

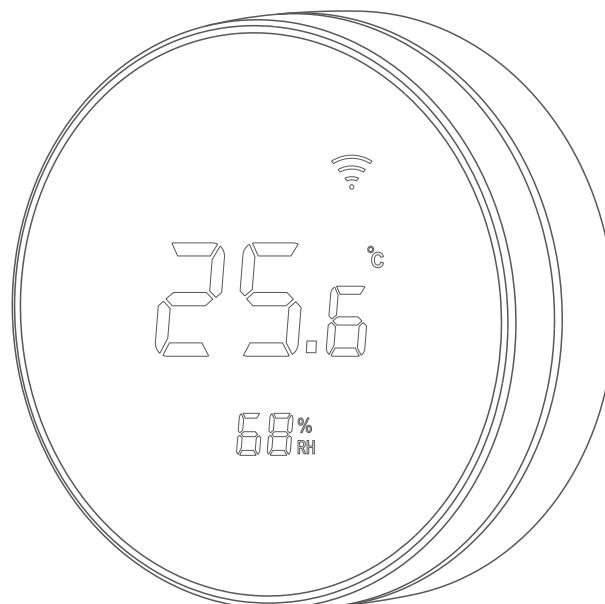
Bandary Smart thermostat FC610

Fan coil controller

Datasheet

Subject to technical alteration

Issue date: 28.08.2020



Application

The Dual-Right thermostat FC610, With Microcomputer control and WIFI communication technology to detect the difference between room temperature and setting temperature,then through controlling the fan, ON/OFFvalve and modulating valve to keep the room at comfortable and constant temperature. This series product apply to control two pipe or four pipe fan coil ,two wire or three wire motorized valve ,3-stage fan ,EC fan and an electrical heating water flow system . you can also control your thermostat anyway where you are by APP in your cell phone ,with 1-way RS485 interface to BMS control system , can realize centralized control and management.

Security Advice – Caution



The installation and assembly of electrical equipment should only be performed by authorized personnel.

The product should only be used for the intended application. Unauthorised modifications are prohibited! The product must not be used in relation with any equipment that in case of a failure may threaten, directly or indirectly, human health or life or result in danger to human beings, animals or assets. Ensure all power is disconnected before installing. Do not connect to live/operating equipment.



CAUTION! Risk of electric shock due to live components within the enclosure, especially devices with mains voltage supply (usually between 198..240 V).

Please comply with

- Local laws, health & safety regulations, technical standards and regulations
- Condition of the device at the time of installation, to ensure safe installation
- This data sheet and installation manual

Notes on Disposal



As a component of a large-scale fixed installation, Bandary products are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location, hence the Waste Electrical and Electronic Act (WEEE) is not applicable. However, most of the products may contain valuable materials that should be recycled and not disposed of as domestic waste. Please note the relevant regulations for local disposal.

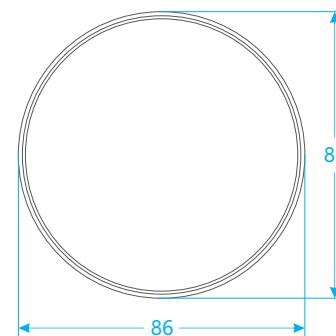
Remarks to Room Sensors

Location and Accuracy of Room Sensors

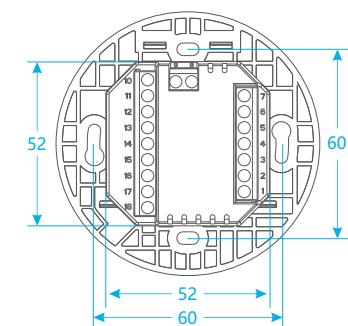
The room sensor should be mounted in a suitable location for measuring accurate room temperature. The accuracy of the temperature measurement also depends directly on the temperature dynamics of the wall. It is important, that the back plate is completely flush to the wall so that there is sufficient circulation of air through the vents in the cover, otherwise, deviations in temperature measurement will occur due to uncontrolled air circulation. The temperature sensor should not be covered by furniture or other objects. Mounting next to doors (due to draught) or windows (due to colder outside wall) should be avoided.

Surface and Flush Mounting

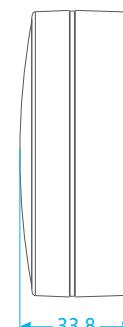
The measuring result is influenced by the thermal characteristics of the wall. A solid concrete wall responds to thermal fluctuations within a room in a much slower than a light-weight structure wall. Room temperature sensors installed in flush-mounted boxes have a longer response time to thermal variations. In extreme cases they detect the radiant heat of the wall even if the air temperature in the room is lower for example. The quicker the dynamics of the wall (temperature acceptance of the wall) or the longer the selected inquiry interval of the temperature sensor is the smaller the deviations limited in time are.



