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

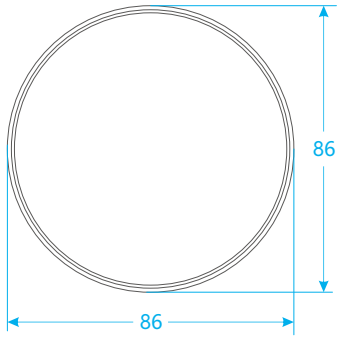
Location and Accuracy of Room Sensors

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.

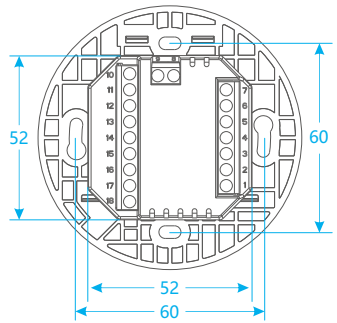
Surface and Flush Mounting

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.

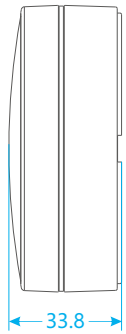
Dimension:



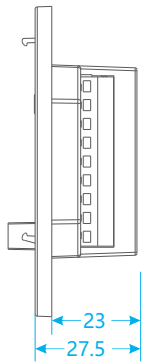
Front



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 mm²	
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

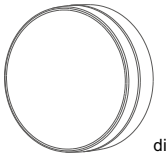
Dear customer,

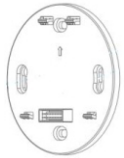
Thank you very much for choosing Bandary products, so glad to have nice chance to serve you. In order to have a good experience ,please keep this user manual properly ,after buying our product .

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

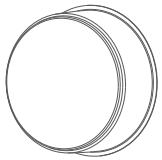
* Please install the product at normal temperature with good ventilation, keep away from heat source, Windows and Doors, avoid direct sunlight.
* This product should be installed on standard 86 *86 wall box and kept 60mm between two installation screws.

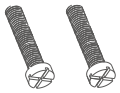
Product list:


display unit x 1


power box x 1

user manual x1


protection cover x 1


installation screw x2

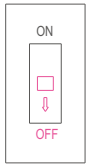
Installation Description

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.

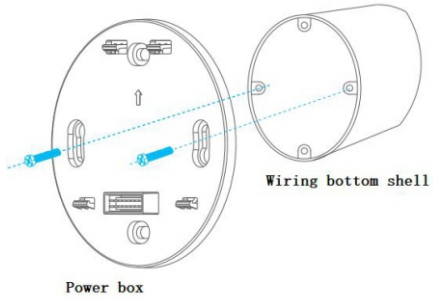
418	**0x01A2**	Read-write	**reserved**			0
419	**0x01A3**	Read-write	**reserved**			0
420	**0x01A4**	Read-write	**reserved**			0
464	**0x01D0**	Read-write	**Make next day(s) holiday** **0bxxx00000= None** **0bxxx00001 …0bxxx11111 days of holidays (next n-days (starting next 0:00) forces the coming 1...31 days to be treated as the day specified by the 3 MSB. Does overwrite the calender.** **0b000xxxxx = use ECO setting** **0b001xxxxx = set day = Mo** **0b010xxxxx = set day = Tu** **0b011xxxxx = set day = Wed** **0b100xxxxx = set day = Thu** **0b101xxxxx = set day = Fr** **0b110xxxxx = set day = Sat** **0b111xxxxx = set day = Sun**			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)

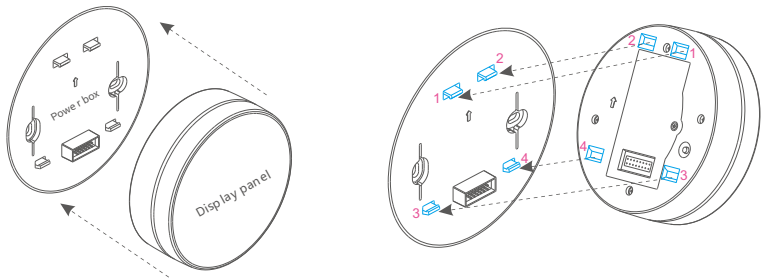
	Address	Access	Description	Resolution / Unit		Default
512	**0x0200**	Read-write	**Active fan speed setting** 0 = OFF 1, 2, 3 = Stage 1, 2, 3 4 = Auto / DC-Fan			0
513	**0x0201**	Read-write	**setpoint temperature** 0…500 -> 0…50,0°C			0
514	**0x0202**	Read-write	**Controller Mode** b0000 0000=F610 off (Frost protection active), Comfort Mode 0b0000 0001= controler auto mode (heating&cooling), Comfort Mode 0b0000 0010= controller heating mode only, Comfort Mode			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.

