



安装使用说明书
Installation and Operation Manual

中央空调 BACnet 网关套件 MG30-24/D1 (B)
BACnet Gateway Kit MG30-24/D1(B) for Central Air Conditioners

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为了正确使用本产品，请在使用前仔细阅读本使用说明书，并妥善保存以供今后参考。
Please read this manual carefully before using this product and keep it properly for future reference.

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一、功能介绍

1 功能概述

格力中央空调 BACnet 网关套件 MG30-24/D1(B) 可实现空调机组和 BAS 系统的数据交换，提供标准的 BACnet/IP 楼宇接口，并且支持 Web 服务器功能，实现对机组的远程监测和控制，可满足互联网高速监控空调信息。

2 功能特点

使用 BACnet/IP 楼宇接口功能时，BACnet 网关的 TCP/IP 默认属性为 IP Address: 192.168.1.150、Subnet Mask: 255.255.255.0、Default Router: 192.168.1.1。

使用 Web 服务器功能时，用互联网浏览器访问 BACnet 网关，登陆的默认地址为 http://192.168.1.150，默认用户名为：admin，密码为空。

BACnet 网关的 TCP/IP 属性能够通过 WEB 界面登陆后，按客户自身需求进行修改配置。

注意：访问 BACnet 网关时，需要调整客户端设备（如 PC 机）的 TCP/IP 属性与 BACnet 网关的 TCP/IP 属性在同一 IP 允许互相访问的网段区域。具体操作示例见英文版附录 A (Appendix A)。

对于 BACnet 网关的 BACnet/IP 楼宇接口和 Web 服务器两种功能的介绍分别描述如下：

2.1 BACnet/IP 楼宇接口功能

BACnet 网关支持符合 ANSI ASHARE Standard 135-2008 (BACnet2008) 标准的 BACnet/IP 接口协议，并且通过了 BTL 认证。BACnet 网关的 PICS 声明和协议详述见英文版附录 B (Appendix B)。

支持的空调各种设备类型的参数如下：

空调设备类型	参数名称	空调设备类型	参数名称
GMV 室内机 (参数说明： 远程屏蔽指所 屏蔽的参数仅 远程监控可控 制；远程锁定 指屏蔽所有参 数，仅远程监 控可控制。)	多联机内机故障总标志	GMV 室外机	多联机电外机故障总标志
	多联机内机故障码		多联机电外机故障码
	多联机内机环境温度		多联机电外机环境温度
	多联机内机温度设定		多联机电外机压缩机运行状态
	多联机内机模式状态	多联热水机	多联热水机特殊故障标志
	多联机内机模式设定		多联热水机特殊故障码
	多联机内机开关机状态		多联热水机水箱温度状态
	多联机内机开关机设定		多联热水机水箱温度设定
	多联机内机风速状态		多联热水机水箱运行状态
	多联机内机风速设定		多联热水机水箱运行设定
	多联机内机扫风设定		多联热水机水箱模式状态
	多联机内机节能设定		多联热水机水箱模式设定
	多联机内机远程屏蔽温度设定		多联热水机套管出水温度状态
	多联机内机远程屏蔽模式设定		多联热水机地暖供水温度设定
	多联机内机远程屏蔽开关机设定		多联热水机消毒运行状态
	多联机内机远程锁定设定		多联热水机地板采暖有无状态
			水箱控制屏蔽状态码

2.2 Web 服务器功能

BACnet 网关的 WEB 服务器功能，是通过 HTML 页面的形式提供 Web 内容，实现监测、控制空调信息，支持多用户终端同时访问。具有访问权限的用户在标准浏览器上即可访问 Web 界面。详细操作说明见 Web Server 的帮助文档。

2.2.1 使用环境要求：

- 1) 操作系统：windows 操作系统，苹果操作系统，LINUX/UNIX 操作系统；
- 2) 浏览器：支持 JAVA 技术的浏览器，如 IE, CHROME, NETSCAPE, FIREFOX 等；
- 3) 语言支持：简体中文及英文（黑体）；
- 4) Java 虚拟机安装：如果浏览器无法打开网页，请先从 Java 官网 www.java.com 下载 Java 虚拟机，安装后便可正常使用。

5) 最低硬件配置要求：

CPU: Pentium 400 MHz

RAM: 128MB

硬盘: 10GB

2.2.2 登陆界面和主界面示意图如下（具体以实际运行界面为准）：



二、结构图

1 产品图片

格力中央空调 BACnet 网关套件 MG30-24/D1 (B) 产品实物图如下：

- ① PCD 控制器 (CPU 模块)PCD3. M6340
- ② PCD 控制器 (WEB SERVER 模件)PCD3. R600
- ③ Battery Module 模件 （含纽扣电池，注意电池正极朝外）
- ④ PCD 控制器 (BACnet 模件)PCD7. R560
- ⑤ PCD 控制器 (SD 卡)PCD7. R-SD1024

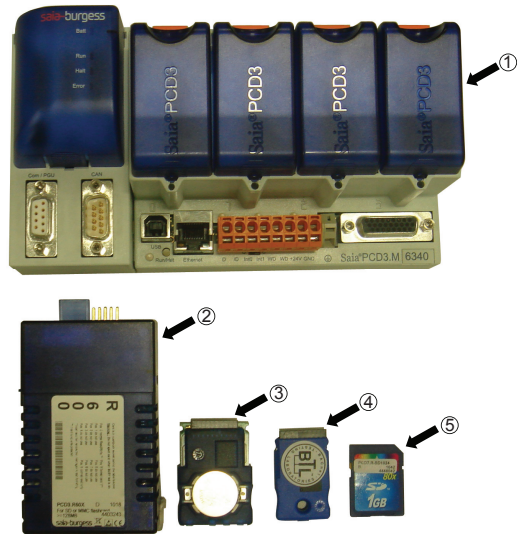


图 2-1 BACnet 网关套件 MG30-24/D1 (B) 产品各个模块实物图

2 产品尺寸

格力中央空调 BACnet 网关套件 MG30-24/D1 (B) 产品尺寸示意图如下：

(单位：mm)

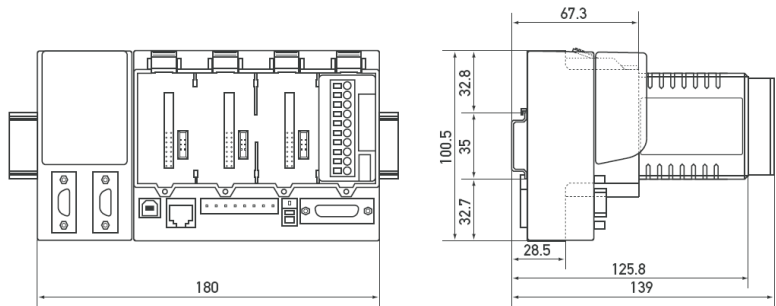


图 2-2 BACnet 网关套件 MG30-24/D1 (B) 产品尺寸图

类型	描述	重量
PCD3. M6340	BACnet 网关主控制器，支持 Web 服务器功能，控制器掉电时纽扣电池可保护网关数据 1~3 年。	560g

3 各个模块安装图

格力中央空调 BACnet 网关套件 MG30-24/D1(B) 产品各个模块安装图如下：

- ① 装入 PCD 控制器 (WEB SERVER 模块)PCD3. R600 到 SLOT0 插槽
- ② 装入 Battery Module 模块（含纽扣电池，注意电池正极朝外）到 Batt Module 插槽
- ③ 装入 PCD 控制器 (BACnet 模块)PCD7. R560 到 M1 插槽
- ④ 标准 RJ45 网络接口，10M/100M 自适应 Ethernet，连接网线到 BAS 系统
- ⑤ +24VDC、GND 电源线连接

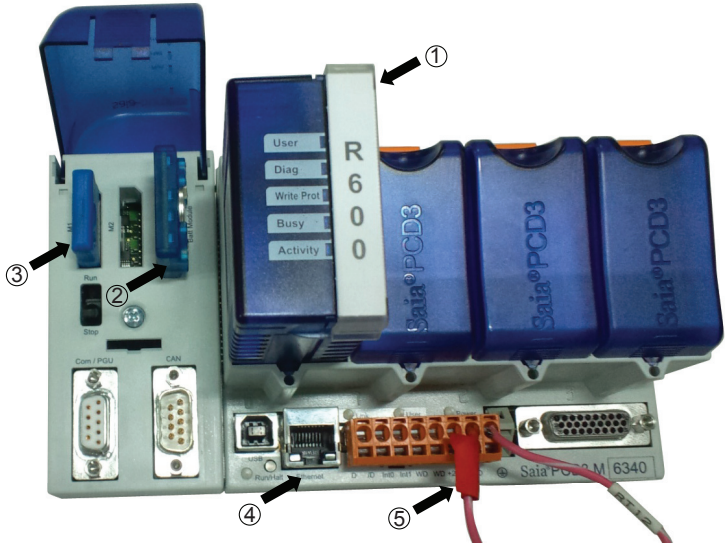


图 2-3 BACnet 网关套件 MG30-24/D1(B) 产品各个模块安装图

备注：装入 PCD 控制器 (SD 卡)PCD7. R-SD1024 到 PCD3. R600 中操作示意如下：



图 2-4 PCD 控制器 (WEB SERVER 模块)PCD3. R600 装入 SD 卡图

4 产品整体效果图

格力中央空调 BACnet 网关套件 MG30-24/D1(B) 产品整体效果图如下：



图 2-5 BACnet 网关套件 MG30-24/D1(B) 产品整体效果图

三、使用说明

1 接口

1.1 电源接口

如图 2-5 所示。电源（POWER）采用接线端子输入，具体输入电源规格为 24VDC -20/+25% incl.5% ripples 符合 EN/IEC 61131-2，正常 175mA/4.2W，最大 500mA/12W。

注意：24 直流电源输入端子电源线不能接反，否则将会损坏 BACnet 网关设备。

丝印	端子	端子引脚	接口说明
+24V GND	接线端子	PIN7: +24VDC	24V 直流输入

1.2 模块安装接口

如图 2-5 所示。BACnet 网关左方打开壳盖，可以看到 M1、M2、Batt Module 插口，BACnet 网关右方打开壳盖，从左到右分为 4 个插口分别为 Slot0、Slot1、Slot2、Slot3，如图所示，已将 PCD3. R600 插入 Slot0。

丝印	端子	端子引脚	接口说明
M1 、 M2	插口	Socket M1 或 Socket M2，选择任一个端子接入 BACnet 卡件	接入 PCD 控制器 (BACnet 模块) PCD7. R560
Batt Module	插口	接入主控制器 PCD3. M6340 包含 Battery Module 卡件	接入 Battery Module，带纽扣电池
Slot0 Slot1 Slot2 Slot3	卡座插口	选择 Slot0 卡座（该卡座最靠近 USB 接口）接入 PCD3. R600（SD 卡 PCD7. R-SD1024 插入该 WEB Server 模块）	选择 Slot0 接入 WEB Server 模块 PCD3. R600

1.3 通讯接口

如图 2-5 所示。BACnet 网关正面接线端子处可以看到对应的丝印 D、/D、O、C，网口采用 RJ45 标准接口。

丝印	端子	端子引脚	接口说明
D /D	接线端子	P1: 485 通讯 A	RS485 接口，接机组 MODBUS 设备的监控 / 楼宇接口，无极性。D——R+/D+(或 485 +)，/D——R-/D-(或 485-) 。
		P2: 485 通讯 B	
O C	开关拨码	Switch position: “0”(Left)—没有加匹配电阻 “C”(Right)—加匹配电阻	MODBUS 端匹配电阻添加选择按钮，默认拨为 C，即加匹配电阻。
Ethernet	标准 RJ45 网络接口	Ethernet	BACnet 网关与 BAS 系统连接接线端子。

2 指示灯

2.1 电源指示灯

如图 3-1 所示，丝印 Power 指示灯为电源指示灯，Power 指示灯被点亮红色表示 BACnet 网关电源已连接好，否则表示 BACnet 网关电源未连接好。

2.2 PCD 控制器（CPU 模块）PCD3. M6340 指示灯

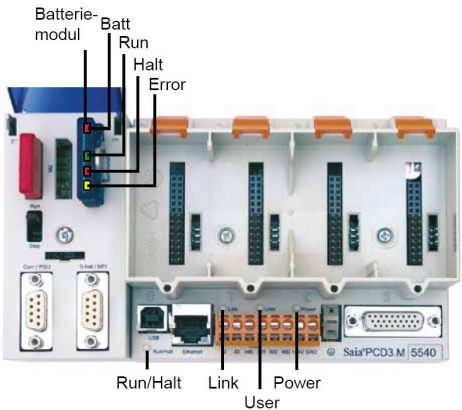


图 3-1 电源模块指示灯示意图

CPU 类型	PCD3. Mxxxx 电源模块			
LED	电源	运行	停止	故障
颜色	红	绿	红	黄
运行	○	●	○	○
运行指令	○	● / ○	○	○
故障运行	○	●	○	●
故障运行指令	○	● / ○	○	●
停止	○	○	○	○
故障停止	○	○	○	●
暂停	○	○	●	○
系统诊断	○	● / ○	● / ○	● / ○
无电源 / 电压	●	○	○	○

○ LED 熄灭 ● LED 点亮 ● / ○ LED 闪烁

开始	开机或重启后，自动诊断 1 秒钟。
运行	启动后，用户程序正常运行。由于安全原因，当编程器通过 CD8. K11x 连入 PGU 模式时（例如，PGU 模式中的 PG5），CPU 自动进入停止状态，而非运行状态。
条件运行	条件运行状态。调试器中所设置的运行条件，目前还没有完全满足。
故障运行	同“运行”，但带有故障信息。
故障运行指令	同“条件运行”，但带有故障信息。
停止	以下情况将出现停止状态： ● 当 CPU 启动时，PGU 模式下有连接编程器 ● 编程器使 PGU 停止运行 ● “条件运行”设置条件得到满足时
故障停止	同“停止”，但带有故障。
暂停	以下情况下将出现暂停状态： ● 运行暂停指令 ● 用户程序出现严重故障 ● 硬件故障 ● 没有加载程序 ● 在 S-Bus PGU 或网关主接口上没有通讯模块
系统诊断	如果 PLC 两分钟后没有运行，模块需发回制造商进行维修。
重置	以下情况将出现重置： ● 电源电压过低 ● 固件没有运行

