

SM-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 (optional)
- Key lock
- Configurable user parameters
- Modbus RTU communication
- White backlight LCD
- Flush Mounting



Application

2103-FDM series Fan Coil Thermostats used in individual rooms or zones in buildings. It is designed for 2-pipe or 4-pipe fan coil units. 2103-FDM has two input as external sensor or open/close contact input, five relay outputs and RS-485 ports. It controls the fan coil unit depending on the internal room sensor or external return sensor temperature.

Notes on Usage

Please, read this datasheet carefully. 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 220V AC and it has no internal fuse. Disconnect from power supply before separating front plate.



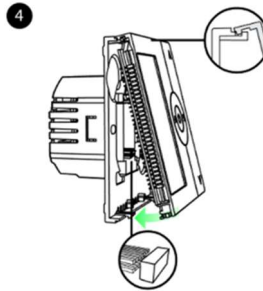
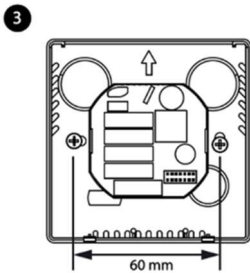
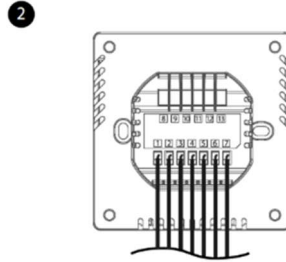
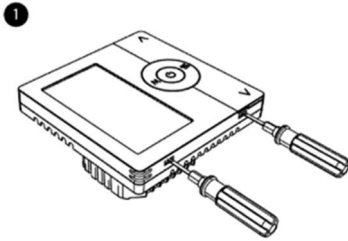
Ordering Information

Product Code	Description	Power	Communication
SM-2103-FDM	3 pcs Digital Outputs (Relay) Fan Control 2 pcs Digital Outputs (Relay) Valve Control 1 pcs Analog Input 1 pcs Digital Input 1 pcs RS-485 Port	220 VAC	Modbus RTU

Technical Specification

Power Supply	220 VAC±10%, 50/60 Hz
Power Consumption	< 2.0W
Electrical Connection	Terminal Connectors
Relay Rating	5A (2A)

Mounting Instructions



Please follow the below instructions during mounting.

Step 1: Take the thermostat and user manual out of the package. Remove the front cover freeing the hooks at the bottom of the front panel with a flat screwdriver.

Step 2: Connect the cables according to the wiring diagram below.

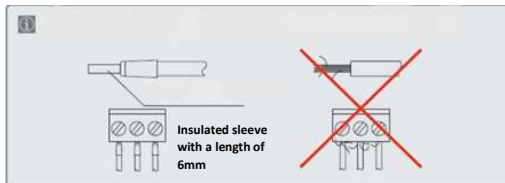
Step 3: Surface mounting in a 60mm wall box. Make sure the back cover is in the appropriate position (according to the arrow on it)

Step 4: Attach Connect the front plate to the back plate. Ensure that the front plate's pins are fully inserted into the back plate. Push the front of the case until you hear a click.

Step 5: Refer to the pictures after installation.

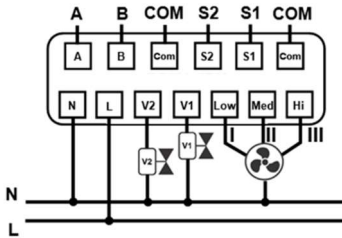
Step 6: Power on the thermostat to work.

Important Note: Using the screws included in the product box is recommended. Otherwise, there could be fitting problems during the mounting.



Caution! *The ends of the connecting wires must be protected against delamination using insulated sleeves as shown in the figure.*

Connection Diagram



2-pipe: V1 Cooling/Heating valve

4-Pipe: V1: Cooling Valve

V2: Heating Valve

S1: Dry Contact/External Sensor

S2: Remote Sensor

A/B: Modbus Communication

Configuration Menu Parameters

Switch off the thermostat and press "M" and "▲" for 5 seconds to enter the parameter setting menu.

No.	Name of Parameter	Parameter Definition	Default
P1	System Type	0= 2-pipe fan coil unit 1= 4-pipe fan coil unit 2= Cool: FCU, Heat: FCU+ Floor Heating 3= Cool: FCU, Heat: Floor Heating	0
P2	Automatic Mode	0= Manual 1= Automatic	0
P3	Sensor Type	1= Internal sensor only 2= External sensor only 3= Internal sensor & External sensor	1
P4	Fan Control	0= Fan stop after reaching temperature setpoint 1= Fan continuously running after reaching setpoint	0
P5	Unoccupancy Status	0 = Cut off all outputs 1 = Setback setpoint	-
P6	Temperature Display	0= Show room temperature 1= Show setpoint	0
P7	Display Temperature Adjustment	-4°C ~ 4°C	0
P8	Dead Band	1°C ~ 4°C	1°C
P9	Auto Heat Pipe Temperature	21°C ~ 40°C For 2-pipe auto mode with external sensor only	22°C
P10	Auto Cool Pipe Temperature	10°C ~ 20°C For 2-pipe auto mode with external sensor only	18°C
P11	Keypad Lockout	0= All keys available 1= All buttons locked out 2= System button locked out 3= All buttons locked out except the system	0
P12	Power Up Status	0= System off 1= System last state before power off 2= System on	0
P13	Energy Saving- Dry Contact (Key Card)	0= If the card is inserted, S1 and COM will be open. (NC dry contact as default) 1= If the card is inserted, S1 and COM are closed. (No Dry Contact)	0
P14	Frost Protection	0= Disable 1= Enable	0