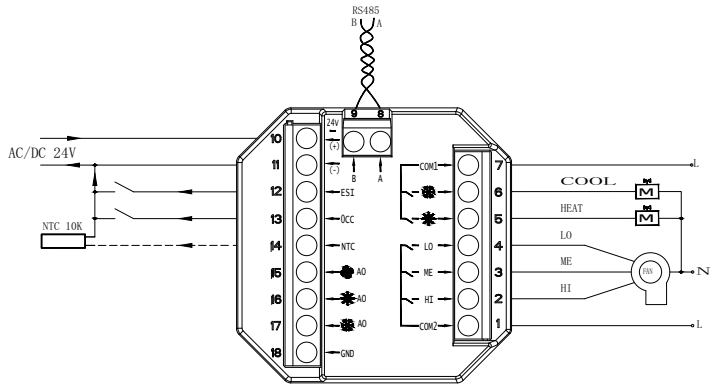


Step 3 :Fasten the power box and display unit .Don't press the panel in order to protect LCD ,and put the plastic cover on the panel to protect the panel.

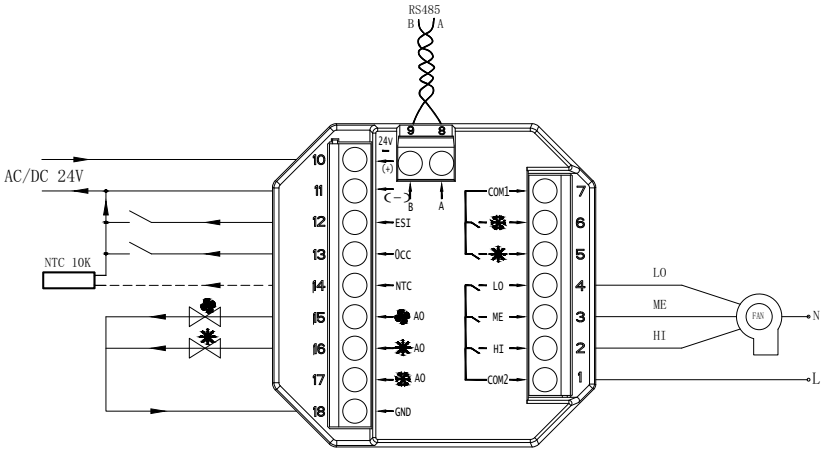


Terminal Connection wiring diagram

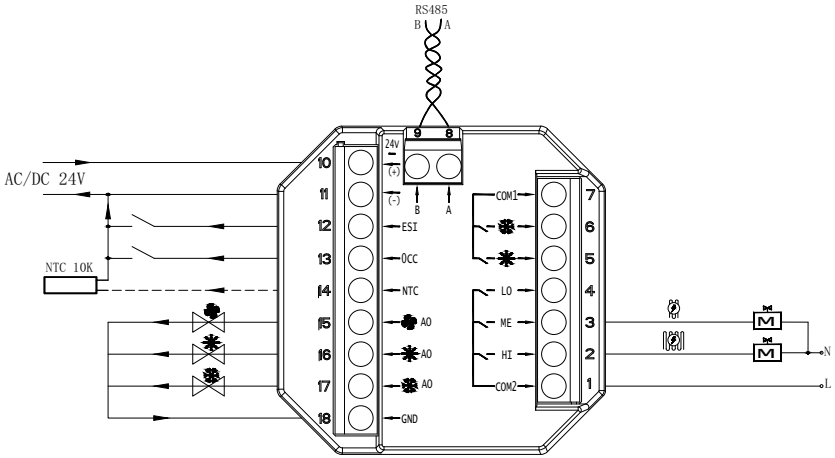
FC610 5DO wiring diagram



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)			
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

