aircom

AD/HD

WTP03

User Manual

Aircom User Manual

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Important Symbols

Electrical hazard

General hazard or note

Information relating to ATEX hazardous areas

Table of Contents

Part I Welcome

1.1 About this document

Welcome to the Aircom user manual. This manual will guide you through hardware and software configuration for an Aircom RTU transmitter and other important technical information.

1.2 Hazards

Handling of Aircom products should be done by competent persons only. Incorrect use by non-qualified personnel may result in damage, injury or death. Prior to handling the equipment this manual should be reviewed and correct safety precautions taken.

Certain Aircom products are designed for use in hazardous (explosive) environments. Prior to use in any hazardous environment the supplied ATEX certificate should be reviewed by a competent person to ensure the device is safe for use in the specific application.

The Aircom RTU is an electrical device which is powered either by an internal battery or auxiliary power supply. Care should be taken and the instructions in this manual / ATEX certificate should be observed to ensure safe operation.

1.3 Intended use

This product is designed to monitor and control instruments for use in ATEX defined hazardous areas.

DO:

- Carefully read all manuals and certification prior to use.
- Use this product for its intended use.
- Use this product for the certified hazardous area as per the current ATEX certificate see 7.1 ATEX certificate.
- Follow the correct installation and wiring for appropriate instruments as per 2.5 Electrical Installation.

DO NOT:

- Misuse or use for unintended purposes.
- Use this device in hazardous areas not within its certification.
- Wire incorrectly.
- Use any battery other than the official Aircom battery.
- Use an auxiliary power supply not within the specified parameters, see 2.5.4 Auxiliary power supply.

1.4 Responsibility of the user

It is the responsibility of the user to use Aircom products only within the scope it has been designed for. Prior to installation and operation it is imperative to observe all the relevant documentation and ensure only competent personnel operate the equipment. Should any assistance be required please contact YZ Systems, *see page 2*.

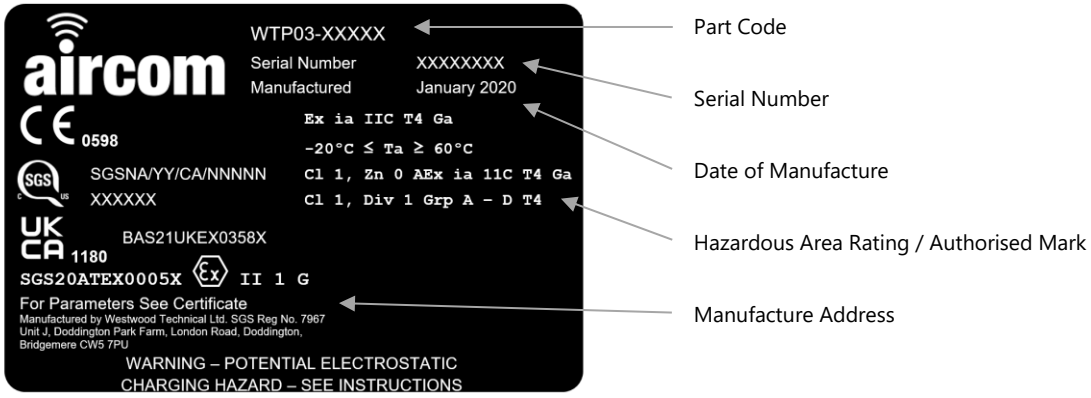
Part II Getting Started

2.1 About Aircom

Aircom™ is a self-contained, battery-powered communications device capable of collating data from various instruments. With its powerful ARM microprocessor it can act as a datalogger, RTU or PLC for monitoring and control applications. It has been designed to withstand harsh environments and transmit data from the asset to any Command Centre globally. It's easy to install and configure with its Mobile Bluetooth App and can be left to operate without the need for human intervention.

2.2 Manufacturer's label

Every Aircom supplied will have a manufacturer's label attached to the left-hand side of the enclosure. The label will be depicted as below:



2.3 Product range

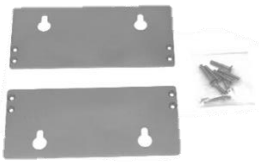
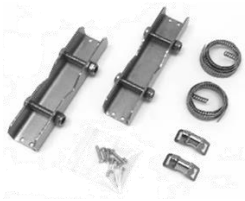
2.3.1 Part code builder

Part Code Builder							
Example Code	**WTP03**	**-**	**Ex**	**-**	**AD485**	**-**	**L868**
Product Code							
Aircom Transmitter	WTP03						
Hazardous Area Certification							
Safe Area Only	00						
Hazardous Area	Ex						
Inputs & Outputs – *See Power & I/O Options Table*							
x2 AI / DO, x4 DI, x2 Serial	AD485						
x5 AI / DO, x4 DI, x2 Serial	HD485						
Communications							
LoRaWAN EU868-870MHz	EU868						
LoRaWAN US902-928MHz	US915						
LoRaWAN AU915-928MHz	AU915						
LoRaWAN AS920-923MHz	AS1						
LoRaWAN AS923-925MHz	AS2						
LoRaWAN IN865-867MHz	IN865						

