

SAS922XFCT-4-RCS-485 Digital Thermostat

**Application: 2 pipe cool/ventilation or 2 pipe heat/cool/ventilation/AUTO
or 4 pipe heat/cool/ventilation/AUTO Installation and operation instructions**

PRODUCT DESCRIPTION:

SAS922XFCT-4-RCS-485 The thermostats have been designed for the control of Fan coils of 2 or 4 pipes and fan of 3 speeds (manual or automatic). The main features are:

- ◆ Room card function: it has an input contact for occupation cards or motion detector that allows an ECO regime of reduced consumption when there is no occupation. Also configurable as a remote start / stop contact or window contact.
- ◆ Remote sensor: optionally, you can use a remote sensor to replace the internal air temperature sensor or a supply water temperature sensor to change the automatic mode (2-pipe) or as a minimum thermostat (2 and 4 pipes) .
- ◆ Communication: the SAS922XFCT-4-RCS-485 version integrates an interface for Mod Bus communication that can be integrated in a BMS system.

PRODUCT SPECIFICATION:

Dimension	88mm×88mm×12mm
Setting temperature range	5°C~35°C
Accuracy	±0.5°C
Power	100-240VAC 50/60Hz
Fan Relay Amps	8(5)A
Valve relay Amps	3(2)A
Protection class	IP21
Working environment	0-50°C, 5-95%RH

OPERATION:

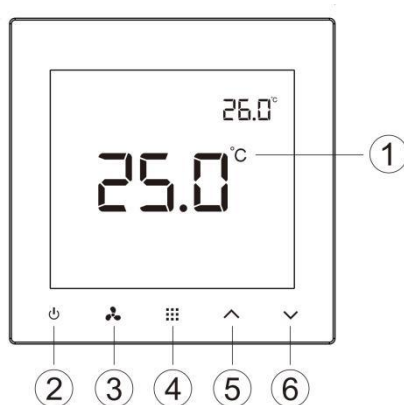


Figure 1

Buttons:

- | | |
|----------------|---------------|
| ① Display area | ④ Mode button |
| ② Power button | ⑤ up button |
| ③ Fan button | ⑥ Down button |

Introduction of Button:

- ② Power button: ON/OFF thermostat
- ③ Fan button: Setting fan mode (HI, MED, LOW and AUTO)
- ④ Mode button: Working mode option (Cool, heat and ventilate)
- ⑤ UP button: Raise temperature
- ⑥ Down button: Lower temperature



Figure 2

The Display:

- a : Indicates heat mode
- b : Indicates cool mode
- (a/b flashes at the same time ,it indicate the automatic mode)
- c : Indicates ventilation mode
- d : Indicates thermostat is “calling” for cool
- e : Indicate external sensor status
- f : Indicates setting
- g : Indicates compressor delay
- h : Indicates current fan setting
- i : Indicates thermostat is “calling” for heat
- j : Indicates room temperature
- K: **Button lock**
- L : ECO mode (**Room card function**)
- M:Indicates set temperature

FUNCTION:

1. Fan operation

Press button to choose HI /MED /LOW /AUTO speed, Without AUTO mode in ventilation mode.

2. Mode operation

1) Press button to select different working mode in power on status

= CH: Heat mode/cool mode/AUTO mode/ventilate mode

= CO: cool only mode/ventilate mode

3. HE is electrically heated ; and there are only electric heating and ventilation modes in 2 pipe

modes (except for single cooling).

In power on status, long press the power button  to query the external probe temperature.

In power on status, long press the mode button  to activate the button lock or cancel the button lock.

CONFIGURATION:

The configuration menu allows you to set thermostat operating characteristics to your system or personal requirements. Switch off the thermostat and hold the  button for over 5 seconds entered the configuration menu item setting, and will show the first configuration menu item.

Press  and  button to select. Press  to enter next item. Press  back to previous item Press  to exit menu and back to power off status.

If no keys are pressed within 30 seconds the thermostat will be switched off. To revert to factory default setting, push  button for over 5 seconds. Display will show “DEF” indicates all the configuration setting has reverted to factory default.

NO	Press button	Displayed (factory default)	Press  and  to select	Description
1	 / 	CL (0)	-4.0—+4.0℃	Calibrate Temperature
2	 / 	AH (28℃)	AL℃—40.0℃	Select maximum setting temperature
3	 / 	AL (18℃)	5.0℃—AH	Select minimum setting temperature
4	 / 	bl (2)	1-3	Backlight options
5	 / 	LA (OFF)	ON/OFF	Fan running mode selection OFF: Fan coil would not linkage output with valve ON: Fan coil and valve linkage output, When valve stop, fan will stop too.
6	 / 	rE (rE)	rd/ rE	Memorize power on/off option before power loss rd: no matter the thermostat is switched on or off before power loss, after the power supply comes to normal again the thermostat will keep power off. rE: the thermostat will keep memory when its ON or OFF status before power loss
7	 / 	CH (CH)	CO/CH	Model Selection: CO: Cooling only CH: heating and cooling both
8	 / 	FE (2)	2/4	Control system selection for fan coil 2: 2 pipe 4 : 4 pipe
9	 / 	LE (SC)	SC/SCD/OC/OCD/ SCE/SCF/OCE/OCF	Activation Modes of the Occupation Contact
10	 / 	CC(26℃)	5℃ - 40℃	Non-Contact Occupancy Cooling Temperature (ECO)
11	 / 	HC(16℃)	5℃ - 40℃	Occupational Contact less Heating Temperature (ECO)

