14(CRC).

4.5.6. Write Multiple Registers

Note： Write control data from the master unit to the register and support the broadcast

- **Function Code：** 0x10

Table 10: Request Frame

Device Add.	Function Code	Starting Add.	Data Size	Byte Count	Effective Date	CRC
1 Byte	1 Byte	2 Bytes	2 Bytes	1 Byte	n Bytes	2 Bytes

Table 11: Response Frame

Device Add.	Function Code	Starting Add.	Effective Data	CRC
1 Byte	1 Byte	2 Bytes	2 Bytes	2 Bytes
Note: The response frame has the same device address, function code, starting address and data size as the request frame.				

- **Case**: Write three words (0x12, 0x23, 0x34) from the device 10 starting at the address 2, as follows:
- **Request Frame:** 0A (device address) 10 (function code) 00 02(starting address) 00 03(data size) 06 (byte count) 00 12 00 23 00 34(effective data) 15 DF (CRC)
- **Response Frame:** 0A (device address) 10 (function code) 00 02 (starting address) 00 03 (data size) 20 B3 (CRC)

4.5.7. Alarm Response

Note: The master unit sends out a request frame, but the Modbus Gateway detects that there is some default, so an alarm response alarm is replied.

- **Function Code**: Set the highest-order bit to "1", which is value figured out through the OR operation of the request frame's function code and 0x80.

Communication Format of the Response Frame:

Table12: Alarm Response Frame

Device Add.	Function Code	Alarm Code	CRC
1 Byte	1 Byte	1 Bytes	2 Bytes

Description to the Alarm Codes:

Table13: Alarm Codes

Alarm Code	Name	Description
0x03	Illegal data	The transmitted data is incorrect or beyond the data area.
0x04	Slave device failure	There is communicating failure between the Modbus Gateway and the unit.

- **Case**: Read 128 words from the device 10 starting at the address 0, but the data size 80 exceeds the read range of Modbus , so the replay of the alarm response frame is as follows:
- **Request Frame:** 0A (device address) 03(function code) 00 00(starting address) 00 80(data size) 45 11 (CRC);
- **Reponses Frame**: 0A (device address) 83(function code) 03(alarm code) 70 F3 (CRC).

5. Communication Protocol for GMV Multi VRF System

5.1. General

1） The BMS is available to provide the Modbus protocol interface. The long-distance monitoring system can be used to monitor the Multi VRF System(CAN Mode) or be incorporated into the BMS system. Through the long-distance monitoring PC or the BMS system, the user can take a centralized management and control to up to 256 sets of outdoor units and 1024 indoor units. It without doubt is the high-efficiency tool for the management of the intelligent air conditioners system in the modern buildings.

2） This BMS system is applicable to the Multi VRF System(CAN Mode).

3） Through this interface, it can not only realize the long-distance monitoring to the unit, including the running temperature of the unit, the status of the compressor, and the failure status but also set the unit long distantly, like temperature, running mode, on/off, mode shield, on/off shield etc.

4） In the protocol, “R” indicates “only read” and “W/R” indicates “write and read”.

5.2. Precautions before the Software Development to the BMS Interface for the GMV Multi VRF System

Before the software development to the provided BMB interface, please make sure the setting of the DIP switch and the wiring are correct.

- **Precautions to the Software Design：**

★（1）： When there is a conflict with cooling and heating type of outdoor unit, the mode set by BMS system software is invalid. Monitoring software is suggested to indicate invalid operation.
If the outdoor unit is cooling only type, setting of heating/floor heating/heat supply/quick heating is invalid;
If the outdoor unit is heating only type, setting of cooling/dehumidifying is invalid;
If the outdoor unit is air supply type, setting of other modes is void, except air supply/fresh air.

★（2）：When there is a conflict with the mode of master indoor unit, the indoor unit mode set by BMS system software is invalid; Floor heating/heat supply/quick heating modes are handled only by the corresponding indoor units and they are invalid for other indoor units.

★（3）：When the frame type of exception response received by BMS system software is 0x04, it means there is communication malfunction between the unit and gateway.

★（4）： Energy saving process:
When “energy saving” functional is turned on, all upper limit temperature and lower limit temperature of energy saving will react.
Setting lower limit temperature of cooling energy saving: when “energy saving” reacts and the lower limit of energy-saving temperature is higher than the *Temperature setting* set by BMS system software, BMS system software is suggested to indicate operation failure if BMS system software sets *Temperature setting*. It is valid only when the *Temperature setting* set by BMS system software is higher than the lower limit of energy saving temperature. Lower limit temperature setting of dehumidifying energy saving, quick heating energy saving and heat supply energy saving are in a similar way.
Setting upper limit temperature of heating energy saving: when “energy saving” reacts and the upper limit energy-saving temperature is lower than the *Temperature setting* by BMS system software, BMS system software is suggested to indicate operation failure if BMS system software sets *Temperature setting*. It is valid only when the *Temperature setting* set by BMS system software is lower than the upper limit temperature of energy saving.

★（5）： Determine the effective range of all data sent by BMS system software to gateway.

★（6）： After de-energization and energization of gateway, prior to not receiving one frame of effective device information data, the gateway will report abnormal response 04.

★（7）： Forced mode of outdoor unit takes priority over control of BMS system software. In this case, any control of BMS system software is invalid.

★（8）： Remote lock
Under any status, setting is valid;
Under remote lock status, forced mode of outdoor unit is valid, as well as hardware resetting of indoor unit.