Power and I/O Options			
Options	**LD000**	**AD485**	**HD485**
12-23VDC Auxiliary Power Input	-	☑	☑
3.6V, 19.Ah Lithium Thionyl Chloride Replaceable Battery	☑	☑	☑
Digital Inputs	***Max 2****	***Max 4****	***Max 4****
0-24VDC Voltage Inputs	-	x2	x2
Proximity Switch, NAMUR Type	-	x2	x2
Volt-Free or Pulse Inputs	x2	x2	x2
Volt-Free Inputs	-	x2	x2
Digital Outputs	***Max 2****	***Max 2****	***Max 5****
20mA @ 16.4VDC Digital Outputs	x2	x2	x5
Analogue Inputs	***Max 3****	***Max 2****	***Max 5****
4-20mA Passive	x2	x2	x5
HART®	-	x2	x2
4-20mA Active	-	x2	x2
-10-10V Input	-	x2	x2
PT100 3/4 Wire or PT1000	x1	x2	x2
Thermocouple Type J or K	-	x2	x2
0-10k Resistance or Potentiometer Inputs	-	x2	x2
0-1.5V mV Inputs	-	x2	x2
Serial Options	-	***Max 2****	***Max 2****
RS485	-	x2	x2

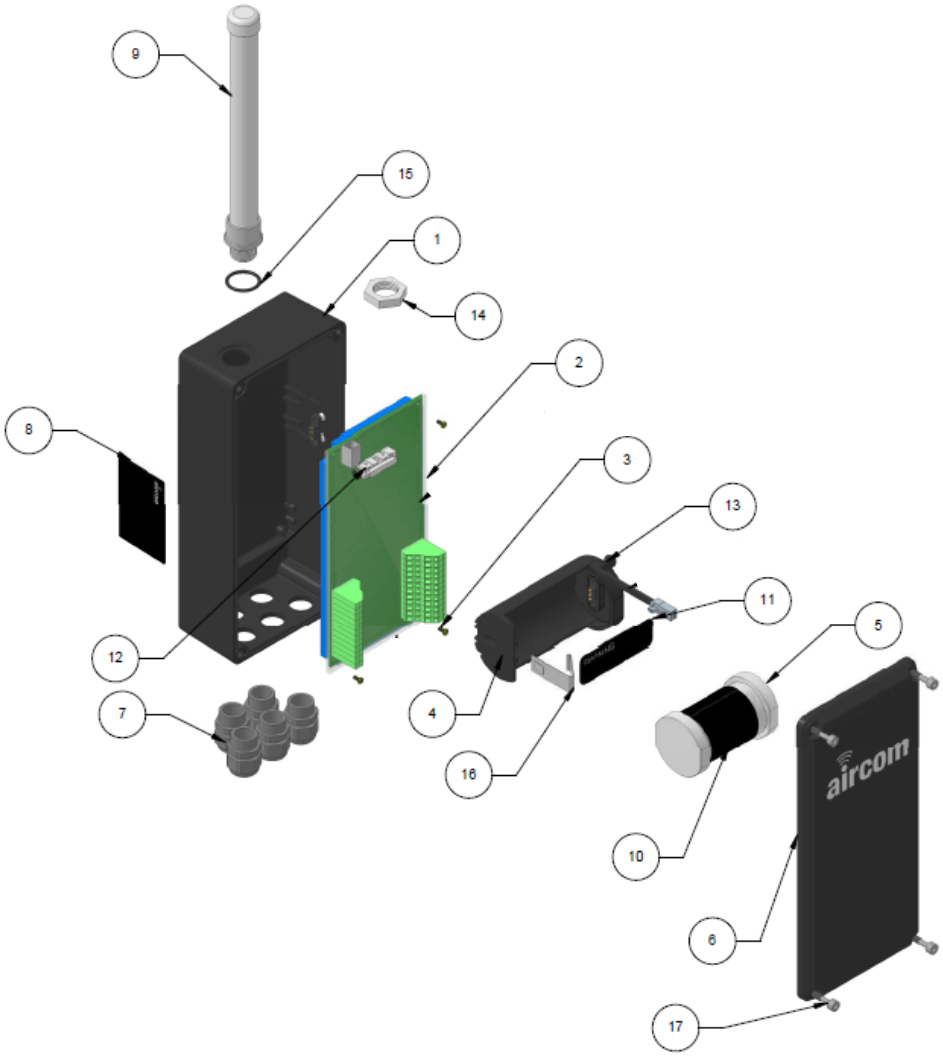
***Note:** There is a maximum number of I/O that can be utilised for each variant. **Example**: AD485 has *Max x2* Analogue Channels. Only 2 of the available analogue inputs can be used at one time such as x1 4-20mA and x1 PT100 at once or any other combination of two of the available input options.

2.3.2 Accessories

Code	Description	
ZC-0003	Battery-ATEX	
ZC-0006	Wall Mount, includes: ▪ x2 304SS wall brackets ▪ x8 304SS thread forming screws.	
ZC-0005	Post Mount, includes: ▪ x2 304SS post brackets ▪ x4 304SS M6 machine screws & nyloc nuts ▪ x2 304SS jubilee clips ▪ x8 304SS thread forming screws	
DD-0001	Telescopic Magnet	
DD-0002	Terminal Tool	
-	IP68 M20 Cable Gland	
-	IP68 M20 Plug	