12		db (10°C)	5°C - 15°C	Dead band AUTO mode without Contact of Occupation (ECO)
13		HE(HF)	HE/HF	Heating mode: HF :Fan coil heating HE: Electric heating
14		LF(1)	0/1/2	0:All buttons are locked when the button lock is activated 1:Only the up and down button can operate when the button lock is activated 2:Only the up /down/fan button can operate when the button lock is activated
15		LI(0)	0/1/2	0:Display room and setting temperature 1:Display room temperature 2:display setting temperature
16		d3 (0)	0,1,2	Remote sensor options
17		FC(C-C)	C-C/F-F	°C or °F switch

Detailed explanation of the functions of each parameter

1: CL Adjustment of the internal temperature probe

You can adjust the reading of the internal temperature probe displayed on the screen up to 5 degrees above or below.

2: AH Setting of maximum heating temperature

You can adjust the maximum regulation temperature limit. It can be adjusted between AL and 40° C.

3: AL Minimum cooling temperature setting

You can set the minimum regulation temperature limit between 5° C and AH

4: BL Backlight options

- 1) The light will remain off continuously
- 2) The display will turn on when any button on the thermostat is touched and will turn off automatically after 15 seconds.
- 3) The screen will stay on all the time.

5: LA Option stop fan

Use the ▲ or ▼ button to select between "ON" and "OFF". If you select "ON", the thermostat will keep the fan running at the speed provided by the fan button and will not stop the fan when there is no demand for heat or cold. If you select "OFF", the thermostat will stop the fan when there is no heat or cold demand.

6: rE Memory option for power failure

Use the ▲ or ▼ button to select "rE" or "rd"

"Rd": Regardless of the status of the thermostat (on or off) at the time of power failure, when it is recovered, the thermostat will remain off.

"RE": The thermostat will remember the status it was in, on or off, when the power failure occurred.

7: CH Single Cooling mode/ heating and cooling mode selection

Press the ▲ or ▼ button to select "CO" or "CH". CO:single cooling mode ,CH:heating and cooling mode

8: FE Selection of 2/4 pipes configuration

Press the ▲ or ▼ button to select "4" or "2". 4 means 4 pipes and 2 means 2 pipes.

9: LE Contact occupation configuration

Select SC to activate the ECO mode with closed contact.

Select SCD to activate the ECO mode with closed contact with a delay of 1 minute.

Select OC to activate the ECO mode in open contact.

Select OCD to activate the ECO mode in open contact with a delay of one minute.

Select SCE to activate the remote start / stop mode (or window) with closed contact.

Select SCF to activate the remote start / stop mode (or window) with closed contact with a delay of 1 minute.

Select OCE to activate the remote start / stop mode (or window) in open contact.

Select OCF to activate the remote start / stop mode (or window) in open contact with a one-minute delay.

If an ECO mode is activated, during the time that the system remains in ECO mode, the fan stops if there is no demand, regardless of the configuration of parameter "LA".

10: CC Setpoint saving energy for cooling (ECO Mode)

You can change the ECO WINTER mode setpoint between 5 ° C and 40 ° C.

11: HC Setpoint saving energy for heating (ECO mode)

You can change the ECO SUMMARY mode setpoint between 5 ° C and 40 ° C.

12: db Dead band in AUTO operation (ECO Mode)

If the thermostat is operating in AUTO mode (4T), the thermostat enters Cold Mode if the ambient temperature is db ° C higher than the setpoint, and in Heat mode, if it is db ° C lower.

13: HE Heating mode configuration

HF: Heating by hot water battery.

HE: Heating with electrical resistance.

In the electric resistance heating mode, take into account the following peculiarities:

- The fan has a delay of 1 minute before stopping after leaving the heating mode.
- If it has been configured for a fan coil with 2 pipes, the operation in cold mode only takes into account the fan.
- If the thermostat is turned off while the system is running on heating, the system automatically activates the fan at low speed for one minute to dissipate the remaining heat in the electrical resistance.

Note: If your system is configured with electric resistance heating, it is recommended that you set parameter "LA" to LA = ON.

