

2103-FDM

Fan Coil Thermostat

For 2-pipe and 4-pipe Fan Coil Units



Features

- Manual or automatic 3-speed fan control
- On/Off control heating/cooling valves
- Auto, Heat, Cool and Ventilation modes
- Manual or automatic heating/cooling changeover
- Input for external sensor (air or pipe temperature)
- Input for windows/energy saving contact etc.
- Automatic heating/cooling changeover via changeover sensor
- User setpoint limitation
- Clock and time schedule functions
- Key lock
- Configurable user parameters
- Modbus RTU communication
- Blue backlight LCD
- Flush Mounting



Applications

2103-FDM Series Fan Coil Thermostat used in individual rooms or zones in buildings. It is designed for two and four pipe fan coil units. It has two inputs for external sensor and open/close contact input, five relay outputs and one RS-485 port. 2103-FDM controls the fan coil unit depending on the internal room sensor or external return sensor temperature.

Notes on Usage

Please, read this datasheet carefully. SM-2103-FDM thermostat safety rules in accordance with the latest technological developments designed and manufactured. To avoid injury and property damage safety warnings must be observed.

Security Advice-Caution

Assembly, maintenance, diagnostic and repair must be done by authorized service. The power supply of the device is 220VAC and it has no internal fuse. Disconnect from power supply before separating front plate.



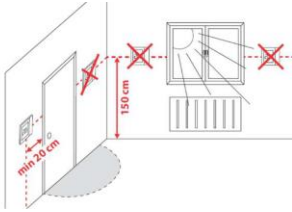
Ordering Information

Product Code	Description	Power	Communication
SM-2103-SDM	3 Digital Outputs (Relay) Fan Control 2 Digital Outputs (Relay) Valve Control 1 Analog Input 1 Dry Contact 1 RS-485 Port	230 VAC	Modbus RTU

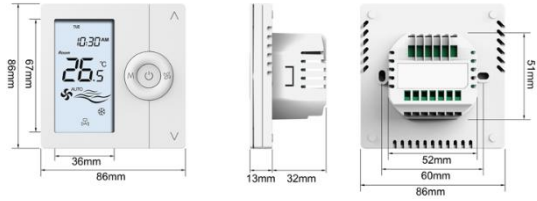
Technical Specification

Power Supply	220VAC±10%, 50/60 Hz	Inputs	1 Analog Input (NTC10K) 1 Dry Contact
Power Consumption	< 2.0W	Outputs	5 Digital Output (5 x 5 (2) A Relay)
Electrical Connection	Terminal Connectors	Communication	1 x RS-485 Port
Temperature Accuracy	±0,5°C	Temperature Setting	5°C ... 35°C
Temp. Control Accuracy	±1°C	Dimensions	86 x 86 x 45 mm

Mounting Location



Dimension

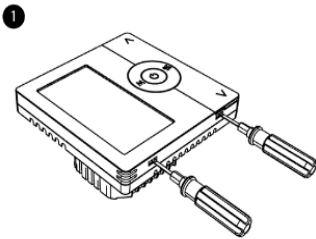


Thermostat is suggested to be installed indoor, a place with around 1.5m height above the floor where represents the average room temperature. It should be away from direct sunlight, any cover or any heat source, to avoid false signal for temperature control.

CAUTION: Power off supply at circuit breaker or fuse before installation to avoid fire, shock or death!

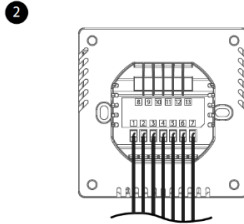


Mounting Instructions

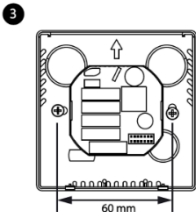
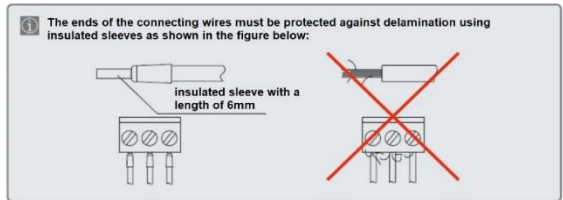


Please follow below instructions during mounting.