2.4 Mechanical installation

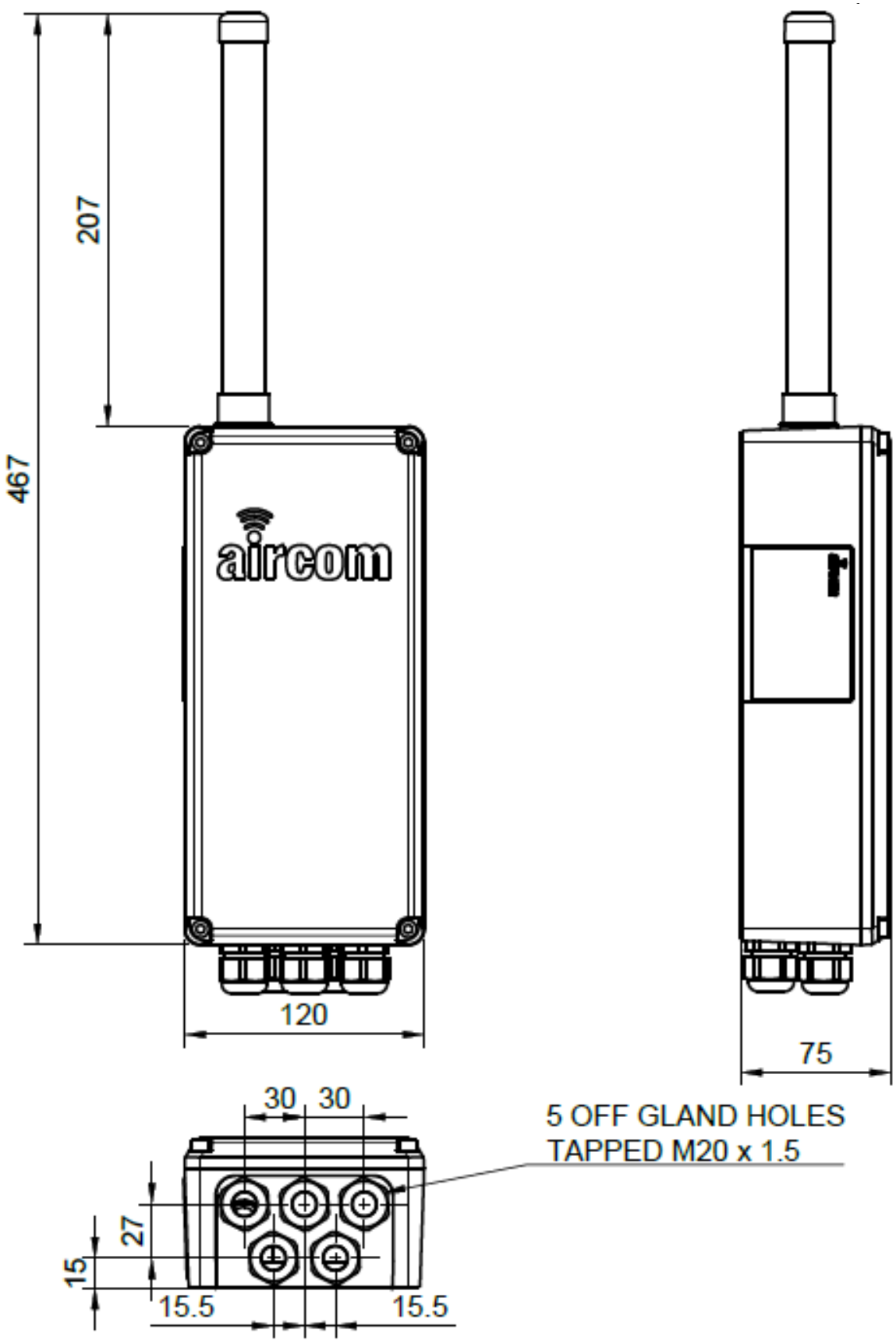
Your new Aircom device should arrive assembled, tested, and ready for installation. Each standard unit should be supplied with all the following components:



Item	Qty	Part No.	Material	Description
1	1	WTP03-0075	ABS	Transmitter Box
2	1	WTP03-0001	-	Assembled PCB
3	4	WTP03-0051	Stainless Steel	M3x8 Screw
4	1	WTP03-0074	ABS	Battery Enclosure
5	1	WTP03-BEx **or** WTP03-BSa	ABS Casing, Lithium Thionyl Chloride Cell	Battery
6	1	WTP03-0076	ABS	Transmitter Lid
7	5	WTP03-0008	Nylon 6 (Polyamide 6)	IP68 M20 Cable Gland
8	1	WTP03-0007	Polyester	Manufacturer's Label
9	1	WTP03-0002	ABS	Antenna
10	1	WTP03-0023	Polyester	Manufacturer's Label
11	1	WTP03-0035	Polyester	Warning Label
12	1	WTP03-0050	-	Port Cover
13	1	-	-	Battery PCB Cable
14	1	WTP03-0045	ABS	Antenna Nut
15	1	WTP03-0052	Rubber	Antenna, 22mm O-Ring
16	1	WTP03-0073	Stainless Steel	Battery Spring