★（9）： ON / OFF

When unit is forcedly shutdown with power shortage (displaying malfunction code L8), start-up sent by BMS system software is invalid.
In any other case, On/Off by BMS system software is valid.
★（10）： Remote shielding of ON / OFF, shielding ON, shielding OFF
Under any status, setting is valid;
Under these three shielding status, timer of indoor unit is temporarily invalid (timer mark is not cleared), and can not be set; But timer can be cancelled by remote controller;
★（11）： 8℃ heating function (i.e. absence mode)
It is valid only to set the function under heating mode. 8℃ heating (absence mode) will exit automatically if switch to other modes. When 8℃ heating has been set, fan speed and sleep setting are invalid;
8℃ heating (i.e. absence mode) and remote shielding of temperature setting are mutually exclusive, whichever set first will prevail: that is to say, if remote shield temperature setting has been set, 8℃ heating (i.e. absence mode) cannot be set; if indoor unit has been under 8℃ heating (i.e. absence mode), it is invalid to set remote shield temperature setting function;
★（12）： Low temperature dehumidifying:
Setting of low temperature dehumidifying is valid only under the dehumidifying mode. Low temperature dehumidifying mode will exit automatically when switching to other mode;
Low temperature dehumidifying and remote shielding of temperature setting are mutually exclusive, the same as that of 8℃ heating.
Under low temperature dehumidifying, set temperature is forced to be 12℃;
★（13）： Temperature setting
Set temperature is forced to be 8℃ or 12℃ when the unit is under 8℃ heating or low temperature dehumidifying. In this case, Temperature setting by BMS system software is invalid.
When energy saving of indoor unit is turned on, temperature set by BMS system software will be invalid if it is beyond the limited value of energy saving (for example, the lower limit of energy saving in cooling is 20℃. If the temperature set by BMS system software is lower than 20℃, it will be invalid); The energy saving will be of no effect temporarily, if the BMS system software sets shielding temperature. In this case, it shall response the temperature set by BMS system software.
★（14）： Shielding of temperature setting
Shielding of temperature setting is mutually exclusive with absence mode (8℃ heating) and low temperature dehumidifying (whichever set first will prevail);
Energy saving will be of no effect temporarily when set temperature has been shielded;
Sleep mode will be cancelled and cannot be set when set temperature has been shielded.
★（15）： Energy saving and its limited temperature
Under fan mode, energy saving setting is invalid;
Energy saving will be of no effect temporarily when set temperature has been shielded (energy saving mark cannot be cleared);
Under any status, setting limited temperature of energy saving is valid.
★（16）： Shielding of energy saving:
Under any status, setting is valid.
★（17）： Sleep mode
The current indoor unit only has sleep mode 2. If long-distance monitoring sets sleep mode 1, mode 2 or mode 3, all of them are analyzed to be sleep mode 2, and the status responded by indoor unit is also sleep mode 2;
Sleep mode will be cancelled and can not be set when shielding temperature setting.
Sleep mode will retime when adjusting temperature setting (including BMS system software).
★（18）： Fan speed:
Under dehumidifying mode, fan speed is forced to be low fan speed. Other fan speed set by BMS system software is invalid.
If BMS system software sets the fan speed with indoor unit under turbo status or forced quiet status, the indoor unit will exit from the status; under 8℃ heating, fan speed is forced to be auto. Setting other fan speed is invalid;
If the fan of indoor unit only has three kinds of fan speed, the five kinds of fan speed sent by BMS system software will be analyzed as below: low and medium-low fan speed are analyzed to be low fan speed; medium fan speed is analyzed to be medium fan speed; medium-high and high fan speed are analyzed to be

high fan speed;

★（19）： Turbo

The setting is valid only under cooling/heating mode and invalid under other modes.

Turbo cannot be set under 8℃ heating;

When the indoor unit is running under quiet mode, if BMS system software sets turbo mode and it is valid, the indoor unit will enter turbo mode and exit from quiet mode;

★（20）： Quiet

Under dehumidifying/fan mode, quiet setting is invalid;

Quiet mode cannot be set under 8℃ heating;

When the indoor unit is running under turbo mode, if BMS system software sets quiet mode and it is valid, the indoor unit will enter quiet mode and exit from turbo mode;

★（21）： Swing

Setting of up&down swing and left&right swing is only valid to the model with these swing ways (see indoor unit logic);

For the indoor unit without fixed angel swing function, setting (up&down, left&right) swing in position 1, position 2, position 3, position 4 and position 5 are equal to swing off; other settings are equal to swing on;

★（22）： Drying

Setting drying mode is valid only under cooling/dehumidifying mode and unit on status; it will not be cancelled in case of switching mode.

★（23）： Air exchange

Setting air exchange function by BMS system software is valid under any status;

Manual shutdown (including BMS system software) and timer off will turn off air exchange function;

★（24）： Filter cleaning reminder and elimination:

Under any status, setting is valid;

★（25）： Shielding of timer

Under any status, setting is valid;

Timer of indoor unit will be of no effect temporarily if timer is shielded (timer mark is not cleared); Timer is not displayed and cannot be set; Timer will recover after canceling shielding;

★（26）： Prohibition of auxiliary heating

Under any status, setting is valid;

Export unit doesn’t have controllable auxiliary heating function and prohibition function of auxiliary heating.

5.3. Definition of Effective Data

The data for the Modbus communication protocol can be divided into two types: register and switching value. The former one indicates the values of temperature, valves and other continuous, multi-mode values, while the later one indicates the value which only has two status, like the temperature sensor failure (with only two options: "Yes" or "No").

