**采暖温控器通用接口协议** **（ MODBUS ）**

**Heating thermostat universal interface protocols（MODBUS)**

**Beta V2.0**

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协议是在标准 **MODBUS** 基础上提炼而成；专用于采暖温控器与客房控制器的连接。

Protocol based on MODBUS and derived;it is exclusively used in connection between heating thermostat and room controller.

一、**MODBUS** 说明：

1、MODBUS Instructions

|  |  |  |
| --- | --- | --- |
| **序号** | **参数名称** | **规定** |
| **Number** | **Parameter Name** | **Regulations** |
| 1 | 工作模式 | RS485 半双工；主从巡检方式；温控器为从机。 |
|  | Working Mode | RS485 half-duplex;master-slave inspection way;thermostat is slave |
| 2 | 物理接口 | A(+),B(-),二线制 |
|  | Physical Interface | A(+),B(-),2-wire system |
| 3 | 波特率 | (标准为 9600bps) |
|  | Baud Rate | (Standard Rate is 9600bps) |
| 4 | 字节格式 | 9 位格式：8 数据位＋1 停止位 |
|  | Byte Format | 9 format:8 bits + 1 stop bit |
| 5 | Modbus | RTU模式 |
|  |  | RTU mode |
| 6 | 传输方式 | RTU(远程终端单元)格式（请参阅 MOBUS 说明） |
|  | Transmission Mode | RTU(Remote Terminal Unit ) mode (Please refer to the MOBUS |
|  |  | instructions) |
| 7 | 温控器地址 | 1－247；（0 地址为广播地址，不能使用） |
|  | Thermostat Address | 1－247;(0 is the broadcast address,can not be use) |
| 8 | 命令代码 | 3，6 （3：读取温控器；6：设置温控器） |
|  | Command Code | 3, 6(3: read thermostat;6:setting thermostat) |
| 9 | CRC 校验和 | CRC－16 （请参阅 MOBUS 协议说明） |
|  | CRC Checksum | CRC－16 (Please refer to the MOBUS instructions) |
| 10 | 校验方式 | CRC－16 （请参阅 MOBUS 协议说明 |
|  | Calibration Mode | CRC－16 (Please refer to the MOBUS instructions) |

**二、读取温控器操作帧格式：**

**2、read the thermostat operation frame format**

＊ 命令帧（PC控制器发出）读取温控器状态；

＊command frame(given out by PC controller)read the thermostat state;

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **字节 1** | **字节 2** | **字节 3** | **字节 4** | **字节 5** | **字节 6** | **字节 7** | **字节 8** |  |
| **Byte 1** | **Byte 2** | **Byte 3** | **Byte 4** | **Byte 5** | **Byte 6** | **Byte 7** | **Byte 8** |  |
|  |  |  |  |  |  |  |  |  |
|  |  | 读取寄存器起 | 读取寄存器起 | 读取寄存器个 | 读取寄存器个 |  |  |  |
| 温控器地址 |  | 始地址高字节 | 始地址低字节 | 数高字节 | 数低字节 | CRC 高 | CRC 低 |  |
| Thermostat | 03 | Read the | Read the | Read the | Read the |  |
| CRC HIGH | CRC LOW |  |
| Address |  | register | register low | high byte | low byte |  |
|  |  |  |  |
|  |  | high | starting | register | register |  |  |  |