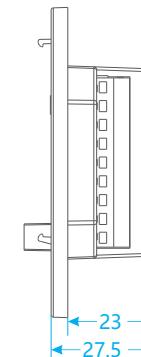
Front



Backpack



Side



Backside

			0b0000 0011= controller cooling mode only, Comfort Mode 0b0000 0100= ventilating (PI loop controls fan stages only, valves closed) 0b0001 0000= FC610 off (Frost protection active), ECO Mode 0b0001 0001= controller auto mode (heating&cooling), ECO Mode 0b0001 0010= controller heating mode only, ECO Mode 0b0001 0011= controller cooling mode only, ECO Mode 0b0001 0100= ventilating (PI loop controls fan stages only, valves closed) HMI mode 0b1xxx xxxx=HMI mode ,controller OFF 0b1xxx xx01=show symbol "ventilating " 0b1xxx xx10=show symbol "heating " 0b1xxx xx11=show symbol "cooling" 0b1xxx x110=show AUTO+ heating symbol 0b1xxx x111=show AUTO+ cooling symbol 0b1xxx x101= show AUTO+ ventilating symbol 0b1xxx1xxx=reserved			
515	0x0203	Read-write	Active Symbols 0x00= show none 0x01= show Leaf 0x02= show dew point 0x04= show frost protect ON 0x08= show open window 0x10= show Attention! 0x20= show hourglass 0x40= show lock 0x80= show ECO		0	
516	0x0204	Read-write	Control variable y%(HMI MODE) 0-100% If output is 2-point ,output will be ON for control variable >5%	0.1	%	0
517	0x0205	Read-write	Room temperature on LCD (HMI mode) 0....500=0...50°C	0.1	%	0

Technical Data		
Measuring values	temperature	
Output switch contact	terminal 5 6 2 normally open contacts, 250 V load max 3 A (heating & cooling via 2-point control)	terminal 2 3 4 – LO ME HI 3x normally open contact, 250 V load max. 3 A, Fan
Output voltage	terminal 16 17 2x 0..10 V for heating and cooling	terminal 15 1x 0..10 V for fan
Inputs	terminal 14 input for external sensor NTC10K	terminal 12– ESI DP input digital for floating contact, window contact, dew point sensor
	terminal 13 - OCC input digital for floating contact, occupancy sensor, key card switch	
Network technology	RS485 Modbus, RTU, half-duplex, baud rate 4.800, 9.600, 19.200 or 38.400, parity: non (2 stopbits), even or odd (1 stopbit) WIFI 2.4G wifi communication	
Power supply	24 DC/AC 50/60Hz	
Power consumption	Max 3w	
Max load current	<3A	
Measuring range temp.	+1..+50 °C	
Accuracy temperature	±1 K (typ. at 21 °C)	
Control functions	set point adjustment +1..+50 °C, (default +16..+30 °C)	
Display	LCD Ø49 mm, black background white lighting	
Enclosure	Power unit :Fire proof PC+ABC Display unit : Aluminum Alloy + High strength 3D Curved tempered glass	
Protection	IP20 according to EN 60529	
Cable entry	rear entry	
Connection electrical	terminal block max. 1,5 mm ²	
Ambient condition	-10..+50 °C, max. 95% rH non-condensing	
Mounting	flush mounted with standard 86*86 wall box (Ø=60 mm)	
Dimension(L*W*H)	86*86*61mm	

Mounting advices

Dear customer,

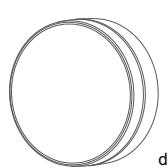
Thank you very much for choosing Bandary products, so glad to have nice chance to serve you. In order to have a good experience ,please keep this user manual properly ,after buying our product .

Ensure all power is disconnected before installing .Do not connect to live operating equipment.

* Please install the product at normal temperature with good ventilation, keep away from heat source, Windows and Doors, avoid direct sunlight.

* This product should be installed on standard 86 *86 wall box and kept 60mm between two installation screws.

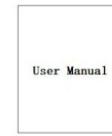
Product list:



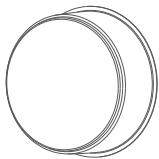
display unit x 1



power box x 1



user manual x1



protection cover x 1



installation screw x2

Installation Description

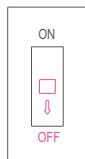
1. Switch off power

This protects you and avoids blowing a fuse in your equipment.

Please install the product at normal temperature with good ventilation, keep away from heat source,

Windows and doors, avoid direct sunlight.

This product should be installed on standard 86 *86 wall box and kept 60mm between two installation screws.



Electric controlpanel

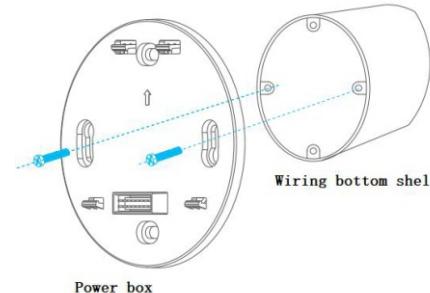
Installation steps:

Step 1: Please follow the wiring diagram to connect the wires.