1. Data and Address Distribution of the Analog Values: (Word 0 ~ Word 3458）

Add.	Access Type R: only read W/R: write/ read	Data Meaning	Range	Accuracy	Unit	Data Type (Actual Value)	Pay special attention to the data marked with ★(see section 5.2)	Remarks
……								
Word 101	R	Project No. of starting indoor unit of gateway	Transmission value=true value, true value: 1; 129;	/	/	Unsigned integer type		Gateway data
Word 102	W/R	On/off	Transmission value=true value, true value: On: 0xAA; Off: 0x55	/	/	Unsigned integer type	★（9）	Data of 1# indoor unit
Word 103	W	Operation mode setting	Transmission value=true value, true value: 0: invalid; 1: cooling; 2: dehumidifying; 3: fan; 4: heating; 5: automatic; 6: floor heating; 7: quick heating; 8: heat supply	/	/	Unsigned integer type	★（2）	
	R	Operation mode reading	Transmission value=true value, true value: 0: invalid; 1: cooling; 2: dehumidifying; 3: fan ; 4: heating; 5: auto cool; 6: auto heat; 7: floor heating; 8: quick-heat; 9: heat supply; A:clothes-drying; B: ventilation; C:fresh; D: auto dehumidify;	/	/	Unsigned integer type		
Word 104	W/R	Temperature setting	Transmission value=true value×10, true value: 16～30;	1	℃	Unsigned integer type	★（13）	
Word 105	W	Fan speed setting	Transmission value=true value, true value: 0: invalid; 1: auto fan speed; 2: low fan speed; 3: medium-low fan speed; 4: medium fan speed; 5: medium-high fan speed; 6: high fan speed; 7: turbo	/	/	Unsigned integer type	★（18）、★（19）	
	R	Fan speed reading	Transmission value=true value, true value: 0: invalid; 1: fan stop; 2: ultra-low fan speed; 3: low fan speed; 4: medium-low fan speed;	/	/	Unsigned integer type		

			5: medium fan speed; 6: medium-high fan speed; 7: high fan speed; 8: ultra-high fan speed; 9: quiet fan speed R1; A: quiet fan speed R2; B: quiet fan speed R3;					
Word 106	W/R	Setting lower limit temperature of cooling energy saving	Transmission value=true value×10, true value: 16～30;	1	℃	Unsigned integer type	★（4）	
Word 107	W/R	Setting upper limit temperature of heating energy saving	Transmission value=true value×10, true value: 16～30;	1	℃	Unsigned integer type	★（4）	
Word 108	W/R	Setting lower limit temperature of dehumidifying energy saving	Transmission value=true value×10, true value: 16～30;	1	℃	Unsigned integer type	★（4）	
……								
Word 116	R	Indoor ambient temperature	Transmission value=true value×10, true value range: (-30~138);	0.1	℃	Floating-point type		
Word 117	R	Gate control status	Transmission value=true value, true value: 0: invalid; 1: without gate control; 2: insert card; 3. pull out card;	/	/	Unsigned integer type		
Word 118	R	Outdoor unit number which indoor unit belongs to	Transmission value=true value, true value range: (1~16);	/	/	Unsigned integer type		

Word 123	R	Rated capacity of indoor unit	Transmission value=true value, true value: 22; 25; 28; 32; 36; 40; 45; 50; 56; 63; 71; 80; 90; 100; 112; 125; 140; 160; 180; 224; 250; 280; 335; 350; 400; 450; 500; 560;	1	Hecto watt	Unsigned integer type		
……								
Word (102+25*(n-1))	W/R	On/off	Transmission value=true value, true value: On: 0xAA; Off: 0x55	/	/	Unsigned integer type	★（9）	Data of n# indoor unit
Word (103+25*(n-1))	W	Operation mode setting	Transmission value=true value, true value: 0: invalid; 1: cooling; 2: dehumidifying; 3: fan; 4: heating; 5: automatic; 6: floor heating; 7: quick heating; 8: heat supply	/	/	Unsigned integer type	★（2）	
	R	Operation mode reading	Transmission value=true value, true value: 0: invalid; 1: cooling; 2: dehumidifying; 3: fan ; 4: heating; 5: auto cool; 6: auto heat; 7: floor heating; 8: quick-heat; 9: heat supply; A:clothes-drying; B: ventilation; C:fresh; D: auto dehumidify;	/	/	Unsigned integer type		
Word (104+25*(n-1))	W/R	Temperature setting	Transmission value=true value ×10, true value: 16～30;	1	℃	Unsigned integer type	★（13）	

Word 105+25*(n-1))	W	Fan speed setting	Transmission value=true value, true value: 0: invalid; 1: auto fan speed; 2: low fan speed; 3: medium-low fan speed; 4: medium fan speed; 5: medium-high fan speed; 6: high fan speed; 7: turbo	/	/	Unsigned integer type	★（18）、★（19）	
	R	Fan speed reading	Transmission value=true value, true value: 0: invalid; 1: fan stop; 2: ultra-low fan speed; 3: low fan speed; 4: medium-low fan speed; 5: medium fan speed; 6: medium-high fan speed; 7: high fan speed; 8: ultra-high fan speed; 9: quiet fan speed R1; A: quiet fan speed R2; B: quiet fan speed R3;	/	/	Unsigned integer type		
Word 106+25*(n-1))	W/R	Setting lower limit temperature of cooling energy saving	Transmission value=true value ×10, true value: 16～30;	1	℃	Unsigned integer type	★（4）	
Word 107+25*(n-1))	W/R	Setting upper limit temperature of heating energy saving	Transmission value=true value ×10, true value: 16～30;	1	℃	Unsigned integer type	★（4）	
Word 108+25*(n-1))	W/R	Setting lower limit temperature of dehumidifying energy saving	Transmission value=true value ×10, true value: 16～30;	1	℃	Unsigned integer type	★（4）	
……								
Word (116+25*(n-1))	R	Indoor ambient temperature	Transmission value=true value × 10, true value range: (-30~138);	0.1	℃	Floating-point type		
Word (117+25*(n-1))	R	Gate control status	Transmission value=true value, true value: 0: invalid; 1: without gate control; 2: insert card; 3. pull out card;	/	/	Unsigned integer type		
Word (118+25*(n-1))	R	Outdoor unit number which indoor unit belongs to	Transmission value=true value, true value range: (1~16);	/	/	Unsigned integer type		