2.3 WEB Server 控制器指示灯

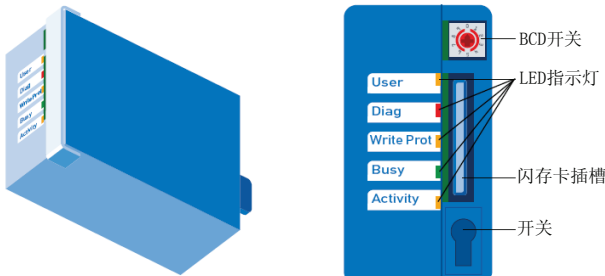


图 3-2 PCD 控制器 (WEB SERVER 模块) PCD3. R600 指示灯示意图

带有 5 个 LED 指示灯的储存卡模块：

LED	说明
User	用户指示灯，根据模块的基址由用户程序进行设置（SET：关，RES：开）。
Diag	出现故障时，指示灯闪烁。
Write Prot	当检测到“写入保护”时，指示灯亮（只读 SD 开关，BCD 开关或软件）
Busy	此指示灯亮时，不能移走储存卡模块。
Activity	如硬盘驱动一样工作，处理数据时，该指示灯闪烁。

3 工程安装说明

3.1 BACnet 网关安装在电控柜中侧面示意说明

根据 DIN EN60715 TH35(即老的 DIN EN50022),PCD3 CPU 和模块底托可固定在 35mm 的顶帽型安装导轨上。

将 PCD3 安装在顶帽型安装导轨上。

① 将网关外罩的底部按压在安装表面上。

② 沿安装导轨向上按压网关。

③ 朝安装表面，向下按压网关外罩的顶部，网关与安装导轨咬合。

④ 朝顶安装导轨，相下按压网关外罩，确保网关安装牢固可靠。

拆卸：

拆卸外罩时，将其向上推，然后取出。

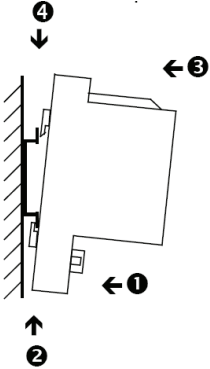


图 3-3 BACnet 网关安装和拆卸说明示意图

3.2 BACnet 网关安装在电控柜中正面示意说明

① 将模块插入正确的安装位置，且朝 CPU 底部或模块底托向下压。

② 为了安全和防止网关安装不当，可使用导轨。在某些不方便的情况下，网关可使用螺丝固定。

螺丝钉型号：自动螺丝 3×8mm， 可从五金店购买。

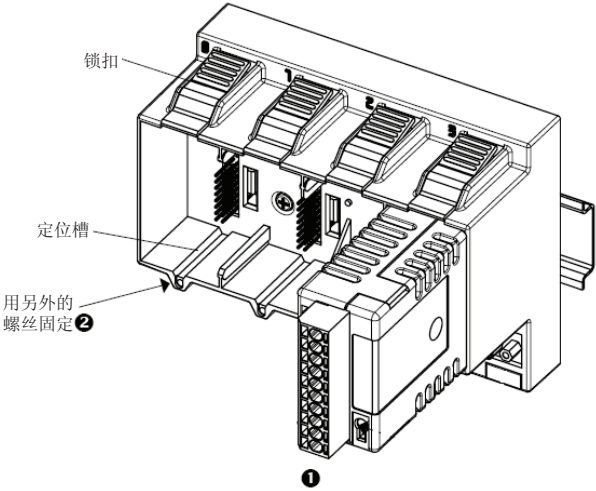


图 3-4 BACnet 网关正面示意图

3.3 BACnet 网关的网络拓扑图

网络拓扑结构见下图 3-6。整个系统由两部分通讯网络构成：机组内部网络和 BACnet/IP 网络。两个网络通过 BACnet 网关桥接，使两个网络的通讯数据可以互相交换。

一个 BACnet 网关能接 4 个通讯模块，也就是能接 4 套多联机机组（支持 64 个内机）。

下述以某一种通讯模块为例，具体以实际通讯模块拨码方式为准。通讯模块内部 8 位拨码开关用来设置设备地址，在 PCB 板上地址拨码由 SA2 和 SA3 组成，实际使用时，底壳标识为 DIP1。拨码拨到 ON 端表示 0，拨到数字端表示 1。接入 BACnet 网关时，通讯模块的有效地址范围为地址 1 到地址 4。详细拨码设置需见通讯模块使用说明书。

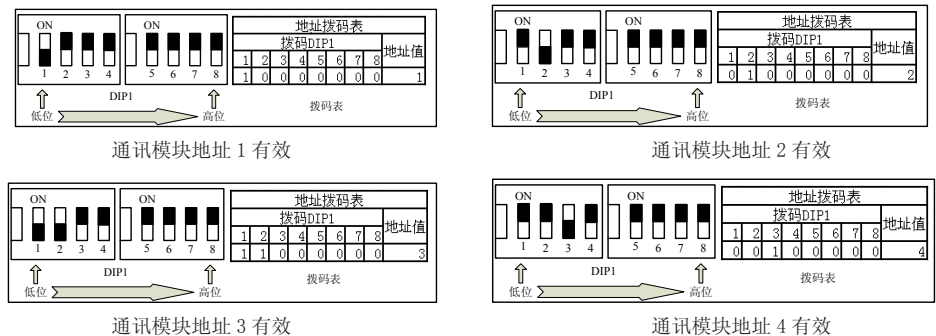


图 3-5 BACnet 网关连接的通讯模块设备有效地址拨码示意图

注：当多联机机组数量大于 4 套时，BMS 系统可以再使用一个网关搭建新的网络。

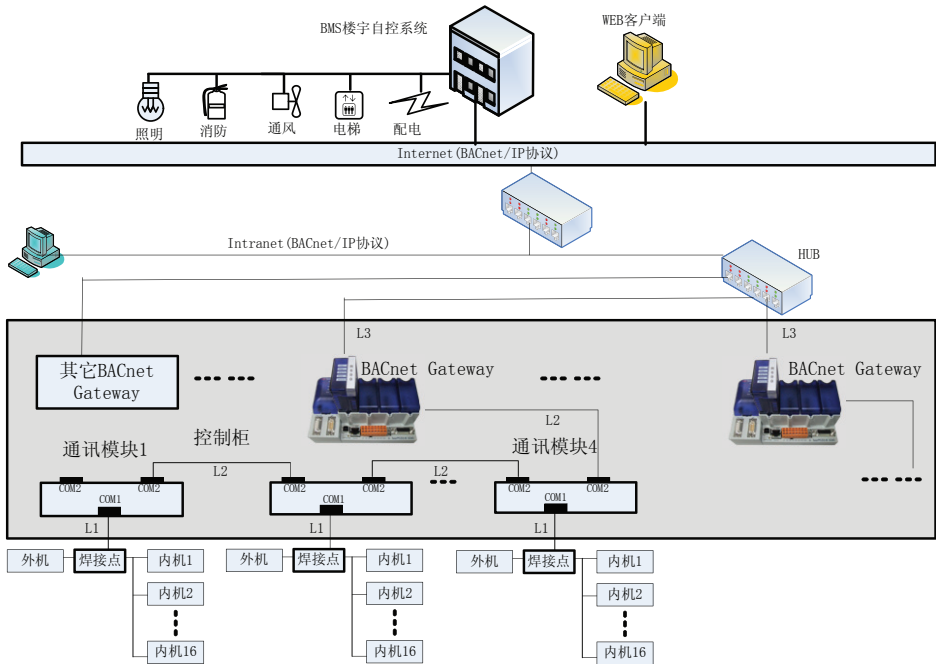


图 3-6 BACnet 网关网络拓扑

1) 此图以某一种通讯模块连接方式为例，通讯模块连接接口（是否为 COM1、COM2 接口）方式以具体实际通讯模块接口为准；

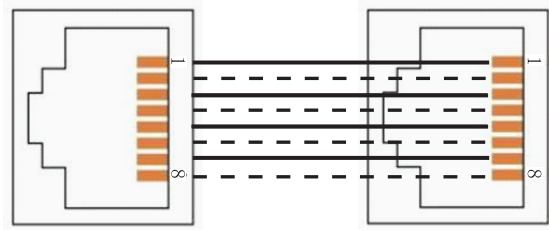
2) 在上述网络中，通讯介质 L3 为 RJ45 网口间通用网线；

3) BMS (BACnet/IP) 系统和 BACnet Gateway 所能提供的 WEB Server 功能可以同时使用。

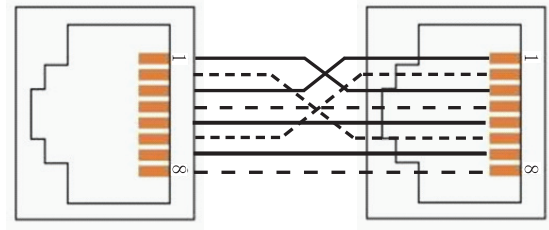
3.4 BACnet 网关与上层 BACnet 通讯设备的连接方式

3.4.1 网口连接的示意图

1) RJ45 网口平行网线连接方式

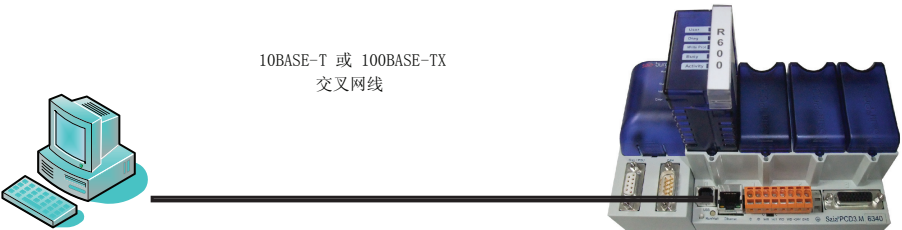


2) RJ45 网口交叉网线连接方式

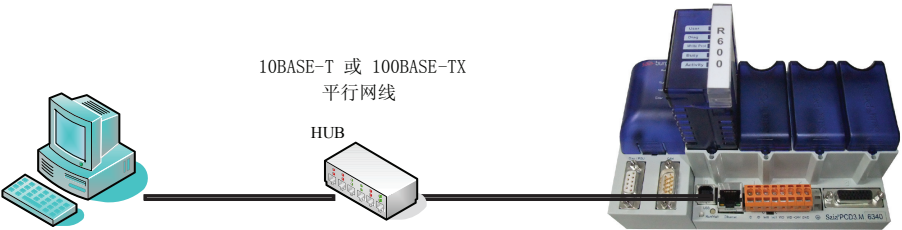


3.4.2 BACnet 网关与 PC 机客户端连接的示意图

1) 采用交叉网线，BACnet 网关直接对接 PC 机

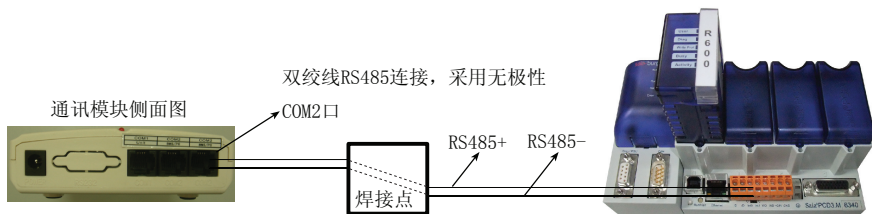


2) 采用平行网线，BACnet 网关通过 HUB，对接 PC 机



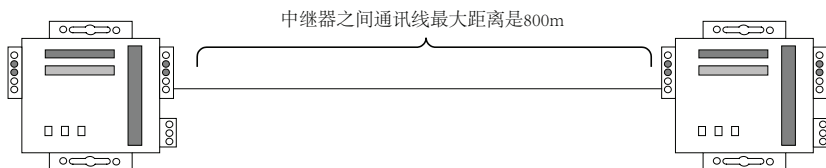
3.5 BACnet 网关与下层通讯模块设备的连接方式

3.5.1 下述以某一种通讯模块为例，具体以实际通讯模块连接接口方式为准



3.5.2 中继器套件选配

如果 BACnet 网关与通讯模块设备连接距离超过 800m 时，需要选配中继器套件。



四、注意事项

- 1) 确保电源适配器的规格，否则 BACnet 网关将不能正常工作甚至被损坏；
- 2) 确保设备装配到正确位置，否则将通讯故障；
- 3) 确保通讯线接入正确的接口，否则将通讯故障；
- 4) 用焊锡加固连接通讯线后，应使用绝缘胶布保护，以免氧化、短路；
- 5) BACnet 网关正常工作环境要求：①温度：0~55℃，②湿度小于等于 95%；③安装在室内（推荐安装在电控柜中），避免阳光直晒，雨雪等；
- 6) 警示：如果工作环境不满足以上要求，BACnet 网关可能工作异常！
- 7) 为有效保护客户的访问权限，客户使用 BACnet 网关的 WEB 服务器功能时，需及时修改 WEB 服务器的访问密码；
- 8) 格力保留产品升级时不另行通知的权利。

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<http://www.gree.com>



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1 Functional Specifications

1.1 Brief Introduction

BACnet gateway kit MG30-24/D1(B) is capable of realizing the data exchange between the air conditioning unit and BAS, supporting the Web server, providing remote monitoring and control to the air conditioning unit, and also enabling the internet to monitor the information related to the air conditioning unit at high speed.

1.2 Features

When BACnet/IP BAS interface is put into use, the default properties of BACnet gateway is shown as below:

IP Address: 192.168.1.150

Subnet Mask:255.255.255.0

Default Router:192.168.1.1

Under the condition that the Web server is put into use, when visiting the BACnet gateway through the Internet browser:

Web Server Default Login Address: [http:// 192.168.1.150](http://192.168.1.150)

Web Server Default Login Username: admin

Web Server Default Login Password: null

After logging in the Web page, these properties listed above are allowed to be modified.

Note: When visiting the BACnet gateway, it is required to adjust the TCP/IP properties of the client-side equipment (like, PC) to be compatible with that of the BACnet gateway. See the example covered in Appendix A for more details.

BACnet/IP BAS interface and BACnet Web server are two major functions for the BACnet gateway. See the followings for more details.

1.2.1 BACnet BAS Interface

This BTL certificated BACnet gateway supports the standard BACnet/IP interface protocol which complies with the ANSI ASHRAE standard 135-2008 (BACnet2008). See Appendix B for PICS of the BACnet gateway and more detailed protocol content.

