

T7000e 温控器 Modbus 协议点表

T7000e Thermostat Modbus Data Table

版本 Version	日 期 Date	更 改 内 容 Change Points
V1.0	2023-11-14	新发布 New release

1 Modbus 协议定义

Modbus Interface Definition

通讯协议 Protocol	MODBUS
设备类型 Device type	RTU
错误检测 Check	CRC-16/MODBUS
通讯端口 Communication Port	RS-485，半双工 RS-485, half-duplex
通讯接口 Interface Connection	TB1-A，TB1-B
波特率 Baud rate	9600bps/4800bps
地址 Slave address range	1-64
功能码 Function code	1，3，6，16（6/16 支持广播） 1，3，6，16（6/16 supporting broadcast）
异常响应 Exception responses	异常码 01 Exception code 01 异常码 02 Exception code 02 异常码 03 Exception code 03
数据格式 Data format	10 bits:1 位起始位，8 位数据位，1 位停止位，无奇偶校验。 10 bits: 1 Start, 8 Data, 1 Stop, no parity

2 Modbus 通讯协议

Modbus data table

说明：温控器为从机

Notes: Thermostat is slave

03/06/16 功能码

03/06/16 function code

寄存器地址 Register	功能码 Function code	描述 Description	默认 Default	读写 RW	注释 Comments
1	03	产品型号 Product Model	00	R	00: NG1; 01:NG2; 02:NG3; 03:NG4 04:NG5
2	03	软件版本 Firmware version	/	R	00~99, 12 版本显示 12 00~99, Version 12 is 12
3	03	室温温度 Room temperature	/	R	实际温度值*10 The value is equal to the real room temperature multiplied by 10
4	03	故障状态 Error	/	R	Bit0 = 0: 正常、1: 故障 E0 Bit0 = 0: Normal 1: E0 error occurs Bit1 = 0: 正常、1: 故障 E1 Bit1 = 0: Normal 1: E1 error occurs Bit2 = 0: 正常、1: 故障 E2 Bit2 = 0: Normal 1: E2 error occurs Bit3 = 0: 正常、1: 故障 E3 Bit3 = 0: Normal 1: E3 error occurs Bit4 = 0: 正常、1: 故障 E4 Bit4 = 0: Normal 1: E4 error occurs Bit5 = 0: 正常、1: 故障 E5 Bit5 = 0: Normal 1: E5 error occurs Bit8 = 0: 正常、1: 故障 E8

					Bit9 = 0: 正常、1: 故障 EE Bit9 = 0: Normal 1: EE error occurs Bit10 = 0: 正常、1: 故障 HI Bit10 = 0: Normal 1: HI error occurs Bit11 = 0: 正常、1: 故障 Lo Bit11 = 0: Normal 1: Lo error occurs
5	03	负载状态 load status	/	R	Bit7=0 强制关闭输出标志清零 1: 强制关闭输出标志置位 Flag indicating turn off all output when thermostat is in alarm state. Bit7=0 clear this flag. 1: set this flag. Bit6=0 Tio2/ESP 关、1: 开(对于支持 Tio/ESP 的应用) Bit6=0 Tio2/ESP off、1: on(for applications supporting Tio2/ESP) Bit5=0 2 管制盘水阀关、1: 开 Bit5=0 2 pipe valve off 1: on Bit4=0 4 管制盘热水阀关、1: 开 Bit4=0 4 pipe heating valve off 1: on Bit3=0 4 管制盘冷水阀关、1: 开 Bit3=0 4 pipe cooling valve off 1: on Bit2=0 高档风机继电器关、1: 开 Bit2=0 high speed fan relay off 1: on Bit1=0 中档风机继电器关、1: 开 Bit1=0 medium speed fan relay off 1: on Bit0=0 低档风机继电器关、1: 开 Bit0=0 low speed fan relay off 1: on
6	03	ECM 风机 A0 输出 (热水阀的输出) ECM fan A0 output (or heating valve output)	00-100	R	34 代表 3.4, 十倍传输 (对于 NG3/4/5 的 APP5, ECM 输出于热水阀的输出) The value is multiplied by 10. 34 stands for 3.4 voltage. For models supporting application 5, here stands for heating valve output.
7	03	比例阀 A0 输出 proportional valve analog output	00-100	R	34 代表 3.4, 十倍传输 The value is multiplied by 10. 34 stands for 3.4 voltage.