17	1	-	Stainless Steel	M5 x 20mm Machine Screw

2.4.1 Dimensions



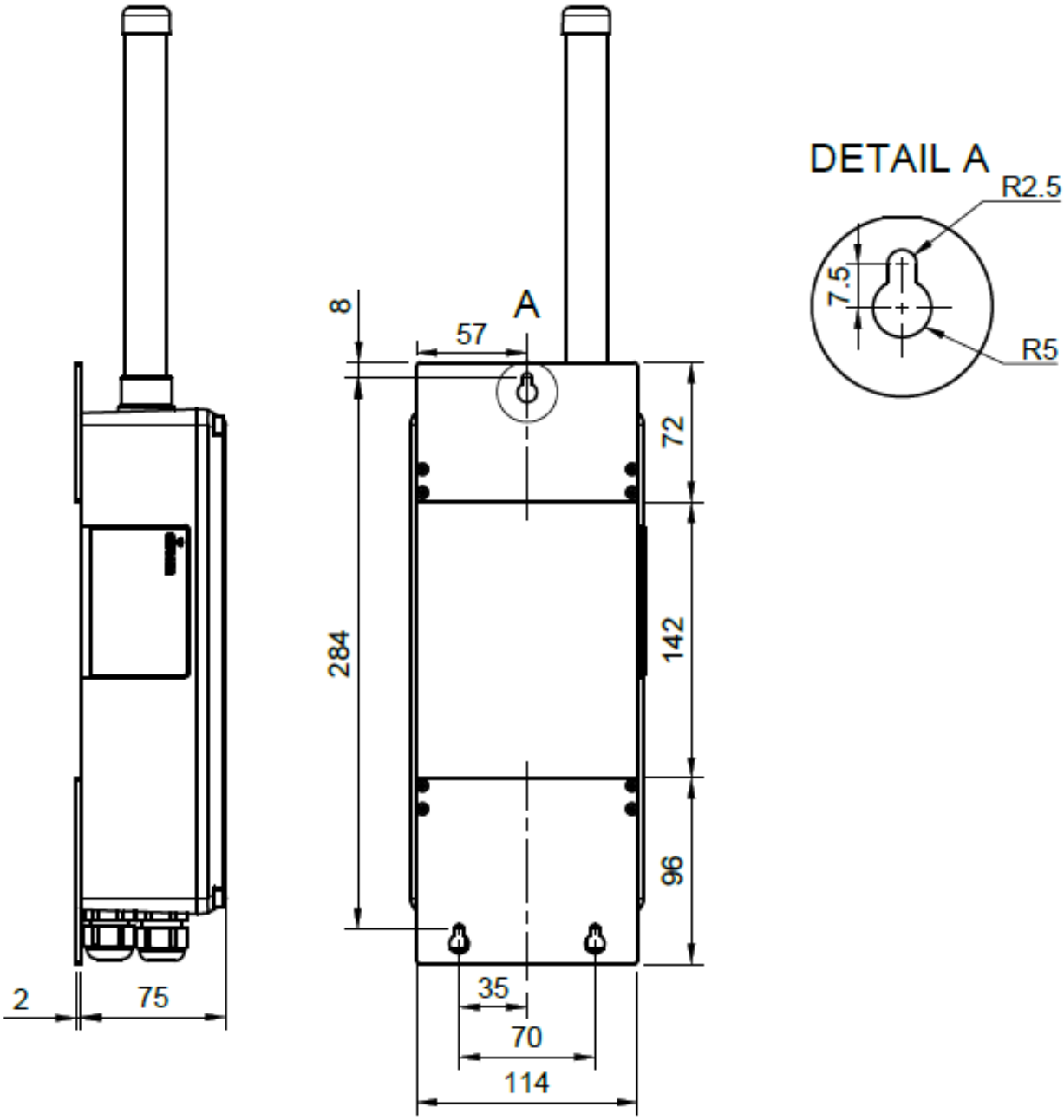
2.4.2 Brackets

Within the Aircom range two brackets are available:

WTP03-Mwall:

Wall mount bracket includes:

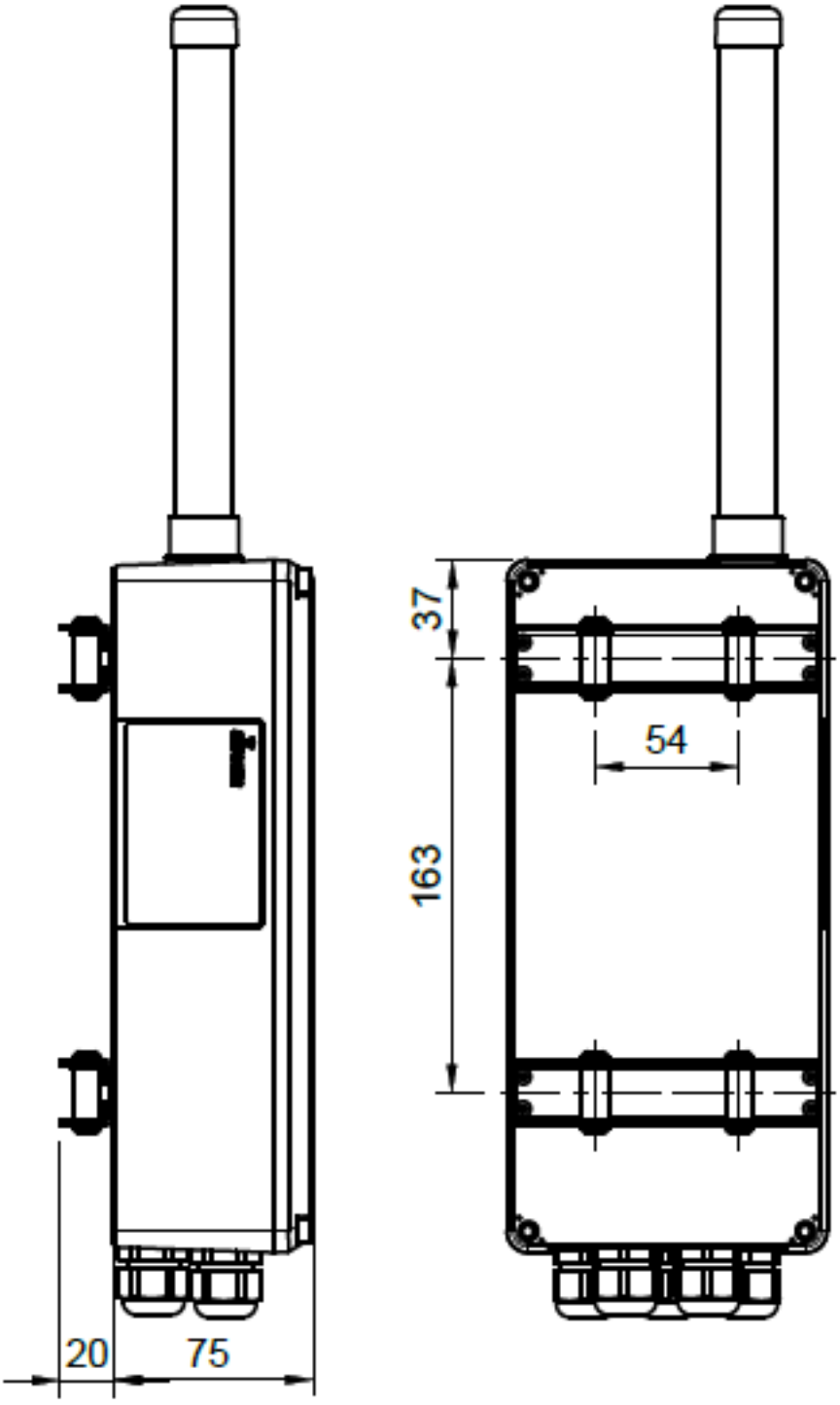
- x2 304SS mounting plates
- x8 304SS thread forming screws, 3x16mm, Pozi



WTP03-Mpost:

Post mount bracket includes:

- x2 304SS post brackets
- x4 M6 machine screws & nyloc nuts
- x2 304SS jubilee clips
- x8 304SS thread forming screws, 3x14mm, Pozi



2.5 Electrical installation

Certain Aircom products are designed for use in hazardous (explosive) environments. Prior to use in any hazardous environment the supplied ATEX certificate should be reviewed by a competent person to ensure the device is safe for use in the specific application.

The Aircom RTU is an electrical device which is powered either by an internal battery or auxiliary power supply. Care should be taken and the instructions in this manual / ATEX certificate should be observed to ensure safe operation.

2.5.1 Terminals

The Aircom wiring terminals are located inside the enclosure at the bottom in two blocks of 24 pins.

The terminals are spring type and require the use of a flat head screwdriver to install / remove wires. It is recommended that the Aircom accessory WTP03-Tterm, terminal tool be utilised.

TB1

1	2	CH1	CH2	4-20mA Active
3	4			
5	6	CH1		4-20mA Passive HART® / DO
7	8	CH2		4-20mA Passive HART® / DO
9	10	CH1		+/- 10V
11	12	CH2		+/- 10V
GND	GND			GND
15	16	CH1		PRX Namur / Voltage Input
17	18	CH2		PRX Namur / Voltage Input
19	20	CH1	CH2	Voltage Input
GND	GND			GND
23	24			Auxiliary Power Supply

TB2

RTD, TC & Resistance	CH1	24	23	
		22	21	
RTD, TC & Resistance	CH2	20	19	
		18	17	
Volt-Free DI		16	15	
		14	13	
GND		GND	GND	
RS485	CH1	10	9	
RS485	CH2	8	7	
4-20mA Passive / DO	CH3	6	5	
4-20mA Passive / DO	CH4	4	3	
4-20mA Passive / DO	CH5	2	1	