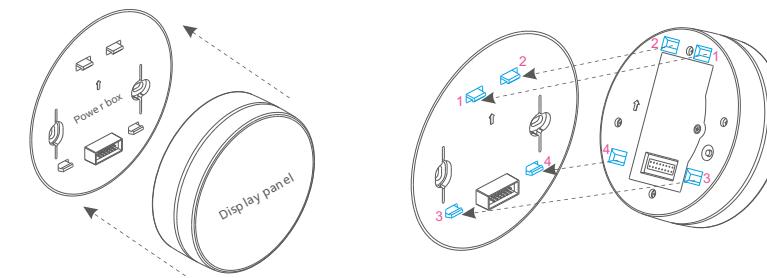
418	0x01A2	Read-write	reserved		0
419	0x01A3	Read-write	reserved		0
420	0x01A4	Read-write	reserved		0
464	0x01D0	Read-write	<p>Make next day(s) holiday</p> <p>0bxxx00000= None</p> <p>0bxxx00001 ...0bxxx11111 days of holidays (next n-days (starting next 0:00) forces the coming 1...31 days to be treated as the day specified by the 3 MSB. Does overwritte the calender.</p> <p>0b000xxxxx = use ECO setting</p> <p>0b001xxxxx = set day = Mo</p> <p>0b010xxxxx = set day = Tu</p> <p>0b011xxxxx = set day = Wed</p> <p>0b100xxxxx = set day = Thu</p> <p>0b101xxxxx = set day = Fr</p> <p>0b110xxxxx = set day = Sat</p> <p>0b111xxxxx = set day = Sun</p>		0
496	0x01F0	Read-write	system time—year 2022-2099		2022
497	0X01F1	Read-write	system time—month 1-12		1
498	0X01F2	Read-write	system time—day 1-31		1
499	0X01F3	Read-write	system time-hour 00-23		0
500	0X01F4	Read-write	system time-minutes 00-59		0
501	0X01F5	Read-write	system time-seconds 00-59		0
Holding Register (operation to override FC from Modbus)					
Address	Access	Description	Resolution / Unit	Default	
512	0x0200	Read-write	<p>Active fan speed setting</p> <p>0 = OFF</p> <p>1, 2, 3 = Stage 1, 2, 3</p> <p>4 = Auto / DC-Fan</p>		0
513	0x0201	Read-write	setpoint temperature 0...500 -> 0...50,0°C		0
514	0x0202	Read-write	<p>Controller Mode</p> <p>b0000 0000=F610 off (Frost protection active), Comfort Mode</p> <p>0b0000 0001= controller auto mode (heating&cooling), Comfort Mode</p> <p>0b0000 0010= controller heating mode only, Comfort Mode</p>		0

			Sunday in October (-1h) 7=MEX (First Sunday in April (+1h) - Last Sunday in October (-1)			
403	0x0193	Read-write	7day4periods programmable 0=deactivated 1=activated		0	
404	0x0194	Read-write	1 period: Start time hour 0-23h	h	0	
405	0x0195	Read-write	1 period :Start time minute 0-59m	min	0	
406	0x0196	Read-write	1 period :Start setpoint 0...500 -> 0...50,0°C	°C	210	
407	0x0197	Read-write	2 period : start time hour 0-23h	h	0	
408	0x0198	Read-write	2 period : start time minute 0-59m	min	0	
409	0x0199	Read-write	2 period : start setpoint 0...500 -> 0...50,0°C	°C	210	
410	0x019A	Read-write	3 period :start time hour 0-23h	h	0	
411	0x019B	Read-write	3 period :start time minute 0-59m	min	0	
412	0x019C	Read-write	3 period :start setpoint 0...500 -> 0...50,0°C	°C	210	
413	0x019D	Read-write	4 period : start time hour 0-23h	h	0	
414	0x019E	Read-write	4 period :start time minute 0-59m	min	0	
415	0x019F	Read-write	4 period :start setpoint 0...500 -> 0...50,0°C	°C	210	
416	0x01A0	Read-write	reserved		0	
417	0x01A1	Read-write	reserved		0	

Step 2:Fix the thermostat power box to the wall box through itself two installation screws with distance between axes of 60mm.

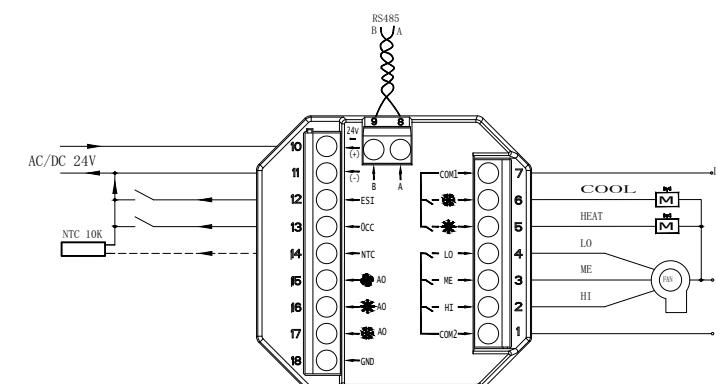


Step 3 :Fasten the power box and display unit .Don't press the panel in order to protect LCD ,and put the plastic cover on the panel to protect the panel.