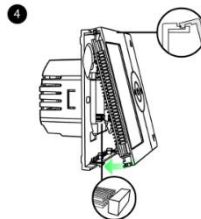
Step 1: Remove the front cover by prying hooks with flat screwdriver at the bottom of the front panel



Step 2: For the convenience of installation, the first step is to wire the volt-free wires, low-voltage wires then high-voltage wires. Check the wires are property connected

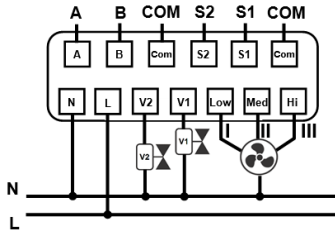


Step 3: It is for flush mounting in a 60mm wall box. Make sure the back cover is in the appropriate position (according to the arrow on it)



Step 4: Fit the front part of the casing to the top edge and make sure the pins are properly positioned. Push the front of the casing until you hear positive click.

Connection Diagrams



2-pipe: V1 Cooling/Heating valve
4-pipe: V1: Cooling valve
V2: Heating valve
S1: Dry contact
S2: Remote sensor
A/B: Modbus

Display and Operations

1	System type	0:2-pipe fan coil unit (Default) 1:4-pipe fan coil unit 2: Cool: FCU, Heat: FCU+ Floor Heating 3, Cool: FCU, Heat: Floor Heating
2	Auto Mode	0: manual (Default) 1: auto
3	Sensor type	1: internal sensor only (Default) 2: external sensor only 3: internal sensor& external sensor
4	Fan control	0: fan stop after reach temperature setpoint (Default) 1: fan continuous running after reach setpoint
5	Unoccupancy status	0: cut off all outputs 1: setback setpoint
6	Temperature Display	0 = show room temperature (Default) 1 = show setpoint
7	Display Temp. adjustment	-4°C~4°C(Default=0)
8	Dead band	1-4°C(Default=1)
9	Auto heat pipe temperature	21~40°C (Default value 22°C) for 2-pipe auto mode with external sensor only
10	Auto Cool pipe temperature	10~20(Default value 18°C) for 2-pipe auto mode with external sensor only
11	Keypad Lockout	0 All keys available(default) 1 All buttons locked out 2 System button Locked out 3 All buttons locked out except System
12	Power Up Status	0: System Off(default) 1: System last state before power off 2: System On
13	Energy saving- Dry Contact (KeyCard)	0: If the card is inserted, S1 and S2 will be open (NC Dry Contact as Default) 1: If the card is inserted, S1 and S2 will be closed (NO Dry Contact)
14	Freeze Protection	0: Disable (Default) 1: Enable
15	N/A	N/A
16	Preheat Temp.	21-50°C(Default=38)
17	Minimum setpoint	5-18°C (Default value=5°C)
18	Cooling Setpoint setback	22-32°C(Default=28)
19	Maximum setpoint	20-35°C (Default value=35°C)

20	Heating Setpoint setback	10-21°C(Default=18)
21	Heat Delay	0-4minutes (Default=0)
22	Compressor Protection	0-4minutes (Default=0)
23	Fahrenheit/Celsius	F/C (Default=Celsius)

1-Selectable System Type: control 2 / 4-pipe fan coil units

2-Auto Mode: you can set your 2-pipe/4-pipe system running as manual or auto season changeover

3-Sensor Type: 1: Internal sensor only. 2: external sensor only 3: the external sensor is used for measuring the water pipe temperature to change mode between Heat and Cool automatically, this function is only available under 2-pipe Fan coil auto system only (Option 1=0 and Option 2=1). System works in cooling mode if the water temperature is less than or equal to certain temperature (Default as 18°C see option 10), and work in heating mode if the water temperature is higher than or equal to certain temperature (Default as 22°C, see option 9). Option 03 only can set to 03 when option 01 value=0 and option 2=1 at the same time.