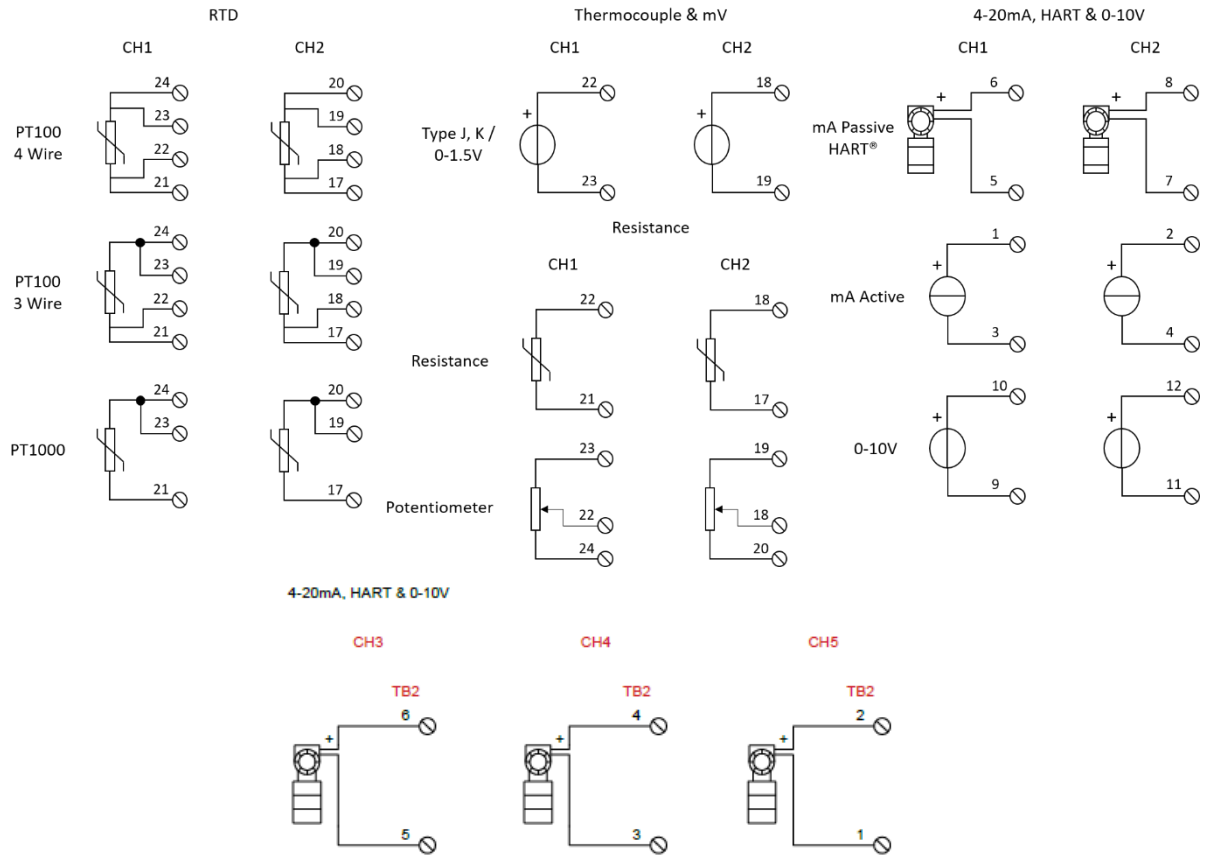
Note: *The above terminal layout applies to Aircom models WTP03-Ex-HD485 & WTP03-Ex-AD485. For Aircom model WTP03-Ex-AD232 terminals 1 to 6 of TB2 are as depicted to the right.*

RS GND		GND	GND
RS232	CH1	4	3
RS232	CH2	2	1

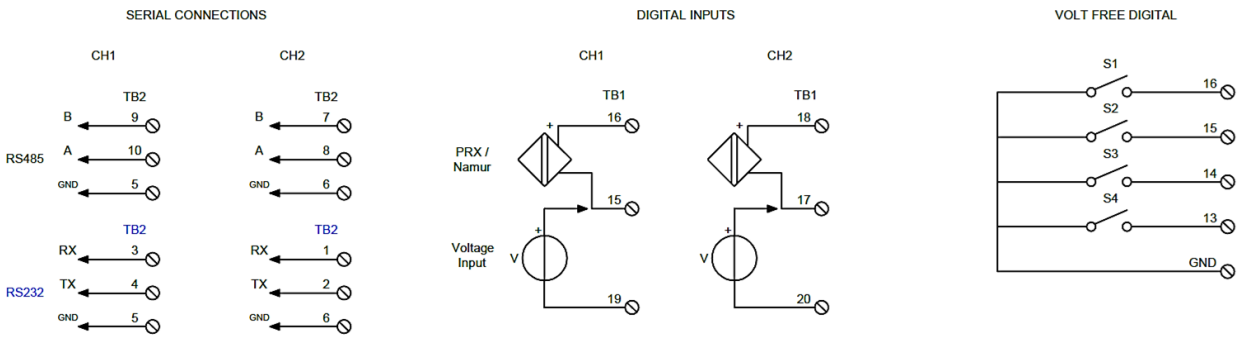
2.5.2 Wiring diagrams

The following diagrams depict the standard wiring arrangements:

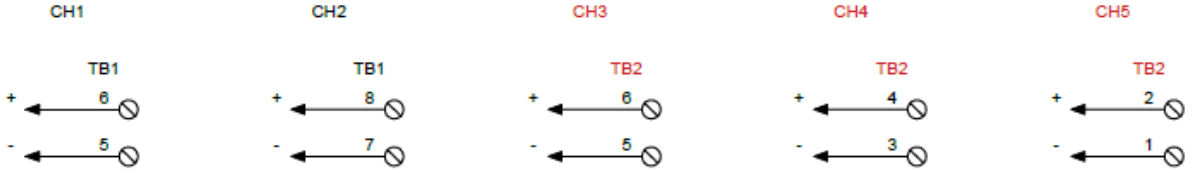
Analogues:



Digitals & Serials:



Digital Outputs:



Note: *Connections marked in Red are for WTP03-Ex-HD485 version only, marked in Blue WTP03-Ex-AD232.*

2.5.3 Battery

All Aircom units will be supplied with a battery as the primary power source, see 2.5.4 Auxiliary Power supply for external power applications.

For applications in explosive environments ensure the battery is WTP03-BEx and appropriate for the rated hazardous area.

Specification:

Voltage	3.6V
Capacity	19Ah
Chemistry	Lithium Thionyl Chloride
Material	ABS
Certification (WTP03-BEx, only)	Ⓔx II 1G Ex ia IIC T4 Ga (-20 ≤ Ta ≤ +60°C)
Dimensions	83mm H x 51mm D
Weight	0.190kg
Connection	3 pin female, central pin positive, 2 outer pins 0V

Installing/removing the battery:

The battery will be supplied disconnected from the Aircom unit. To install the battery, open the Aircom transmitter by removing the four M5 Hex screws and lid. Once the lid is removed insert the battery into the holster by pushing back left against the spring and registering the two flat edges of the battery against the holster side walls. Once the battery is in place the spring will push it to the right to make contact with the 3 male pins.