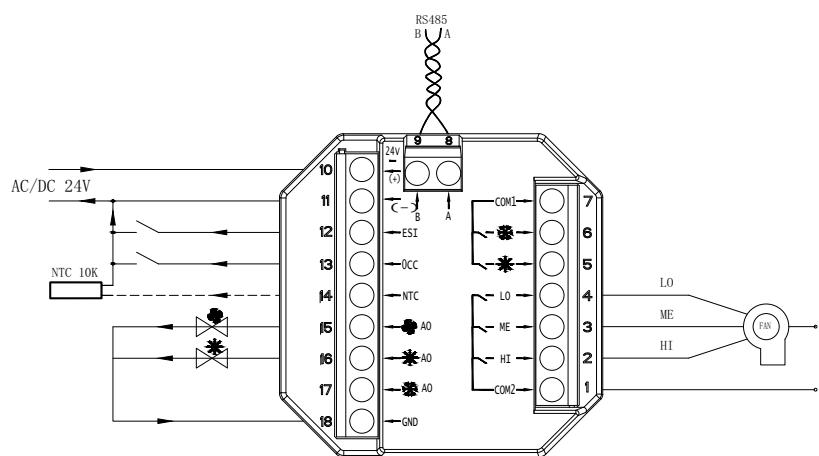


Terminal Connection wiring diagram

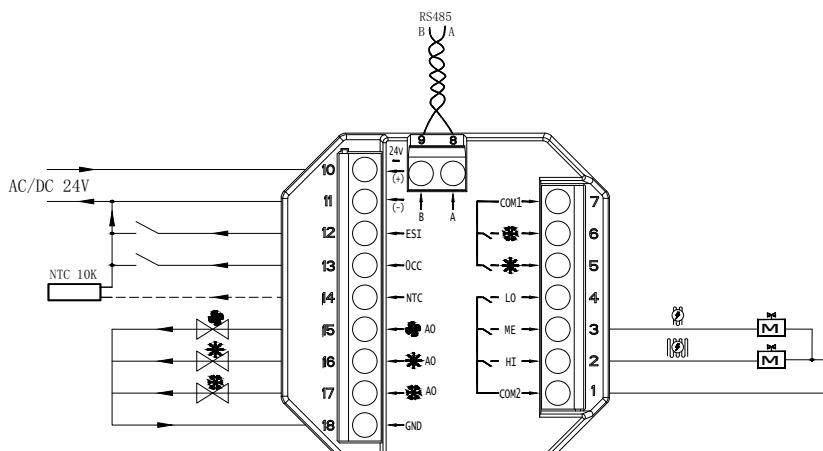
FC610 5DO wiring diagram



FC610 2AO3DO wiring diagram



FC610 3AO2DO wiring diagram



9 = Dew Point Sensor (Open = Dewpoint crossed, disable cooling)
 10 = Dew Point Sensor (Closed = Dewpoint crossed, disable cooling)

			9 = Dew Point Sensor (Open = Dewpoint crossed, disable cooling) 10 = Dew Point Sensor (Closed = Dewpoint crossed, disable cooling)		
337	0x0151	Read-write	Configuration external input 2 0 = No function 1 = Occupancy sensor (Open = Occupied) 2 = Occupancy sensor (Closed = Occupied) 3 = Window contact (Open = Window Open) 4 = Window contact (Closed = Window Open) 5 = Disable heating (Open = Heating disabled) 6 = Disable heating (Closed = Heating Disabled) 7 = Disable cooling (Open = Disable Cooling) 8 = Disable cooling (Closed = Disable Cooling) 9 = Dew Point Sensor (Open = Dewpoint crossed, disable cooling) 10 = Dew Point Sensor (Closed = Dewpoint crossed, disable cooling)	0	
338	0x0152	Read-write	Configuration Sensor Input 0= none 1 = Change Over Temp sensor (NTC10K) 2 = Ext. Temp sensor (NTC10K) 3 = Temperature Limiter	0	
339	0x0153	Read-write	ESI (Energy Savings Input) - ON delay ON delay for ESI. Delays Energy stop by n seconds	1.0	s 0
340	0x0154	Read-write	OCC input - OFF delay 0...65535 -> 0...65535 seconds	1.0	s 1800

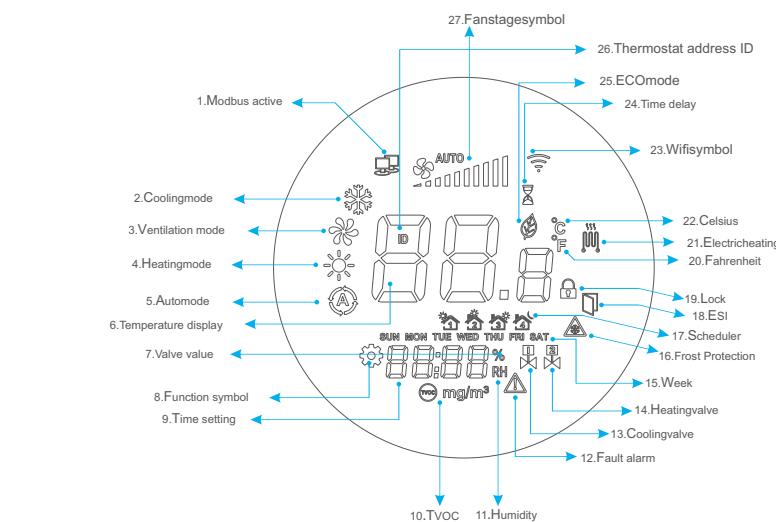
Timer

	Address	Access	Description	Resolution / Unit	Default
400	0x0190	Read-write	reserved		0
401	0x0191	Read-write	reserved		0
402	0x0192	Read-write	Automatic Summer/winter time 0=OFF 1=EU automatic (last Sunday in March (+1h) - last Sunday in October (-1h)) 2=US automatic (2nd Sunday in March (+1h) - 1st Sunday in November (-1h)) 3=AUS automatic (First Sunday in October (+1h) - 1st Sunday in April (-1h)) 4=BR automatic (First Sunday in November (+1h) - Third Sunday in February (-1h)) 5=CHL automatic (Second Sunday in August (+1h) - Second Sunday May (-1h)) 6=ISR (Friday before last Sunday in March + 1h) - Last		0

303	0x012F	Read-write	Electrical Heater Stage 3 Threshold control variable 0..100%	1.0	%	90
304	0x0130	Read-write	Valve type selection 5DO: 0= ON-OFF (ON = Valve Open, OFF = Valve Closed) 1= PWM (0% = 0% PWM .. 100% = 100% PWM) 2= OFF-ON (OFF = Valve Open, ON = Valve Closed) 3= inverted PWM (0% = 100% PWM .100% = 0% PWM) AO2DO3R, AO3DO2R: 4= proportional (0V = 0% ..10V = 100%) 5= invers proportional (0V = 100% ..10V = 0%) 6: proportional Belimo 6 way 7: proportional Sauter 6 way with Ø15mm 8: proportional Sauter 6 way with Ø20mm 9: proportional Belimo 6 way, counter direction 10: proportional Sauter 6 way with Ø15mm, counter direction 11: proportional Sauter 6 way with Ø20mm, counter direction DO5R,AO2DO3R, AO3DO2R: 12: no valve	5DO:0 AO2DO3R:4 AO3DO2R:4		
305	0x0131	Read-write	reserved			0