Parameters of the Supported Air Conditioning Units

AC Type	Parameters Name
GMV Indoor Units (Note: “Remote temp/mode/On/Off shield mark” indicates the parameter of “temp/mode/On/Off” is disabled to be set through the unit controller but the remote monitoring system; while “Remote lock mark” indicates all parameter are disabled to be set through the unit controller but the remote monitoring system.)	Indoor unit general error mark
	Indoor unit error code
	Indoor unit environment Temp
	Indoor unit Temp(setting)
	Indoor unit mode(status)
	Indoor unit mode(setting)
	On/Off(status)
	On/Off(setting)
	Fan Speed(status)
	Fan Speed(setting)
	Swing(setting)
	Energy saving(setting)
	Remote temp shield mark(setting)
	Remote mode shield mark(setting)
	Remote On/Off shield mark(setting)
	Remote lock mark(all shield)(setting)
GMV Outdoor Units	Outdoor unit general error mark
	Outdoor unit error code
	Outdoor environment temp
	Complete machine compressor state
GMV Water Heater	Specific error mark for the GMV Water Heater
	Specific error codes for the GMV Water Heater
	Water tank temp(status)
	Water tank temp(setting)
	Water tank(status)
	Water tank(setting)
	Water tank mode(status)
	Water tank mode(setting)
	Double-Tube supply Water Temp
	Floor Heating supply Water Setting Temp
	Disinfecting
	Floor heat power
	Water tank control shielding code(setting)

1.2. 2 BACnet Web Server

The BACnet is capable of supporting the controller Web server in the form the HTML Web pages so as to control, monitor and display the data of the air conditioning unit, meanwhile supporting the multi-user visit at a time. For detailed information see the Help document on the Web Sever page.

1.2.2.1 Application Conditions:

- 1) Operation System: Windows, Mac, LINUX/UNIX.
- 2) Browser: Browsers which support JAVA, like, IE, CHROME, NETSCASPE, FIREBOX, etc.
- 3) Supportive Language: Simplified Chinese and English
- 4) Installation of the JAVA virtual machine: when the browser fails to access to the web page, please download the JAVA virtual machine at first from the official website:www.java.com, then install it properly, after that the normal use is available.

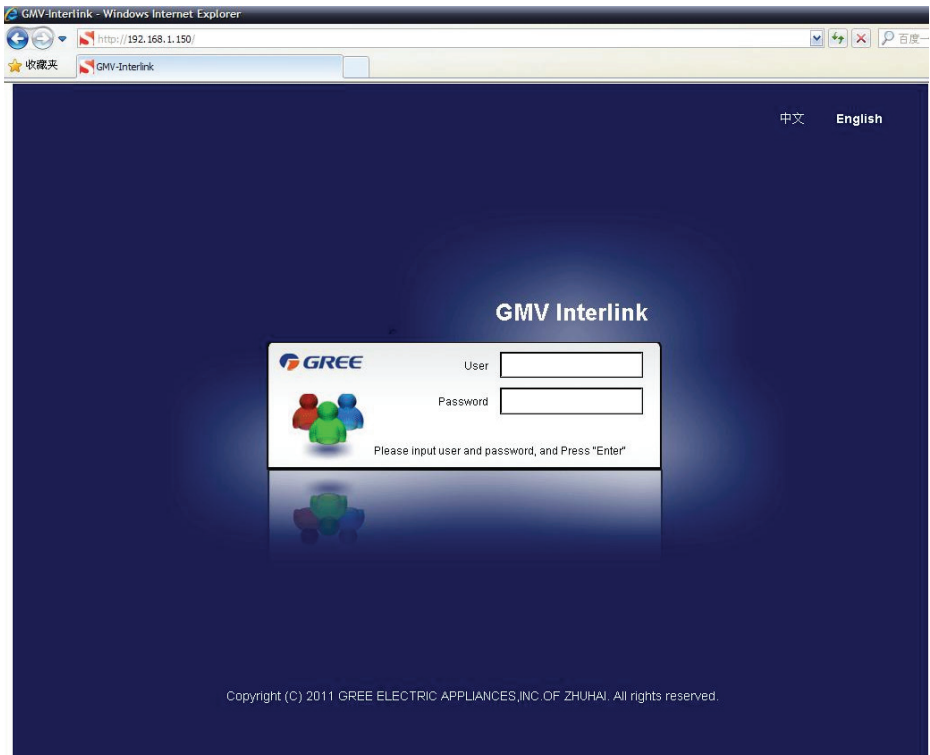
5) Minimum Requirements on the Hardware:

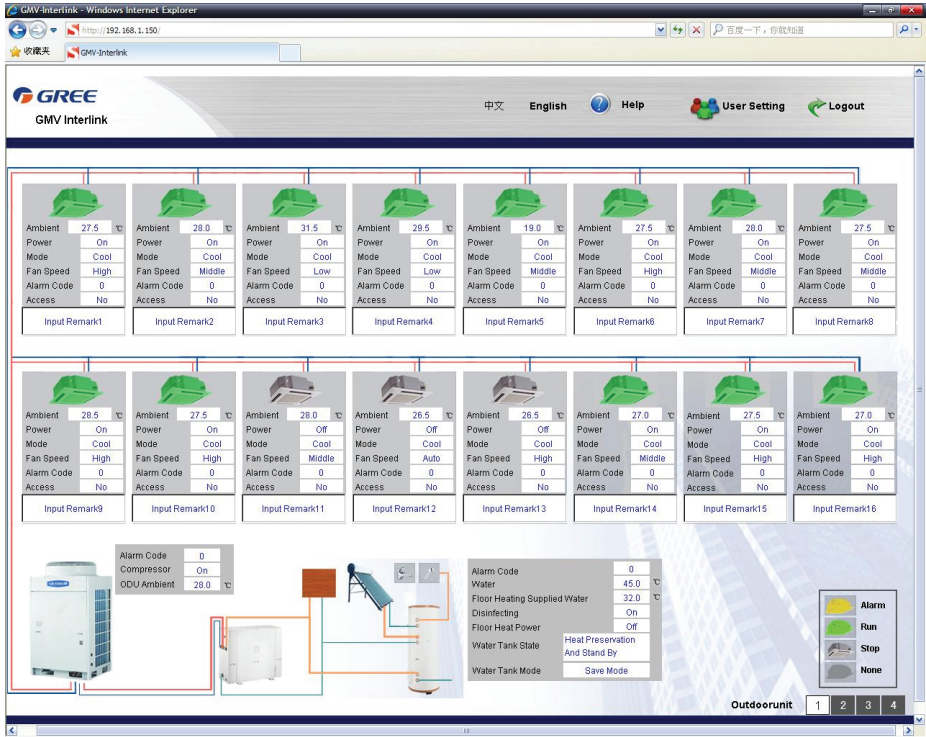
CPU: Pentium 400 MHz

RAM: 128MB

Hard Disc: 10GB

1.2.2.2 Login and Main Interface (Always see the actual running interface)





2 Product Drawing

2.1 Parts Drawing

See the following real image drawing of each module of the BACnet Gateway MG30-24/D1(B)

- ① . CPU Module PCD3.M6340
- ② . Web Server Module PCD3.R600
- ③ . Battery Module (incl. button cell with the positive electrode outward)
- ④ . BACnet Module PCD 7.R560
- ⑤ . SD Card PCD 7.R-SD1024

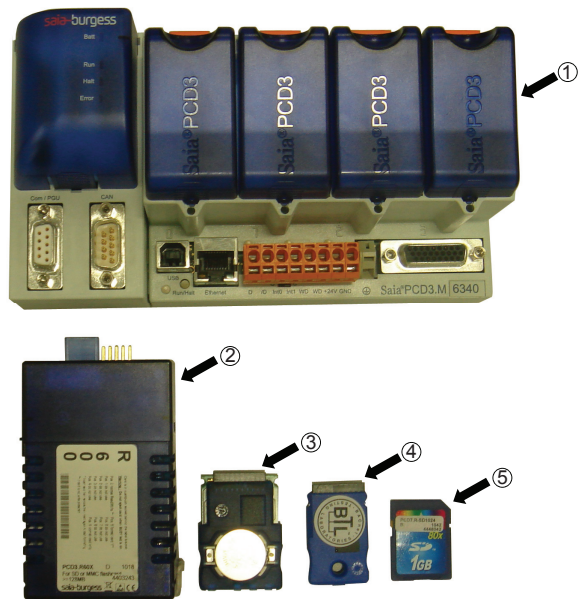
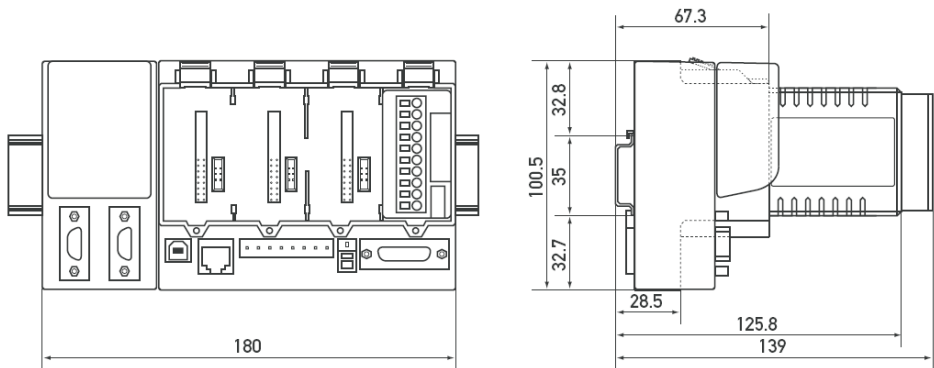


Fig. 2-1 Real Image Drawing of Each Module of BACnet Gateway MG30-24/D1(B)

2.2 Dimension Drawing

See the following drawing for the dimensions of the BACnet Gateway MG30-24/D1(B)

(Unit:mm)



Type	Description	Weight
PCD3.M6340	PLC with 1 MB of user memory with Run/Stop switch Back up option with PCD7.R500 Flash Card,USB port for PG5 Max.1023 digital I/Os,2 interrupts,Web-Server,RS232,RS485 for Profi-S-Net,CAN interface Data protection 1~3 years with Lithium battery	560g

Fig. 2-2 Dimension Drawing of BACnet Gateway MG30-24/D1(B)

2.3 Installation Drawing

See the following drawing for the installation of each module of the BACnet Gateway MG30-24/D1(B)

- ① . Install the Web server PCD3.R600 at slot0.
- ② . Install the battery module at the battery module special slot.
- ③ . Install the BACnet module PCD7.R560 at M1
- ④ . Standard RJ45 interface, 10M/100M self-adaptive to the Ethernet, linked to the BAS through the communication line.
- ⑤ . +24VDC GND, used to connect the power cord.

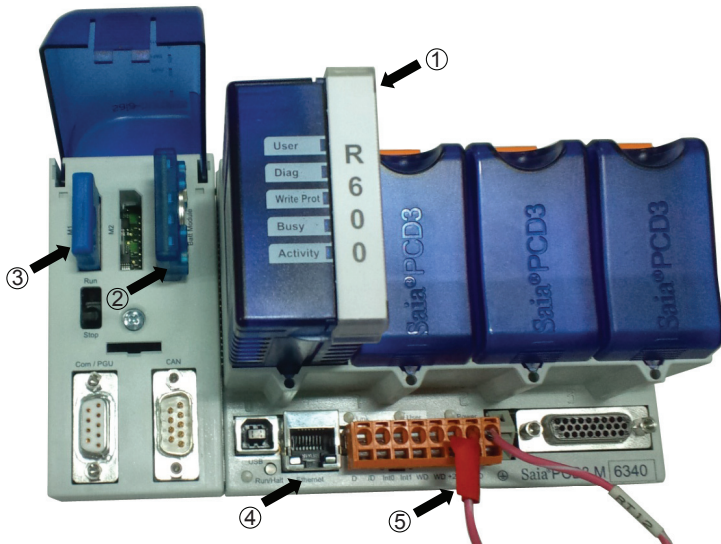


Fig.2-3 Installation Drawing of Each Module of the BACnet Gateway MG30-24/D1(B)

Note: See the following drawing for how to install the SD card into the Web server module PCD3.R600.



Fig.2-4 Installation of the SD Card into the Web Server Module PCD3.R600

2.4 General Drawing

See the following drawing for the outline of the whole BACnet MG30-24/D1(B)



Fig. 2-5 Outline Drawing of the Whole BACnet MG30-24/D1(B)

3 Operation Instructions

3.1 Interfaces

3.1.1 Power Supply Interface

As shown in Fig.2-5, the power supply is input through the wiring terminal.

Power Supply: 24VDC -20/+25% incl. 5% ripples as per EN/IEC 61131-2, 175mA/4.2W normal, 500mA/12W maximum.

Note: the power cord mustn't be connected reversely and the power supply mustn't be beyond the specified I, otherwise the BACnet gateway would be damaged.

Printed Mark	Terminal	Pin	Description
+24V GND	Wiring Terminal	+24VDC	24V DC Input

3.1.2 Module Installation Interfaces

As shown in Fig.2-5, when the left cover is opened, the interfaces of M1, M2 and Batt Module can be seen; when the right cover is opened, the interfaces from left to right are Slot0, Slot1, Slot2 and Slot3, in which case, PCD3.R600 has been inserted into Slot0.

Printed Mark	Terminal	Pin	Description
M1, M2	Socket	/	It is used to connect BACnet module PCD7.R560
Batt Module	Socket	/	It is used to connect battery module PCD3.M6340 (incl. button cell)
Slot0 Slot1 Slot2 Slot3	Socket	/	Slot0 (at the side of the nearest USB interface) is used to connect the Web server module PCD3.R600 into which PCD7.R-SD1024 is inserted.

3.1.3 Communication Interfaces

As shown in Fig.2-5, the printed marks D, /D, O, and C can be seen in the front of the wiring terminals of the BACnet gateway, and the RJ45 standard interface is prepared.

Printed Mark	Terminal	Pin	Description
D /D	Wiring Terminal	P1: 485 A	RS485 Interface, it is used to connect the Modbus device and of no polarity. D——R+/D+(or 485+); /D——R-/D-(or 485-)
		P2: 485 B	
O C	DIP Switch	Switch Setting “0”(Left)—without the matched resistance “C”(Right)—with the matched resistance	It is used to set if the matched resistance is connected or not. It is defaulted to be set to “C”
Ethernet	RJ45 Network Interface	Ethernet	Communication Interface, used for the communication line which connects the BACnet gateway and the BAS.

3.2 Indicating LEDs

3.2.1 Power Indicating LED

As shown in Fig. 3-1, the printed mark “Power” represents the power indicating LED. When it turned to red, it indicates the BACnet gateway is powered on; when it turns off, it indicates the BACnet gateway is powered off.