To remove the battery simply pull left and upward at the same time. If a new battery is to be installed after removing the old, the Aircom will have the last configuration stored, this can be kept, edited or deleted. If the old configuration is kept, transmissions will be disabled until you update the clock time and re-join the network. (see 4.6).

The Aircom battery must only be replaced with Aircom Type WTP03-BEx / BSa Lithium Thionyl Chloride Replaceable Battery Pack. A full battery voltage is around 3.6V, at 3.2V the battery will typically have between 1-4 weeks charge left and 2.9V is a dead battery.

Storage. The batteries have a 10 year storage life and typically have a 1% loss of charge per year at 20DegC.

2.5.4 Auxiliary power supply

All Aircom devices have an auxiliary power supply input. The required supply parameters are determined if the application is safe or hazardous:

A suitable ATEX intrinsically safe barrier should be selected as per the requirements detailed below. Our recommend barriers are P&F KFD2-SLD-Ex1.13100 for zone 0 and Stahl 9143/10-124-150-10 & Stahl 9143/10--65-250-10 for zone 1.

Hazardous (ATEX):

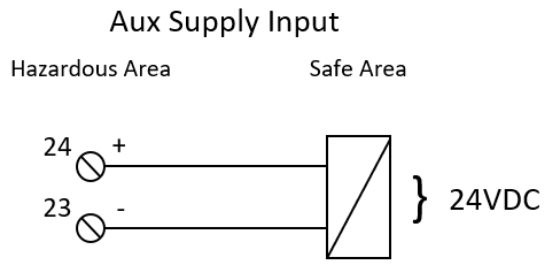
Ui (V)	23VDC
Ii (mA)	380mA
Pi (mW)	2100mW

Safe Area:

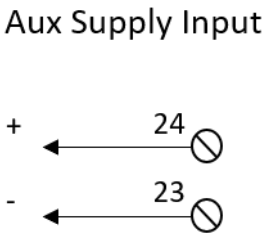
Volt	12VDC
Amps	85mA
Power	1W

Wiring:

Hazardous (ATEX):



Safe Area:



Note: *See 2.5.1 Terminals.*

2.6 Installing the configuration app

All Aircom devices are configured via a Bluetooth (BLE) mobile app. The app is free to download on both the Google Play Store and Apple App Store.

Configuration App Icon

2.6.1 System requirements

Minimum requirements for a device to successfully use the Aircom configuration app are as follows:

Android Devices:

- Android 5.0 Lollipop or later.
- Bluetooth Low Energy (BLE).

iOS Devices (iPhone/iPad):

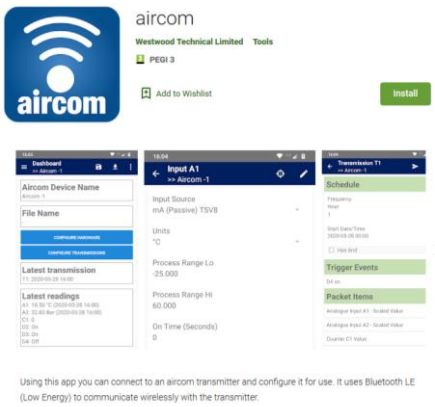
- iOS 12.0 or later.
- Bluetooth Low Energy (BLE).

2.6.2 Installing the app on an Android device

On your Android phone or tablet:

- Open Google Play Store.
- Search for Aircom by YZ Systems Limited.
- Tap **Install**.

You can also navigate directly to the app on Google Play Store using the following link: play.google.com/store/apps/details?id=com.aircom



Manually

The main steps required to install the app manually are:

- Obtain a link or email copy of the Aircom app installation file. The file name should be "aircom-2.0.apk" or similar. (The version number, e.g. "2.0", may be different.) *For security, it is important that you obtain this installation file directly from the manufacturer.*
- Download the installation file to your device. Make a note of the folder you saved the file to.
- Use a file manager app or your device's "Downloads" app to browse to the folder you saved the installation file to. If your device does not have a file manager app, you can download a free one from the Google Play Store.
- Tap the installation file to install the app. If this is the first time you are manually installing an app, you will be prompted to enable installation of "unknown apps" or similar. Follow the instructions to enable installation. Then return to your file manager or Downloads app and tap the installation file to install it. Tap OK to any prompts if you are happy to proceed. The app should now be installed and can be opened.

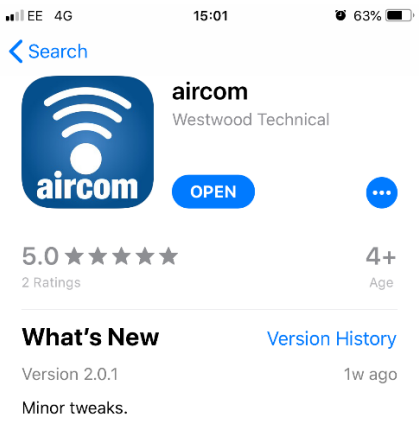
Please note that you may need to adjust these procedures depending on the make and Android version of your device.