Inputs					
	Address	Access	Description	Resolution / Unit	Default
336	0x0150	Read-write	Configuration external input 1 0 = No function 1 = Occupancy sensor (Open = Occupied) 2 = Occupancy sensor (Closed = Occupied) 3 = Window contact (Open = Window Open) 4 = Window contact (Closed = Window Open) 5 = Disable heating (Open = Heating disabled) 6 = Disable heating (Closed = Heating Disabled) 7 = Disable cooling (Open = Disable Cooling) 8 = Disable cooling (Closed = Disable Cooling)		0

Display panel



1 Modbus active – When the device is connected to BMS via RS485 interface ,the Modbus symbol will active.

2 Cooling mode – when the set temperature is lower than room temperature ,the device will work in cooling mode.

3 Ventilation mode - Fan is working, water valve keeps off.

4 Heating mode – when the set temperature is higher than room temperature ,the device will work in heating mode .

5 Auto mode –The thermostat switches automatically between cooling and heating according to the temperature difference between set temperature and room temperature. A time delay of approx..1min between cooling /heating mode changes is implemented to ensure safe and eco-friendly operation .Auto mode will be active in below types:

6 Temperature display – Normally ,the device displays room temperature .when the user change temperature ,it displays set temperature ,after 4 seconds ,display room temperature. (Factory default : °C display),you can switch to Fahrenheit (°F) by APP or Modbus.

7 Valve value – valve value%

8 Function symbol – Temperature setting, Mode adjustment or Parameter setting status

9 Time setting –Real time of Day

10 TVOC – Room air quality

11 Humidity – Relative room humidity

12 Fault alarm – ERROR alarm symbol and display ERROR code

13 Cooling valve – Cooling mode is active .

14 Heating valve – heating mode is active

15 week-week display

16 Frost Protection – In Standby the display is off, but the control loop is actively monitoring the temperature and will activate the heating output if the room temperature drops below the frost protection threshold.

17 Scheduler- one day is divided into 4 periods. The user can set temperature for every period individually. the user has set a set temperature during operation ,the current period runs with the last set temperature ,the next period will adopt the changed settings.

18 ESI – Windows function detection, When ESI symbol is lighted indicates ESI function is active (Optional)

19 Lock – Local thermostat will not be workable when this symbol indicated unless it is released by APP on smart phone ,Modbus register or the device power off and restart .

20 Fahrenheit (°F) – indicates Fahrenheit (°F) display

21 Electric heating – indicates electric heating is active .The device has this function only in cooling only + Electric heater system

22 Celsius(°C) – indicates Celsius(°C) display

23 Wifi symbol – 3- different status display:

Blink in gap indicates the thermostat is offline

Rapid blink indicates the device is in pairing

Normal status indicates the thermostat connects to router or server successfully.

24. Time delay symbol

25 ECO mode – ECO mode is active ,set temperature will be replaced by ECO .

26 Thermostat address ID – Indicates the ID address on modbus .

27 Fan stage symbol – Different fan speed display. Low level (3 pillars), Middle level (7 pillars), High level (10 pillars), Auto speed ("Auto" be shown) as below:



Communication

Bandary Thermostat FC610 supports wifi and Modbus dual communication .

Modbus communication :

Communication-section	1..247
Factory default:	1
Address 0:	broadcast address
Communication-Interface:	RS485
Communication-Protocol:	Modbus-RTU
Baud Rate:	4800 bps / 9600 bps / 19200 bps / 38400 bps (optional)
Factory default:	9600 bps
Parity:	no parity / odd parity / straight parity (optional)
Factory default:	no parity
Data:	8 bit
Stop:	2 bit

282	0x011A	Read-write	PWM Cycle time DO5R: 0 = no PWM for valves but 2-point control			15
283	0x011B	Read-write	Deadband 1...100 -> 0,1...10,0K	0.1	K	10
284	0x011C	Read-write	Heating Proportional Band Xp_heat 1...100 -> 0,1...10,0°C	0.1	°C	20
285	0x011D	Read-write	Heating Integration Time Tn_heat 0...255 = 0...255 Minutes	1.0	min	30
286	0x011E	Read-write	Cooling Proportional Band Xp_cool 1...100 -> 0,1...10,0°C	0.1	°C	20
287	0x011F	Read-write	Cooling Integration Time Tn_cool 0...255 = 0...255 Minutes	1.0	min	30
288	0x0120	Read-write	Minimal limit of the control variable heat 0..100	1.0	%	0
289	0x0121	Read-write	Maximal limit of the control variable heat 0..100	1.0	%	100
290	0x0122	Read-write	Minimal limit of the control variable cool 0..100	1.0	%	0
291	0x0123	Read-write	Maximal limit of the control variable cool 0..100	1.0	%	100
292	0x0124	Read-write	Fan stage 1 ON threshold control variable heat 0..100	1.0	%	5
293	0x0125	Read-write	Fan stage 2 ON threshold control variable heat 0..100	1.0	%	35
294	0x0126	Read-write	Fan stage 3 ON threshold control variable heat 0..100	1.0	%	70
295	0x0127	Read-write	Fan stage 1 ON threshold control variable cool 0..100	1.0	%	5
296	0x0128	Read-write	Fan stage 2 ON threshold control variable cool 0..100	1.0	%	35
297	0x0129	Read-write	Fan stage 3 ON threshold control variable cool 0..100	1.0	%	70
298	0x012A	Read-write	Frost protection temperature threshold 50...150 -> 5,0...15,0°C	0.1	°C	70
299	0x012B	Read-write	Change-Over Temperature Threshold for Heating 0...500 -> 0...50,0°C	0.1	°C	300
300	0x012C	Read-write	Change-Over Temperature Threshold for Cooling 0...500 -> 0...50,0°C In case temperature is in between both thresholds the last state will be maintained	0.1	°C	190
301	0x012D	Read-write	Electrical Heater Stage 1 Threshold control variable 0..100%	1.0	%	65
302	0x012E	Read-write	Electrical Heater Stage 2 Threshold control variable 0..100%	1.0	%	80

