

ECO-3Mini Energy Controller

Instruction Manual



Energy Saving and Carbon Reduction is ECO Smart's Point View

Contents

Chapter 1	<u>Feature</u>	-----	3
Chapter2	<u>Hardware</u>	-----	4
1.	<u>ECO-3Mini exterior</u>	-----	4
2.	<u>Connection</u>	-----	4
Chapter 3	<u>Process Flow Diagram</u>	-----	5
Chapter 4	<u>Operation and Setting</u>	-----	6
1.	<u>Splash Screen</u>	-----	6
2.	<u>Main screen</u>	-----	6
3.	<u>ECO-IR Setting screen</u>	-----	7
3-1	<u>Infrared copy</u>	-----	8
3-2	<u>Schedule Setting</u>	-----	9
3-2-1	<u>Time Setting</u>	-----	10
3-2-2	<u>Periods Setting</u>	-----	10
3-2-3	<u>Deactivated date</u>	-----	11
3-3	<u>Cycle Suspend</u>	-----	12
3-4	<u>Mode Setting</u>	-----	13
3-5	<u>Sleeping Time Setting</u>	-----	14
3-6	<u>Humidity Setting</u>	-----	14
3-7	<u>Temp. & Humidity Advance Setting</u>	-----	15
3-8	<u>Temp. Control Power</u>	-----	15
3-9	<u>Current Value Setting</u>	-----	16
3-10	<u>Name Setting</u>	-----	16
4.	<u>Setting</u>	-----	17
4-1	<u>Time Setting</u>	-----	17
4-2	<u>Engineer Mode</u>	-----	18
4-3	<u>Link setting</u>	-----	18
Chapter 5	<u>Common Settings</u>	-----	19
1.	<u>Schedule Setting</u>	-----	19
2.	<u>Temp. control setting</u>	-----	21
3.	<u>Passive Infrared Sensor Setting</u>	-----	22

Chapter 1 - Features

Schedule Setting

- 16 periods can be set.
- ECO-IR built in weekly schedule.

Temperature control

When the ambient temperature is below the set value, ECO-IR will set air conditioning on fan mode.

Cycle Suspend

Multiple air conditioners take turns running in fan mode (Compressor turns off) to achieve energy-saving. According to the actual test results, effective energy saving rates up to 16.7%.

Infrared copy and control

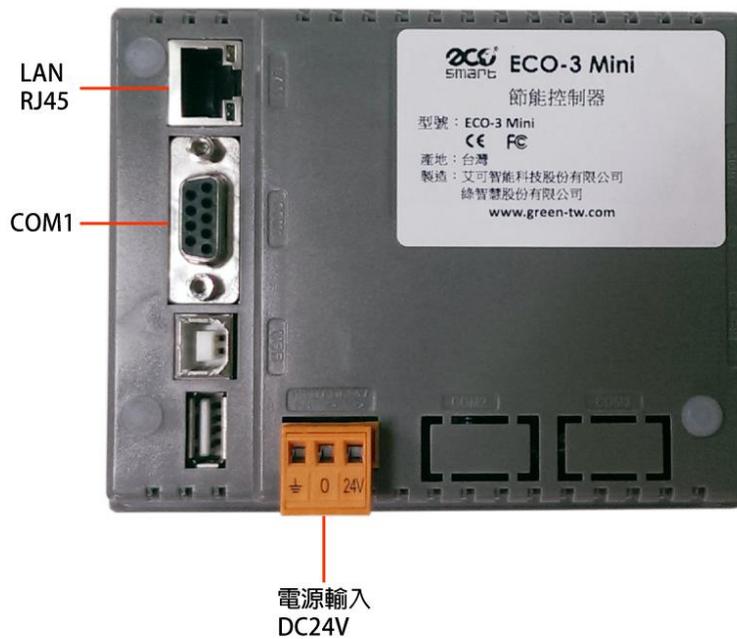
ECO-IR can copy infrared code and control A/C.
Users don't need to modify A/C.

Digital output (DO)

ECO-IR which has built-in 2 set of DO relays, can stop supply power to device.
The application of ECO-IR is installed in central air conditioning system, conventional device, etc.