Word (123+25*(n-1))	R	Rated capacity of indoor unit	Transmission value=true value, true value: 22; 25; 28; 32; 36; 40; 45; 50; 56; 63; 71; 80; 90; 100; 112; 125; 140; 160; 180; 224; 250; 280; 335; 350; 400; 450; 500; 560;	1	Hecto watt	Unsigned integer type		
……								
Word 3277	W/R	On/off	Transmission value=true value, true value: On: 0xAA; Off: 0x55	/	/	Unsigned integer type	★（9）	Data of 128# indoor unit
Word 3278	W	Operation mode setting	Transmission value=true value, true value: 0: invalid; 1: cooling; 2: dehumidifying; 3: fan; 4: heating; 5: automatic; 6: floor heating; 7: quick heating; 8: heat supply	/	/	Unsigned integer type	★（2）	
	R	Operation mode reading	Transmission value=true value, true value: 0: invalid; 1: cooling; 2: dehumidifying; 3: fan ; 4: heating; 5: auto cool; 6: auto heat; 7: floor heating; 8: quick-heat; 9: heat supply; A:clothes-drying; B: ventilation; C:fresh; D: auto dehumidify;	/	/	Unsigned integer type		

Word 3279	W/R	Temperature setting	Transmission value=true value ×10, true value: 16～30;	1	℃	Unsigned integer type	★（13）	
Word 3280	W	Fan speed setting	Transmission value=true value, true value: 0: invalid; 1: auto fan speed; 2: low fan speed; 3: medium-low fan speed; 4: medium fan speed; 5: medium-high fan speed; 6: high fan speed; 7: turbo	/	/	Unsigned integer type	★（18）、★（19）	
	R	Fan speed reading	Transmission value=true value, true value: 0: invalid; 1: fan stop; 2: ultra-low fan speed; 3: low fan speed; 4: medium-low fan speed; 5: medium fan speed; 6: medium-high fan speed; 7: high fan speed; 8: ultra-high fan speed; 9: quiet fan speed R1; A: quiet fan speed R2; B: quiet fan speed R3;	/	/	Unsigned integer type		
Word 3281	W/R	Setting lower limit temperature of cooling energy saving	Transmission value=true value ×10, true value: 16～30;	1	℃	Unsigned integer type	★（4）	
Word 3282	W/R	Setting upper limit temperature of heating energy saving	Transmission value=true value ×10, true value: 16～30;	1	℃	Unsigned integer type	★（4）	
Word 3283	W/R	Setting lower limit temperature of dehumidifying energy saving	Transmission value=true value ×10, true value: 16～30;	1	℃	Unsigned integer type	★（4）	
……								
Word 3291	R	Indoor ambient temperature	Transmission value=true value × 10, true value range: (-30~138);	0.1	℃	Floating-point type		
Word 3292	R	Gate control status	Transmission value=true value, true value: 0: invalid; 1: without gate control; 2: insert card; 3. pull out card;	/	/	Unsigned integer type		
Word 3293	R	Outdoor unit number which indoor unit belongs to	Transmission value=true value, true value range: (1~16);	/	/	Unsigned integer type		

Word 3298	R	Rated capacity of indoor unit	Transmission value=true value, true value: 22; 25; 28; 32; 36; 40; 45; 50; 56; 63; 71; 80; 90; 100; 112; 125; 140; 160; 180; 224; 250; 280; 335; 350; 400; 450; 500; 560;	1	Hecto watt	Unsigned integer type		
Word 3302	W/R	Setting upper limit capacity of outdoor unit	Transmission value=true value, true value: 30~100	/	%	Unsigned integer type	Note: DC Inverter GMV Water Cool Heat Pump unit is without this parameter	Data of 1# outdoor unit
Word 3303	R	Reserved						
Word 3304	R	Reserved						
Word 3305	R	Reserved						
Word 3306	R	Cooling and heating mode of complete unit	Transmission value=true value; true value: 0: invalid; 1: cooling only; 2: heating; 3: cooling and heating; 4: fan	/		Unsigned integer type	★（1）	
Word 3307	R	Outdoor ambient temperature	Transmission value=true value×10, true value range: (-30~155);	0.1	℃	Floating-point type	Note: DC Inverter GMV Water Cool Heat Pump unit is without this parameter	

Word 3308	R	Emergency operation mode	Transmission value=true value; true value: 1: Without emergency operation; 2: Emergency operation of compressor; 3: Emergency operation of fan; 4: Emergency operation of module;	/	/	Unsigned integer type		
……								
Word (3302+10*(m-1))	W/R	Setting upper limit capacity of outdoor unit	Transmission value=true value, true value: 30~100	/	%	Unsigned integer type	Note: DC Inverter GMV Water Cool Heat Pump unit is without this parameter	Data of m# outdoor unit
Word (3303+10*(m-1))	R	Reserved						
Word (3304+10*(m-1))	R	Reserved						
Word (3305+10*(m-1))	R	Reserved						
Word (3306+10*(m-1))	R	Cooling and heating mode of complete unit	Transmission value=true value; true value: 0: invalid; 1: cooling only; 2: heating; 3: cooling and heating; 4: fan	/		Unsigned integer type	★（1）	
Word (3307+10*(m-1))	R	Outdoor ambient temperature	Transmission value=true value×10, true value range: (-30~155);	0.1	℃	Floating-point type	Note: DC Inverter GMV Water Cool Heat Pump unit is without this parameter	
Word (3308+10*(m-1))	R	Emergency operation mode	Transmission value=true value; true value: 1: Without emergency operation; 2: Emergency operation of compressor; 3: Emergency operation of fan; 4: Emergency operation of module;	/	/	Unsigned integer type		
……								
Word 3452	W/R	Setting upper limit capacity of outdoor unit	Transmission value=true value, true value: 30~100	/	%	Unsigned integer type	Note: DC Inverter GMV Water Cool Heat Pump unit is without this parameter	Data of 16# outdoor unit
Word 3453	R	Reserved						
Word 3454	R	Reserved						