8	03	通讯地址 slave address	01	R	1~64
9	03	波特率设置 Baud rate setting	00	R	00: 9600bps 01: 4800bps
10	03/06/16	应用设置 Application	00	RW	根据型号 00~05
11	03/06/16	Tio2/ESP 手 动/联动 Tio2/ESP Control	00	RW	00:手动操作 Tio2/ESP 功能 00: could be controlled separately 01: Tio2/ESP 功能与风机联动 01: work with fan simultaneously
12	03/06/16	手动开启 Tio2/ESP Tio2/ESP relay	00	RW	00 代表 Tio2 关, 01 代表 Tio2 开 00: Tio2 off 01:Tio2 on
13	03/06/16	掉电重启开关 机 Power on/off the thermostat after power loss	00	RW	00: 恢复掉电前状态; 01: 关闭 00: keep previous status before power loss 01: power off
14	03/06/16	干节点输入功 能选择 Dry contact input function selection	00	RW	00: 房卡功能 (常开) 00: open circuit indicates room card is inserted(occupied); closed circuit indicates room card is pulled out(unoccupied) 01: 房卡功能 (常闭) 01: closed circuit indicates room card is inserted(occupied); open circuit

					indicates room card is pulled out (unoccupied) 02: 外部传感器 02: remote temperature sensor 03: 露点报警 (常开) 03: open circuit indicates dew point risk; closed circuit indicates no dew point risk 04: 露点报警 (常闭) 04: closed circuit indicates dew point risk; open circuit indicates no dew point risk 05: 开路表示有人, 短路表示无人, 关闭风扇和阀门 05: open circuit indicates occupied; Closed circuit indicates unoccupied, shut off fan and valve.
15	03/06/16	LCD 屏温度显示 LCD temperature display	00	RW	00: 正常情况下显示房间温度 00: Display room temperature 01: 正常情况下显示设置温度 01: Display setpoint
16	03/06/16	摄氏度华氏度 转换 Unit selection	00	RW	00: 摄氏度 (°C) 01: 华氏度 (°F); 00: Celsius degree (°C) 01: Fahrenheit degree (°F)
17	03/06/16	设定温度下限 setpoint lower limit	50°C, 410°F	RW	0~设定温度上限-10°C, 320~设定温度上限-10°F, 10 倍传输 0~(setpoint upper limit - 10)°C, 320~(setpoint upper limit - 10)°F The value is multiplied by 10.
18	03/06/16	设定温度上限 setpoint upper limit	350°C, 950°F	RW	设定温度下限+10~495°C, 设定温度下限+10~1210°F, 10 倍传输 (setpoint lower limit + 10)°C~495°C, (setpoint lower limit + 10)°F~1210°F
19	03/06/16	温度偏移	0	RW	-50~50°C, -90~90°F 10 倍传输

		Offset			Offset to be compensate the room temperature. The value is multiplied by 10.
20	03/06/16	背光开启时间设置 LCD backlight turn-on time setting	20	RW	5-99 秒 5-99s
21	03/06/16	背光亮度设置 Backlight brightness setting	80	RW	20%-100%
22	03/06/16	可操作模式选择 Mode selection	00	RW	00-制冷/制热/通风 00-cooling/heating/ventilation 01-制冷/通风 01-cooling/ventilation 02-制热/通风 02-heating/ventilation 03-制冷/制热/自动/通风 03-cooling/heating/auto/ventilation
23	03/06/16	恢复默认值 Ex-factory reset	00	RW	00: 不恢复 00:No 01: 恢复 01: Yes Restore all settings to factory default values.
24	03/06/16	无人状态制冷设定值 Unoccupied cooling setpoint	26℃, 79 °F	RW	22-32℃, 72~90°F
25	03/06/16	无人状态制热设定值 Unoccupied heating setpoint	18℃, 64 °F	RW	10-21℃, 50~70°F
26	03/06/16	按键锁(开关键) ON/OFF key	00	RW	00: 不锁定 00: No 01: 锁定 01: Yes