			0x00=unlocked 0x01=lock			
270	0x010E	Read-write	reserved			0

Set point settings						
	Address	Access	Description	Resolution / Unit	Default	
271	0x010F	Read-write	Default Setpoint after Power On Reset 0...500 -> 0...50,0°C	0.1	°C	210
272	0x0110	Read-write	Setpoint temperature lower limit 0...500 -> 0...50,0°C	0.1	°C	160
273	0x0111	Read-write	Setpoint temperature upper limit 0...500 -> 0...50,0°C	0.1	°C	300
274	0x0112	Read-write	Setpoint increment/decrement value 1...100 -> 0,1...10,0°C	0.1	°C	5
275	0x0113	Read-write	ECO mode temperature setpoint cooling 250...450 = 25,0...45,0°C	0.1	°C	300
276	0x0114	Read-write	ECO mode temperature setpoint heating 120...240 = 12,0...24,0°C	0.1	°C	190

PI controller						
	Address	Access	Description	Resolution / Unit	Default	
277	0x0115	Read-write	reserved			0
278	0x0116	Read-write	Fan coil type 0b00000000= 2-pipe : cooling&heating with Change-Over 0b00000001= 4-pipe : cooling&heating			1
279	0x0117	Read-write	Fan stages and operation modes 0b00000000 = none, (fan key is locked the fan symbol will be faded on the LCD) 0bxxxx0001 = single stage; 0bxxxx0010 = 2 stages 0bxxxx0011 = 3 stages 0bxxxx1000 = EC Fan 0b0001xxxx = fan works not in heating mode 0b0010xxxx = fan works not in cooling/ventilation mode (0b0011xxxx = fan works not in heating & cooling mode)			3
280	0x0118	Read-write	Start fan at highest stage for _ seconds 0...60 -> fan start at highest fan stage for 0...60s seconds	1.0	s	0
281	0x0119	Read-write	Fan OFF-Delay 0= fan never stops 1..255 = Fan stops 1...255 minutes after valves closing	1.0	min	15

Wifi communication:**Download APP:**

1.1 For IOS devices ,search for "Smart life" in Apple store and download ,or scan the relevant QR code here .



1.2 For Android devices ,search for "Smart life" in google play and download ,or scan the relevant QR code .



1.3 Add device in APP.

1.4 Register account in APP .

2.2 In stand-By mode ,Long pressing "ON/OFF" key for more than 3-second until the "wifi" symbol flash ,clockwise rotation the first ring to confirm,the device is in pairing status

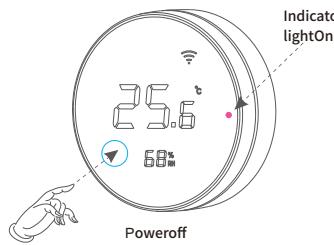


2.3 click on "+" symbol on "Smart life",and then find "small home appliance "menu to click on "thermostat" symbol , then you will be asked for inputting wifi account No and password ,input WIFI account No. and passwords .

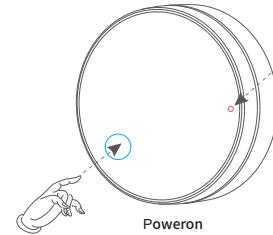
2.4 follow up with the guider to operate next step, the app will automatic search the device ,and add in its register table.

Function operation instruction**ON/OFF:**

In stand-By mode, press any point of the panel can switch on the panel .First press ,thermostat is on ECO mode ,Second press , the thermostat will turn on, and indicator light will be lighted ,the indicator light display different color to indicate different mode. Without any operation , thermostat will access in screen saver mode after backlights delay time ,but indicator light always keeps lighting .



In normal mode, the indicator light and LCD display will be turned off after pressing the touch panel.

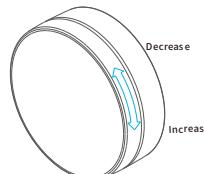


Set temperature setting:

In normal mode, clockwise rotation the first ring, the setting temperature would be 0.5°C increase ,otherwise, Anti-Clockwise rotation the first ring will keep temperature 0.5°C decreased . When rotation the first ring , the set temperature will be blink in 5-second on the main interface, then it shows the room current temperature.

Fan stage Setting

In normal mode, Anti- clockwise rotation the second ring, the fan speed would be decreased progressively, otherwise, Clockwise rotation the second ring will keep fan speed increase progressively.