Word 3455	R	Reserved						
Word 3456	R	Cooling and heating mode of complete unit	Transmission value=true value; true value: 0: invalid; 1: cooling only; 2: heating; 3: cooling and heating; 4: fan	/		Unsigned integer type	★（1）	
Word 3457	R	Outdoor ambient temperature	Transmission value=true value×10, true value range: (-30~155);	0.1	℃	Floating-point type	Note: DC Inverter GMV Water Cool Heat Pump unit is without this parameter	
Word 3458	R	Emergency operation mode	Transmission value=true value; true value: 1: Without emergency operation; 2: Emergency operation of compressor; 3: Emergency operation of fan; 4: Emergency operation of module;	/	/	Unsigned integer type		
……								

2. Data and Address Distribution of Switching Value：（Bit 0 ~ Bit 9263）

Add. Bit	Access Type R: only read W/R: write/read	Meaning of Data Bit	Range	Parameter Type	Pay special attention to the data marked with ★(see section 5.2)	Remarks
……						
Bit 88	R	1# outdoor unit with/without	0:without, 1: with	Status parameter		Outdoor unit 1~16, with or without
Bit 89	R	2# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 90	R	3# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 91	R	4# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 92	R	5# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 93	R	6# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 94	R	7# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 95	R	8# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 96	R	9# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 97	R	10# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 98	R	11# outdoor unit with/without	0:without, 1: with	Status parameter		

Bit 99	R	12# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 100	R	13# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 101	R	14# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 102	R	15# outdoor unit with/without	0:without, 1: with	Status parameter		
Bit 103	R	16# outdoor unit with/without	0:without, 1: with	Status parameter		
.....						
Bit 120	R	1# indoor unit with/without	0:without, 1: with	Status parameter		Indoor unit 1~128, with or without information
Bit 121	R	2# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 122	R	3# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 123	R	4# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 124	R	5# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 125	R	6# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 126	R	7# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 127	R	8# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 128	R	9# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 129	R	10# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 130	R	11# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 131	R	12# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 132	R	13# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 133	R	14# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 134	R	15# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 135	R	16# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 136	R	17# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 137	R	18# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 138	R	19# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 139	R	20# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 140	R	21# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 141	R	22# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 142	R	23# indoor unit with/without	0:without, 1: with	Status		

				parameter	
Bit 143	R	24# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 144	R	25# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 145	R	26# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 146	R	27# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 147	R	28# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 148	R	29# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 149	R	30# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 150	R	31# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 151	R	32# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 152	R	33# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 153	R	34# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 154	R	35# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 155	R	36# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 156	R	37# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 157	R	38# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 158	R	39# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 159	R	40# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 160	R	41# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 161	R	42# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 162	R	43# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 163	R	44# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 164	R	45# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 165	R	46# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 166	R	47# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 167	R	48# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 168	R	49# indoor unit with/without	0:without, 1: with	Status parameter	
Bit 169	R	50# indoor unit with/without	0:without, 1: with	Status parameter	

Bit 170	R	51# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 171	R	52# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 172	R	53# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 173	R	54# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 174	R	55# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 175	R	56# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 176	R	57# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 177	R	58# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 178	R	59# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 179	R	60# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 180	R	61# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 181	R	62# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 182	R	63# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 183	R	64# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 184	R	65# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 185	R	66# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 186	R	67# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 187	R	68# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 188	R	69# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 189	R	70# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 190	R	71# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 191	R	72# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 192	R	73# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 193	R	74# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 194	R	75# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 195	R	76# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 196	R	77# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 197	R	78# indoor unit with/without	0:without, 1: with	Status		

				parameter		
Bit 198	R	79# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 199	R	80# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 200	R	81# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 201	R	82# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 202	R	83# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 203	R	84# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 204	R	85# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 205	R	86# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 206	R	87# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 207	R	88# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 208	R	89# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 209	R	90# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 210	R	91# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 211	R	92# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 212	R	93# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 213	R	94# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 214	R	95# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 215	R	96# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 216	R	97# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 217	R	98# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 218	R	99# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 219	R	100# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 220	R	101# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 221	R	102# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 222	R	103# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 223	R	104# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 224	R	105# indoor unit with/without	0:without, 1: with	Status parameter		

Bit 225	R	106# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 226	R	107# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 227	R	108# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 228	R	109# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 229	R	110# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 230	R	111# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 231	R	112# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 232	R	113# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 233	R	114# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 234	R	115# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 235	R	116# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 236	R	117# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 237	R	118# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 238	R	119# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 239	R	120# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 240	R	121# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 241	R	122# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 242	R	123# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 243	R	124# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 244	R	125# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 245	R	126# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 246	R	127# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 247	R	128# indoor unit with/without	0:without, 1: with	Status parameter		
Bit 248	W/R	Remote emergency stop of 1# outdoor unit	0:off, 1: on	Status parameter		Outdoor unit 1~16 remote emergency stop signal
Bit 249	W/R	Remote emergency stop of 2# outdoor unit	0:off, 1: on	Status parameter		
Bit 250	W/R	Remote emergency stop of 3# outdoor unit	0:off, 1: on	Status parameter		
Bit 251	W/R	Remote emergency stop of 4# outdoor unit	0:off, 1: on	Status parameter		
Bit 252	W/R	Remote emergency stop of 5#	0:off, 1: on	Status		