3.2.2 CPU Module PCD3.M6340 Indicating LED

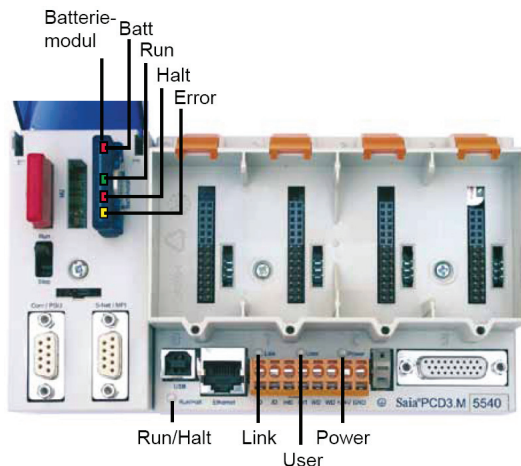


Fig. 3-1 Battery Module Indicating LEDs

CPU type	PCD3.Mxxxx Battery module			
LED	Batt	Run	Halt	Error
Colour	Red	Green	Red	Yellow
Run	○	●	○	○
Run cond.	○	●/○	○	○
Run with error	○	●	○	●
Run cond. with error	○	●/○	○	●
Stop	○	○	○	○
Stop with error	○	○	○	●
Halt	○	○	●	○
System diagnostics	○	●/○	●/○	●/○
Batt./Super Cap voltage absent	●	○	○	○

○ LED off ● LED on ●/○ LED flashing

Start	Self-diagnosis for approx. 1 sec. after switching on or after a Restart
Run	Normal processing of the user program after Start. Where a programming unit is connected via a PCD8.K11x in PGU mode (e.g. PG5 in PGU mode), the CPU automatically goes into the Stop state and not the Run state; this is for safety reasons
Run conditional	Conditional Run state. A condition has been set in the debugger (Run until...), which has not yet been met
Run with error	Same as Run, but with an error message
Run cond. with error	Same as conditional Run, but with an error message
Stop	The Stop state occurs in the following cases: • Programming unit in PGU mode connected when the CPU was switched on • PGU stopped by programming unit • Condition for a COND.RUN has been met
Stop with error	Same as Stop, but with an error message
Halt	The Halt state occurs in the following cases: • Halt instruction processed • Serious error in user program • Hardware fault • No program loaded • no communication module on an S-Bus PGU or Gateway Master port
System diagnostics	If the PLC doesn't go to RUN after 2 minutes, you have to send it for repair
Reset	The RESET state has the following causes: • Supply voltage too low • Firmware not starting up

3.2.3 WEB Server Module Indicating LED

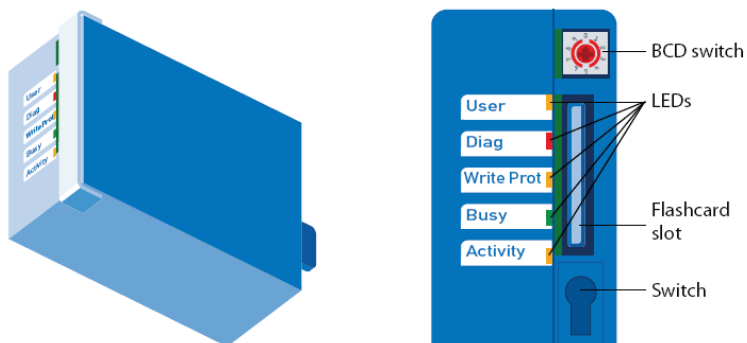


Fig.3-2 Web Server Module PCD3.R600 Indicating LED

The memory module is fitted with 5 LEDs:

LED	Meaning
User	User LED, set by the user program with the base address of the module (SET = off; RES = on)
Diag	Flashes when there is an error message
Write Prot	Active when a "write-protected" condition is detected (read-only SD switch, BCD switch or software)
Busy	Do not remove the module when this LED is on.
Activity	Works as with a hard disk drive; flashes when data being processed

Note: Do not remove the card when the "Busy" LED is on.

3.3 Installation Instructions

3.3.1 Side View of the Installation and Removal of the BACnet Gateway

The PCD3 CPUs and module holders can be snapped onto a 35 mm Top-hat rail according to DIN EN60715 TH35 (formerly DIN EN50022).

Mounting the PCD3 on the top-hat rail

- ① . Press bottom of housing onto the mounting surface
- ② . Press upwards against the top-hat rail
- ③ . Press top of housing against the mounting surface and snap into place
- ④ . Push the housing down onto the top-hat rail to ensure that it is secure

Removal:

To remove the housing, push upwards and pull out.

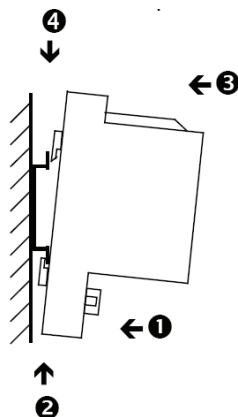


Fig.3-3 Side View of the Installation and Removal of the BACnet Gateway

3.3.2 Front View of the Installation and Removal of the BACnet Gateway

① . Insert the module into the appropriate module location and press down to the bottom of the CPU or module holder housing;

② . For security, a guide way is provided to prevent the module being inserted the wrong way round. In awkward positions, the modules can also be secured with a screw. Screw type: self-tapping 3x8mm, standard type obtainable from hardware stores;

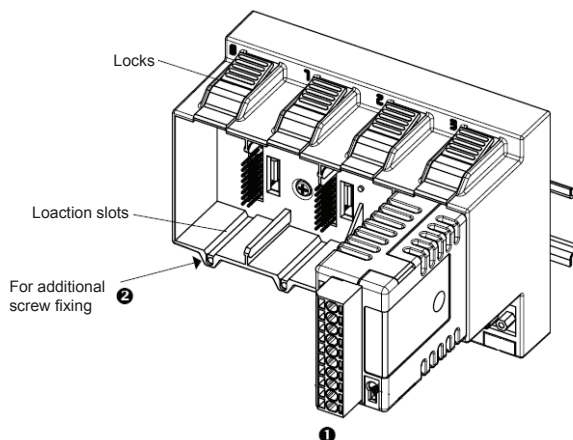


Fig.3-4 Front View of the Installation and Removal of the BACnet Gateway

3.3.3 Network Topology

See Fig.3-6 for the network topology. The whole system consists of the internal network of the air conditioning unit and BACnet/IP network through which the communication data can be exchanged.

One Bacnet gateway can support up to four communication modules, that it, four sets of GMV units (max. 64 indoor units)

Take a certain module as an example, however, always see the real communication module for

the DIP switch setting. Inside the communication module there is 8-position switch among which the SA2 and SA3 are used to set the device address. In the actual application, when the DIP switch is set to the side “ON”, it represents “0” of the binary system and “1” on the opposite end. Once the communication module is integrated with the BANnet gateway, its address range is 1 thru 4. See the Operation Instruction of the Communication Module for more details about the setting of the DIP switch.

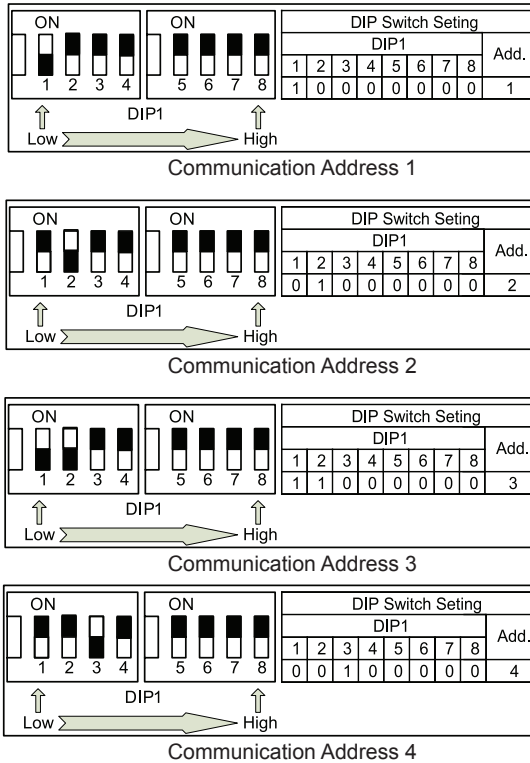


Fig.3-5 Address DIP Switch Setting of the Communication Module

Note: when the quantity of the GMV units exceeds 4, it is allowed for the BMS system to build a new network with another BACnet gateway .

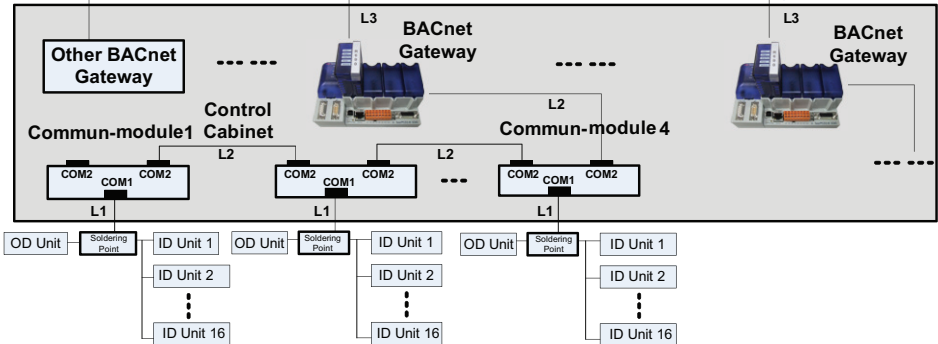
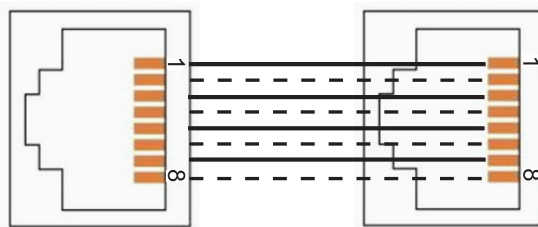


Fig.3-6 BACnet Network Topology

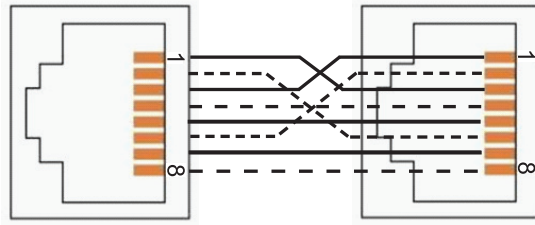
- 1) The communication module shown above is just taken as example, and always see the real communication module for the actual interfaces.
- 2) As shown in the figure above, “L3” represents the universal communication line between RJ45 interfaces.
- 3) The Web Server function provided by BMS(BACnet/IP) and BACnet gateway can be used at the same time.

3.3.4 Connection between the BACnet Gateway and the Upper Communication Device

3.3.4.1 Interface Connection



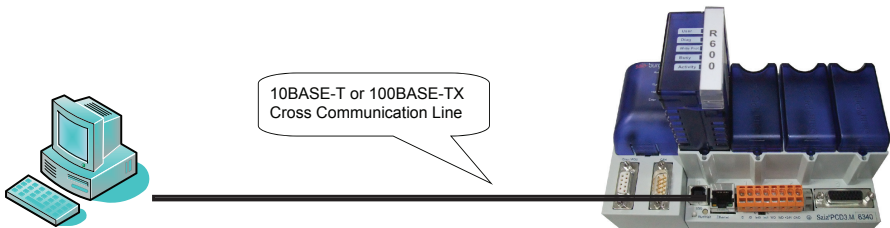
RJ45 Interface Connection with Parallel Line



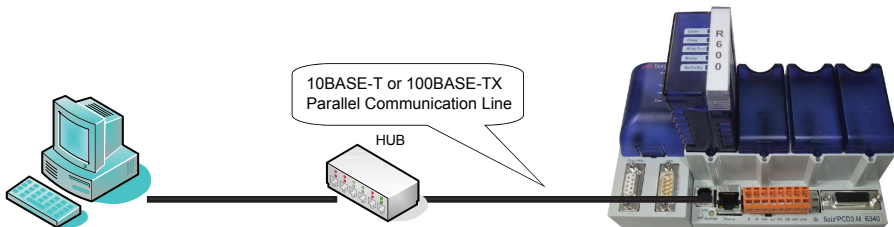
RJ45 Interface Connection with Cross Line

3.3.4.2 Connection between the BACnet Gateway and the Client-Side PC

1) Direction Connection with the Cross Communication Line:

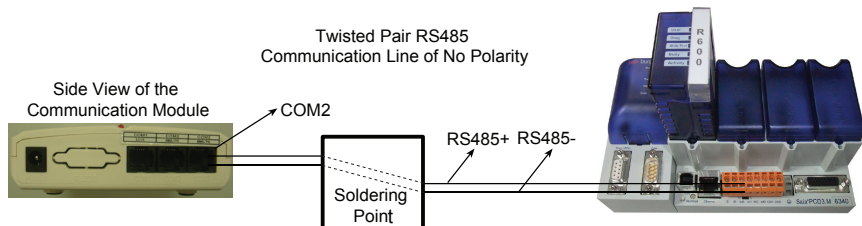


2) Indirection Connection via the Hub with the Parallel Communication Line:



3.3.5 Connection between the BACnet Gateway and the Lower Communication Device

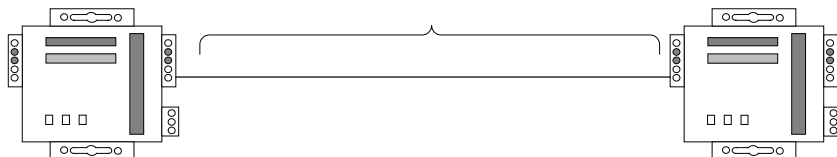
3.3.5.1 Take some communication module as an example, however, always see the real interfaces located at the communication module for actual connection.



3.3.5.2 Optional Repeater Kit

A RS-422/485 repeater (isolated) is required to amplify the communication signal when the communication distance exceeds 800m.

Max. distance of communication line between two repeaters is 800m



4 Precautions

1) Be sure the adaptor is proper; otherwise the BACnet gateway would function improperly or even be damaged.

2) Be sure the communication equipments are located at the proper place; otherwise it would lead to communication error.

3) Be sure the communication line is connected to the correct interface; otherwise it would lead to communication error.

4) After secured through soldering, the communication line should be protected with the insulating tape so as to avoid oxidization and short-circuiting.

5) Working Conditions for BACnet gateway:

Temperature: 0~55°C;

Humidity: equal to or less than 95%;

Located in the room (esp. the electric control cabinet) to avoid direct sunlight, rain and snow etc.

6) WARNING: If the working conditions are beyond what stated above, then BACnet would function improperly!