		lock			
27	03/06/16	按键锁(模式键) Mode key lock	00	RW	00: 不锁定 00: No 01: 锁定 01: Yes
28	03/06/16	按键锁(风速键) Fan key lock	00	RW	00: 不锁定 00: No 01: 锁定 01: Yes
29	03/06/16	按键锁(上下键) Up/down key lock	00	RW	00: 不锁定 00: No 01: 锁定 01: Yes
30	03/06/16	低温保护 Frost protection	00	RW	00:关闭 00:disable 01: 开启 01:enable
31	03/06/16	低温保护设定值 Frost protection setpoint	5℃, 41°F	RW	1-10℃, 34-50°F
32	03/06/16	滤网时间设置 Filter time setting	0	RW	0~50, 0 代表关闭滤网计时, 10 代表滤网时间是 1000 小时, 22 代表滤网时间是 2200 小时. 0~50, 0 stands for disabling filter timing, 10 stands for a filter reminder time of 1000 hours, 22 stands for a filter reminder time of 2200 hours.
33	03/06/16	滤网时间及提醒复位 Filter reminder time reset	00	RW	00: 不复位 00: No 01: 复位 01: Yes
34	03/06/16	自动风速下达到设定温度后 风机模式 Fan speed after	00	RW	00:低风运行 00:low speed 01: 关闭运行 01: off

		reaching the setpoint in auto fan speed setting			
35	03/06/16	风机延时关闭时间 Fan off delay time	0	RW	0-100 秒 0-100s
36	03/06/16	无人状态下风机模式 Fan speed when unoccupied	00	RW	00: 关闭运行 00: off 01: 低风运行 01: low speed
37	03/06/16	风机档位 Fan speed selection	00	RW	00: 三速风机: 低速+中速+高速+自动 00: low / medium / high speed / auto 01: 二速风机: 低速+中速+自动 01: low / medium speed / auto 02: 一速风机: 低速 02: low speed
38	03/06/16	ECM 风机最低电压设置 ECM fan minimum voltage setting	0	RW	0~ ECM 风机最高电压设置-10, 100 代表 10.0V, 有配置才有效 0~(ECM fan maximum voltage - 10), 100 stands for 10.0 volts. The value is multiplied by 10.
39	03/06/16	ECM 风机最高电压设置 ECM fan maximum voltage setting	100	RW	ECM 风机最低电压设置+10~100, 100 代表 10.0V, 有配置才有效 0~(ECM fan minimum voltage + 10), 100 stands for 10.0 volts. Only for the application supporting ECM fan. The value is multiplied by 10.
40	03/06/16	高速风输出电压设置 High speed fan output voltage	60	RW	最低电压~最高电压, 有配置才有效 ECM fan minimum voltage~ ECM fan maximum voltage The value is multiplied by 10. Only for the application supporting ECM

		setting			fan.
41	03/06/16	中速风输出电压设置 Medium speed fan output voltage setting	45	RW	最低电压~最高电压, 有配置才有效 ECM fan minimum voltage~ ECM fan maximum voltage The value is multiplied by 10. Only for the application supporting ECM fan.
42	03/06/16	低速风输出电压设置 low speed fan output voltage setting	30	RW	最低电压~最高电压, 有配置才有效 ECM fan minimum voltage~ ECM fan maximum voltage The value is multiplied by 10. Only for the application supporting ECM fan.
43	03/06/16	阀控制死区 Dead band for valve control	10℃, 20 °F	RW	5-20℃, 10-40°F, 10 倍传输, 差值 The value is multiplied by 10.
44	03/06/16	比例阀 PB 值 proportional band for proportional valve PID control	5	RW	1-10
45	03/06/16	比例阀 KI 值 KI parameter for proportional valve PID control	10	RW	0-99
46	03/06/16	比例阀采样时间 Sample time for proportional valve PID control	10	RW	1-99