		outdoor unit		parameter		
Bit 253	W/R	Remote emergency stop of 6# outdoor unit	0:off, 1: on	Status parameter		
Bit 254	W/R	Remote emergency stop of 7# outdoor unit	0:off, 1: on	Status parameter		
Bit 255	W/R	Remote emergency stop of 8# outdoor unit	0:off, 1: on	Status parameter		
Bit 256	W/R	Remote emergency stop of 9# outdoor unit	0:off, 1: on	Status parameter		
Bit 257	W/R	Remote emergency stop of 10# outdoor unit	0:off, 1: on	Status parameter		
Bit 258	W/R	Remote emergency stop of 11# outdoor unit	0:off, 1: on	Status parameter		
Bit 259	W/R	Remote emergency stop of 12# outdoor unit	0:off, 1: on	Status parameter		
Bit 260	W/R	Remote emergency stop of 13# outdoor unit	0:off, 1: on	Status parameter		
Bit 261	W/R	Remote emergency stop of 14# outdoor unit	0:off, 1: on	Status parameter		
Bit 262	W/R	Remote emergency stop of 15# outdoor unit	0:off, 1: on	Status parameter		
Bit 263	W/R	Remote emergency stop of 16# outdoor unit	0:off, 1: on	Status parameter		
……						
Bit 280	W	Setting all indoor units on	0: No, 1: Yes	Status parameter		
Bit 281	W	Setting all indoor units off	0: No, 1: Yes	Status parameter		
Bit 282	R	Reserved				
Bit 283	R	Reserved				
Bit 284	R	Reserved				
Bit 285	R	Reserved				
Bit 286	R	Reserved				
Bit 287	R	Reserved				
Bit 288	W/R	Remote shielding of energy saving function	0: no shielding, 1: shielding	Status parameter		Data of 1# indoor unit
Bit 289	W/R	Remote shielding of temperature setting function	0: no shielding, 1: shielding	Status parameter	★（14）	
Bit 290	W/R	Remote shielding of mode function	0: no shielding, 1: shielding	Status parameter		
Bit 291	W/R	Remote shielding of on/off function	0: no shielding, 1: shielding	Status parameter	★（10）	
Bit 292	W/R	Remote lock function	0: no shielding, 1: shielding	Status parameter	★（8）	
Bit 293	W/R	Indoor unit with power supply priority	0: No, 1: Yes	Status parameter	Power shortage mode of power supply system, indoor unit is with power	

					supply priority
Bit 294	W/R	Up&down swing	0: Off, 1: On	Status parameter	★（21）
Bit 295	W/R	Left&right swing	0: Off, 1: On	Status parameter	★（21）
Bit 296	W/R	Energy saving setting	0: Off, 1: On	Status parameter	★（4）、★（15）
Bit 297	W/R	Prohibit turning on auxiliary heating	0: Allow turning on auxiliary heating, 1: Prohibit turning on auxiliary heating	Status parameter	★（26）
Bit 298	W/R	Power-off memory of indoor unit	0: stand-by, 1: power-off memory	Status parameter	
Bit 299	W/R	Cancel filter cleaning reminder	0: No, 1: Yes;	Status parameter	★（24）
Bit 300	W/R	Drying	0: Off, 1: On	Status parameter	★（22）
Bit 301	W/R	Sleep	0: Off, 1: On	Status parameter	★（17）
Bit 302	W/R	Quiet	0: Off, 1: On	Status parameter	★（20）
Bit 303	W/R	Air exchange	0: Off, 1: On	Status parameter	★（23）
Bit 304	W/R	Low temperature dehumidifying	0: cancel, 1: start	Status parameter	★（12）
Bit 305	W/R	Shielding ON	0: no shielding, 1: shielding	Status parameter	★（10）
Bit 306	W/R	Shielding OFF	0: no shielding, 1: shielding	Status parameter	★（10）
Bit 307	W/R	Shielding of timer	0: no shielding, 1: shielding	Status parameter	★（25）
Bit 308	W/R	8℃ heating function setting	0: cancel 8℃ heating, 1: start 8℃ heating	Status parameter	★（11）
Bit 309	R	Reserved			
Bit 310	R	Reserved			
Bit 311	R	Reserved			
Bit 312	R	Reserved			
Bit 313	R	Reserved			
Bit 314	R	Reserved			
Bit 315	R	Master mode indoor unit/slave mode indoor unit	0: Slave mode indoor unit, 1: Master mode indoor unit;	Status parameter	★（2）
Bit 316	R	Auxiliary electric heating of indoor unit	0: Off, 1: On	Status parameter	

Bit 317	R	Reserved				
Bit 318	R	Reserved				
Bit 319	R	Indoor unit general malfunction	0: No, 1: Yes	Malfunction parameter		
……						
Bit (288+64*(n-1))	W/R	Remote shielding of energy saving function	0: no shielding, 1: shielding	Status parameter		Data of n# indoor unit
Bit (289+64*(n-1))	W/R	Remote shielding of temperature setting function	0: no shielding, 1: shielding	Status parameter	★（14）	
Bit (290+64*(n-1))	W/R	Remote shielding of mode function	0: no shielding, 1: shielding	Status parameter		
Bit (291+64*(n-1))	W/R	Remote shielding of on/off function	0: no shielding, 1: shielding	Status parameter	★（10）	
Bit (292+64*(n-1))	W/R	Remote lock function	0: no shielding, 1: shielding	Status parameter	★（8）	
Bit (293+64*(n-1))	W/R	Indoor unit with power supply priority	0: No, 1: Yes	Status parameter		
Bit (294+64*(n-1))	W/R	Up&down swing	0: Off, 1: On	Status parameter	★（21）	
Bit (295+64*(n-1))	W/R	Left&right swing	0: Off, 1: On	Status parameter	★（21）	
Bit (296+64*(n-1))	W/R	Energy saving setting	0: Off, 1: On	Status parameter	★（4）、★（15）	
Bit (297+64*(n-1))	W/R	Prohibit turning on auxiliary heating	0: Allow turning on auxiliary heating, 1: Prohibit turning on auxiliary heating	Status parameter	★（26）	
Bit (298+64*(n-1))	W/R	Power-off memory of indoor unit	0: stand-by, 1: power-off memory	Status parameter		
Bit (299+64*(n-1))	W/R	Cancel filter cleaning reminder	0: No, 1: Yes;	Status parameter	★（24）	
Bit (300+64*(n-1))	W/R	Drying	0: Off, 1: On	Status parameter	★（22）	
Bit (301+64*(n-1))	W/R	Sleep	0: Off, 1: On	Status parameter	★（17）	