4-Fan Control: when the room temperature reaches setpoint, you can set the fan stop running or continuous blowing

5-Unoccupied Status: when the hotel card is pulled out, the unoccupancy status will be: 0: no output; 1: thermostat will work in energy saving mode with setback setpoint, fan will run at low speed

7- Display Temperature adjustment: you can calibrate the room temperature by the range from -4°C to 4°C

8-Dead Band: the cool/heat will be only activated if differential temperature between setpoint and room temperature $\geq$ the dead band. For example, under cooling mode, the setpoint is 25°C with dead band=1°C, the cool air will be only available if the room temperature $\geq$ 26°C.

9 & 10 Auto Heat/Cool Mode pipe temperature: if you set the option 01 =0, option 2=1 and option 03 =3. means the system will work as auto changeover under 2-pipe system. The fan will be only activated if the external sensor measure water in the fan coil pipe is hot or cold enough, this is for anti-freezing air blow under heating mode if the pipe water is not hot enough(temperature set range 21~40°C), also for energy saving under cooling mode if the pipe water is not cold enough(temperature set range 10~20°C)

11- Keypad lock: Keypad lock can be set to 4 status for different people authorization, the symbol  will show on the screen

12- Power Up Status: when the electric power is failure and back again, the thermostat will follow three status: 0: keep system off; 1: keep the system original status before the power failure. 2: switch the system on automatically

13- Energy Saving-Hotel Card function A dry contact (such as hotel key card) can activate the energy saving mode with  icon appearing on screen.

14- Freezing protection: In freezing protection mode (no such mode in cool only application), when thermostat is in OFF mode while the acquired temperature is below 6°C, the thermostat will start heat mode until the temperature rises to 8°C

17&19 Temperature Limited: you can set the Min. cooling and Max. heating setpoint to save energy

18&20 under Energy saving mode (option 13 activates), the thermostat will set the setpoint as setback temperature for energy saving.

Please note: the item 1 is only for the product with -4. the item 3,5,9,10,13,16,17,19 is only for the product with -D

Modbus Setting:

Turn off the thermostat, press and hold the "M" key for five seconds to entry the Modbus parameter. Press "M" three times to entry each item below:

Item 01 "Address": From 01~32. Press "M" 3 times to entry item 02

Item 02 "baud rate", 01:4800, 02: 9600, 03:19200. Press "M" 3 times to entry the item 03

Item 03 "Parity", 00: No Parity, 01: Odd Parity, 02: Even Parity

Press power button " " or wait 30Sec to exit and save all settings

MODBUS PROTOCOL

Modbus Transport Protocols

Thermostats come with the option of Modbus communication. The support of Modbus communication allows simple integration of the thermostats with a building management system using standard Modbus serial communication.

Thermostats communicate as a Modbus RTU slave device over a serial RS-485 connection, allowing for the transfer of real-time data. RS-485 communication parameters such as baud rate, parity check and Modbus address can be adjusted. These parameters are defined for each thermostat in the Parameter Settings Table. If required, adjust the settings to disable the Modbus connection. Connection to the RS-485 network is made via dedicated terminals on the back of the thermostat and marked A (+) and B (-). The following Modbus register types and formats are supported:

Serial number	Specification	Protocol Specification
1	Media	RS485
2	Baud Rate	19200BPS/9600 BPS /4800 BPS
3	Transmit Mode	RTU
4	Data Unit	Additional address + Function code+ Data 1.....N+ CRC High byte, CRC Low byte
5	Address	1-32
6	Function Code	3, 6, 16
7	Data Qty	<255
8	DATA	0-255
9	CRC check	CRC-16
10	Byte Format	11 digits: 1 start digit+8 data digit+ odd parity digit+ 1 stop digit
11	Check Method	CRC-16
12	0 Address	Broadcast Address
13	Port Definition	A (+), B (-)