14: LF Button lock select

0: All buttons are locked when the button lock is activated

1: Only the up and down button can operate when the button lock is activated

2: Only the up /down/fan button can operate when the button lock is activated

15: LI Temperature show

0: Display room and setting temperature

1: Display room temperature

2: display setting temperature

16: d3 Remote sensor options

0: Remote temperature sensor in air. Replaces the thermostat's internal temperature air probe for regulation.

1: Mixing temperature sensor. The regulation is performed with the arithmetic mean of the temperatures measured by the internal probe of the thermostat and the remote probe in air.

2: Supply water temperature sensor for automatic mode change (2 tubes) or as minimum thermostat. As a minimum thermostat the sensor does not allow the fan to start when the supply water temperature is less than 22 ° C operating in heating. In cold this function only applies if it is a 2-pipe installation, there is cold demand

and the water supply temperature is higher than 18° C.

This mode (d3 = 2) is disabled if parameter “HE” is set to HE = HE (Electric heating).

Modbus communication operating parameters

Long press  over 5 seconds after power off .It will enter setting interface of Modbus. Press  button to change to the next item. Press  and  button to change setting. In setting interface of Modbus, long press  over 5 seconds until it show DEF to revert to factory default setting.

NO.	Press button	Displayed (factory default)	Press“^”、 “v”to select	Descriptions
1	 / 	Addr (1)	1~247	RS485 slave address :Show decimalism need to change it into hexadecimal when using
2	 / 	baud (2)	1/2/3/4/5	RS485 baud rate setting 1: 4800 2: 9600 3: 19200 4: 38400 5: 115200
3	 / 	CHEC (0)	0/1/2	RS485 verification mode 0: None parity 1: Odd parity 2: Even parity
4	 / 	St OP (1)	1/2	RS485 Stop bit settings 1: One stop bit 2: Two stop bit

1: Communication addresses 485

The communication range is 1 ~ 247; By factory default is "1", press the  or  button to select another one.

2:Communication speed configuration

1: 4800 2: 9600 3: 19200 4: 38400 5: 115200

3: Communication parity configuration

0: No parity 1: odd 2: **Even**

4:RS485 Stop bit settings

1: One stop bit

2: Two stop bit

OPERATING MODES OF THE THERMOSTAT:

The regulation temperature is the measurement temperature in the following operating modes (Cooling, Heating, Automatic). By default it is determined thanks to the internal thermostat sensor.

If a remote room sensor is connected, the regulation temperature will be that of the remote sensor (parameter “d3” set to 0) or that of the arithmetic mean thereof with the measurement of the internal sensor (parameter “d3” set to 1).

Therefore, the regulation temperature in the successive operating modes will depend on the sensor used in each case.

1.1 Cooling mode

1.1.1 Valve control

If the regulation temperature is higher by 1 ° C at the set point temperature, the valve will open. If the regulation temperature is lower by 1 ° C at the set point temperature, the valve will close.

For a 2-pipe configuration with supply water temperature sensor, the opening of the valve is conditional on the water temperature being 18 ° C or less.

1.1.2 Fan control

Using the button you can select the fan speed manually or automatically: with the AUTO selection it will be the same thermostat that will choose the appropriate speed:

When the set point temperature is reached, the fan can stop if its installer has set parameter "LA" (fan stop option) to OFF or continue running if it was selected in ON value.

For a 2-pipe configuration with a water supply temperature sensor, starting the fan if there is a cold demand is conditioned by the water temperature being 18 ° C or less.

2.1 Heating mode

2.1.1 Valve control

If the regulation temperature is lower by 1 ° C at the setpoint temperature, the valve will open. If the regulation temperature is higher by 1 ° C at the setpoint temperature, the valve will close.

For a 2-tube configuration with supply water temperature sensor, the opening of the valve is conditioned by the water temperature being 22 ° C or more.

2.1.2 Fan control

Using the button you can select the fan speed manually or automatically: with the AUTO selection it will be the same thermostat that will choose the appropriate speed:

When the set point temperature is reached, the fan can stop if its installer set parameter "LA" to ON or continue running if it was selected in OF value.

If parameter "HE" was set to HE, the fan stop will occur with one minute of stop delay from heating.

For a configuration with supply water temperature sensor (Minimum thermostat), if there is heat demand, the fan start is conditioned to the water temperature being 22 ° C or more.

3.1. Automatic Mode

3.1.1 2-pipe

The installer must set parameter "FE" to value 2 (2-pipe), connect the supply water temperature sensor, and set parameter "d3" to value 2.

In this AUTO mode for 2-pipe, the sensor of the water supply pipe has the function of managing the change of Mode: Cold, if the pipe is at 18 ° C or less and Heat, if it is at 22 ° C or more .

If the sensor is damaged and terminals RS and RG are short-circuited, an ER2 error message will appear on the screen. If the cables are cut or there is no sensor connected, the ER2 fault message will appear on the screen.