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starting

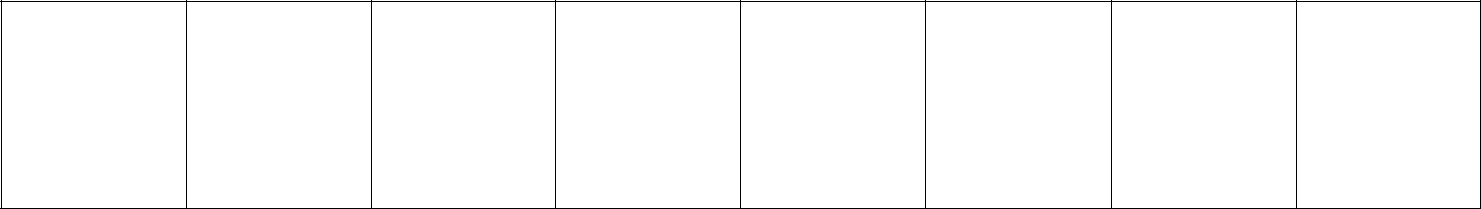
address

byte

address

byte

number



number

＊ 应答帧（温控器发出）

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ＊ Response frame (Given out by | | | thermostat) | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
| **字节 1** | **字节 2** | **字节 3** | **字节 4** | **字节 5** | **……** |  |  |  |  |  |
| **Byte 1** | **Byte 2** | **Byte 3** | **Byte 4** | **Byte 5** |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  | 返回第1个 | 返回第1个 |  | 返回第 n 个 | 返回第 n 个 |  |  |  |
|  |  |  | 寄存器数 |  | 寄存器数 |  |  |  |
|  |  | 返回数据 | 寄存器数 |  | 寄存器数 |  |  |  |
|  |  | 据高字节 |  | 据高字节 |  |  |  |
|  |  | 字节个数 | 据低字节 |  | 据低字节 |  |  |  |
| 温控器地址 |  | Returns |  | Returns |  |  |  |
|  | Returns | Returns |  | Returns | CRC 高 | CRC 低 |  |
| Thermostat | 03 | the first | …… | the N |  |
| data and | the first | the N | CRC HIGH | CRC LOW |  |
| Address |  | high |  | high |  |
|  | byte | low byte |  | low byte |  |  |  |
|  |  | byte |  | byte |  |  |  |
|  |  | numbers | register |  | register |  |  |  |
|  |  | register |  | register |  |  |  |
|  |  |  | data |  | data |  |  |  |
|  |  |  | data |  | data |  |  |  |
|  |  |  |  |  |  |  |  |  |

**三、设置温控器帧格式**

**3、,**Set the thermostat frame format

＊ 命令帧 1（PC 控制器发出）

* Command frame 1 (given out by PC controller)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **字节 1** | **字节 2** |  | **字节 3** | | **字节 4** | |  | **字节 5** | **字节 6** |  | **字节 7** | **字节 8** |  |
| **Byte 1** | **Byte 2** |  | **Byte 3** | | **Byte 4** |  |  | **Byte 5** | **Byte 6** |  | **Byte 7** | **Byte 8** |  |
|  |  |  | 设置寄存器起 | | 设置寄存器起 | |  |  |  |  |  |  |  |
|  |  |  | 始地址高字节 | |  |  |  |  |  |  |  |
|  |  |  | 始地址低字节 | |  |  |  |  |  |  |  |
|  |  |  | Set the |  |  |  |  |  |  |  |  |
| 温控器地址 |  |  |  | Set the |  |  |  |  |  |  |  |  |
|  |  | register | |  | 设置值高位 | | 设置值低位 | | CRC 高 | CRC 低 |  |
| Thermostat | 06 |  | register low | |  |
|  | high |  | Set high value | | Set low value | | CRC HIGH | CRC LOW |  |
| Address |  |  |  | starting |  |  |
|  |  | starting |  |  |  |  |  |  |  |  |  |
|  |  |  |  | address |  |  |  |  |  |  |  |  |
|  |  |  | address |  |  |  |  |  |  |  |  |  |
|  |  |  |  | byte |  |  |  |  |  |  |  |  |
|  |  |  | byte |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| ＊ 应答帧（温控器发出） | | | |  |  |  |  |  |  |  |  |  |  |
| ＊ Response frame (Given out by | | | | thermostat) | |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | |  |  |  |  |  |  |  |
| **字节 1** | **字节 2** |  | **字节 3** |  | **字节 4** | |  | **字节 5** | **字节 6** |  | **字节 7** | **字节 8** |  |
| **Byte 1** | **Byte 2** |  | **Byte 3** |  | **Byte 4** |  |  | **Byte 5** | **Byte 6** |  | **Byte 7** | **Byte 8** |  |
|  |  | 设置寄存器起始 | | | 设置寄存器起 | | 设置值高位(可 | | 设置值低位(可 | |  |  |  |
|  |  | 始地址低字节 | | 写)/返回状态 | | 写)/返回状态 | |  |  |  |
|  |  | 地址高字节 | |  |  |  |  |
| 温控器地址 |  |  | Set | the | 值(只读) | | 值(只读) |  |  |  |  |
|  | Set the | |  |  | CRC 高 | CRC 低 |  |
| Thermostat | 06 |  | register low | | Set | high | Set | low |  |
| register | | high | CRC HIGH | CRC LOW |  |
| Address |  | starting |  | value(Writeabl | | value(Writeabl | |  |
|  | starting | |  |  |  |  |  |
|  |  |  | address |  | e)/Return | | e)/Return |  |  |  |  |
|  |  | address byte | | |  |  |  |  |  |
|  |  | byte |  | state(read only) | | state(read only) | |  |  |  |
|  |  |  |  |  |  |  |  |  |