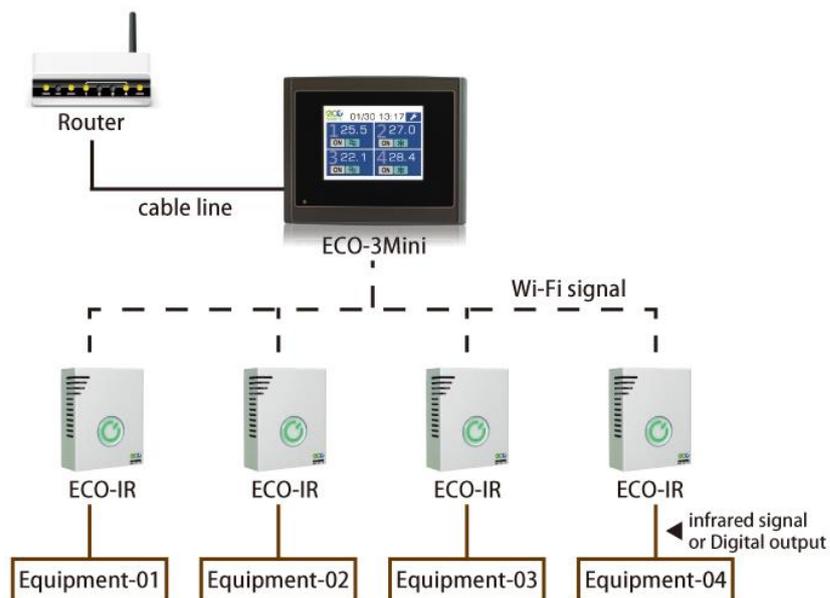
Chapter 2 - Hardware

1. ECO-3Mini exterior

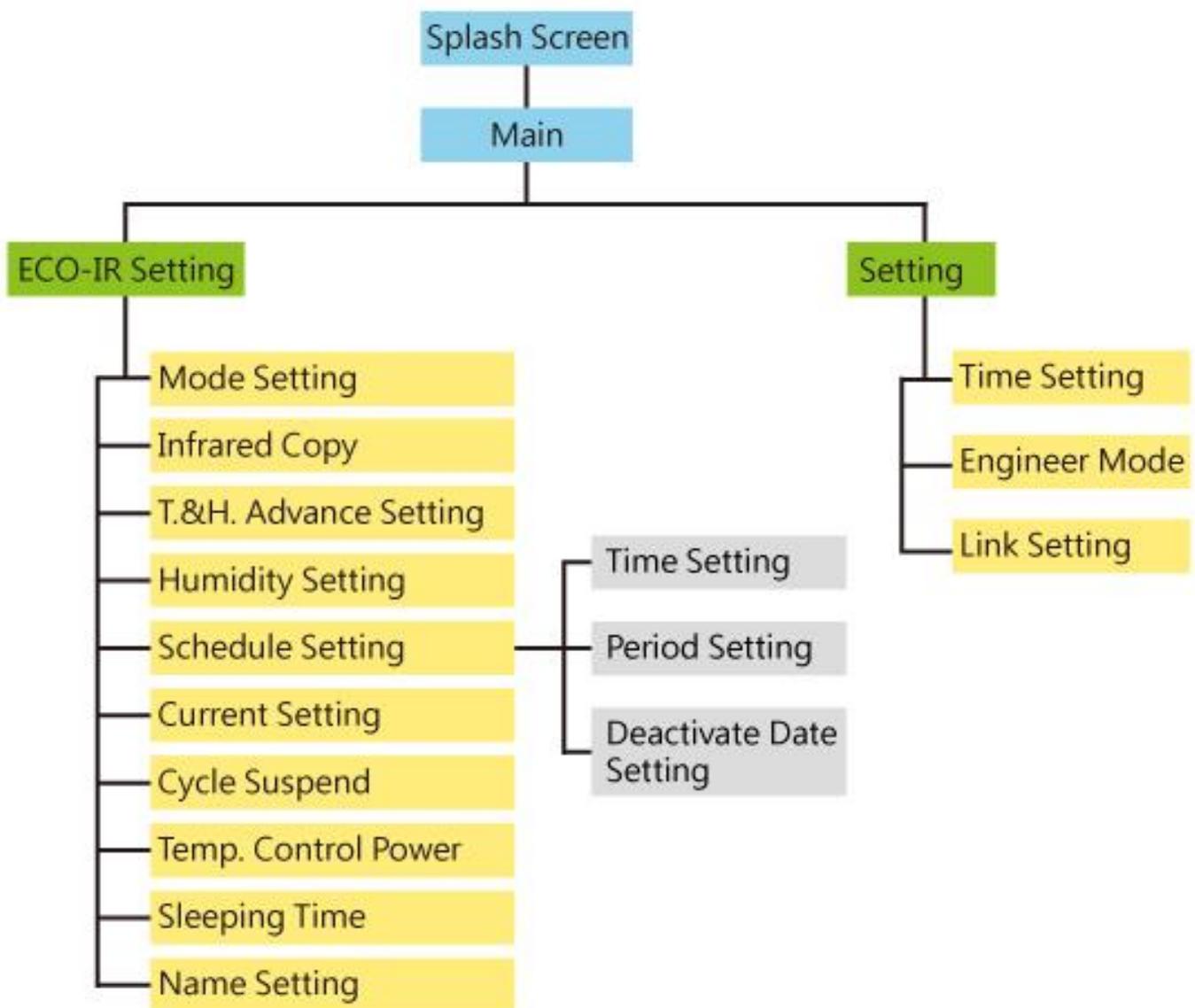


2. Connection

ECO-3Mini can communicate with ECO-IR by connecting a router.
ECO-3Mini can be connected up to 4 sets of ECO-IR.



Chapter 3 - Process Flow Diagram



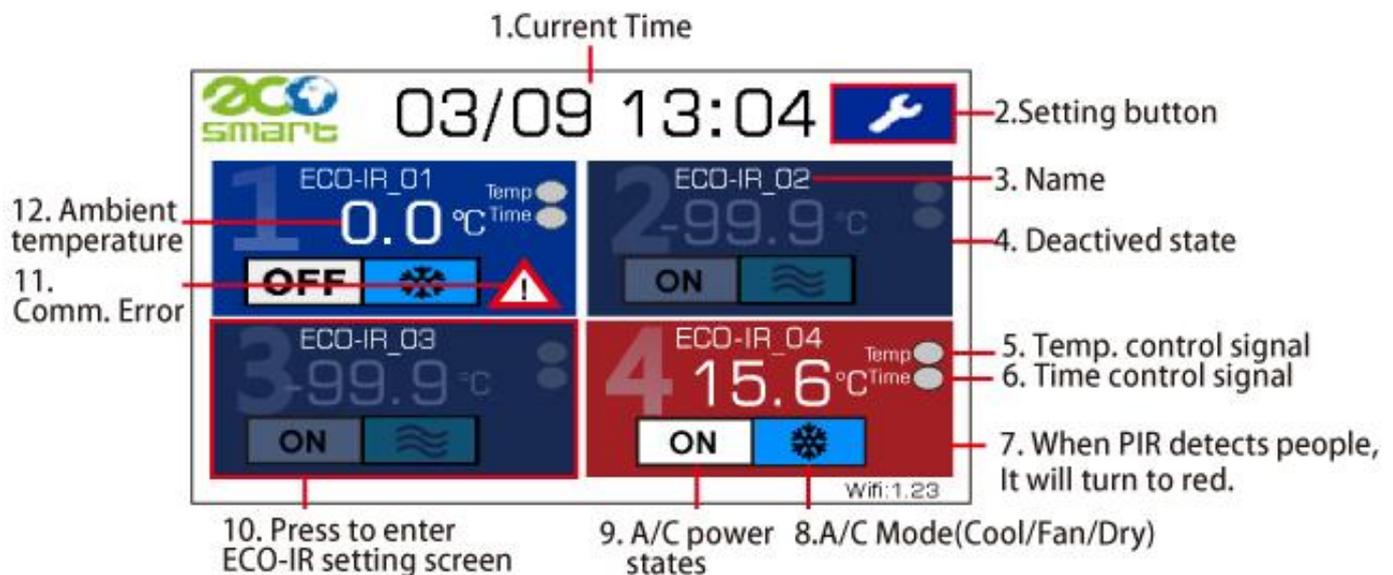
Chapter 4 - Operation and Setting

1. Splash Screen



When power was turned on, ECO-3Mini will run splash screen for 5 second and then enter screen.