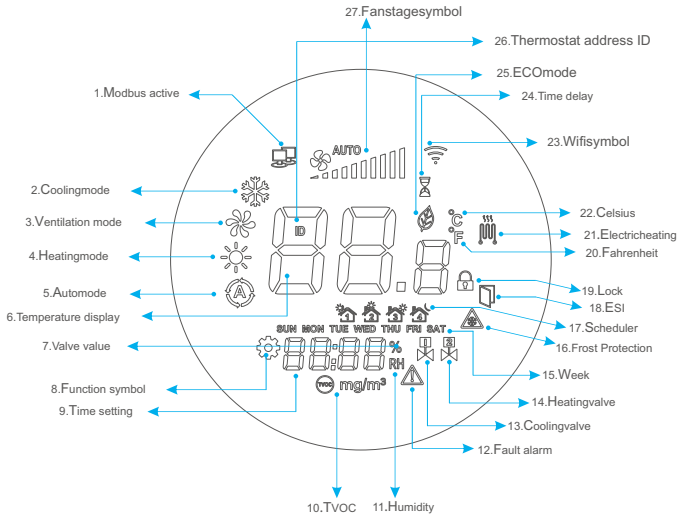
Timer

	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 aurtomatic (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 to 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 : ℃ 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(℃) – indicates Celsius(℃) 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:

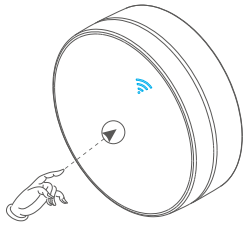
1.1 For IOS devices ,search for “Smart life” in Apple store and download ,or scan the relevant QR code here .

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



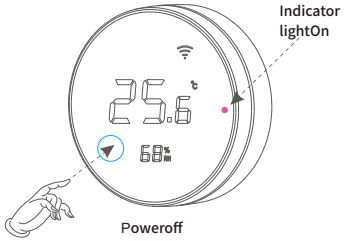
2.3 click on “+” symbol on “Smart life”,and then find “small home appliance “menu to click on “thermostat” symbol , then you will be asked for inputting wifi account No and password ,input WIFI account No. and passwords .

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

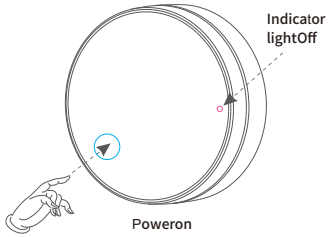
Function operation instruction

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.

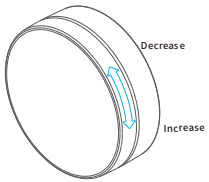


Set temperature setting:

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

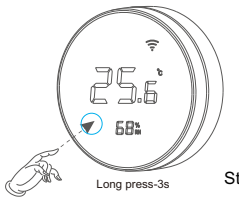
Fan stage Setting

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 = DO5R** **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 meaured value) -50…50 -> -5,0…5,0°C	0.1	°C	0
263	0x0107	Read-write	**external Sensor Temperature Offset** (added to meaured 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

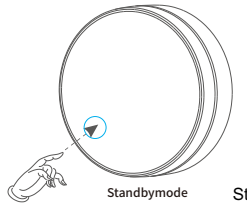
In normal mode, without any operation, the thermostat will access in screen saver mode after the backlight delay time , you can wake up the thermostat by pressing the touch panel ,by rotation the ring , by APP ,or by motion sensor .

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

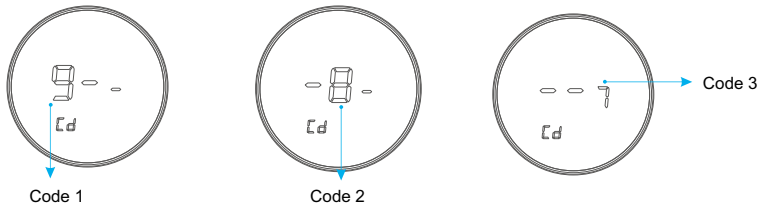
Enter into Parameter Setting

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.

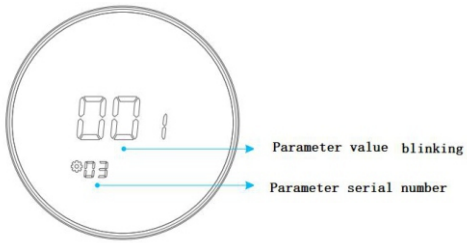


Step 3 If password is correct, it will access in parameter setting interface.if the password is wrong ,you need to re-input correctly passwords to access in parameter setting interface.

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 ℃~5.0℃/23°F ~41°F	0℃/32°F
2	External temperature offset	-5.0 ℃~5.0℃/23°F ~41°F	0℃/32°F
3	Upper temperature limited	0℃~50℃ / 32°F ~99°F	30℃/86°F
4	Down temperature limited	0℃~50℃ / 32°F ~99°F	16℃/60°F
5	Frost protection	5℃~15℃ / 41°F ~59°F	7℃/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	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=℃ 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	DO5R:0 2AO3DO:4 3AO2DO:4
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.