3.1.2 4-pipe

The installer must adjust parameter "FE" to value 4 (4-pipe).

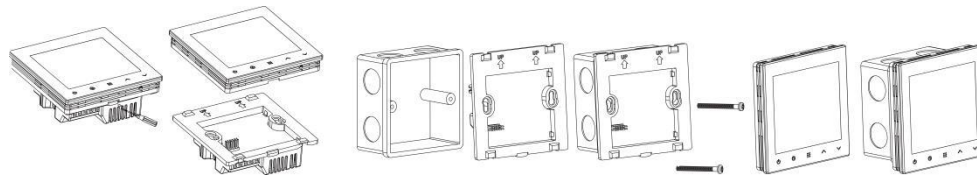
When selecting AUTO mode, the thermostat enters Cold Mode if the regulation temperature is 2 ° C higher than the set temperature and in Heat mode, if it is 2 ° C lower. In both cases the output to the Cold or Heat valves will switch to OFF when the temperature difference between regulation temperature and set point drops to 1 ° C. There is therefore a dead zone of 2 ° C that allows an energy saving combining with a satisfactory degree of comfort. For example, with a set point of 23 ° C the thermostat will start up in heat at 21 ° C and stop at 22 ° C. At 25 ° C ambient will enter Cold and stop at 24 ° C.

For a configuration with temperature sensor of the supply water (minimum thermostat), if there is a demand for heat, starting the fan in heat is conditioned by the water temperature being 22 ° C or more.

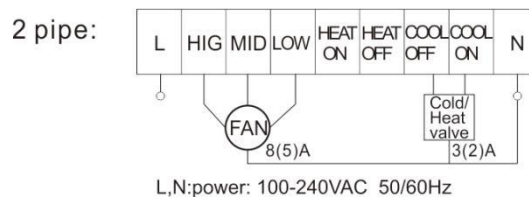
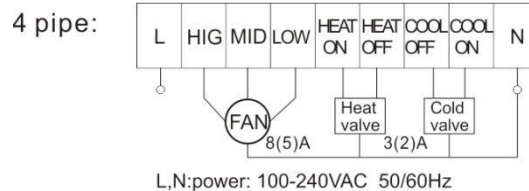
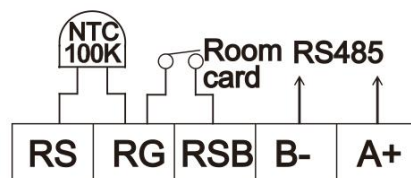
[If the room temperature sensor is faulty, an ER1 error message will appear on the screen.](#)

INSTALL THE THERMOSTAT:

1. Gently opening the front panel by screw driver at the bottom open mouth.
2. Gently pulling the control panel straight off the base connector.
3. Fix the cover on the base.



WIRING DIAGRAM:



IMPORTANT SAFETY INFORMATION:

- Always turn off power at the main power source by unscrewing fuse or switching circuit breaker to the off position before installing, removing, cleaning, or servicing this thermostat.
- Read all of the information in this manual before installing this thermostat.
- Only a professional contractor should install this thermostat.
- All wiring must conform to local and national building and electrical codes and ordinances.
- If system is not operating properly, check wiring and replace fuse if necessary.

- Use this thermostat only as described in this manual.

RS-485 MODBUS Universal Interface Protocols

User Manual

The default configuration of the RS485 connection of the thermostat is as follows: Baud: 9600, 8N1 (8 data bits, No parity and 1 stop bit).

Parameters **Modbus communication operating parameters** can be used for the configuration of the connection speed and parity, respectively.

Possible addresses are from 1 to 247, with address 1 being the default device.

Modbus RTU functions:

03 reading (Read Holding Register function)

06 writing (Write Single Register)

Format UINT16

Registry	Description	Possible values	Functions
0	ON / OFF status	1 on / 0 off	R / W
1	Operation mode	0 Cool / 1 Heat / 2 Auto / 3 Ventilation	R / W
2	Fan speed mode	1 High / 2 Medium / 3 Low / 0 Auto	R / W
3	Temperature set point *		R / W
4	Internal probe temperature *		R
5	Remote probe temperature *		R
6	Keypad lock	0 unlocked / 1 blocked	R / W
7	Contact occupation status	0: OC / 1: SC	R
8	Valves status	0 None active 1 Cooling valves active 2 Heating valves active	R
9	Fan speed status	0 None active 1 High 2 Medium 3 Low	R
11	ON / OFF status	1 on / 0 off	R
12	Operation mode	0 Cool / 1 Heat / 3 Ventilation / 6 Auto cool / 7 Auto heat	R
13	Fan speed mode	1 High / 2 Medium / 3 Low / 0 Auto	R
14	Temperature set point *		R

* Temperature display x 10