2. Main screen

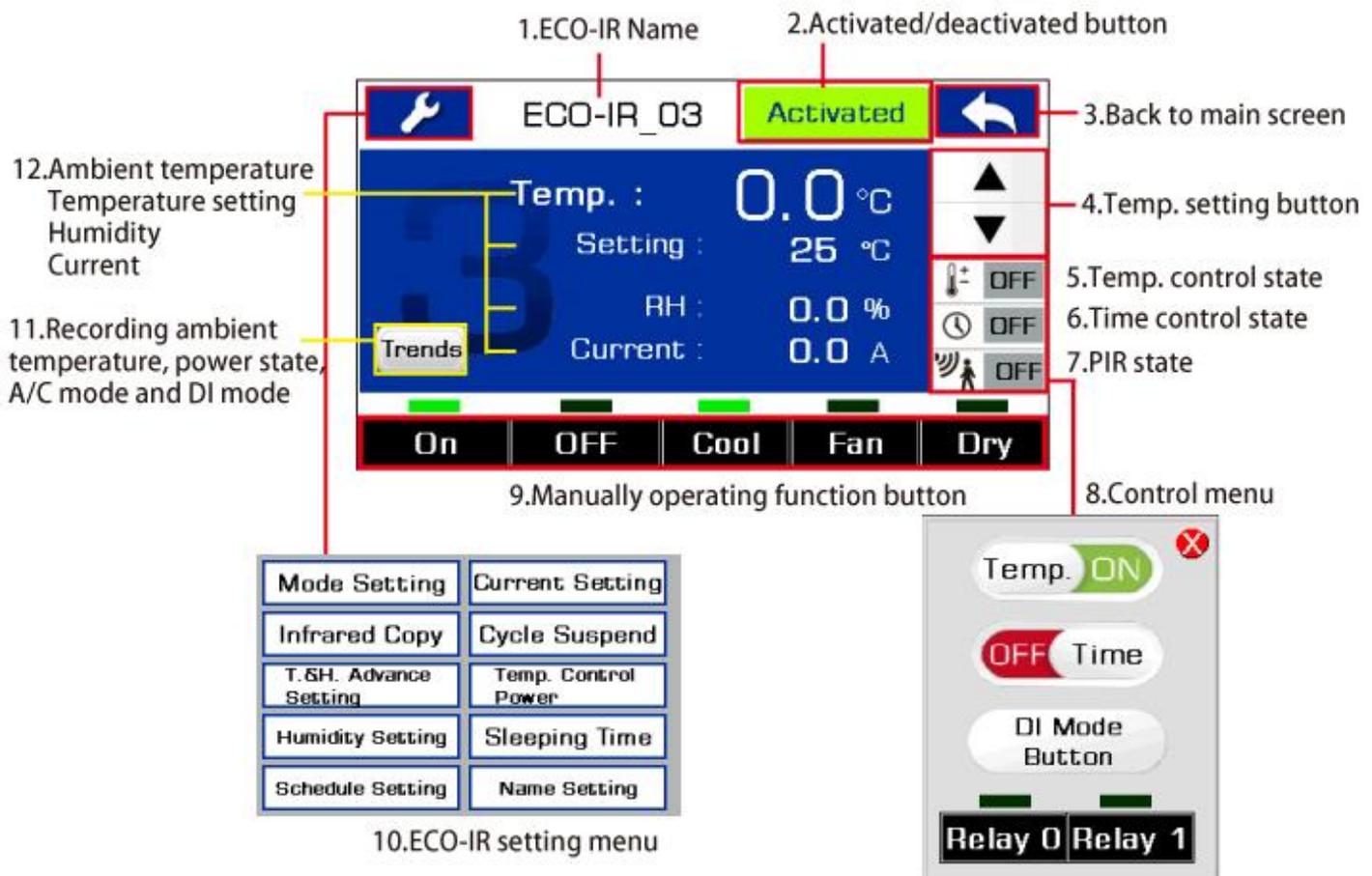


Main screen can know 4 sets of ECO-IR's states.

1. Current Time
2. Press setting button to enter setting menu.
3. ECO-IR Name
4. Deactivated state. User can enter ECO-IR Setting screen to control activated or deactivated

5. When temp. control button was turned on, temp. control signal will light up.
6. When time control button was turned on, time control signal will light up.
7. When passive infrared sensor detects people, this area will turn red. °
8. Showing air-conditioning mode (cool/fan/dry).
9. Showing air-conditioning power state (on/off).
10. Press this area to enter ECO-IR setting screen and set.
11. When ECO-IR communication occurred, main screen will show error icon.
12. Showing ambient temperature.

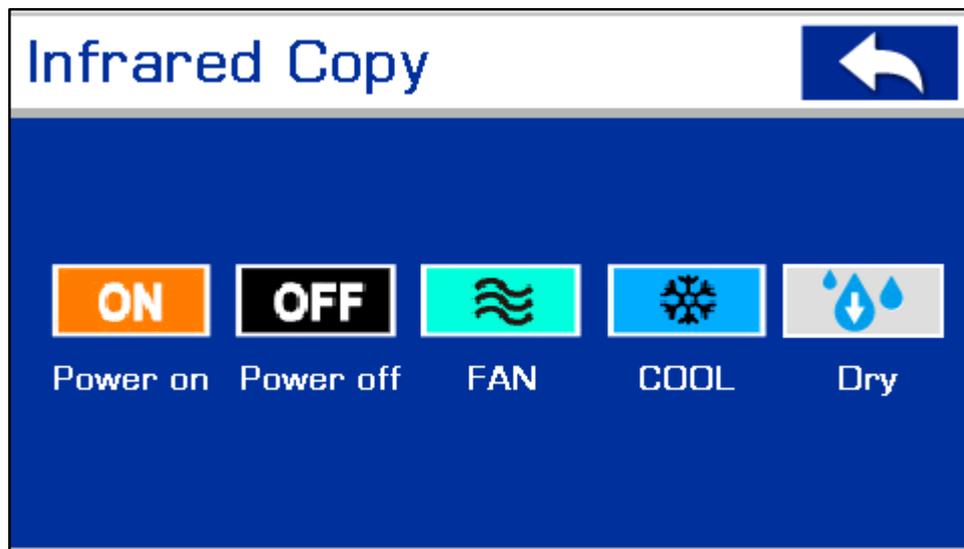
3. ECO-IR Setting screen



1. ECO-IR name
2. Activated/Deactivated button. If ECO-IR is deactivated, screen will show non activated and ECO-3MINI won't communicate with ECO-IR.
3. Back to main screen.
4. Temperature setting button. User can press up and down button to set temperature of the unit.

5. **Temperature control state:** If temp. control state shows on mode, ECO-IR will set A/C on cool or fan mode by temperature setting.
6. **Time control state:** If time control state shows on mode, ECO-IR will set A/C to turn on or off by schedule setting.
7. **PIR (Passive Infrared Sensor) state:** User can set DI mode: motion to turn on PIR function in control menu. If PIR state shows on mode, gray background means non people passed and green background means people passed.
8. Press states area to open control menu. User can operate temp., time and relays to turn on or off. DI mode have three modes: button, motion, off.
9. Manually operating A/C function button (on, off, cool, fan, dry).
10. ECO-IR setting menu.
11. Trends recording ambient temperature, power state, A/C mode and DI mode for the past 24 hours.
12. Showing ambient temperature, temperature setting, humidity and current.

3-1 Infrared copy



Step 1. Press button which you want to copy function.

Step 2. ECO-IR will continue to flash for the 30 seconds. Remote control is aimed at IR receiving hole and sent infrared code.

Step 3. If it is successful, ECO-IR light will fade in and return to original operation.

Flash light signal :

Power on: Flash white light

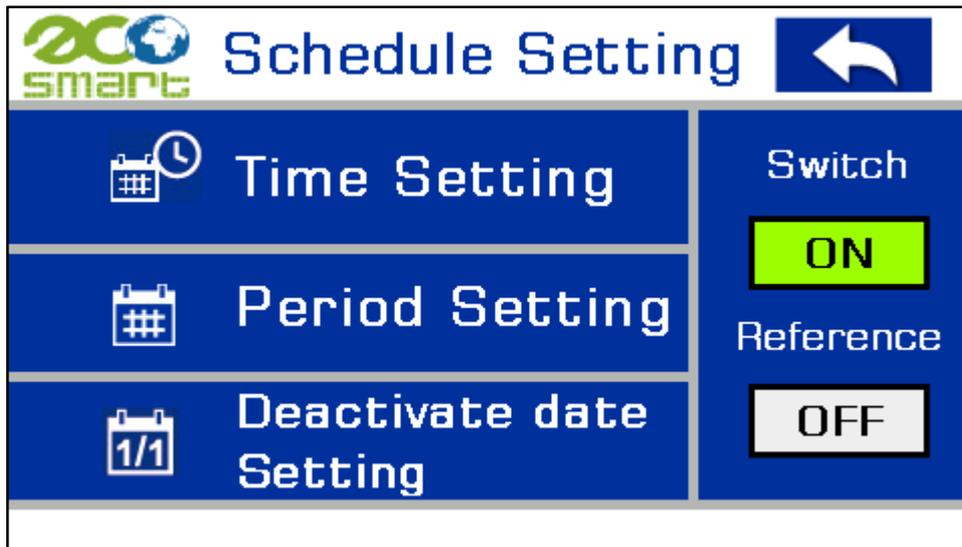
Power off: Flash orange light

Fan: Flash green light

Cool: Flash blue light

Dry: Flash yellow light

3-2 Schedule Setting



1. **Time Setting:** 16 periods can be set freely.
2. **Period Setting:** In weekly schedule, 16 periods can be set to turn on or off.
3. **Deactivate date setting:** ECO-IR will deactivate on specific dates.
4. **Switch:** If switch turns on, ECO-IR will work by schedule setting. This switch and control menu time control button in the ECO-IR setting screen are the same.
5. **Reference:** Advanced application. If switch and reference turn on, time control becomes one of condition.
 For example, time control and PIR are the condition. If two conditions were achieved: PIR detects people passed and this period is turned on in period setting, A/C power will turn on.
 Another example is time control and temp. control power.

