# Tech Note

|  |  |  |  |
| --- | --- | --- | --- |
| **Project Name** | **ECO001** | **Author:** | **Paul Kelly** |
| **Date:** | **26/10/16** | **Document No.:** | **TN\_ECO001\_004** |

|  |
| --- |
| **Subject** |
| **Air-Controller Monitor Manual and Setup Guide v4.0** |

**Scope**

This document explains how to setup and configure the two variants of the Air-con monitor unit using the button. The document also gives an overview of the normal operation. Variant 1 is the basic build and does not include features or USB capabilities. Variant 2 is the full feature version.

**First Power Up**

When the unit is powered up for the first time the red LED remains illuminated for 15 seconds and then stops for 3 seconds. During this time the PIR is being allowed to settle to avoid any false triggers.

*This means the unit cannot be interacted with for 20 seconds.*

**LED’s**

In normal operation the LED’s will indicate the following

RED Flash

*Movement was detected from the PIR sensor*

In setup mode the LED’s will indicate

RED Flash

*The number of flashes per second will indicate the current setup mode the unit is in*

Green Flash

*The green LED will indicate either the parameter selected or unit status depending on current mode*

**Normal Operation**

In Normal operation the unit will wake up once a minute or if movement is detected. The unit will wake to movement once in a 1 minute period. On every timed wake up the unit will record the current daylight level and also check to see if any sensors need timers increasing.

On each timed wakeup a counter is incremented for the movement sensor. If movement is detected then the counter is reset to zero. If the unit wakes up a specified number of times (set by the PIR delay in minutes) without detecting movement then the IR OFF Command will be sent on the final wake up.

**IR Commands**

**Variant 1** only has the ability to store 1 command

**Variant 2** has 2 IR commands:-

Air-con OFF command. - This command will switch the Air control unit off

Air con TEMP UP command - This command will increment the set temperature up 1 degree.

The following conditions must be met for the unit to send out the recorded IR commands

For Variant 1

* The Air-con OFF Command must be stored
* The PIR delay time has been exceeded
* When “Do not switch A/C off at night” is enabled, it must be light
* When “Do not switch A/C off at night” is disabled, it can be either dark or light

For Variant 2

Variant 2 has 2 IR commands

For OFF Command

* Either the Motion or Door sensors must be enabled
* The Air-con OFF Command must be stored
* Either the PIR or Door delay time has been exceeded
* The unit is within an active time window
* When “Do not switch A/C off at night” is enabled, it must be light
* When “Do not switch A/C off at night” is disabled, it can be either dark or light

For TEMP UP command

* The Air-con TEMP UP command must be stored
* Temperature control is enabled
* Recorded temperature is less than the specified minimum temperature set in the unit
* The Air-con OFF command has **not** been sent

**External Inputs**

Door Sensor

For variant 2 units a counter also exists for a door sensor. If the door is closed the counter is reset to zero on every wakeup. The counter is incremented every time the unit wakes with the door open. If the counter exceeds the set Door switch time delay IR channel 1 (OFF Command) is sent. The counter is not incremented if the door switch is disabled.

Temperature Control

This feature is only available on Variant 2 units. The room temperature is recorded every 15 minutes. If the recorded temperature is less than the set temperature set in the unit, then the Air-con TEMP UP command is sent. If both the OFF command and the Air-con temp command are due to be sent at the same time then only the OFF command will be sent. The green LED will flash twice when this command is being sent. The TEMP UP command will only be sent if the OFF Command has NOT been sent.

**USB**

USB interface is only available on Variant 2 units. The unit will only communicate with custom ECO configuration software. The unit uses the windows embedded HID device driver allowing the unit to be used without the requirement of 3rd party device drivers. When the USB cable is connected, the unit will connect to the PC either when it wakes up on the next minute or if the button is pressed.

The following unit settings can be changed using the USB interface

* Active time window
* Motion sensor delay time before IR command is sent
* Door sensor delay time before IR command is sent
* Light Sensor Threshold
* Minimum temperature setting
* The motion, Disable OFF command at night, temperature and door sensors can be enabled or disabled

**Do not switch A/C off at night**

This feature is only available on variant 2 units and allows the unit to operate differently at night. When this feature is enabled the OFF command will not be sent when it’s dark if no movement is detected. The unit will continue to adjust the temperature if required during this time. The unit has a built in light sensor to measure the light level to determine the night time period. This threshold level can be adjusted on the PC software.

When the night time regulator is disabled the OFF command will be sent when it’s dark as normal

**Active Time Window**

This feature is only available on variant 2 units. The unit can be set to only operate at a specified time of the day. The start and stop times can be set using the ECO configuration software. If the start time set is greater than the end time the unit will assume that the stop time will be tomorrow. If the current time is outside an active window the unit will not wake from sleep until the start time of the next active window.