47	03/06/16	调节阀最小电压值 Minimum output voltage for proportional valve	0	RW	0V~调节阀最大电压值-10, 100 代表 10.0V, 有配置才有效 0~ (Maximum output voltage -10), 100 stands for 10.0 volts. The value is multiplied by 10. Only for the application supporting proportional valve.
48	03/06/16	调节阀最大电压值 Maximum output voltage for proportional valve	100	RW	调节阀最小电压值+10V~100, 100 代表 10.0V, 有配置才有效 (Minimum output voltage + 10)~100, 100 stands for 10.0 volts. The value is multiplied by 10. Only for the application supporting proportional valve.
49	03/06/16	开关机 Power on/off	01	RW	00: 关 1: 开 00: off 1: on
50	03/06/16	运行模式 Setting mode	01	RW	00: 制冷 01: 通风 02: 制热 03: 自动 在可选档位内 00: cooling 01: ventilation 02: heating 03: auto
51	03/06/16	设定温度 Setpoint	200	RW	实际设定温度值*10 The value is multiplied by 10.
52	03/06/16	风速设定 Fan speed setting	01	RW	00: 自动 01: 低 02: 中 03 高; 在可选档位内选择 00: auto 01: low speed 02: medium speed 03: high speed
53	03/06/16	定时开 Timer on	00~23	RW	2 代表 2 小时后开, 0 代表无取消功能 2 meaning the thermostat will turn on after 2 hours, 0 meaning disable timer on.
54	03/06/16	定时关	00~23	RW	2 代表 2 小时后关, 0 代表无取消功能 2 meaning the thermostat will turn off after 2 hours, 0 meaning disable timer off.

示例数据 Example

功能码 03: (读取 1 号机室内温度, 室内温度为 24, 即 24℃)

Function code 03(Read the room temperature value of the thermostat with address 1. Room temperature is 0xF0(240), meaning 24°C.)

主机请求 Request:01 03 00 03 00 01 74 0A

从机回复 Reply: 01 03 02 00 F0 B8 00

功能码 06: (更改 1 号机的 LCD 显示为显示设置温度)

Function code 06: (Change the LCD display of thermostat with address 1 to show the setpoint.)

主机请求 Request:01 06 00 0F 00 01 78 09

从机回复 Reply: 01 06 00 0F 00 01 78 09

功能码 16: (更改 1 号机的无人状态制冷设定值和无人状态制热设定值分别为 24℃和 17℃)

Function code 16: (Change the unoccupied cooling setpoint and unoccupied heating setpoint of the thermostat with address 1 to 24° C and 17° C, respectively.)

主机请求 Request:01 10 00 18 00 02 04 00 18 00 11 B3 0E

从机回复 Reply: 01 10 00 18 00 02 C1 CF

01 功能码

Function code 01

地址 Slave address	功能码 Function code	描述 Description	注释 Comments
1	01	风机低继电器输出 low speed fan relay output	00: 关闭/无效; 01:开启 00: OFF/Invalid; 01:ON
2	01	风机中继继电器输出 medium speed fan relay output	00: 关闭/无效; 01:开启 00: OFF/Invalid; 01:ON
3	01	风机高继电器输出 high speed fan relay output	00: 关闭/无效; 01:开启 00: OFF/Invalid; 01:ON
4	01	4 管制冷阀继电器输出 4 pipe cooling valve relay output	00: 关闭/无效; 01:开启 00: OFF/Invalid; 01:ON
5	01	4 管制热阀继电器输出 4 pipe heating valve relay output	00: 关闭/无效; 01:开启 00: OFF/Invalid; 01:ON
6	01	2 管制阀继电器输出 2 pipe valve relay output	00: 关闭/无效; 01:开启 00: OFF/Invalid; 01:ON
7	01	Ti02/ESP 继电器输出 Ti02/ESP relay output	00: 关闭/无效; 01:开启 00: OFF/Invalid; 01:ON
8	01	强制关闭输出标志 Flag indicating turn off all output when thermostat is in alarm state.	00: 无效 01:强制关闭输出(保 护或者故障) 00: invalid 01: turn off all output(in alarm state)

注：表格中“无效”代表该项不适合当前的应用。比如不支持 Ti02/ESP 的应用，Ti02/ESP 继电器输出就是无效的。

Note: "Invalid" in the table indicates that the item is not applicable to the current application. For example, if the application does not support Tio2/ESP, the Tio2/ESP relay output is considered invalid.

示例数据 Example:

功能码 01: （读取 1 号机 8 个线圈信息）

Function code 01: (Read the 8 coils of the thermostat with address 1.)

主机请求 Request:01 01 00 01 00 08 6C 0C

从机回复 Reply: 01 01 01 60 51 A0（两管制继电器有输出，Ti02/ESP 继电器有输出 2 pipe valve relay output 1 and Ti02/ESP relay output 1）