3-2-1 Time Setting

Time Setting				
Switch	Period	Start Time	End Time	
ON	1	12:30	13:50	
OFF	2	00:00	00:00	1
OFF	3	00:00	00:00	
OFF	4	00:00	00:00	

Set 16 periods begin and end time. The right arrow can turn up and down.

Step 1. Press begin time and end time (ex: red circle), then enter the time you want to set by number keyboard.

Step 2. Switch will turn on automatically. User also can turn off switch to deactivate manually.

3-2-2 Periods Setting

Period Setting						
Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.
Period(1)	Period(2)	Period(3)	Period(4)			
Period(5)	Period(6)	Period(7)	Period(8)			
Period(9)	Period(10)	Period(11)	Period(12)			
Period(13)	Period(14)	Period(15)	Period(16)			

Set 16 periods on or off in weekly schedule.

1. Select day which you want to set.
2. Press the period you want to activate, then the period will turn green background.

3-2-3 Deactivated date

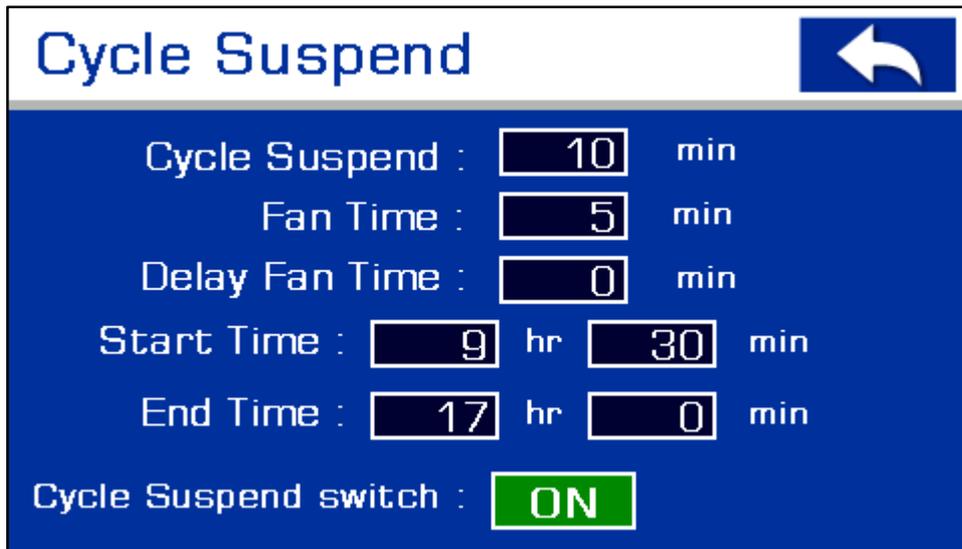


ECO-IR won't operate on specific dates. This function is suitable for festivals.

Step 1. Press the month button at the upper left and enter number.

Step 2. Press the day you want to set, then the day will turn green background.

3-3 Cycle Suspend



Cycle Suspend

Cycle Suspend : 10 min

Fan Time : 5 min

Delay Fan Time : 0 min

Start Time : 9 hr 30 min

End Time : 17 hr 0 min

Cycle Suspend switch : **ON**

Let you save more energy by cycle suspend. This function can force to turn fan in a short time.

Step 1. Set cycle suspend. It means “how long is a cycle? “ The shortest cycle is 2 minutes.

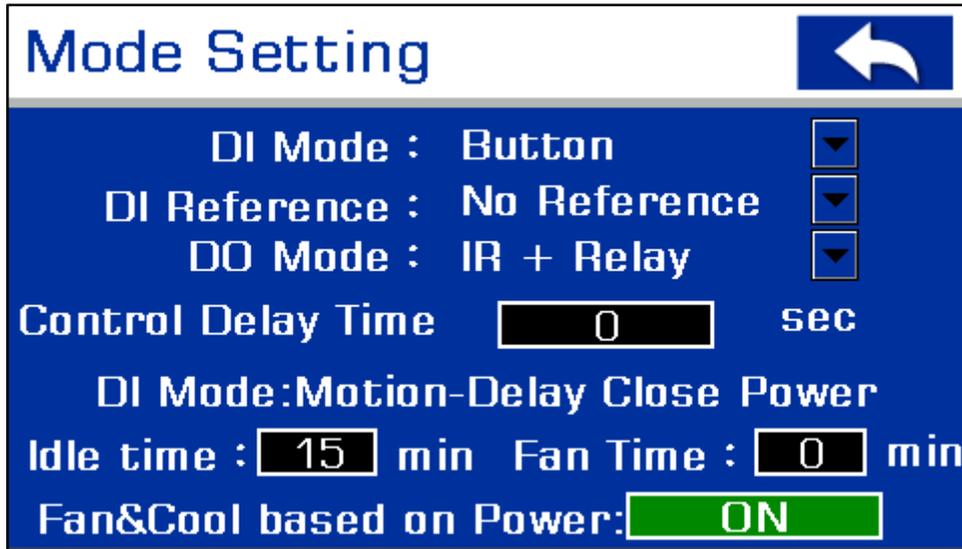
Step 2. Set fan time in a cycle.

Step 3. Set start time and end time, then cycle suspend will work in this period.

Step 4. Turn cycle suspend switch on.

Delay Fan Time: To avoid multiple air conditioners turn fan in the same time, user can set delay fan time to delay A/C turning fan.

3-4 Mode Setting



DI Mode : (1) OFF : DI deactivated

(2) Button: ECOIR DI can connect external button which manually control A/C power on/off or cool/fan.

(3) Motion : According to people motion, PIR controls A/C.

DI Reference: Advanced application. If DI mode turn motion and DI reference turn on, PIR control becomes one of condition. PIR and temp. control power are the condition.

DO Mode : (1) IR + Relay: Infrared and relay are controlled together.

(2) IR Only: Only infrared is controlled.

(3) Relay Only: Only relay is controlled.

(4) IR + Relay0 : Infrared and relay0 (control power) are controlled together. Relay1 (control fan / cool)

Control Delay Time: Set ECO-IR to delay working by 0~10 second.

DI Mode: Motion- Delay close power

Idle time: Last cool mode time. If PIR didn't detect people motion, idle time can delay turning fan mode.

Fan time: Last fan mode time. If PIR didn't detect people motion, fan time can delay turning fan mode.

Fan & Cool based on power: Default: ON. This function is avoiding abnormal operation because some of air conditioners cool/fan infrared code have power infrared code.

3-5 Sleeping Time Setting

Sleeping Time Setting ←

When Sleep Time in DI Mode: Motion is turned on ,air-conditioner will not turned off for a while.

Start Time : hr min

End Time : hr min

Set sleeping time to avoid PIR didn't detect people motion to turn A/C off in a period.