Bit (302+64*(n-1))	W/R	Quiet	0: Off, 1: On	Status parameter	★（20）
Bit (303+64*(n-1))	W/R	Air exchange	0: Off, 1: On	Status parameter	★（23）
Bit (304+64*(n-1))	W/R	Low temperature dehumidifying	0: cancel, 1: start	Status parameter	★（12）
Bit (305+64*(n-1))	W/R	Shielding ON	0: no shielding, 1: shielding	Status parameter	★（10）
Bit (306+64*(n-1))	W/R	Shielding OFF	0: no shielding, 1: shielding	Status parameter	★（10）
Bit (307+64*(n-1))	W/R	Shielding of timer	0: no shielding, 1: shielding	Status parameter	★（25）
Bit (308+64*(n-1))	W/R	8℃ heating function setting	0: cancel 8℃ heating, 1: start 8℃ heating	Status parameter	★（11）
Bit (309+64*(n-1))	R	Reserved			
Bit (310+64*(n-1))	R	Reserved			
Bit (311+64*(n-1))	R	Reserved			
Bit (312+64*(n-1))	R	Reserved			
Bit (313+64*(n-1))	R	Reserved			
Bit (314+64*(n-1))	R	Reserved			
Bit (315+64*(n-1))	R	Master mode indoor unit/slave mode indoor unit	0: Slave mode indoor unit, 1: Master mode indoor unit;	Status parameter	★（2）
Bit (316+64*(n-1))	R	Auxiliary electric heating of indoor unit	0: Off, 1: On	Status parameter	
Bit (317+64*(n-1))	R	Reserved			

Bit (318+64*(n-1))	R	Reserved				
Bit (319+64*(n-1))	R	Indoor unit general malfunction	0: No, 1: Yes	Malfunction parameter		
……						
Bit 8416	W/R	Remote shielding of energy saving function	0: no shielding, 1: shielding	Status parameter		Data of 128# indoor unit
Bit 8417	W/R	Remote shielding of temperature setting function	0: no shielding, 1: shielding	Status parameter	★（14）	
Bit 8418	W/R	Remote shielding of mode function	0: no shielding, 1: shielding	Status parameter		
Bit 8419	W/R	Remote shielding of on/off function	0: no shielding, 1: shielding	Status parameter	★（10）	
Bit 8420	W/R	Remote lock function	0: no shielding, 1: shielding	Status parameter	★（8）	
Bit 8421	W/R	Indoor unit with power supply priority	0: No, 1: Yes	Status parameter	Power shortage mode of power supply system, indoor unit is with power supply priority	
Bit 8422	W/R	Up&down swing	0: Off, 1: On	Status parameter	★（21）	
Bit 8423	W/R	Left&right swing	0: Off, 1: On	Status parameter	★（21）	
Bit 8424	W/R	Energy saving setting	0: Off, 1: On	Status parameter	★（4）、★（15）	
Bit 8425	W/R	Prohibit turning on auxiliary heating	0: Allow turning on auxiliary heating, 1: Prohibit turning on auxiliary heating	Status parameter	★（26）	
Bit 8426	W/R	Power-off memory of indoor unit	0: stand-by, 1: power-off memory	Status parameter		
Bit 8427	W/R	Cancel filter cleaning reminder	0: No, 1: Yes;	Status parameter	★（24）	
Bit 8428	W/R	Drying	0: Off, 1: On	Status parameter	★（22）	
Bit 8429	W/R	Sleep	0: Off, 1: On	Status parameter	★（17）	
Bit 8430	W/R	Quiet	0: Off, 1: On	Status parameter	★（20）	
Bit 8431	W/R	Air exchange	0: Off, 1: On	Status parameter	★（23）	
Bit 8432	W/R	Low temperature dehumidifying	0: cancel, 1: start	Status parameter	★（12）	

Bit 8433	W/R	Shielding ON	0: no shielding, 1: shielding	Status parameter	★（10）	
Bit 8434	W/R	Shielding OFF	0: no shielding, 1: shielding	Status parameter	★（10）	
Bit 8435	W/R	Shielding of timer	0: no shielding, 1: shielding	Status parameter	★（25）	
Bit 8436	W/R	8℃ heating function setting	0: cancel 8℃ heating, 1: start 8℃ heating	Status parameter	★（11）	
Bit 8437	R	Reserved				
Bit 8438	R	Reserved				
Bit 8439	R	Reserved				
Bit 8440	R	Reserved				
Bit 8441	R	Reserved				
Bit 8442	R	Reserved				
Bit 8443	R	Master mode indoor unit/slave mode indoor unit	0: Slave mode indoor unit, 1: Master mode indoor unit;	Status parameter	★（2）	
Bit 8444	R	Auxiliary electric heating of indoor unit	0: Off, 1: On	Status parameter		
Bit 8445	R	Reserved				
Bit 8446	R	Reserved				
Bit 8447	R	Indoor unit general malfunction	0: No, 1: Yes	Malfunction parameter		
……						
Bit 8488	R	Communication malfunction between indoor unit and outdoor unit	0: No, 1: Yes;	Malfunction parameter		Data of 1# outdoor unit
Bit 8489	R	Refrigerant-lacking protection	0: No, 1: Yes;	Malfunction parameter		
Bit 8490	R	Communication malfunction between main control board and drive board	0: No, 1: Yes;	Malfunction parameter		
Bit 8491	R	Power phase protection	0: No, 1: Yes;	Malfunction parameter		
Bit 8492	R	Start electric VIP mode	0: No, 1: Yes;	Status parameter		
Bit 8493	R	Unit debugging status	0: normal, 1: debug	Status parameter		
Bit 8494	R	Operation status of system compressor	0: Off, 1: On	Status parameter		
Bit 8495	R	General malfunction of outdoor unit	0: No, 1: Yes;	Malfunction parameter		
Bit 8526	R	EEPROM read-write malfunction (main board of outdoor unit is not good)	0: No, 1: Yes;	Malfunction parameter		
……						
Bit (8488+48*(m-1))	R	Communication malfunction between indoor unit and outdoor unit	0: No, 1: Yes;	Malfunction parameter		Data of m# outdoor