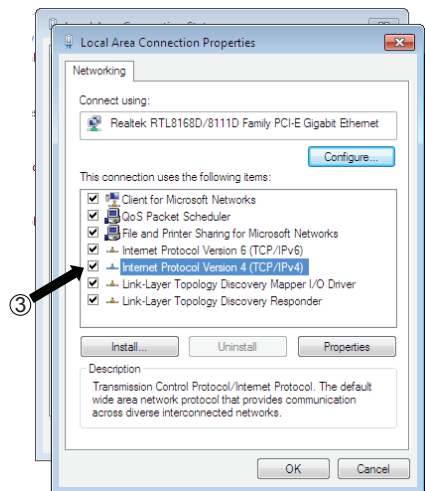
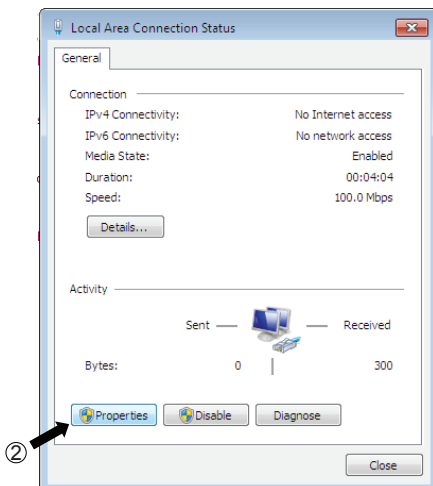
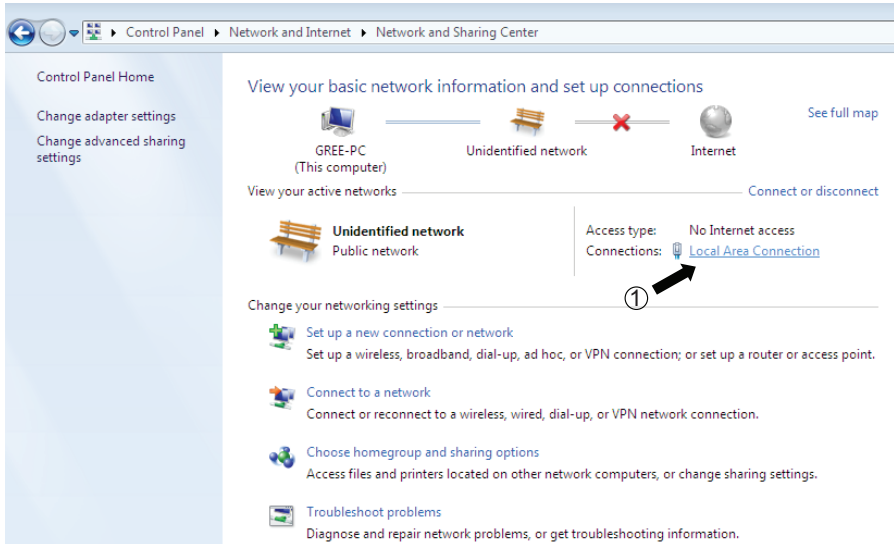
7) In order to protect the user's access authority, when the user is visiting the Web server of the BACnet gateway, it is strongly advised to modify the login passwords.

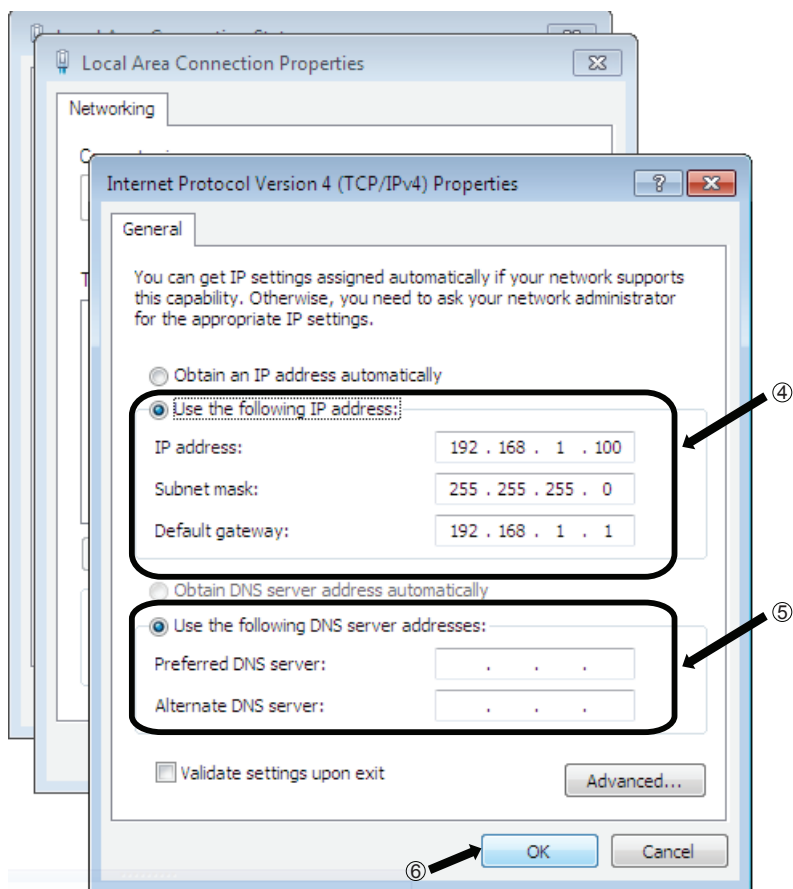
8) GREE keeps the right to update the products without advanced notice.

Appendixes

Appendix A TCP/IP Property Setting

- ① . Choose the “Local Area Connection” on PC.
- ② . Click the “Properties”.
- ③ . Choose the option Internet Protocol Version 4(TCP/IPv4)
- ④ . Choose the “Use the following IP address” and set the TCP/IP properties.
- ⑤ . DNS server addresses is not required to be set but keeps the default setting.
- ⑥ . Click OK and the setting is finished.





Appendix B BACnet Protocol

1 Brief Introduction to the BACnet Protocol

1.1 What is BACnet

BACnet - A Data Communication Protocol for Building Automation and Control Networks - see bacnet.org. BACnet is a standard data communication protocol for Building Automation and Control Networks. BACnet is an open protocol, which means anyone can contribute to the standard, and anyone may use it. The only caveat is that the BACnet standard document itself is copyrighted by ASHRAE, and they sell the document to help defray costs of developing and maintaining the standard (just like IEEE or ANSI or ISO).

1.2 BACnet Collapsed Architecture

BACnet is based on a four-layer collapsed architecture that corresponds to the physical, data link, network, and application layers of the OSI model.

BACnet Layers						Equivalent OSI Layers
BACnet Application Layer						Application
BACnet Network Layer						Network
ISO 8802-2(IEEE 802.2) Type 1		MS/TP	PTP	LonTalk	BVLL	Data Link
ISO 8802-3(IEEE 802.3)	ARCNET	EIA-485	EIA-232		UDP/IP	Physical

BACnet is defined for several physical layers.

BACnet/IP has only later been added to the original group.

1.3 BACnet device profiles

Today 6 device profiles are defined with BACnet:

BACnet Operator Workstation (B-OWS)

BACnet Building Controller (B-BC)

BACnet Advanced Application Controller (B-AAC)

BACnet Application Specific Controller (B-ASC)

BACnet Smart Actuator (B-SA)

BACnet Smart Sensor (B-SS)

Any device that implements all the required BACnet capabilities for a particular device type and interoperability area may claim to be a device of that particular type. Devices may also provide additional capabilities and shall indicate these capabilities in their PICS.

1.4 BACnet standard objects

ANSI/ASHRAE 135-2008 defines 30 BACnet standard objects as shown in the standard document.

Clause	Description	Page	Clause	Description	Page
12.1	Accumulator Object Type	132	12.16	Life Safety Zone Object Type	203
12.2	Analog Input Object Type	140	12.17	Loop Object Type	209
12.3	Analog Output Object Type	145	12.18	Multi-state Input Object Type	216
12.4	Analog Value Object Type	150	12.19	Multi-state Output Object Type	220
12.5	Averaging Object Type	155	12.20	Multi-state Value Object Type	224
12.6	Binary Input Object Type	158	12.21	Notification Class Object Type	229
12.7	Binary Output Object Type	163	12.22	Program Object Type	232
12.8	Binary Value Object Type	169	12.23	Pulse Converter Object Type	237
12.9	Calendar Object Type	174	12.24	Schedule Object Type	244
12.10	Command Object Type	176	12.25	Trend Log Object Type	249
12.11	Device Object Type	180	12.26	Access Door Object Type	257
12.12	Event Enrollment Object Type	188	12.27	Event Log Object Type	264
12.13	File Object Type	193	12.28	Load Control Object Type	270
12.14	Group Object Type	195	12.29	Structured View Object Type	279
12.15	Life Safety Point Object Type	197	12.30	Trend Log Multiple Object Type	281

1.5 BACnet services

BACnet services are divided into five segments:

- 1) Alarm and event Services
- 2) File Access Services
- 3) Object access Services
- 4) Remote device management Services
- 5) Virtual terminal Services

For each device profile certain services are mandatory.

1.6 Description of a service: BIBB

BACnet Interoperability Building Blocks (BIBBs) are collections of one or more BACnet services. These are prescribed in terms of an "A" and a "B" device. Both of these devices are nodes on a BACnet internetwork. In most cases, the "A" device will act as the user of data (client), and the "B" device will be the provider of this data (server). In addition, certain BIBBs may also be predicated on the support of certain, otherwise optional, BACnet objects or properties and may place constraints on the allowable values of specific properties or service parameters.

1.7 Description of a device type: PICS

PICS protocol implementation conformance statement All devices conforming to the BACnet protocol shall have a Protocol Implementation Conformance Statement (PICS) that identifies all of the portions of BACnet that are implemented.

A PICS is a written document, created by the manufacturer of a device, that identifies the particular options specified by BACnet that are implemented in the device. A BACnet PICS is considered a public document that is available for use by any interested party.

2 BACnet protocol implementation conformance statement(PICS)

Date: 08.08.2011

Vendor Name: Saia-Burgess Controls AG (Vendor ID = 89)

Product Names: BACnet_GMV1_V1.0

stations: PCD3.M6340

Product Model Number: PCD7.R560

Applications Software Version: -

Firmware Revision: BACnetPCD3Mxxx0_PCD2M5xx0_1.08.49.blk

BACnet Protocol Revision: 1.4

2.1 Product Description:

The BACnet gateway applied for GREE GMV units links the unit's internal network with the BACnet/IP network, and also provides BACnet BAS interfaces which enable the unit to be seamlessly integrated into the third party's BAS.

2.2 BACnet Standardized Device Profile (Appendix L):

- ☐ BACnet Operator Workstation (B-OWS)
- ☐ BACnet Building Controller (B-BC)
- ☐ BACnet Advanced Application Controller (B-AAC)
- ☒ BACnet Application Specific Controller (B-ASC)
- ☐ BACnet Smart Sensor (B-SS)
- ☐ BACnet Smart Actuator (B-SA)

2.3 List all BACnet Interoperability Building Blocks Supported (Appendix K):

1) Data Sharing BIBBs

Data Sharing Read-Property-B DS-RP-B

Data Sharing Read-Property-Multiple-B DS-RPM-B

Data Sharing Write-Property-B DS-WP-B

Data Sharing Write-Property-Multiple-B DS-WPM-B

Data Sharing COV-B DS-COV-B

Data Sharing COV-Unsolicited-B DS-COVU-B

Data Sharing COV-Property-B DS-COVP-B

2) Device Management BIBBs

Device Management-Dynamic Device Binding-A DM-DDB-A

Device Management-Dynamic Device Binding-B DM-DDB-B

Device Management-Dynamic Object Binding-B DM-DOB-B

Device Management-DeviceCommunicationControl-B DM-DCC-B

Device Management-TimeSynchronization-B DM-TS-B

Device Management-UTCTimeSynchronization-B DM-UTC-B

Device Management-ReinitializeDevice-B DM-RD-B

Device Management-Backup and Restore-B DM-BR-B

Device Management-Restart-B DM-R-B

Device Management-List Manipulation-B DM-LM-B

Device Management-Object Creation and Deletion-B DM-OCD-B

3) Network Management BIBBs

Network Management-Connection Establishment-B NM-CE-B

Network Management-Router Configuration-B NM-RC-B

2.4 Segmentation Capability:

■ Able to transmit segmented messages Window Size 16

■ Able to receive segmented messages Window Size 16

2.5 Standard Object Types Supported:

1) Standard Object Types Supported: Analog-Input-Object

Dynamically Creatable	Dynamically Deleteable	Optional Properties Supported	Writable Properties	Proprietary Properties
□	□	Description Device Type Reliability Update_Interval Min_Pres_Value Max_Pres_Value Resolution COV_Increment Time_Delay Notification_Class High_Limit Low_Limit Deadband Limit_Enable Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Present_Value COV_Increment Time_Delay High_Limit Low_Limit Deadband Limit_Enable Event_Enable	

2) Standard Object Types Supported: Analog-Value-Object

Dynamically Creatable	Dynamically Deleteable	Optional Properties Supported	Writable Properties	Proprietary Properties
□	□	Description Reliability Priority_Array Relinquish_Default COV_Increment Time_Delay Notification_Class High_Limit Low_Limit Deadband Limit_Enable Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Present_Value COV_Increment Time_Delay High_Limit Low_Limit Deadband Limit_Enable Event_Enable	

3) Standard Object Types Supported: Binary-Input-Object

Dynamically Creatable	Dynamically Deleteable	Optional Properties Supported	Writable Properties	Proprietary Properties
□	□	Description Device_Type Reliability Inactive_Text Active_Text Change_Of_State_Time Change_Of_State_Count Time_Of_State_Count_Reset Elapsed_Active_Time Time_Of_Active_Time_Reset Time_Delay Notification_Class Alarm_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Present_Value Time_Delay Event_Enable	

4) Standard Object Types Supported: Binary-Output-Object

Dynamically Creatable	Dynamically Deleteable	Optional Properties Supported	Writable Properties	Proprietary Properties
□	□	Description Device_Type Reliability Inactive_Text Active_Text Change_Of_State_Time Change_Of_State_Count Time_Of_State_Count_ Reset Elapsed_Active_Time Time_Of_Active_Time_ Reset Minimum_Off_Time Minimum_On_Time Time_Delay Notification_Class Feedback_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Present_Value Time_Delay Event_Enable	

5)Standard Object Types Supported: Binary-Value-Object

Dynamically Creatable	Dynamically Deleteable	Optional Properties Supported	Writable Properties	Proprietary Properties
□	□	Description Reliability Inactive_Text Active_Text Change_Of_State_Time Change_Of_State_Count Time_Of_State_Count_ Reset Elapsed_Active_Time Time_Of_Active_Time_ Reset Minimum_Off_Time Minimum_On_Time Priority_Array Relinquish_Default Time_Delay Notification_Class Alarm_Value Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Present_Value Time_Delay Event_Enable	

6) Standard Object Types Supported: Multistate-Input-Object

Dynamically Creatable	Dynamically Deleteable	Optional Properties Supported	Writable Properties	Proprietary Properties
☐	☐	Description Device_Type Reliability State_Text Time_Delay Notification_Class Alarm_Values Fault_Values Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Present_Value Time_Delay Alarm_Values Fault_Values Event_Enable	

7) Standard Object Types Supported: Multistate-Value-Object

Dynamically Creatable	Dynamically Deleteable	Optional Properties Supported	Writable Properties	Proprietary Properties
☐	☐	Description Reliability State_Text Priority_Array Relinquish_Default Time_Delay Notification_Class Alarm_Values Fault_Values Event_Enable Acked_Transitions Notify_Type Event_Time_Stamps	Present_Value Time_Delay Alarm_Values Fault_Values Event_Enable	

2.6 Data Link Layer Options:

■ BACnet IP, (Appendix J)

- ☐ BACnet IP, (Appendix J), Foreign Device
- ☐ ISO 8802-3, Ethernet (Clause 7)
- ☐ ATA 878.1, 2.5 Mb. ARCNET (Clause 8)
- ☐ ATA 878.1, EIA-485 ARCNET (Clause 8), baud rate(s) _____
- ☐ MS/TP master (Clause 9), baud rate(s):
- ☐ MS/TP slave (Clause 9), baud rate(s):
- ☐ Point-To-Point, EIA 232 (Clause 10), baud rate(s):
- ☐ Point-To-Point, modem, (Clause 10), baud rate(s):
- ☐ LonTalk, (Clause 11), medium: _____
- ☐ Other:

2.7 Device Address Binding:

Is static device binding supported? (This is currently necessary for two-way communication with

MS/TP slaves and certain other devices.) ☐ Yes ☒ No

2.8 Networking Options:

☒ Router, Clause 6 - List all routing configurations, e.g., ARCNET-Ethernet, Ethernet-MS/TP, etc.