3-6 Humidity Setting

Humidity Setting ←

When cool mode that has dehumidification effect turn on, Dry Mode won't turn on.

Up limit Humidity : %

Low limit Humidity : %

Start Time : hr min

End Time : hr min

Switch : ON

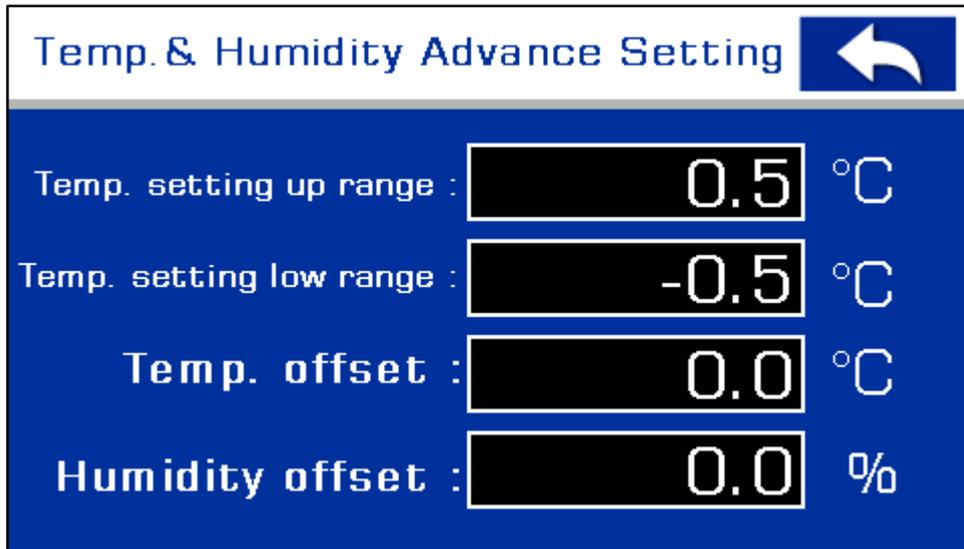
Set automatic dehumidification in the period. When cool mode that has dehumidification effect turns on, dry mode won't turn on.

Step 1. Set up/low limit humidity. If humidity above up limit value, ECO-IR will turn dry mode on. If humidity less than limit value, ECO-IR will return to original mode.

Step 2. Set start time and end time.

Step 3. Turn switch on.

3-7 Temp. & Humidity Advance Setting



Temp. & Humidity Advance Setting

Temp. setting up range : 0.5 °C

Temp. setting low range : -0.5 °C

Temp. offset : 0.0 °C

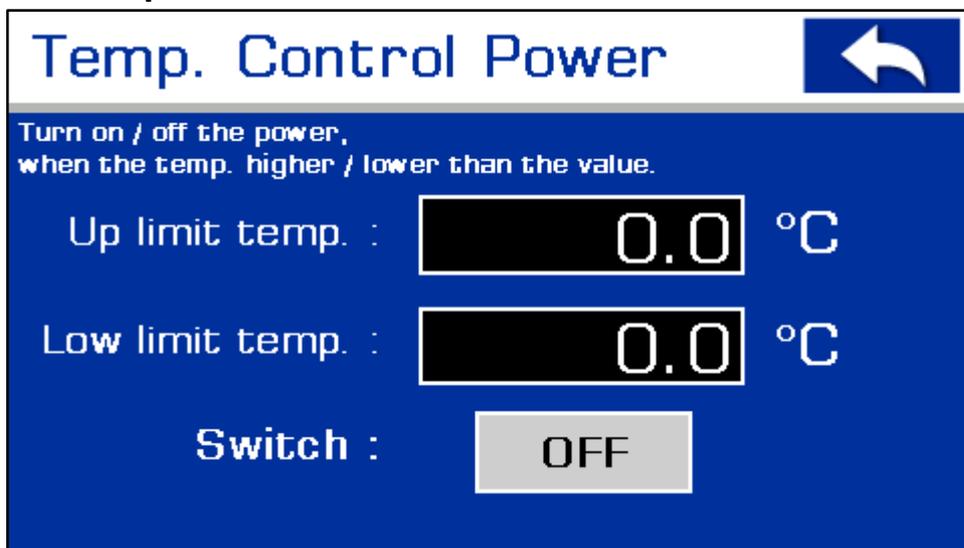
Humidity offset : 0.0 %

Temp. setting up/low range: “default: $\pm 0.5^{\circ}\text{C}$ “ Set Temp. control range in the ECO-IR setting screen.

For example, temp. setting up/low range is $\pm 0.5^{\circ}\text{C}$ and temp. control setting is 27°C in the ECO-IR setting screen. If ambient temp. have risen over 27.5°C , ECO-IR will turn cool mode. If ambient temp. have dropped below 26.5°C , ECO-IR will turn fan mode.

Temp. / Humidity offset: Set temp. / humidity offset, if temp. / humidity have error

3-8 Temp. Control Power



Temp. Control Power

Turn on / off the power,
when the temp. higher / lower than the value.

Up limit temp. : 0.0 °C

Low limit temp. : 0.0 °C

Switch : OFF

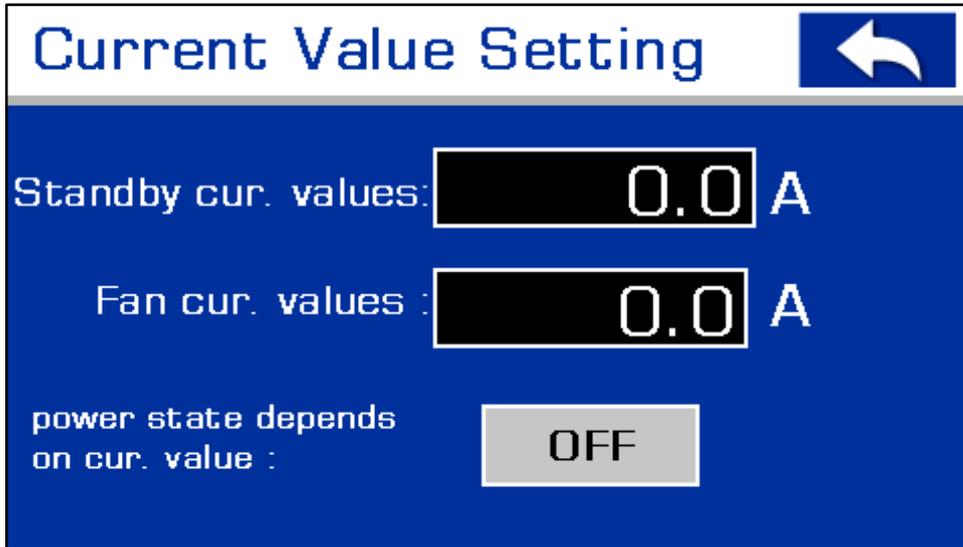
According to ambient temp., ECO-IR turns A/C power on/ off automatically.

Step 1. Set up limit temp.: If ambient temp. higher than value, ECO-IR will turn A/C power on automatically.

Step 2. Set low limit temp.: If ambient temp. lower than value, ECO-IR will turn A/C power off automatically.

