

# HMI Protocol (MODBUS)

**Model Number: F008**

**Version#: 1.1**

*This is version is extracted from standard MODBUS protocol*

## I MODBUS Explanation

Series	Working Data	Specification
1	Working Mode	RS485 Semi-duplex ; PC or main controller is master; thermostat is slave
2	Interface	A(+),B(-), 2 wires
3	Baud Rate	2400bps
4	Byte	9 bits in total: 8 data bit +1 stop bit
5	Modbus	RTU Mode
6	Transmission	RTU(Remote Terminal Unit) format ( please refer to MODBUS instruction )
7	Thermostat address	1–247; ( 0 is broadcast address and stand for all thermostat without response )
8	Command Code	0x03, 0x06, ( 0x03: Read and response thermostat; 0x06, )
9	CRC Verification	CRC– 16 ( please refer to MODBUS instruction )
10	Verification	CRC– 16 ( please refer to MODBUS instruction )

## II. Operation format for thermostat Read and Response:

\* **Command (Master to read/response status of thermostat)**

Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
Thermostat address	0x03	Fetch Starting address- Hi	Fetch Starting address- Lo	Fetch Number of Registers- Hi	Fetch Number of Registers- Lo	CRC-Lo	CRC-Hi

\* **Response (thermostat sends out)**

Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	.....				
Thermostat address	0x03	Numbers of Response Data	The First Response Registers-Hi	The First Response Registers-Lo	.....	The N <sup>th</sup> Response Registers-Hi	The N <sup>th</sup> Response Registers-Lo	CRC-Lo	CRC-Hi

## III. Thermostat Pre-Settings

\* **1<sup>st</sup> Command(The master sends out) Thermostat Pre-Setting(Single Register)**

Bit 1	Bit 2	Bit 3	Bit 4	Bit5	Bit 6	Bit 7	Bit 8
Thermostat Address	06	Preset Starting address -Hi	Preset Starting address- Lo	The 1 <sup>st</sup> Preset Value-Hi	The 1 <sup>st</sup> Preset Value-Lo	CRC_Lo	CRC-Hi

\* **Response(Thermostats send out)**

Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7	Bit 8
Thermostat Address	06	Preset Starting address -Hi	Preset Starting address-Lo	Preset Value-Hi	Preset Value-Lo	CRC-Lo	CRC-Hi

**Thermostat Parameters Status Instruction**

Byte	Instruction	Related Register Address
Bit 0	On/off Flag-Hi is 0	0000H
Bit 1	On/off Flag- Lo: 0-Thermostat Off;1-Thermostat On	
Bit 2	Room Temperature Measurement-Hi:( Hi and Lo bytes stand for measured room temperature)	0001H
Bit 3	Temperature Measurement-Lo: Register Data/10(0~500 stands for temperature range from 0.0 ~50.0 degC)( Read only)	
Bit 4	Set Temperature- Hi ( Hi and Lo bytes stand for Setpoint)	0002H
Bit 5	Set Temperature-Lo: Register Data/10(50~400 stands for temperature range from 5.0 ~40.0 degC)	
Bit 6	00	0003H
Bit 7	Temperature Calibration-Lo: -90~90 stands for calibration range from -9.0 to 9.0 degC	
Bit 8	00	0004H
Bit 9	Mode-Lo(Bit 1,0): 00.Cooling 01 Heating 10. Ventilation	
Bit 10	00	0005H
Bit 11	Sensor selection:0- Internal Sensor; 1 – External Sensor	
Bit 12	Status of Output( Read only):0- Valve off 1- Valve on	0006H
Bit 13	Status of Output(Read only): 0- Low Speed 1-Medium Speed 2-High Speed 4-Fan off	
Bit 14	00	0007H
Bit 15	Button Lock-Lo(Optional): 0 buttons unlock; 1 buttons locked (without LOCK function, response is 0)	
Bit 16	00	0008H
Bit 17	Anti-freeze function: 0- Disable 1- Enable	
Bit 18	Anti-freeze Temperature-Lo: Register Data/10(50~100 stands for temperature range from 5.0 ~10.0 degC)	0009H
Bit 19	Anti-freeze Temperature-Hi: Hi and Lo bytes stand for Setpoint	
Bit 20	Time Setting(optional): Hour 00~23 (BCD code)	000AH
Bit 21	Time Setting(optional): Minute 00~59 (BCD Code)	
Bit 22	Time Setting(optional): 00	000BH
Bit 23	Time Setting(optional): Weekday 01~07 (BCD Code)	
Bit 24	00	000CH
Bit 25	C1,C2 :0-C1 1-C2	
Bit 26	00	000DH
Bit 27	Fan Speed setting: 1-Low Speed 2- Medium Speed 3- Hi Speed 4- Auto	
Bit 28	00	000EH
Bit 29	Working Modes: 00 Auto Mode 01 Manual Mode 10 Temporary Manual Mode	
Bit 30	00 (standby)	000FH
Bit 31	00 (standby)	
Bit 32	00 Standby	0010H
Bit 33	00 Standby	
Bit 34	00 Standby	0011H

Bit 35	00 Standby		
Bit 36	Modbus Version-Hi 0x0A~0x0F(Read only)		0012H
Bit 37	Modbus Version-Lo 0x01~0x00(Read only)		
Bit 38	Part No of Modbus Verison-Hi	0x00 (Read only)	0013H
Bit 39	Part No of Modbus Verison-Lo	0x10~0x99(Read only)	

Example:

**Status of On/off**

Command: 01 03 00 00 00 01 84 0A //Fetch 01 Register 0000 Fetch a Register Data

Response: 01 03 02 00 01 79 84 //Status of On/off

**Part No of Version**

Command: 01 03 00 12 00 02 64 0E // Fetch 01 Register 0012 0013 Fetch two Register Data

Response: 01 03 04 A0 01 00 10 88 3F //Verison A001, Part No. of Version 1.0

**Preset On/off**

Command: 01 10 00 00 00 01 00 01 00 06 //Preset 01 Register 0000 ON

Response: 01 10 00 00 00 01 01 C9 //