Variant 1 units do not have this feature and so will always operate 24 hrs a day

**Button**

Both variants can be configured using the button. The button has three types of presses

Very long press – The button is pressed and held down for 15 seconds

*This button press will return all configurations to factory settings and all IR commands stored will be deleted*

Long press – The button is pressed and held down for 2 seconds

Short press – The button is pressed and held for more than ½ second

Pressing the button will always wake the unit from sleep

**Battery Low**

The battery is checked on every wakeup (once a minute). If the battery found to be low both RED and GREEN led’s will flash 5 times every minute

**Setup Mode**

**Reset to Factory defaults**

From set up mode if the button is held for 15 seconds all configurations will be set back to factory settings and both ‘OFF’ and ‘TEMP UP’ IR commands stored will be deleted.

After 15 seconds the Red and Green LED will start flashing 3 times simultaneously. This will indicate to the user the unit has now been set to factory defaults. The unit will return to normal operating mode once complete

A unit set to factory defaults has the following settings

Active Time Window: Start - 00:00 End - 23:59

Movement Sensor: Enabled

No Movement Detect Delay: 30 minutes

Temperature Control: Disabled

Minimum Set Temperature: 30C

Do not switch A/C off at night: Enabled

Light Threshold scale set to 5 / 10 (mid-scale)

Door Open Delay: 2 Minutes

**Changing Setup Modes**

The unit has 6 setup modes. Each mode controls a different configuration parameter

To enter setup mode press the button and hold for 2 seconds. The unit will enter setup mode 1 indicated by a single flash every 3 seconds on the red led. Releasing the button and then pressing the button again for 2 seconds will put the unit into setup mode 2. This can be repeated to access all 6 setup modes.

During any mode pressing the button for 10 seconds will return the unit to normal operation.

The Red Led will indicate the current mode the unit is in by the number of flashes shown in a 3 second period.

A short button press will change the current setting, indicated by the green LED. The short button press operation will vary depending on which mode is currently active

The following lists the Setup mode function and instructions on how to set each parameter

Setup Mode 1

Indicated on Red Led as 1 flash every 3 seconds

This mode controls the PIR delay time. The table below lists the time delays available which can be selected using the short button press. The Green LED will indicate the current time delay selected. To set the time delay, select the desired setting using the short button press. Then press and hold the button either for 2 seconds to move to the next mode or 10 seconds to return to normal operation

|  |  |  |
| --- | --- | --- |
| Short Button Press | Parameter Set | Flashes per second |
| 1st Press | OFF | 1 Flash |
| 2nd Press | 15 minutes | 2 Flashes |
| 3rd Press | 30 minutes | 3 Flashes |
| 4th Press | 60 minutes | 4 Flashes |
| 5th Press will cycle back to OFF | | |

Setup Mode 2

Indicated on Red Led as 2 flashes every 3 seconds

This mode will enable or disable the A/C OFF command being sent at night. A short button press will enable or disable the light sensor. This will be indicated by the green LED.

Green LED on – “Allow A/C off to be sent at night”

Green LED off – “Not allow A/C off to be sent”

To leave the setup mode with the last command stored. Press the button for 2 seconds to move to the next setup mode or 10 seconds to return to normal operation

Setup Mode 3

This mode is used to set the OFF command. To set press the button to light the Green LED. This indicates the unit is waiting for an IR command

Send the OFF IR command from the Air-con remote control. When the command is received and stored the green LED will switch off and the unit will return to this mode setup. The operation can be re-performed with a further short button press.

If the button is pressed and no IR signal is received after 10 seconds the unit will timeout. If this timeout occurs this will clear any signal currently stored for the OFF command

To leave the setup mode with the last command stored. Press the button for 2 seconds to move to the next setup mode or 10 seconds to return to normal operation

Setup Mode 4

Indicated on Red Led as 4 flashes every 3 seconds

This mode will transmit the currently stored OFF command. The command is transmitted on each short button press. The command is sent once per button press. The green LED will flash when the command is transmitted

To leave the setup mode with the last command stored. Press the button for 2 seconds to move to the next setup mode or 10 seconds to return to normal operation

If using variant 1 the next mode will return back to normal operation.

For variant 2 the next mode will move on to mode 5

Setup Mode 5

Indicated on Red Led as 5 flashes per second

**This mode is only available on variant 2 units**

This mode is used to set the Air-con TEMP UP command. To set press the button to light the Green LED. This indicates the unit is waiting for an IR command

Send the Air-con TEMP UP command from the Air-con remote control. When the command is received and stored the green LED will switch off and the unit will return to this mode setup. The operation can be re-performed with a further short button press.

If the button is pressed and no IR signal is received after 10 seconds the unit will timeout. If this timeout occurs this will clear any signal currently stored for the TEMP UP command

To leave the setup mode with the last command stored. Press the button for 2 seconds to move to the next setup mode or 10 seconds to return to normal operation

Setup Mode 6

Indicated on Red Led as 6 flashes per second

**This mode is only available on variant 2 units**

This mode will transmit the currently stored air-con TEMP UP command. The command is transmitted on each short button press. The command is sent once per button press. The green LED will flash when the command is transmitted

To leave the setup mode, press the button for 2 seconds return to normal operation