Step 3. Turn switch on

3-9 Current Value Setting



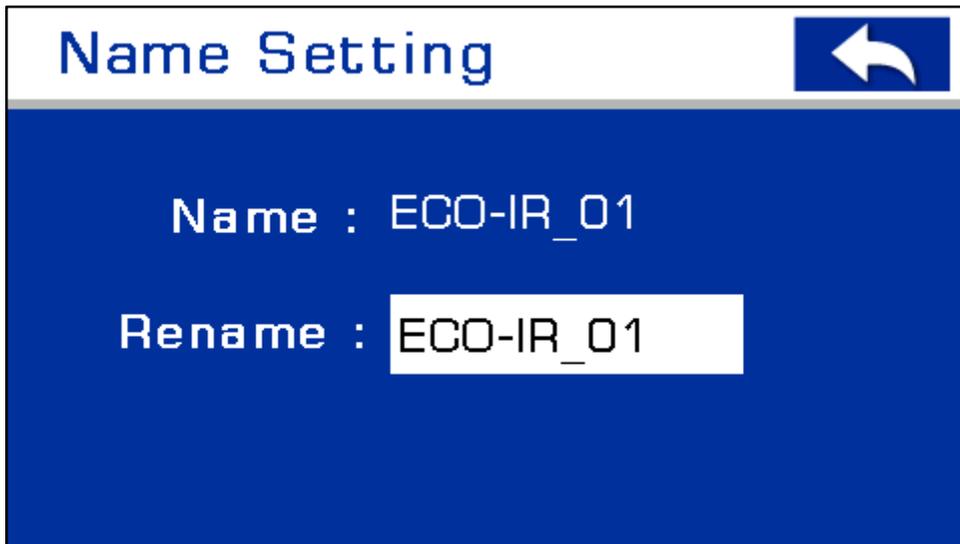
According to the current value, ECO-IR judges A/C state and controls A/C.

Step 1. Set standby current value.

Step 2. Set fan current value.

Step 3. Turn switch on.

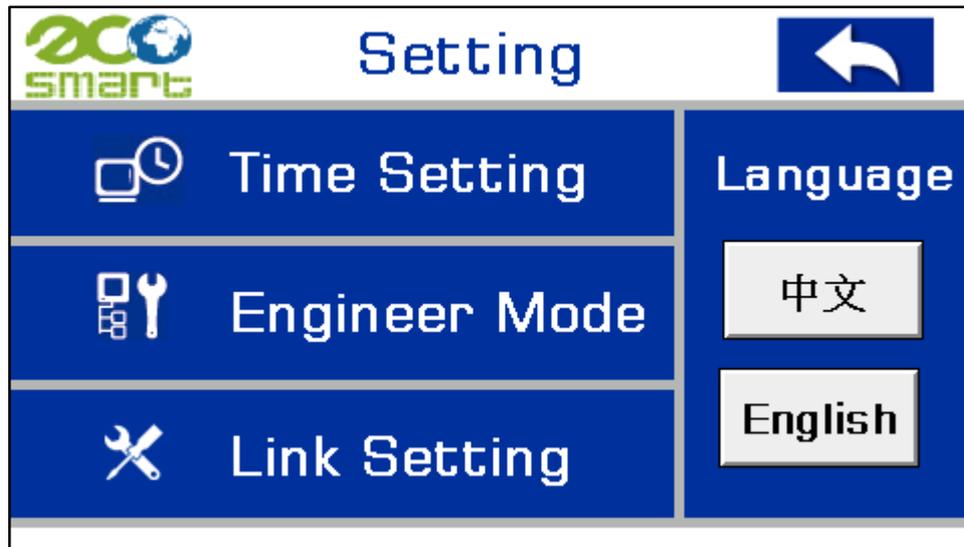
3-10 Name Setting



Change ECO-IR name in 10 words.

The name is stored in ECO-3Mini. If you change the connected ECO-IR, the name won't change.

4. Setting



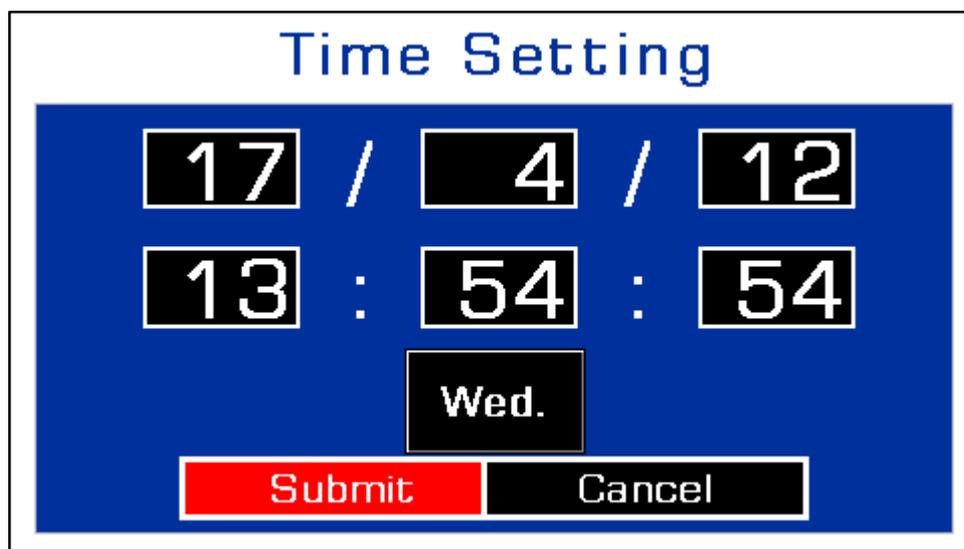
Time setting: Set system time.

Engineer Mode: Set system.

Link setting: Set the connection IP.

Language: Change language Chinese / English.

4-1 Time Setting



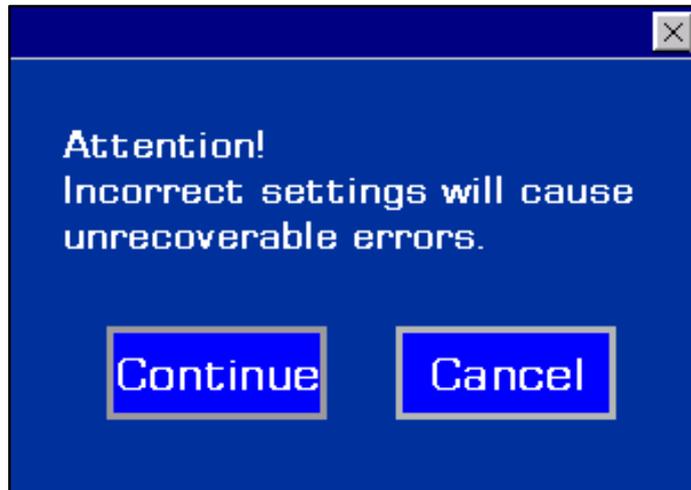
Set system time if time has error.

Step 1. Set time. 20yy / mm / dd , hr / mi / se

Step 2. Select day.

Step 3. Press submit button.

4-2 Engineer Mode



We suggest operating under the professional guidance.

4-3 Link setting

Link Setting 				
No.	Site	Status	Displays	IP Address
	1	OFF	OFF	192.168.1.151
	1	OFF	OFF	192.168.1.152
	1	OFF	OFF	192.168.1.153
	1	OFF	OFF	192.168.1.154

IP address: you can set IP to connect the different ECO-IR.