P15	Reserved	Reserved	-
P16	Reserved	Reserved	-
P17	Minimum Setpoint	5°C ~ 22°C	5°C
P18	Cooling Setpoint Setback	22°C ~ 32°C	28°C
P19	Maximum Setpoint	23°C ~ 35°C	35°C
P20	Heating Setpoint Setback	10°C ~ 21°C	18°C
P21	Heat Delay	0~4 minute	0
P22	Compressor Protection	0~4 minute	0
P23	Fahrenheit/Celsius	°F/°C	Celsius

Table Explanation

P1- Selectable System Type: Used to select the unit control type as 2 or 4 pipes.

P2- Auto Mode: This parameter is used to specify the mode change type auto/manually in 2 or 4-pipe systems.

P3- Sensor Type: 1= Internal sensor only, 2= External sensor only, 3= The external sensor attaches to water pipe for measuring the water pipe temperature to change mode between heat and cool automatically, this function is only available under 2-pipe fan coil (Parameter 1=0) and auto system (Parameter 2=1) at the same time. System works in cooling mode if the water temperature is less than or equal to certain temperature (Default as 18°C see Parameter 10) and work in heating mode if the water temperature is higher than or equal to certain temperature (Default as 22°C see Parameter 9)

P4- Fan Control: This parameter determines the operating status of the fan after the room temperature reaches the set value.


P5- 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, and the fan will run at low speed.

P7- Display Temperature Adjustment: This parameter is used to calibrate the room temperature by -4°C to 4°C.

P8- Dead Band: This parameter determines the zone where the device will not heat or cool. Until the difference between the set point and room temperature exceeds this zone device won't do heating or cooling.

For example, under the cooling mode, the setpoint is 25°C with dead band= 1°C, the cool air will be only available if the room temperature ≥ 26°C.

P9 & P10- Auto Heat/Cool Mode Pipe Temperature: Only available when Parameter 1 =0, Parameter 2=1 and Parameter 3 =3 at the same time. 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°C ~40°C), also for energy saving under cooling mode if the pipe water is not cold enough (temperature set range 10°C ~20°C).


P11- Keypad Lock: Keypad lock can be activated with this parameter. The symbol  will show on the screen.

P12- Power Up Status: This parameter determines in which state the device will be turned on after the power reset. The device will follow three states:

0: Keep the system off.

1: Keep the system's original status before the power failure.

2: Switch the system on automatically.

P13- Energy Saving-Hotel Card Function: A dry contact (such as a hotel key card) can activate the Energy-saving mode with icon  appearing on the screen.

P14- Frost Protection: This parameter is used to activate or deactivate the frost protection scenario. If measured temperature decreases under 6°C when frost protection is activated, the thermostat will be working in heating mode until the temperature increase over 8°C.

P17&P19- Temperature Limited: This parameter determines the maximum and minimum set values that can user selectable.

P18&P20- Energy Saving Set: Under Energy saving mode (P13), the thermostat will set the setpoint as setback temperature for energy saving.

Caution! Parameter 1 is for product -4 only. 3,5,9,13,16,17,19 parameters are for -D product.

SM-2103-FDM Modbus Parameters

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:

Address	Parameter Name	Description
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 bit, CRC low bit
5	Address	1-32
6	Function Code	3,6,16
7	Data Quantity	<255
8	Data	0-255
9	CRC Control	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 (-)

The following points can be modified in the parameter menu.

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

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

Item 02: "Baud rate": 01:4800, 02: 9600, 03:19200. Press "M" 3 times to enter item 03

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

Press power button "C" or wait 30 sec to exit and save all settings.

Address	Parameter Name	Description
1	Address	1-32 (Default=1)
2	Baud Rate	1- 4800 (Default) 2- 9600 3- 19200
3	Byte Format	1- Odd Parity (Default) 2- Even Parity 3- None Parity

Note: After each parameter setting, the device will turn off the parameter screen by itself (about 1 minute). Then the power of the device should be turned off and on. If this operation is not performed, the parameters will return to their default settings.

Function Code	Holding Register Address	Fan Coil	Definition
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 protection (read-only)
03/06/16	4(3)	Set Room Temperature	5°C ~ 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 °C
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 Range 0°C ~ 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 Recovery	0= OFF 1= Back to the 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 the 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	5°C ~ 18°C
03/06/16	22(21)	Set Max Temperature	20°C ~ 40°C
03/06/16	23(22)	Differential Temperature	1°C ~ 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	10°C ~ 21°C
03/06/16	28(27)	Unoccupied cooling set temperature range	22°C ~ 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	21°C ~ 50°C
03/06/16	33(32)	Auto Cool Temp. Setting	10°C ~ 20°C
03/06/16	34(33)	Auto Heat Temp. Setting	21°C ~ 40°C

Dimensions