☐ Appendix H, BACnet Tunneling Router over IP

☐ BACnet/IP Broadcast Management Device (BBMD)

Does the BBMD support registrations by Foreign Devices? ☐ Yes ☒ No

2.9 Character Sets Supported:

Indicating support for multiple character sets does not imply that they can all be supported simultaneously.

☒ ANSI X3.4 ☐ IBM™/Microsoft™ DBCS ☐ ISO 8859-1

☐ ISO 10646 (UCS-2) ☐ ISO 10646 (UCS-4) ☐ JIS C 6226

3 BACnet Objects List

3.1 Supported BACnet Object Type

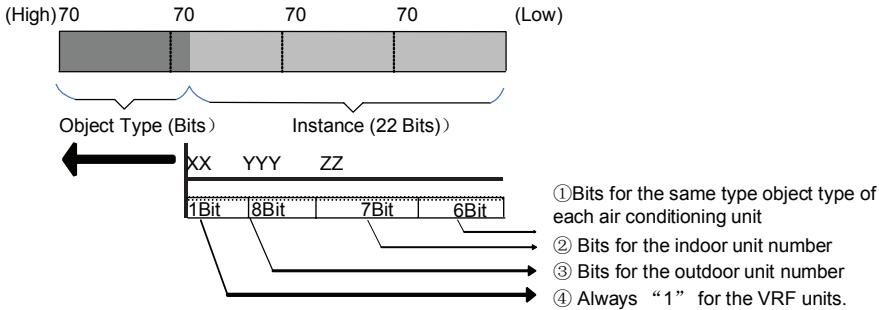
Based on the object type specified in the BACnet standard document, the object type and name related to the air conditioning unit are listed as follows:

Object number	Object Type	Hexadecimal format	Decimal format	Air conditioner Parameter name
0	Analog Input	X'0000 0000'	0	Indoor unit environment Temp, Water tank temp(status), Double-Tube supply Water Temp, Outdoor environment temp
1	Analog Output	X'0040 0000'	4194304	☐
2	Analog Value	X'0080 0000'	8388608	Indoor unit Temp(setting), Water tank temp(setting), Floor Heating supply Water Setting Temp.
3	Binary Input	X'00C0 0000'	12582912	Indoor unit general error mark, On/Off(status), Specific error mark for the GMV Water Heater, Disinfecting, Floor heat power, Outdoor unit general error mark , Complete machine compressor state
4	Binary Output	X'0100 0000'	16777216	On/Off(setting)
5	Binary Value	X'0140 0000'	20971520	Swing(setting), Energy saving(setting), Remote temp shield mark(setting), Remote mode shield mark(setting), Remote On/Off shield mark(setting), Remote lock mark(all shield)(setting)
6	Calendar	X'0180 0000'	25165824	☐
7	Command	X'01C0 0000'	29360128	☐

8	Device	X'0200 0000'	96468992	■
9	Event-Enrollment	X'0240 0000'	37748736	□
10	File	X'0280 0000'	41943040	□
11	Group	X'02C0 0000'	46137344	□
12	Loop	X'0300 0000'	50331648	□
13	Multistate Input	X'0340 0000'	54525952	Indoor unit error code, Indoor unit mode(status), Fan Speed(status), Specific error codes for the GMV Water Heater, Water tank(status), Water tank mode(status), Outdoor unit error code
14	Multistate Output	X'0380 0000'	58720256	□
15	Notification Class	X'03C0 0000'	62914560	□
16	Program	X'0400 0000'	67108864	□
17	Schedule	X'0440 0000'	71303168	□
18	Averaging	X'0480 0000'	75497472	□
19	Multistate Value	X'04C0 0000'	79691776	Indoor unit mode(setting), Fan Speed(setting), Water tank(setting), Water tank mode(setting), Water tank control shielding code(setting)
20	Trend Log	X'0500 0000'	83886080	□
21	Life Safety Point	X'0540 0000'	88080384	□
22	Life Safety Zone	X'0580 0000'	92274688	□
23	Accumulator	X'05C0 0000'	96468992	□
24	Pulse Converter	X'0600 0000'	100663296	□
25	Event Log	X'0640 0000'	104857600	□
26	Reserve	X'0680 0000'	109051904	□
27	Trend Log Multiple	X'06C0 0000'	113246208	□
28	load-control	X'0700 0000'	117440512	□
29	structured-view	X'0740 0000'	121634816	□
30	access-door	X'0780 0000'	125829120	□

3.2 BACnet Point List

A BACnet Object Identifier value shall consist of two components: Object Type and Instance Number. The BACnet object uses the data field of the instance number 22 as shown below.



The detailed object is explicated as below (table 3.2.1 and table 3.2.2 are two parts of the whole point list)

Notes:

1) A object name includes XX_YYY_ZZ, and following each parameter represents the air conditioning unit number. Wherein, XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now(this means the communication module's address); ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.

For instance:

IndoorUnitModeCommand_01_001_01: On/ Off setting of the GMV outdoor unit 1 and indoor unit 1.

IndoorUnitModeCommand_01_001_16: On/Off setting point of the GMV outdoor unit 1 and indoor unit16.

OutdoorUnitErrorMark_01_001_00: General error of the GMV outdoor unit.

WaterTankModeCommand_01_004_00: Want tank mode setting of the GMV outdoor unit 4, only applicable to the unit which can functions as the water heater.

2) See Appendix C, Appendix D, Append E and Appendix F for more details about alarm codes and shield mark.

3) GMV water heater includes both the specific parameters of GMV water heater and parameters of GMV outdoor units.

4) Parameters marked with* are only for the multi GMV water heater with floor heating function.

Table 3.2.1

Parameter number	Parameter name	Object name	Object ID	Object Type
Parameters of GMV Indoor Units				
1	Indoor unit general error mark	IndoorUnitErrorMark_XX_YYY_ZZ	BI(3)+YYY*8192+ZZ*64+1	BI
2	Indoor unit error code	IndoorUnitErrorCode_XX_YYY_ZZ	MI(13)+YYY*8192+ZZ*64+1	MI
3	Indoor unit environment Temp	IndoorUnitEnvironmentTemp_XX_YYY_ZZ	AI(0)+YYY*8192+ZZ*64+1	AI
4	Indoor unit Temp(setting)	IndoorUnitTempCommand_XX_YYY_ZZ	AV(2)+YYY*8192+ZZ*64+1	AV
5	Indoor unit mode(status)	IndoorUnitModeStatus_XX_YYY_ZZ	MI(13)+YYY*8192+ZZ*64+2	MI
6	Indoor unit mode(setting)	IndoorUnitModeCommand_XX_YYY_ZZ	MV(19)+YYY*8192+ZZ*64+1	MV
7	On/Off(status)	OnOffStatus_XX_YYY_ZZ	BI(3)+YYY*8192+ZZ*64+2	BI
8	On/Off(setting)	OnOffCommand_XX_YYY_ZZ	BO(4)+YYY*8192+ZZ*64+1	BO
9	Fan Speed(status)	FanSpeedStatus_XX_YYY_ZZ	MI(13)+YYY*8192+ZZ*64+3	MI
10	Fan Speed(setting)	FanSpeedCommand_XX_YYY_ZZ	MV(19)+YYY*8192+ZZ*64+2	MV
11	Swing(setting)	SwingCommand_XX_YYY_ZZ	BV(5)+YYY*8192+ZZ*64+1	BV
12	Energy saving(setting)	EnergySavingCommand_XX_YYY_ZZ	BV(5)+YYY*8192+ZZ*64+2	BV
13	Remote temp shield mark(setting)	RemoteTempShieldCommand_XX_YYY_ZZ	BV(5)+YYY*8192+ZZ*64+3	BV
14	Remote mode shield mark(setting)	RemoteModeShieldCommand_XX_YYY_ZZ	BV(5)+YYY*8192+ZZ*64+4	BV
15	Remote On/Off shield mark(setting)	RemoteOnOffShieldCommand_XX_YYY_ZZ	BV(5)+YYY*8192+ZZ*64+5	BV
16	Remote lock mark(all shield)(setting)	RemoteLockCommand_XX_YYY_ZZ	BV(5)+YYY*8192+ZZ*64+6	BV
Specific Parameters of GMV Water Heater				
17	Specific error mark for the GMV Water Heater	GMVWaterHeaterSpecificErrorMark_XX_YYY_ZZ	BI(3)+YYY*8192+ZZ*64+1	BI
18	Specific error codes for the GMV Water Heater	GMVWaterHeaterSpecificErrorCode_s_XX_YYY_ZZ	MI(13)+YYY*8192+ZZ*64+1	MI
19	Water tank temp(status)	WaterTankTempStatus_XX_YYY_ZZ	AI(0)+YYY*8192+ZZ*64+1	AI
20	Water tank temp(setting)	WaterTankTempCommand_XX_YYY_ZZ	AV(2)+YYY*8192+ZZ*64+1	AV
21	Water tank(status)	WaterTankStatus_XX_YYY_ZZ	MI(13)+YYY*8192+ZZ*64+2	MI
22	Water tank(setting)	WaterTankCommand_XX_YYY_ZZ	MV(19)+YYY*8192+ZZ*64+1	MV
23	Water tank mode(status)	WaterTankModeStatus_XX_YYY_ZZ	MI(13)+YYY*8192+ZZ*64+3	MI

24	Water tank mode(setting)	WaterTankModeCommand_XX_YYY_ZZ	MV(19)+YYY*8192+ZZ*64+2	MV
25	Double-Tube supply Water Temp	DoubleTubeSupplyWaterTemp_XX_YYY_ZZ	AI(0)+YYY*8192+ZZ*64+2	AI
26	Floor Heating supply Water Setting Temp.	FloorHeatingSupplyWaterSettingTemp_XX_YYY_ZZ	AV(2)+YYY*8192+ZZ*64+2	AV
27	Disinfecting	Disinfecting_XX_YYY_ZZ	BI(3)+YYY*8192+ZZ*64+2	BI
28	Floor heat power	FloorHeatPower_XX_YYY_ZZ	BI(3)+YYY*8192+ZZ*64+3	BI
29	Water tank control shielding code(setting)	WaterTankControlShieldingCodeCommand_XX_YYY_ZZ	MV(19)+YYY*8192+ZZ*64+3	MV
Parameters of GMV Outdoor Units				
30	Outdoor unit general error mark	OutdoorUnitErrorMark_XX_YYY_ZZ	BI(3)+YYY*8192+ZZ*64+4	BI
31	Outdoor unit error code	OutdoorUnitErrorCode_XX_YYY_ZZ	MI(13)+YYY*8192+ZZ*64+4	MI
32	Outdoor environment temp	OutdoorEnvironmentTemp_XX_YYY_ZZ	AI(0)+YYY*8192+ZZ*64+3	AI
33	Complete machine compressor state	CompleteMachineCompressorState_XX_YYY_ZZ	BI(3)+YYY*8192+ZZ*64+5	BI

Table 3.2.2

Parameter number	Instance Number	Present_Value	Units	Min_Pres_Value	Max_Pres_Value	Resolution
Parameters of GMV Indoor Units						
1	YYY*8192+ZZ*64+1	0:without, 1:with				
2	YYY*8192+ZZ*64+1	see Alarm codes				
3	YYY*8192+ZZ*64+1	-20~100	℃	-20	100	1
4	YYY*8192+ZZ*64+1	16~30	℃			
5	YYY*8192+ZZ*64+2	1- Cool, 2- Dehumidify,3- Fan,4-Heat; Others:0 means nothing, used insignificance symbol to express, like "___".				
6	YYY*8192+ZZ*64+1	1- Cool,2- Dehumidify,3- Fan,4-Heat;Others:0 means nothing, used insignificance symbol to express, like "___".				
7	YYY*8192+ZZ*64+2	0:Off,1:On				
8	YYY*8192+ZZ*64+1	0:Off,1:On				
9	YYY*8192+ZZ*64+3	0- Auto fan speed,1- Low fan speed,2- Middle fan speed,3- High fan speed;				
10	YYY*8192+ZZ*64+2	1- Low fan speed,2- Middle fan speed,3- High fan speed;				
11	YYY*8192+ZZ*64+1	0:Off,1:On				