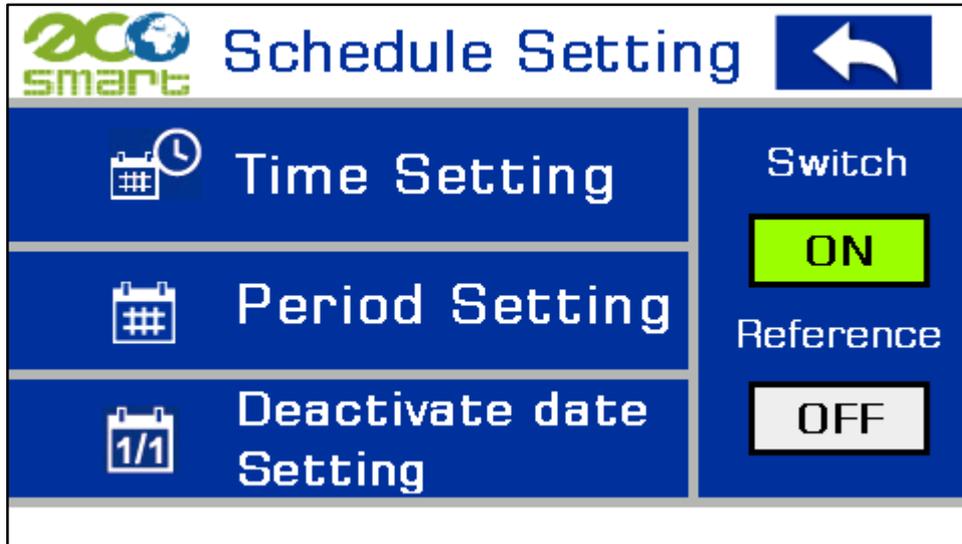
Status: ECO-IR activated or deactivated.

Displays: Default: OFF Show system error.

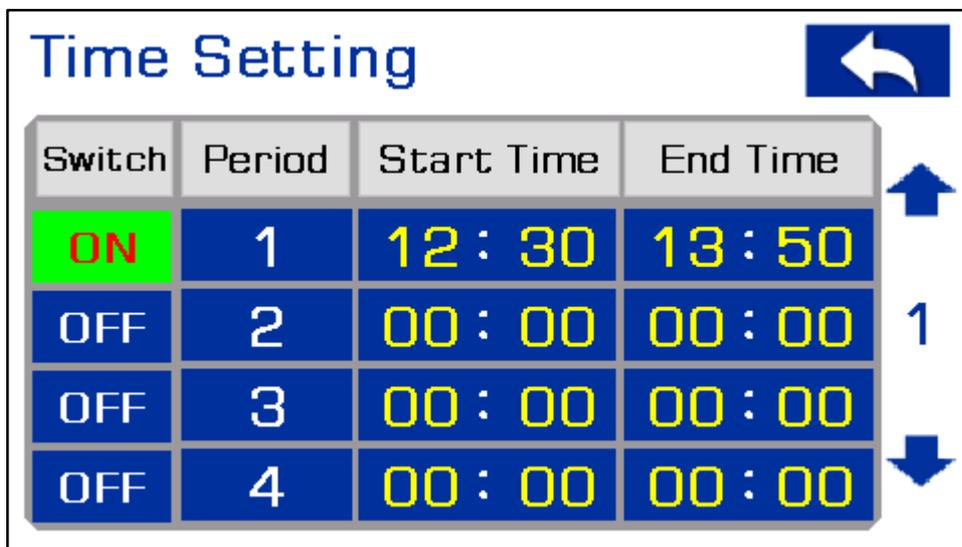
Chapter 5 Common Settings

1. Schedule Setting

ECO-IR setting screen > schedule setting

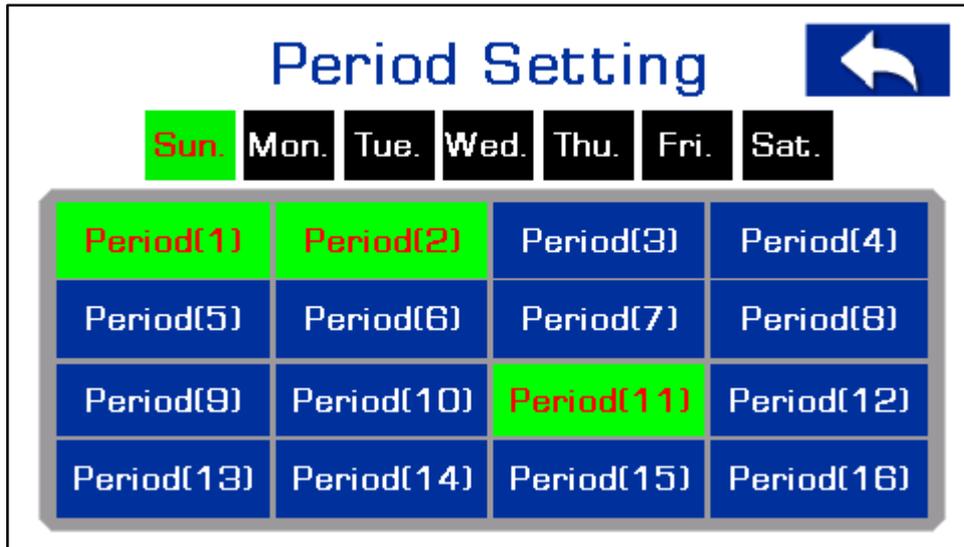


Turn switch on.



Enter time setting.

Set the periods start and end time.

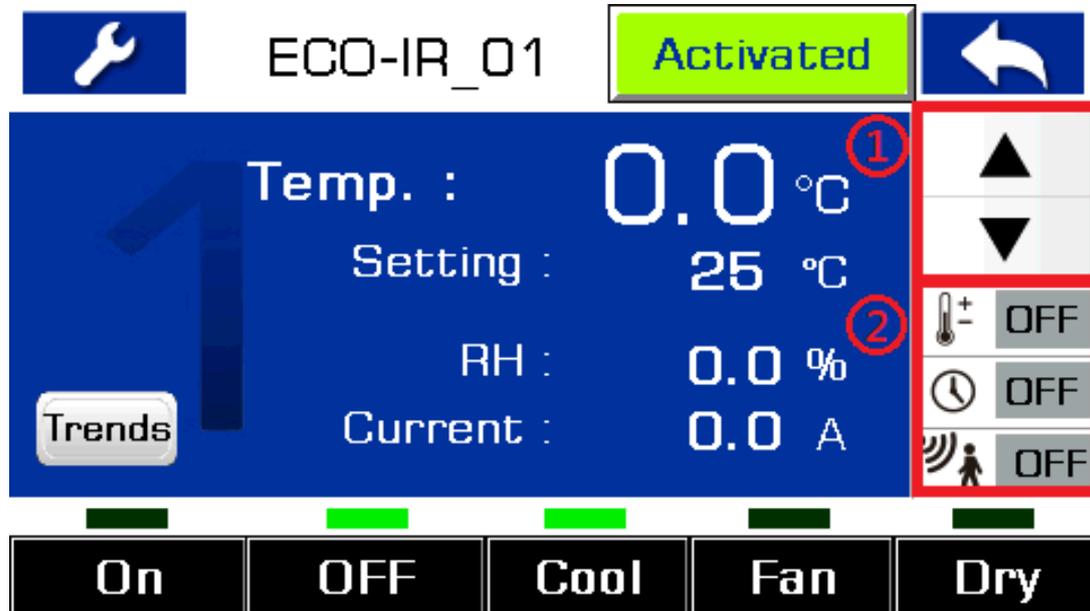


Enter period setting

Select day> press period which you want to activated (green background).