Mode selective

In normal Mode, long press the touch panel for more than 3 seconds until current mode symbol start blinking, rotate the first ring to adjust mode. Cooling/Ventilation/Heating/Auto cooling & heating/cooling.. to recycle.



Step 1, Long press the touch panel for more than 3 seconds

10	0x000A	Read-only	External input 1 0 = Contact Open, 1= contact closed (for window contact, dew point sensor)		
11	0x000B	Read-only	External input 2 0 = Contact Open, 1= contact closed (for OCC-sensor, keycard Switch)		

Holding Register

General settings					
	Address	Access	Description	Resolution / Unit	Default
256	0x0100	Read-write	Customer set Device location identification 0...65535	1.0	1
257	0x0101	Read-write	LCD Temperature Unit 0=°C 1=°F		0
258	0x0102	Read-write	Back-Box type 05 = DOSR 23=2AO3DO 32=3AO2DO		05
259	0x0103	Read-write	reserved		0
260	0x0104	Read-write	Backlight intensity non operated 0..25	1.0	% 25
261	0x0105	Read-write	Backlight operating delay setting 1....255 = 1...255 seconds ON	1.0	s 15
262	0x0106	Read-write	Internal Sensor Temperature Offset (added to measured value) -50...50 >-5,0...5,0°C	0.1	°C 0
263	0x0107	Read-write	external Sensor Temperature Offset (added to measured value) -50...50 >-5,0...5,0°C	0.1	°C 0
264	0x0108	Read-write	Screen saver mode 0= display panel off 1=temp+humidity 2=temp+clock		1
265	0x0109	Read-write	Individual passwords setting 000-998, default=987		987
266	0x010A	Read-write	External temperature (limiter) sensor high limit (338=3, for limiter) -200...+1000 >-20,0...+100,0°C	0.1	°C 40
267	0x010B	Read-write	External temperature (limiter) sensor low limit (338=3, for limiter) -200...+1000 >-20,0...+100,0°C	0.1	°C 0
268	0x010C	Read-write	Power failure 0=keep off after power-on-reset 1=return to last state after power failure 2=switch on after power-on-reset		1
269	0x010D	Read-write	Key-lock		0

		2 = Ext. Temp sensor (NTC10K)
		3 = Temperature Limiter

Restore to factory default value:

Input password "999" to restore to factory default value ,if the user forget the passwords and reset the passwords ,as well the parameters .

Modbus communication Register:

Input Register

	Address	Access	Description	Resolution / Unit
0	0x0000	Read-only	Bandary Model identification 0xFF10 = 5DO 0xFF11 = 3AO2DO 0xFF12 = 2AO3DO	
1	0x0001	Read-only	Firmware-Version e.g. 0x100 = 1.0.0	
2	0x0002	Read-only	Back-Box type 05 = DO5R 23=2AO3DO 32=3AO2DO	
3	0x0003	Read-only	Value of the integrated temperature sensor °C 0...500 -> 0...50,0°C	0,1 °C
4	0x0004	Read-only	fan status 0x00 = Manual OFF 0x01 = Manual low 0x02 = Manual medium 0x04 = Manual high 0x08 = Auto OFF 0x09 = Auto low 0x0A = Auto medium 0x0C = Auto high	
5	0x0005	Read-only	VA1 status 0-100 0 = 0 (Off) ...100% (On), e.g. 693 = 69,3% of PWM cycle time ON	
6	0x0006	Read-only	VA2 status 0-100 0 = 0 (Off) ...100% (On), e.g. 693 = 69,3% of PWM cycle time ON	
7	0x0007	Read-only	electrical heating status 0-100 = 0 ...100%	
8	0x0008	Read-only	External temperature sensor °C 0...500 -> 0...50,0°C	0.1 °C
9	0x0009	Read-only	failure status 0x00=no failure 0x01= control loop temperature sensor alarm 0x02=external temperature sensor high limit Alarm 0x04=external temperature sensor low limit Alarm 0x08= change over sensor missing alarm	



Step 2.change the mode by rotation the first ring

Wake up

In normal mode, without any operation, the thermostat will access in screen saver mode after the backlight delay time , you can wake up the thermostat by pressing the touch panel ,by rotation the ring , by APP ,or by motion sensor .

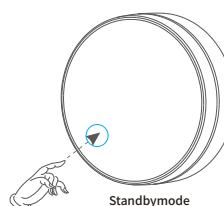


Motion sensor: when thermostat detects the specific distance of hand waving ,thermostat will be wake up, and the touch panel will be lighted .

Parameter Setting

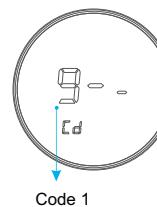
Enter into Parameter Setting

Long press the touch panel for more than 6- second in Stand-By mode, then you are asked to enter the passwords (Factory default:987).Please follow up with below steps to set:

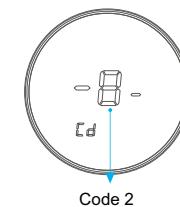


Step 1 Long press the touch panel for more than 6-second in Stand-By mode, then you are asked to enter the passwords (Factory default:987).

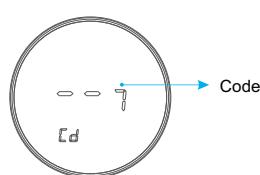
Step 2 Rotate first ring to input first digit value(9) of the password and short press the panel to confirm ,and then input second digital value (8),then the last value (7),and short press the panel to confirm.