12	YYY*8192+ZZ*64+2	0:Off,1:On				
13	YYY*8192+ZZ*64+3	0:Without shield ,1:Shield				
14	YYY*8192+ZZ*64+4	0:Without shield ,1:Shield				
15	YYY*8192+ZZ*64+5	0:Without shield ,1:Shield				
16	YYY*8192+ZZ*64+6	0:Without shield ,1:Shield				
Specific Parameters of GMV Water Heater						
17	YYY*8192+ZZ*64+1	0:without, 1:with				
18	YYY*8192+ZZ*64+1	see Alarm codes				
19	YYY*8192+ZZ*64+1	1) Hot Water, Night, Reserve modes:35℃~58℃ (the upper limit can be adjusted to 65℃); 2) Energy saving mode:35℃~50℃; 3) High temp sterilization mode:65℃~70℃;	℃			1
20	YYY*8192+ZZ*64+1	1) Hot Water, Night, Reserve modes:35℃~58℃ (the upper limit can be adjusted to 65℃); 2) Energy saving mode:35℃~50℃; 3) High temp sterilization mode:65℃~70℃;	℃			
21	YYY*8192+ZZ*64+2	7-off,8-heat preservation and standby,9-heating water				
22	YYY*8192+ZZ*64+1	7-off,8-heat preservation and standby,9-heating water				
23	YYY*8192+ZZ*64+3	1-energy saving mode mode,2-reservation mode mode,3-night mode,4-hot water mode				
24	YYY*8192+ZZ*64+2	1-energy saving mode mode,2-reservation mode mode,3-night mode,4-hot water mode				
25	YYY*8192+ZZ*64+2	-127~255	℃	-127	255	1
26	YYY*8192+ZZ*64+2	30~52	℃			
27	YYY*8192+ZZ*64+2	0:No,1:Yes				
28	YYY*8192+ZZ*64+3	0:off, 1:on				
29	YYY*8192+ZZ*64+3	see shield mark codes				
Parameters of GMV Outdoor Units						
30	YYY*8192+ZZ*64+4	0:without, 1:with				
31	YYY*8192+ZZ*64+4	see Alarm codes				
32	YYY*8192+ZZ*64+3	-127~255	℃	-127	255	1
33	YYY*8192+ZZ*64+5	0:off, 1:on				

3.3 Detailed Descriptions of BACnet Objects

For each communication status, objects related to the unit are treated on the BANnet as follows:

(1) It is known from the BACnet gateway topology that the BACnet objects related to the units include those about the GMV outdoor unit and GMV indoor unit. As for the GMV water heater unit, BACnet objects also include those about the water tank and floor heating device additionally.

(2) Indoor unit general error mark

Member number:1

Object name:IndoorUnitErrorMark_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Units's number,like GMV is between 001 and 004 now;ZZ means Indoor Units's number,like GMV is between 01 and 16 now,otherwise 00 means deviceYYY's Parameters.)

Object type:Binary output

Object ID: BI(3)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the general error of the indoor unit.

Present_Value:

ACTIVE:with

INACTIVE:without

Note :

1) When some error occurs to any one of the indoor unit, Present_Value property will turn to ACTIVE and raise an alarm.

2) Present_Value property is defaulted to be INACTIVE.

(3) Indoor unit error code

Member number:2

Object name:IndoorUnitErrorCode_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Units's number,like GMV is between 001 and 004 now;ZZ means Indoor Units's number,like GMV is between 01 and 16 now,otherwise 00 means deviceYYY's Parameters.)

Object type:Multistate Input

Object ID: MI(13)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the error code of the indoor unit. For more details see Appendix C.

Present_Value:

0x00000000-0x000003FF (See Appendix C)

Notes:

1) When some error occurs to the indoor unit, Present_Value property will produce a decimal numeral. For more details see Appendix C.

2) Multiple error may concur. Each error has a independent error code, e.g. 0x00000008 for "Outlet Tube Temp Sensor Error",0x00000010 for "Inlet Tube Temp Sensor Error". When these errors just happen together, Present_Value property will be 24 (conversion method: 0x00000008 plus 0x00000010 is 0x00000018, that is equal to the decimal numeral 24).

3) When some communication error occurs, it indicates the indoor unit is not well connected with the communication module. When the message "Indoor Unit/Wired Controller Communication Error Mark" is sent, it indicates the outdoor unit is not well connected with the indoor unit or the wired controller.

(4) Indoor unit environment Temp

Member number:3

Object name:IndoorUnitEnvironmentTemp_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Units's number,like GMV is between 001 and 004 now;ZZ means Indoor Units's number,like GMV is between 01 and 16 now,otherwise 00 means deviceYYY's Parameters.)

Object type:Analog Input

Object ID: AI(0)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the indoor unit environment temperature.

Present_Value:-20~100

Units: degrees-Celsius or °C

Min_Pres_Value: -20

Max_Pres_Value: 100

Resolution: 1

Note :

(5) Indoor unit mode(status)

Member number:4

Object name:IndoorUnitModeStatus_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Units's number,like GMV is between 001 and 004 now;ZZ means Indoor Units's number,like GMV is between 01 and 16 now,otherwise 00 means deviceYYY's Parameters.)

Object type:Multistate Input

Object ID: MI(13)+YYY*8192+ZZ*64+2

Instance Number: YYY*8192+ZZ*64+2

Description: this object is used to monitor the running mode of the indoor unit.

Present_Value:

1- Cool,

2- Dehumidify,

3- Fan,

4- Heat;

Others: 0 means nothing, can use insignificance symbol to express, like "--";

Note :

1) The indoor unit running mode takes effective only when the unit is turned on.

(6) Indoor unit mode(setting)

Member number:5

Object name:IndoorUnitModeCommand_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Multistate Value

Object ID: MV(19)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the mode setting of the indoor unit.

Present_Value:

1- Cool,

2- Dehumidify,

3- Fan,

4- Heat;

Note :

1) The indoor unit running mode takes effective only when the unit is turned on.

2) For the cooling only unit, the "HEAT" parameter takes ineffective.

3) It is required to judge if the setting parameter sent by the BMS is within the effective range.

(7) On/Off(status)

Member number:6

Object name:OnOffStatus_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Units's number,like GMV is between 001 and 004 now;ZZ means Indoor Units's number,like GMV is between 01 and 16 now,otherwise 00 means deviceYYY's Parameters.)

Object type:Binary Input

Object ID: BI(3)+YYY*8192+ZZ*64+2

Instance Number: YYY*8192+ZZ*64+2

Description: It is used to monitor the on/off status of the indoor unit.

Present_Value:

ACTIVE:On

INACTIVE:Off

Note :

1) When the unit runs normally, Present_Value wil reflect the real-time on/off status of the unit.

(8) On/Off(setting)

Member number:7

Object name:OnOffCommand_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Output

Object ID: BO(4)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the on/off setting of the unit.

Present_Value:

ACTIVE:On

INACTIVE:Off

Notes:

1) Relinquish default is INACTIVE.

2) In the event that the Present-Value of "Indoor unit mode (status)" is "0", it will be defaulted to

"1" responding to the "On" command.

3) When some error still exists on the unit, the unit may fail to be started prior to the clearance of the error.

(9) Fan Speed(status)

Member number:8

Object name:FanSpeedStatus_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Multistate Input

Object ID: MI(13)+YYY*8192+ZZ*64+3

Instance Number: YYY*8192+ZZ*64+3

Description: this object is used to monitor the fan speed status of the indoor unit.

Present_Value:

- 0- Auto fan speed,
- 1- Low fan speed,
- 2- Middle fan speed,
- 3- High fan speed;

Note :

- 1) When the unit run normally, Present_Value wil reflect the real-time fan speed status.
- 2) Under the "DRY" mode, Present_Value will keep at "1"- "Low fan speed".

(10) Fan Speed(setting)

Member number :9

Object name:FanSpeedCommand_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Units's number,like GMV is between 001 and 004 now;ZZ means Indoor Units's number,like GMV is between 01 and 16 now,otherwise 00 means device YYY's Parameters.)

Object type:Multistate Value

Object ID: MV(19)+YYY*8192+ZZ*64+2

Instance Number: YYY*8192+ZZ*64+2

Description: this object is used to monitor the fan speed setting of the indoor unit.

Present_Value:

- 1- Low fan speed,
- 2- Middle fan speed,
- 3- High fan speed;

Notes :

- 1) Under the "DRY" mode, Present_Value will keep at "1"- Low fan speed.
 - 2) When Present_Value property is "0", it indicates the unit runs at the auto fan speed.
- However, BACnet specifies that the MV object can not be set in such a way, therefore it is invalid.

(11) Swing(setting)

Member number :10

Object name:SwingCommand_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Units's number, like GMV is between 001 and 004 now; ZZ means Indoor Units's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Value

Object ID: BV(5)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the Swing setting of the indoor fan.

Present_Value:

ACTIVE: On

INACTIVE: Off

Note:

1) The Present_Value can reflect the real-time Swing state of the unit. That is, it varies as the change of the Swing setting of the wired controller or the wires controller.

(12) Energy saving(setting)

Member number: 11

Object name: EnergySavingCommand_XX_YYY_ZZ (XX means Air condition type, like GMV is 01; YYY means Outdoor Units's number, like GMV is between 001 and 004 now; ZZ means Indoor Units's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Value

Object ID: BV(5)+YYY*8192+ZZ*64+2

Instance Number: YYY*8192+ZZ*64+2

Description: this object is used to monitor the energy saving setting of the indoor unit.

Present_Value:

ACTIVE: On

INACTIVE: Off

Notes:

1) the Present_Value can reflect the real-time energy saving setting of the unit. That is, it varies as the change of the energy saving setting of the wired controller or the wires controller.

2) When Present_Value is ACTIVE, under either the "COOL" or "HEAT" mode, the unit will run among the energy saving temperature limit so as to save more energy.

(13) Remote temp shield mark (setting)

Member number: 12

Object name: RemoteTempShieldCommand_XX_YYY_ZZ (XX means Air condition type, like GMV is 01; YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Value

Object ID: BV (5)+YYY*8192+ZZ*64+3

Instance Number: YYY*8192+ZZ*64+3

Description: this object is used to enable or disable the wired or wireless controller to set the room temperature.

Present_Value:

ACTIVE: Shield

INACTIVE: Without shield

Note :

1) Present_Value is ACTIVE, the wired or wireless controller is disabled to set the room temperature.

2) Present_Value is ACTIVE, the BMS is enabled to control the room temperature.

(14) Remote mode shield mark(setting)

Member number :13

Object name:RemoteModeShieldCommand_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now;ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means deviceYYY's Parameters.)

Object type:Binary Value

Object ID: BV(5)+YYY*8192+ZZ*64+4

Instance Number: YYY*8192+ZZ*64+4

Description: this object is used to enable or disable the wired or wireless controller to set the running mode the unit.

Present_Value:

ACTIVE: Shield

INACTIVE: Without shield

Note :

1) When Present_Value is ACTIVE, the wired or wireless controller is disabled to set the running mode of the unit.

2) When Present_Value is ACTIVE, the BMS is enabled to control the running mode of the unit.

(15) Remote On/Off shield mark (setting)

Member number :14

Object name:RemoteOnOffShieldCommand_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Unit 's number, like GMV is between 001 and 004 now;ZZ means Indoor Unit's number ,like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Value

Object ID: BV(5)+YYY*8192+ZZ*64+5

Instance Number: YYY*8192+ZZ*64+5

Description: this object is used to enable the wired or wireless controller to start or stop the unit.

Present_Value:

ACTIVE:Shield

INACTIVE:Without shield

Note :

1) When Present_Value is ACTIVE, the wired or wireless controller is enabled to start or stop the unit.

2) When Present_Value is ACTIVE, the BMS is enabled to control the start or stop of the unit.

(16) RemoteLockCommand_XX_YYY_ZZ

Member number :15

Object name:RemoteLockCommand_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means

Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Value

Object ID: BV(5)+YYY*8192+ZZ*64+6

Instance Number: YYY*8192+ZZ*64+6

Description: this object is used to enable or disable the wired or wireless controller to set any parameter.

Present_Value:

ACTIVE:Shield

INACTIVE:Without shield

Note :

1) When Present_Value is ACTIVE, the wired or wireless controller is disable to set any parameter of the unit.

2) When Present_Value is ACTIVE, the BMS controller is enabled to control all functions of the indoor unit.

(17) Specific error mark for the GMV water heater

Member number :16

Object name:GMVWaterHeaterSpecificErrorMark_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Input

Object ID: BI(3)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the special error mark of the GMV water heater unit.

Present_Value:

ACTIVE: with

INACTIVE:without

Note :

1) As for the GMV water heater unit, it includes both the special water heater error and general error of GMV outdoor unit. When this error occurs, Present_Value property wil turn to ACTIVE and an alarm will be raised.

2) Present_Value property is defaulted to be INACTIVE.

3) This parameter is only for the GMV water heater.

(18) Specific error codes for the GMV Water Heater

Member number :17

Object name:GMVWaterHeaterSpecificErrorCodes_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Multistate Input

Object ID: MI(13)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the error code of the GMV water heart. For more details see Appendix E.

Present_Value:

0x00010000-0x0001FFFF (See Appendix E)

Note :

1) When some error occurs to the GMV water heater, Present_Value property will be a decimal numeral related to the error code.

2) Multi errors may concur. Each error has a independent error code, e.g. 0x00000040 for "Water Tank Upper Temp Sensor Error", 0x00000080 for "Water Tank Lower Temp Sensor Error". When these two errors just happen together, Present_Value property will be192 (conversion method: 0x00000040 OR 0x00000080 is 0x000000C0,equal to192).

3) This parameter is only for the GMV water heater.

(19) Water tank temp(status)

Member number :18

Object name:WaterTankTempStatus_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now;ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Analog Input

Object ID: AI(0)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the water tank temperature status of the GMV water heater..

Present_Value:

① . Hot Water, Night, Reserve modes:35°C~58°C (the upper limit can be adjusted to 65°C);

② . Energy saving mode:35°C ~50°C ;

③ . High temp sterilization mode:65°C ~70°C ;

Units: degrees-Celsius or °C

Resolution: 1

Note :

1) The temperature status of the water tank varies as the change of the running mode of the water tank.

2) This parameter is only for the GMV water heater.

(20) Water tank temp(setting)

Member number :19

Object name:WaterTankTempCommand_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type:Analog Value

Object ID: AV(2)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the temperature setting of the water tank of the GMV water heater.

Present_Value:

- ① . Hot Water, Night, Reserve modes:35°C ~58°C (the upper limit can be adjusted to 65°C);
- ② . Energy saving mode:35°C ~50°C ;
- ③ . High temp sterilization mode:65°C ~70°C ;

Units: degrees-Celsius or °C

Notes:

1) The temperature status of the water tank varies as the change of the running mode of the water tank. This object name is WaterTankModeStatus_XX_YYY_ZZ.

2) This parameter is only for the GMV water heater.