2. Temp. control setting

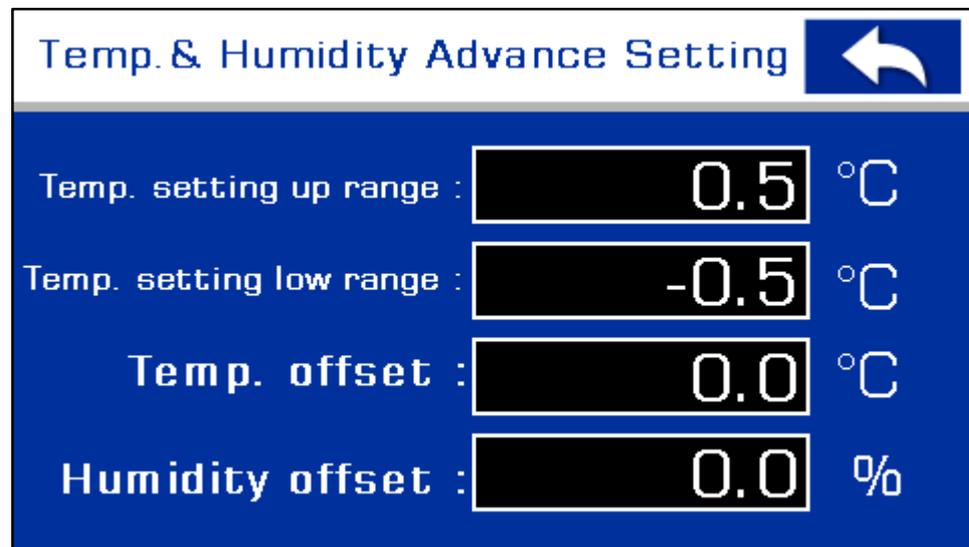
Enter ECO-IR setting screen.



Step 1. Press temp. setting button to increase/ decrease the temp. setting.

Step 2. Press control menu to turn temp. control on.

Advance setting

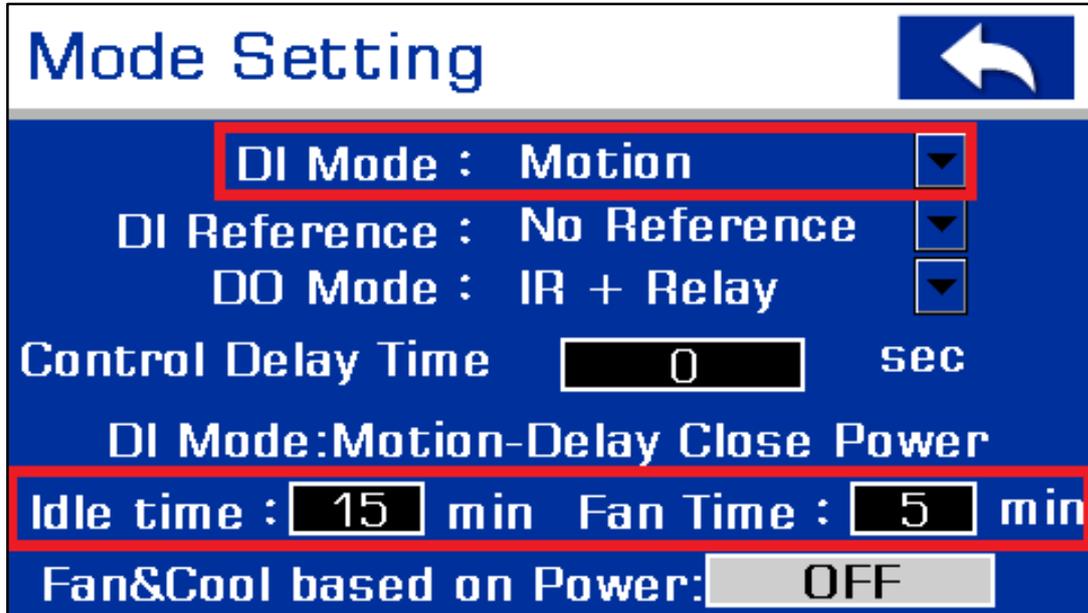


Temp. setting up/low range: "default: $\pm 0.5^{\circ}\text{C}$ " Set Temp. control range in the ECO-IR setting screen.

For example, temp. setting up/low range is $\pm 0.5^{\circ}\text{C}$ and temp. control setting is 27°C in the ECO-IR setting screen. If ambient temp. have risen over 27.5°C , ECO-IR will turn cool mode. If ambient temp. have dropped below 26.5°C , ECO-IR will turn fan mode.

3. Passive Infrared Sensor Setting

ECO-IR setting screen> Mode setting



Mode Setting

DI Mode : Motion

DI Reference : No Reference

DO Mode : IR + Relay

Control Delay Time 0 sec

DI Mode:Motion-Delay Close Power

Idle time : 15 min Fan Time : 5 min

Fan&Cool based on Power: OFF

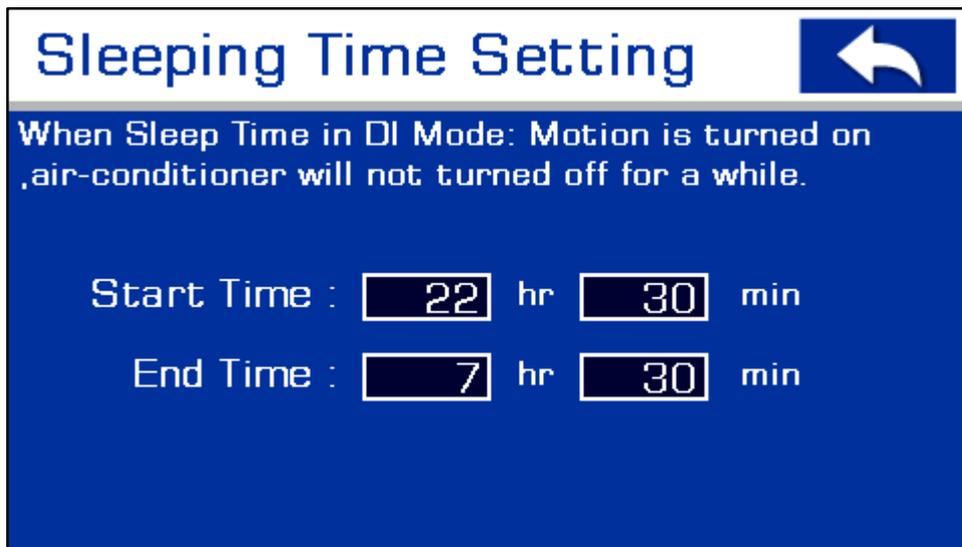
Step 1. Set DI Mode to Motion.

Step 2. Set idle time and fan time.

Idle time: Last cool mode time. If PIR didn't detect people motion, idle time can delay turning fan mode.

Fan time: Last fan mode time. If PIR didn't detect people motion, fan time can delay turning fan mode.

Advance setting: Sleeping time



Sleeping Time Setting

When Sleep Time in DI Mode: Motion is turned on, air-conditioner will not turned off for a while.

Start Time : 22 hr 30 min

End Time : 7 hr 30 min

Set sleeping time to avoid PIR didn't detect people motion to turn A/C off in a period.