Code 1



Code 2



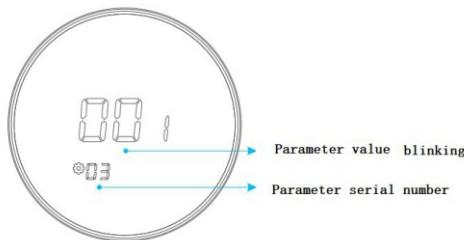
Code 3

Step 3 If password is correct, it will access in parameter setting interface.if the password is wrong ,you need to re-input correctly passwords to access in parameter setting interface.

Step 4 access in parameter setting interface ,the first low of digit indicates the parameter value, the second low of digit indicates the parameter No.

Please find the example as below figure:

03 indicates parameter No.(03- memo after power failure),001 indicates the parameter value (restore last status before power failure)



Shift to next parameter No. by rotation the first ring ,and short press panel to confirm ,rotation the first ring to change the parameter value which you want to set ,and short pressing the panel to confirm. If finish the parameter setting ,long pressing panel for 3-second to exit the parameter setting interface .

Time setting:

If thermostat is connecting to the internet ,the Real time will be updated . If fail to Wifi connection, the user can manual set the date by parameter No.10 . please follow up with orders to set Year/ Month /Date/ Hour& Minute.

Parameter table:

No.	Name of parameter	Parameter definition	Factory default
1	Internal Temperature offset	-5.0 °C~5.0°C/23°F ~41°F	0°C/32°F
2	External temperature offset	-5.0 °C~5.0°C/23°F ~41°F	0°C/32°F
3	Upper temperature limited	0°C~50°C / 32°F ~99°F	30°C/86°F
4	Down temperature limited	0°C~50°C / 32°F ~99°F	16°C/60°F
5	Frost protection	5°C~15°C / 41°F ~59°F	7°C/44°F
6	Lock	0=deactivated 1=activated	0
7	Screen saver mode	0= display panel off 1=temp+humidity 2=temp+clock	1
8	Backlight delay off	10-255 seconds	2 15
9	Power failure	0=stay off after power on 1=restore last status before power failure 2=stay on after power on	1
10	Time	0=deactivated 1=activated	0
11	Schudler	0=deactivated 1=activated	000 0

12	Backlight intensity for screen saver	0..25	25	25
13	Individual password	0-998	987	
14	Temperature format	0 0 0=°C 1=°F	0	
15	Communication ID	0 1...247	1	
16	Baud rate(bps)	1=4800 2=9600 3=19200 4=38400	2	
17	Parity	0=none, 1=odd 2=even	0	
18	Stop Bits	1 = 1 Stopbit 2= 2 Stopbits	2	
19	Winter/summer time	0=OFF 1=EU 2=US 3=AUS 4=BR 5=CHL 6=ISR 7=MEX	0	
20	Power box type	05=5DO 23=2AO3DO 32=3AO2DO	05	
21	Fan coil type	0=2pipe cool&heat 1=4-pipe cool&heat	1	
22	Valve type	depending on back-box type: DO5R: 0= ON-OFF (ON = Valve Open, OFF = Valve Closed) 1=PWM (0%= 0% PWM .. 100% = 100% PWM) 2= OFF-ON (OFF = Valve Open, ON = Valve Closed) 3= inverted PWM (0%= 100% PWM .. 100% = 0% PWM) AO2V-DO3R, AO3V_DO2R: 4= proportional (0V = 0% ..10V = 100%) 5=invers proportional (0V = 100% ..10V = 0%) 6: proportional Belimo 6 way 7: proportional Sauter 6 way with Ø15mm 8: proportional Sauter 6 way with Ø20mm 9: proportional Belimo 6 way, counter direction 10: proportional Sauter 6 way with Ø15mm, counter direction 11: proportional Sauter 6 way with Ø20mm, counter direction DO5R, AO2V-DO3R, AO3V_DO2R: 12: no valve		
23	changeover	0= 0= none 1 = Change Over Temp sensor (NTC10K)	0	

FCC WARNING

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

Manufacturer's Name: Shenzhen BandaryTechonlogy Co., Ltd

Product Name: Smart thermostat

Trade Mark: Bandary

Model number: FC610

This device is in compliance with the essential requirements and other relevant provisions of Directive 2014/53/EU. All essential radio test suites have been carried out.

RF Secification:

Function	Operation Frequency	Max RF output power:	Limit
WIFI 802.11b/g/n(HT20)	802.11b/g/n(20MHz): 2412~2472MHz;	17.17 dBm	20 dBm.



DECLARATION OF CONFORMITY

I hereby declare that the product

Product Name: Smart thermostat

Product Description: Smart thermostat

Model: FC610

Tradename or Brand(s): Bandary

(Name of product, type or model, batch or serial number)

Antenna :

PCB Antenna

2.54 dBi

Hard Ware Version: N/A

Software Version: N/A

Satisfies all the technical regulations applicable to the product within the scope of Council Directives 2014/53/EU and declare that the same application has not been lodged with any other notified body.

ETSI EN 300 328 V2.2.2 (2019-07)

ETSI EN 301 489-1 V2.2.3 (2019-11)

ETSI EN 301 489-17 V3.2.4 (2020-09)

EN 55032:2015+A1:2020

EN 55035:2017+A11:2020

EN IEC 61000-3-2:2019+A1:2021

EN 61000-3-3:2013+A2:2021

EN IEC 62311:2020

EN 62368-1:2014+A11:2017

(Title(s) of regulations, standards, etc.)

All essential radio test suites have been carried out.