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**采暖温控器状态值格式说明表**

Heating thermostat status value format specification table

|  |  |  |  |
| --- | --- | --- | --- |
| **字节长度**  **Byte length** | **属性**  **Attributes** | **说明**  **Specification** | **对应寄存器地址**  Register Address |
| 2 | R | 室内温度（加补偿）（**只读**）:个位为小数位，例如：255是25.5度  Room temperature(after calibration) (read only): the last place is decimal place, for example: 255 is 25.5 degrees | 20000 |
| 2 | R | 外置传感器温度（**只读**）:个位为小数位，例如：255是25.5度  External sensor temperature (read only): the last place is decimal place, for example: 255 is 25.5 degrees | 20001 |
| 2 | R | 负载状态标志位（**只读**）：0 负载关闭；1 负载打开  Load state(read only): 0 load off; 1 load on | 20002 |
| 2 | R | 故障报警状态（**只读**）：bit0~bit15  Fault alarm (read only): bit0~bit15  Bit0:内置传感器 0正常 1 故障  Bit0:Build-in sensor: 0 normal ;1 alarm  Bit1:外置传感器 0正常 1 故障  Bit1: External sensor: 0 normal ;1 alarm  Bit2:低温保护报警 0正常 1 报警  Bit2: Minimum temperature protection alarm: 0 normal ;1 alarm  Bit3:高温保护报警 0正常 1 报警  Bit3: Maximum temperature protection alarm: 0 normal 1 alarm  Bit4:开窗报警 0正常 1 报警  Bit4:Open window alarm: 0 normal 1 alarm  Bit5~bit15:预留  Bit5~bit15:reserved | 20003 |
| 2 | R/W | 上限设置温度：20-70  Maximum temperature setting:20-70 | 20004 |
| 2 | R/W | 下限设置温度：1~10  Minimum temperature setting::1-10 | 20005 |
| 2 | R/W | 设置温度(下限~上限)：个位为小数位，例如：255是25.5度，步进为5(0.5)  Set temperature(Minimum limiting ~ Maximum limiting) the last place is decimal place, for example: 255 is 25.5 degrees, stepping5(0.5) | 20006 |
| 2 | R/W | 开关机标志位：0 关闭温控器；1 开启温控器  Turn on/off: 0 turn off thermostat; 1 turn on thermostat | 20007 |
| 2 | R/W | 全锁半锁标志：0 半锁（锁定温控器时不锁定开关键）；1 全锁（锁定温控器时按键全锁）  Partial locking/full locking: 0: partial locking(only turn on/off key unlocked) ; 1: full locking(all keys are locked) | 20008 |
| 2 | R/W | 锁定标志位：0 解锁温控器；1 锁定温控器  Lock:0:unlock;1 lock | 20009 |
| 2 | R/W | 启动温差：1-10（0.5~2.5度）  Hysteresis of air temperature sensor: 1-10（0.5~2.5degree） | 20010 |
| 2 | R/W | 高温保护启动回差：1~9（1~9度）  Hysteresis of external ﬂoor temperature sensor: 1~9（1~9degree） | 20011 |
| 2 | R/W | 补偿温度：0~36（从-9到9 度 增量0.5 -9->0、-8.5->1...0->18...9->36)  Calibration of air temperature sensor: （-9~9 degree; stepping 0.5; -9->0、-8.5->1...0->18...9->36) | 20012 |
| 2 | R/W | 传感器类型： 0单内置；1单外置 2内外置；  Selection of temperature sensors: 0: only built-in temperature sensor is ON only; 1: only external ﬂoor temperature sensor is ON. 2: built-in and external ﬂoor temperature sensors are ON | 20013 |
| 2 | R/W | 工作模式：0 手动；1编程；2离家; 3 临时手动  Working mode: 0 manual mode; 1 program mode; 2 leaving home mode; 3 temporary manual mode | 20014 |
| 2 | R/W | 高温保护功能：0 关闭 1 开启  Maximum temperature protection function: 0 off ; 1 on | 20015 |
| 2 | R/W | 低温保护功能：0 关闭 1 开启  Minimum temperature protection function: 0 off ; 1 on | 20016 |
| 2 | R/W | 高温保护值：20-70  Maximum temperature：20-70 | 20017 |
| 2 | R/W | 低温保护值：1-10  Minimum temperature：1-10 | 20018 |
| 2 | R/W | 离家天数：1~30天  Leaving home days: 1~30days | 20019 |
| 2 | R/W | 按键操作背光点亮时间：5~30秒 (LCD款产品)  Backlight lighting time: 5~30 seconds (LCD products) | 20020 |
| 2 | R/W | 待机显示亮度调节: 0 不显 1 弱亮 2 半亮 (LED款产品)  Sleep mode – conﬁguration of display parameters: 0: nothing is displayed in standby mode; 1: temperature is displayed in standby mode; 2: temperature is displayed – higher brightness in standby mode(LED products) | 20021 |
| 2 | R/W | 星期数值：1~7  Week: 1~7 | 20022 |
| 2 | R/W | 小时数值：0~23  Hour: 0~23 | 20023 |
| 2 | R/W | 分钟数值：0~59  Minute：0~59 | 20024 |
| 2 | R/W | 秒钟数值：0~59  Second：0~59 | 20025 |
| 2 | R/W | 前1日使用功率：0000~9999 Kwh  Power used in the previous day: 0000~9999 Kwh | 20026 |
| 2 | R/W | 总使用功率：0000~9999Kwh  Power used in total:0000~9999 Kwh | 20027 |
| 2 | R/W | 制热功率：1~35（代表100W~3500W）  Rated power of heating equipment: 1~35（represent 100W~3500W） | 20028 |

**注：属性R 允许读操作，属性W允许写操作**

**Remarks: R means only read, W means can be written**

**注：温控器本地解锁操作为：长按 “下”5秒进行锁定温控器和解锁温控器操作**

**Remarks:thermostat native unlock operation:long press “down” for 5 seconds to unlock thermostat.**

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