Function Code	Holding Register Address	Fan Coil	Data Description
03/06/16	1(0)	Fan mode	00: high speed 01: Medium speed 02: low speed 03: Auto Speed
03/06/16	2(1)	Mode	1: Cool 2: Heat 3: Ventilation
03/06/16	3(2)	Thermostat Status	00: Thermostat OFF 01: Thermostat ON 02: Frost Protect (read only)
03/06/16	4(3)	Set Room Temperature	Temperature (5~35°C)
03/06/16	5(4)	Timer On "Hour"	(0 ~ 24)
03/06/16	6(5)	Timer On "Minute"	(0 ~ 60)
03/06/16	7(6)	Timer Off "Hour"	(0 ~ 24)
03/06/16	8(7)	Timer Off "Minute"	(0 ~ 60)
03	9(8)	Communication check	Communicate between 0/1
03	10(9)	Room Temperature	0-50
03	11(10)	Output	Bit0: Cooling valve(4-pipe) 0: OFF, 1: ON Bit1: Fan low speed 0: OFF, 1: ON Bit2: Fan medium speed 0: OFF, 1: ON Bit3: Fan high speed 0: OFF, 1: ON Bit4: Heating valve (4-pipe) 0: OFF, 1: ON

			Bit5-7: Reserved
03	12(11)	Error Information	Bit0: Internal sensor error 0: OK,1 Error Bit1: External sensor error 0: OK,1 Error Bit2: Reserved Bit3: Reserved Bit4- Bit7: Reserved
03	13(12)	External sensor	Temperature Rage (0~+99°C)
03	14(13)	Reserved	
03/06/16	15(14)	Reserved	
03/06/16	16(15)	Enable Frost Protection	00: OFF, 01: ON
03/06/16	17(16)	Programmable	01: Manual 02: Timer 03: Programmable 04: Timer+Programmable
03/06/16	18(17)	Thermostat status after Power Recover	0: OFF 1: Back to status before the power failure 2: ON
03/06/16	19(18)	Keypad lockout	00: Disable 01: Lock all buttons 02: Lock ON/OFF button 03: Lock all buttons except ON/OFF button
03/06/16	20(19)	Temperature Display	00: Show room temperature 01: Show set Temperature
03/06/16	21(20)	Set Min Temperature	Set Range (5 ~ 18°C)
03/06/16	22(21)	Set Max Temperature	Set Range (20 ~ 40°C)
03/06/16	23(22)	Differential Temperature	Set Range (1 ~ 4°C)
03/06/16	24(23)	Sensor Selection	01: Internal 02: External 03: Internal &External
03/06/16	25(24)	Occupancy/dry contact close/open	00: Occupied when open-circuit

			01: Occupied when short-circuit
03/06/16	26(25)	Unoccupied Status	00: cut off all outputs 01: entry ECO mode
03/06/16	27(26)	Unoccupied Heating set temperature range	Set Range (10 ~ 21°C)
03/06/16	28(27)	Unoccupied cooling set temperature range	Set Range (22 ~ 32°C)
03/06/16	29(28)	Fan operation after setting temperature is reached	00: fan off 01: fan on
03/06/16	30(29)	2/4 pipe selection	00: 2-pipe 01: 4-pipe
03/06/16	31(30)	Heat/Cool changeover	00: Manual 01: Auto 02: Reserved
03/06/16	32(31)	Preheat Temp. Setting	Set Range (21 ~ 50°C)
03/06/16	33(32)	Auto Cool Temp. Setting	Set Range (10 ~ 20°C)
03/06/16	34(33)	Auto Heat Temp. Setting	Set Range (21 ~ 40°C)