Bit (8489+48*(m-1))	R	Refrigerant-lacking protection	0: No, 1: Yes;	Malfunction parameter		unit
Bit (8490+48*(m-1))	R	Communication malfunction between main control board and drive board	0: No, 1: Yes;	Malfunction parameter		
Bit (8491+48*(m-1))	R	Power phase protection	0: No, 1: Yes;	Malfunction parameter		
Bit (8492+48*(m-1))	R	Start electric VIP mode	0: No, 1: Yes;	Status parameter		
Bit (8493+48*(m-1))	R	Unit debugging status	0: normal, 1: debug	Status parameter		
Bit (8494+48*(m-1))	R	Operation status of system compressor	0: Off, 1: On	Status parameter		
Bit (8495+48*(m-1))	R	General malfunction of outdoor unit	0: No, 1: Yes;	Malfunction parameter		
……						
Bit (8526+48*(m-1))	R	EEPROM read-write malfunction (main board of outdoor unit is not good)	0: No, 1: Yes;	Malfunction parameter		
……						
Bit 9208	R	Communication malfunction between indoor unit and outdoor unit	0: No, 1: Yes;	Malfunction parameter		Data of 16# outdoor unit
Bit 9209	R	Refrigerant-lacking protection	0: No, 1: Yes;	Malfunction parameter		
Bit 9210	R	Communication malfunction between main control board and drive board	0: No, 1: Yes;	Malfunction parameter		
Bit 9211	R	Power phase protection	0: No, 1: Yes;	Malfunction parameter		
Bit 9212	R	Start electric VIP mode	0: No, 1: Yes;	Status parameter		
Bit 9213	R	Unit debugging status	0: normal, 1: debug	Status parameter		
Bit 9214	R	Operation status of system compressor	0: Off, 1: On	Status parameter		
Bit 9215	R	General malfunction of outdoor unit	0: No, 1: Yes;	Malfunction parameter		
……						
Bit 9246	R	EEPROM read-write malfunction (main board of outdoor unit is not good)	0: No, 1: Yes;	Malfunction parameter		
……						
Bit 9248	W/R	DO point 1	0: Off, 1: On			D0 area
Bit 9249	W/R	DO point 2	0: Off, 1: On			
Bit 9250	W/R	DO point 3	0: Off, 1: On			
Bit 9251	W/R	DO point 4	0: Off, 1: On			

Bit 9252	W/R	DO point 5	0: Off, 1: On			
Bit 9253	W/R	Reserved				
Bit 9254	W/R	Reserved				
Bit 9255	W/R	Reserved				
Bit 9256	R	DI point 1(Fire alarm signal)	0: Off, 1: On		Send control signal to let all outdoor units stop for emergency	DI area
Bit 9257	R	DI point 2	0: Off, 1: On			
Bit 9258	R	DI point 3	0: Off, 1: On			
Bit 9259	R	DI point 4	0: Off, 1: On			
Bit 9260	R	DI point 5	0: Off, 1: On			
Bit 9261	R	Reserved				
Bit 9262	R	Reserved				
Bit 9263	R	Reserved				
……						

Annex A

A.1 CRC Calculation Method

Calculation Method of CRC: The CRC is first preloading a 16-bit register to all 1's. Then successively transact each 8–bit bytes of the message. During generation of the CRC, each 8–bit character is exclusive ORed with the register contents. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB was a 1, the register is then exclusive ORed with a preset, fixed value. If the LSB was a 0, no exclusive OR takes place. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next 8–bit character is exclusive ORed with the register's current value, and the process repeats for eight more shifts as described above. The final contents of the register, after all the characters of the message have been applied, is the CRC value. During transmission and reception of data in CRC, low order byte is in the front.

A.2 How to Calculate the CRC

1） Preload a 16–bit register with FFFF hex (all 1's). Call this the CRC register.
2） Exclusive OR the first 8–bit byte of the message with the low–order byte of the 16–bit CRC register, putting the result in the CRC registers.
3） Shift the CRC register one bit to the right (toward the LSB), zero–filling the MSB. Extract and examine the LSB.
4） (If the LSB was 0): Repeat Step 3 (another shift). (If the LSB was 1): Exclusive OR the CRC register with the polynomial value A001 (1010 0000 0000 0001).
5） Repeat Steps 3 and 4 until 8 shifts have been performed. When this is done, a complete 8–bit byte will have been processed.
6） Repeat Steps 2 and 5 to process the next 8-bit data.
7） The final obtained CRC register is CRC.

A.3 CRC Example

Parameters： Data (starting address of the block data), Data Size (Byte count of the block data)
Return： CRC Calculating Result

```
uint16 CRC_Calculate(uint8 *data, uint16 dataSize)
{
 uint8 i;
       uint8 temp;
 uint16 j;
       uint16 CRCode;
 CRCode=0xffff;
 for(j=0;j<dataSize;j++){
       CRCode=CRCode^data[j];
       for( i=0; i < 8; i++ ){
             temp=CRCode & 0x0001;
             CRCode=(CRCode >> 1);
             if(temp ==1){
                   CRCode=(CRCode^0xA001);// 0xA001 is a preset multinomial, a constant.
             }
       }
 }
      return CRCode;
}
```

References

1） MODBUS Protocol.
2） Operation Instructions of the Long-Distance Monitoring System to Gree Central AC.