(21) Water tank temp(setting)

Member number :20

Object name:WaterTankTempCommand_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type:Analog Value

Object ID: AV(2)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the temperature setting of the water tank of the GMV heater water.

Present_Value:

- ① . Hot Water, Night, Reserve modes:35°C~58°C (the upper limit can be adjusted to 65°C);
- ② . Energy saving mode:35°C~50°C;
- ③ . High temp sterilization mode:65°C~70°C;

Units: degrees-Celsius or °C

Notes:

1) The temperature setting range of the water tank varies as the change of the running mode of the water tank whose object name is WaterTankModeStatus_XX_YYY_ZZ.

2) This parameter is only for the GMV water heater.

(22) Water tank(status)

Member number :21

Object name:WaterTankStatus_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Multistate Input

Object ID: MI(13)+YYY*8192+ZZ*64+2

Instance Number: YYY*8192+ZZ*64+2

Description: this object is used to monitor the status of the water tank of GMV water heater.

Present_Value:

7-off;

8-heat preservation and standby;

9-heating water.

Note:

1) This parameter is only for the GMV water heater.

(23) Water tank(setting)

Member number :22

Object name:WaterTankCommand_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Multistate Value

Object ID: MV(19)+YYY*8192+ZZ*64+1

Instance Number: YYY*8192+ZZ*64+1

Description: this object is used to monitor the status setting of the water tank of GMV water heater.

Present_Value:

7-off;

8-heat preservation and standby;

9-heating water.

Note :

1) Present_Value “7” and “8” can be set successfully only when they comply with the temperature control logic of the unit.

2) This parameter is only for the GMV water heater.

(24) Water tank mode(status)

Member number :23

Object name:WaterTankModeStatus_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Multistate Input

Object ID: MI(13)+YYY*8192+ZZ*64+3

Instance Number: YYY*8192+ZZ*64+3

Description: this object is used to monitor the status of the water tank of GMV water heater.

Present_Value:

1-energy saving mode;

2-reservation mode;

3-night mode;

4-hot water mode.

Notes:

1) This parameter is only for the GMV water heater.

(25) Water tank mode(setting)

Member number :24

Object name:WaterTankModeCommand_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type:Multistate Value

Object ID: MV(19)+YYY*8192+ZZ*64+2

Instance Number: YYY*8192+ZZ*64+2

Description: this object is used to monitor the mode setting of the water tank of GMV water heater.

Present_Value:

1-energy saving mode mode;

2-reservation mode mode;

3-night mode;

4-hot water mode.

Note :

1) Present_Value can reflect the running mode of the water tank. That is, it varies as the change of the water tank mode setting of the wired controller or the wires controller.

2) This parameter is only for the GMV water heater.

(26) Double-Tube supply Water Temp

Member number :25

Object name:DoubleTubeSupplyWaterTemp_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Analog Input

Object ID: AI(0)+YYY*8192+ZZ*64+2

Instance Number: YYY*8192+ZZ*64+2

Description: this object is used to monitor the double-tube supply water temperature of GMV water heater.

Present_Value:

-127-255

Units: degrees-Celsius or °C

Min_Pres_Value: -127

Max_Pres_Value: 255

Resolution:1

Note :

1) This parameter is only for the GMV water heater.

(27) Floor Heating supply water setting temp.

Member number :26

Object name:FloorHeatingSupplyWaterSettingTemp_XX_YYY_ZZ (XX means Air condition

type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Analog Value

Object ID: AV(2)+YYY*8192+ZZ*64+2

Instance Number: YYY*8192+ZZ*64+2

Description: this object is used to monitor the setting temperature of floor heating of GMV water heater.

Present_Value:

30-52

Units: degrees-Celsius or °C

Note :

1) This parameter is only for the GMV water heater with floor heating device.

(28) Disinfecting

Member number :27

Object name:Disinfecting_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Input

Object ID: BI(3)+YYY*8192+ZZ*64+2

Instance Number: YYY*8192+ZZ*64+2

Description: this object is used to monitor the disinfecting status of GMV water heater.

Present_Value:

ACTIVE: Yes

INACTIVE:No

Note:

1) This parameter is only for the GMV water heater.

(29) Floor heat power

Member number :28

Object name:FloorHeatPower_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Input

Object ID: BI(3)+YYY*8192+ZZ*64+3

Instance Number: YYY*8192+ZZ*64+3

Description: this object is used to monitor the on/off status of the floor heating device of GMV water heater.

Present_Value:

ACTIVE: On

INACTIVE:Off

Note :

1) This parameter is only for the GMV water heater.

(30) Water tank control shielding code(setting)

Member number :29

Object name:WaterTankControlShieldingCodeCommand_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Units's number,like GMV is between 001 and 004 now;ZZ means Indoor Units's number,like GMV is between 01 and 16 now,otherwise 00 means deviceYYY's Parameters.)

Object type:Multistate Value

Object ID: MV(19)+YYY*8192+ZZ*64+3

Instance Number: YYY*8192+ZZ*64+3

Description: this object is used to enable or disable the wired or wireless controller to control the water tank of GMV water heater. For more details see Appendix F.

Present_Value:

0x00000001-0x80000000 (See Appendix F)

Note :

1) When Present_Value is "0", it indicates the wired or wireless controller is enabled to control the water tank.

2) Multiple functions of the water tank may be disabled to be set through the wired or wireless controller, e.g. 0x00000001 for "On/Off Shielding State" 0x00000004 for "Setting Temp Shielding State". When these two happen together, then Present_Value property will be "5" (conversion method: 0x00000001 OR 0x00000004 is 0x00000005, equal to 5).

3) When Present_Value is 0x80000000, all disabled functions will be enabled and the Present_Value property will be "0".

4) This parameter is only for the GMV water heater.

(31) Outdoor unit general error mark

Member number :30

Object name:OutdoorUnitErrorMark_XX_YYY_ZZ (XX means Air condition type,like GMV is 01;YYY means Outdoor Units's number,like GMV is between 001 and 004 now;ZZ means Indoor Units's number,like GMV is between 01 and 16 now,otherwise 00 means deviceYYY's Parameters.)

Object type:Binary Input

Object ID: BI(3)+YYY*8192+ZZ*64+4

Instance Number: YYY*8192+ZZ*64+4

Description: this object is used to monitor the outdoor unit error.

Present_Value:

ACTIVE: with

INACTIVE:without

Note :

1) When some error occurs to the GMV outdoor unit, Present_Value property will turn to "ACTIVE" and raise an alarm.

2) Present_Value property is defaulted to be INACTIVE.

(32) Outdoor unit error code

Member number :31

Object name:OutdoorUnitErrorCode_XX_YYY_ZZ (XX means Air condition type, like GMV

is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Multistate Input

Object ID: MI(13)+YYY*8192+ZZ*64+4

Instance Number: YYY*8192+ZZ*64+4

Description: this object is used to monitor the error code of the GMV outdoor unit. For more details see Appendix D

Present_Value:

0x00000000-0x003FFFFFF (For more details see Appendix D)

Note :

1) When some error occurs to the GMV outdoor unit, Present_Value property will be the decimal numerical. For more details, please see Appendix D.

2) Multiple errors may concur. Each error has a independent error code, e.g. 0x00000001 for "Outdoor Environment Temp Sensor Error", 0x00000040 for "High Pressure Transducer Error". When these two error do occur together, Present_Value property will be "65". (conversion method: 0x00000001 OR 0x00000040 is 0x00000041, equal to 65).

(33) Outdoor environment temp

Member number :32

Object name: Outdoor Environment Temp_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Analog Input

Object ID: AI(0)+YYY*8192+ZZ*64+3

Instance Number: YYY*8192+ZZ*64+3

Description: this object is used to monitor the outdoor environment temperature.

Present_Value:

-127-255

Units: degrees-Celsius or °C

Min_Pres_Value: -127

Max_Pres_Value: 255

Resolution: 1

Note:

(34) Complete machine compressor state

Member number :33

Object name: CompleteMachineCompressorState_XX_YYY_ZZ (XX means Air condition type, like GMV is 01;YYY means Outdoor Unit's number, like GMV is between 001 and 004 now; ZZ means Indoor Unit's number, like GMV is between 01 and 16 now, otherwise 00 means device YYY's Parameters.)

Object type: Binary Input

Object ID: BI(3)+YYY*8192+ZZ*64+5

Instance Number: YYY*8192+ZZ*64+5

Description: this object is used to monitor the on/off status of the compressor of the GMV outdoor unit.

Present_Value:

ACTIVE: On

INACTIVE:Off

Note :

Appendix C Indoor Unit Error Codes

Indoor Unit Error Codes													
Present_Value	Code										Meaning		
	B32	...	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	
0x00000001	0	0	0	0	0	0	0	0	0	0	0	1	Indoor Unit Mode Conflict Mark
0x00000002	0	0	0	0	0	0	0	0	0	0	1	0	Full Water Protection Mark
0x00000004	0	0	0	0	0	0	0	0	0	1	0	0	Midway Tube Temp Sensor Error
0x00000008	0	0	0	0	0	0	0	0	1	0	0	0	Outlet Tube Temp Sensor Error
0x00000010	0	0	0	0	0	0	0	1	0	0	0	0	Inlet Tube Temp Sensor Error
0x00000020	0	0	0	0	0	0	1	0	0	0	0	0	Environment Temperature Sensor Error
0x00000040	0	0	0	0	0	1	0	0	0	0	0	0	Auxiliary Heater Protection Error
0x00000080	0	0	0	0	1	0	0	0	0	0	0	0	Freeze Protection
0x00000100	0	0	0	1	0	0	0	0	0	0	0	0	Communication Error
0x00000200	0	0	1	0	0	0	0	0	0	0	0	0	Indoor Unit/Wired Controller Communication Error Mark

Appendix D Outdoor Unit Error Codes

Outdoor Unit Error Codes												
Present_Value	Code										Meaning	
	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1	
0x00000001	0	0	0	0	0	0	0	0	0	0	1	Outdoor Environment Temp Sensor Error
0x00000002	0	0	0	0	0	0	0	0	0	1	0	Outdoor Unit Inlet Tube Temp Sensor Error
0x00000004	0	0	0	0	0	0	0	0	1	0	0	Outdoor Unit Midway Tube Temp Sensor Error
0x00000008	0	0	0	0	0	0	0	1	0	0	0	Outdoor Unit Outlet Tube Temp Sensor Error
0x00000010	0	0	0	0	0	0	1	0	0	0	0	Fixed-Frequency Compressor Discharge Temp Sensor Error
0x00000020	0	0	0	0	0	1	0	0	0	0	0	Variable-Volume Compressor Discharge Temp Sensor Error
0x00000040	0	0	0	0	1	0	0	0	0	0	0	High Pressure Transducer Error
0x00000080	0	0	0	1	0	0	0	0	0	0	0	Fixed-Frequency Compressor Oil Temp Sensor Error
0x00000100	0	0	1	0	0	0	0	0	0	0	0	Low Pressure Transducer Error
0x00000200	0	1	0	0	0	0	0	0	0	0	0	Variable-Volume Compressor Oil Temp Sensor Error
0x00000400	1	0	0	0	0	0	0	0	0	0	0	High Pressure Protection

Outdoor Unit Error Codes																
Present_ Value	Code												Meaning			
	B32	...	B22	B21	B20	B19	B18	B17	B16	B15	B14	B13		B12	...	
0x00000800	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Low Pressure Protection/Refrigeration Insufficiency Protection/Discharge Protection/Oil Temperature Protection/Overcurrent Protection/Drive Error/Communication Error	
0x00001000	0	0	0	0	0	0	0	0	0	0	0	1	0	0		
0x00002000	0	0	0	0	0	0	0	0	0	0	1	0	0	0		
0x00004000	0	0	0	0	0	0	0	0	0	1	0	0	0	0		
Applicable only to the digital multi GMV system (R22) and digital multi GMV system (R410A) with the capacity of 56 and 60kW																
0x00008000	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	Subunit Outlet Tube Temp Sensor Error
0x00010000	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	Subunit Midway Tube Temp Sensor Error
0x00020000	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	Subunit Inlet Tube Temp Sensor Error
0x00040000	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	Subunit Oil Temp Sensor Error (1)
0x00080000	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	Subunit Discharge Temp Sensor Error (2)
0x00100000	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	Subunit Discharge Temp Sensor Error (1)
0x00200000	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Subunit Oil Temp Sensor Error (2)

Appendix E Specific Error Codes for the GMV Water Heater

Specific Error Codes for the GMV Water Heater																				
Present_ Value	Code																Meaning			
	B32	...	B17	B16	B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4		B3	B2	B1
0x00000001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	Outdoor Unit Inlet Tube Temp Sensor Error (1)
0x00000002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	Outdoor Unit Midway Tube Temp Sensor Error (1)
0x00000004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	Outdoor Outlet Tube Temp Sensor Error (1)
0x00000008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	Outdoor Unit Inlet Tube Temp Sensor Error (2)
0x00000010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	Outdoor Unit Midway Tube Temp Sensor Error (2)
0x00000020	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	Outdoor Outlet Tube Temp Sensor Error (2)
0x00000040	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	Water Tank Upper Temp Sensor Error
0x00000080	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	Water Tank Lower Temp Sensor Error
0x00000100	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	Water Tank Outlet Tube Temp Sensor Error
0x00000200	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	Water Tank Inlet Tube Temp Sensor Error
0x00000400	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	Hydrobox Communication Error
0x00000800	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	Electric Heater Dry Heating Error
0x00001000	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	Creepage Protection
0x00002000	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	Contact Caking Error
0x00004000	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Water Flow Switch Protection
0x00008000	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Freeze Protection
0x00010000	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Jumper Cap Error

Appendix F Water Tank Control Shielding Codes

Water tank control shielding codes												
Present_Value	Code										Meaning	
	B32	...	B8	B7	B6	B5	B4	B3	B2	B1		
0x00000001	0	0	0	0	0	0	0	0	0	1	On/Off Shielding State	
0x00000002	0	0	0	0	0	0	0	0	1	0	User Mode Shielding State	
0x00000003	0	0	0	0	0	0	0	1	0	0	Setting Temp Shielding State	
0x00000004	0	0	0	0	0	0	1	0	0	0	Quick Water-Heating Shielding State	
0x00000005	0	0	0	0	0	1	0	0	0	0	Cleaning Shielding State	
0x00000006	0	0	0	0	1	0	0	0	0	0	Parameter Viewing Shielding State	
0x00000007	0	0	0	1	0	0	0	0	0	0	Priority Control Shielding State	
0x00000008	0	0	1	0	0	0	0	0	0	0	Lock State	
.....												
0x80000000	1	0	0	0	0	0	0	0	0	0	All no shield command	

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