2.6.3 Installing the app on an iOS device

On your iOS phone or tablet:

- Open the App Store.
- Search for Aircom by YZ Systems Limited.
- Tap **Install**.

You can also navigate directly to the app on the App Store using the following link: https://apps.apple.com/gb/app/aircom/id1463034584?mt=8



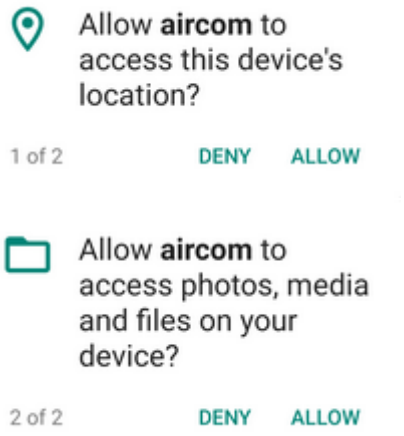
Part III Configuration App – The Basics

3.1 Opening the app

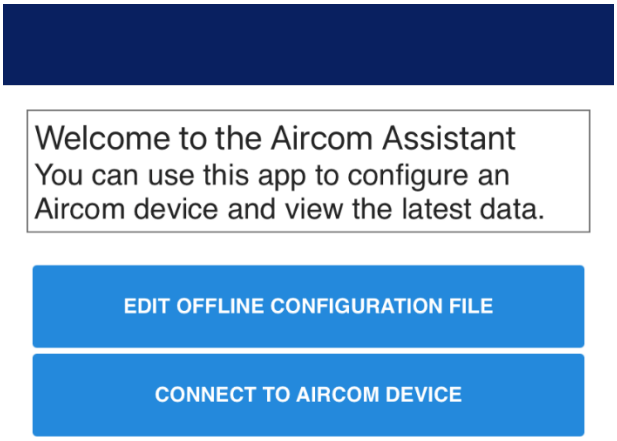
To open the app:

- Tap the Aircom icon in your device's list of apps:

- (Android only) When you open the app for the first time, you may see the following prompts, or similar:



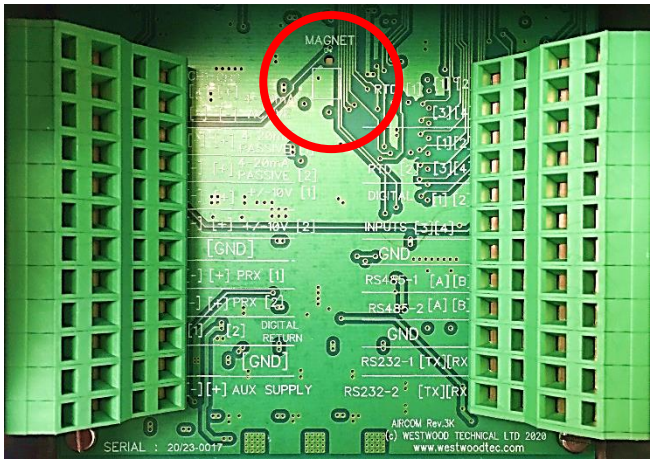
- Tap "Allow". You should now see the welcome screen:



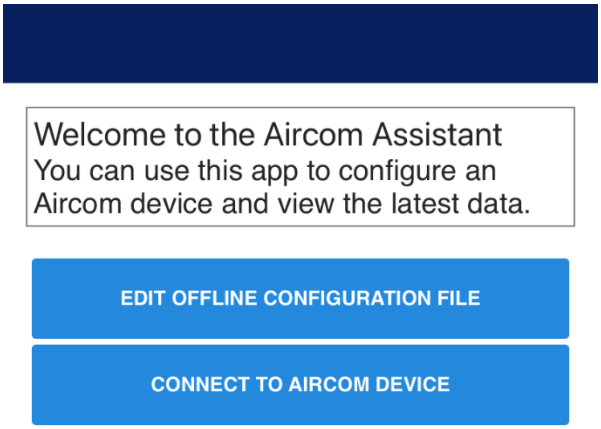
3.2 Connecting to an Aircom

To connect to an Aircom transmitter:

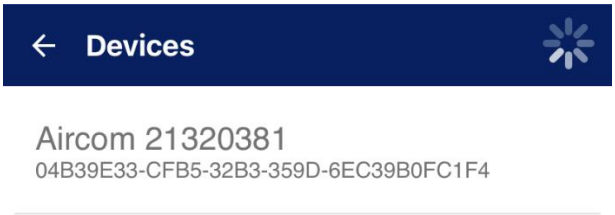
- Activate the transmitter Bluetooth. To activate the Bluetooth, tap a magnet onto the magnet square inside the unit between the two terminal blocks. The factory set sequence is 3 slow taps. Once you activate the Bluetooth the green LED above the magnet square will flash to indicate activation.



- In the welcome screen of the configuration app tap "CONNECT TO AIRCOM DEVICE":

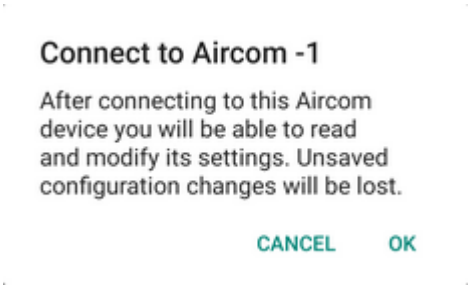


- The devices screen will appear and show any devices that are powered on and within range:

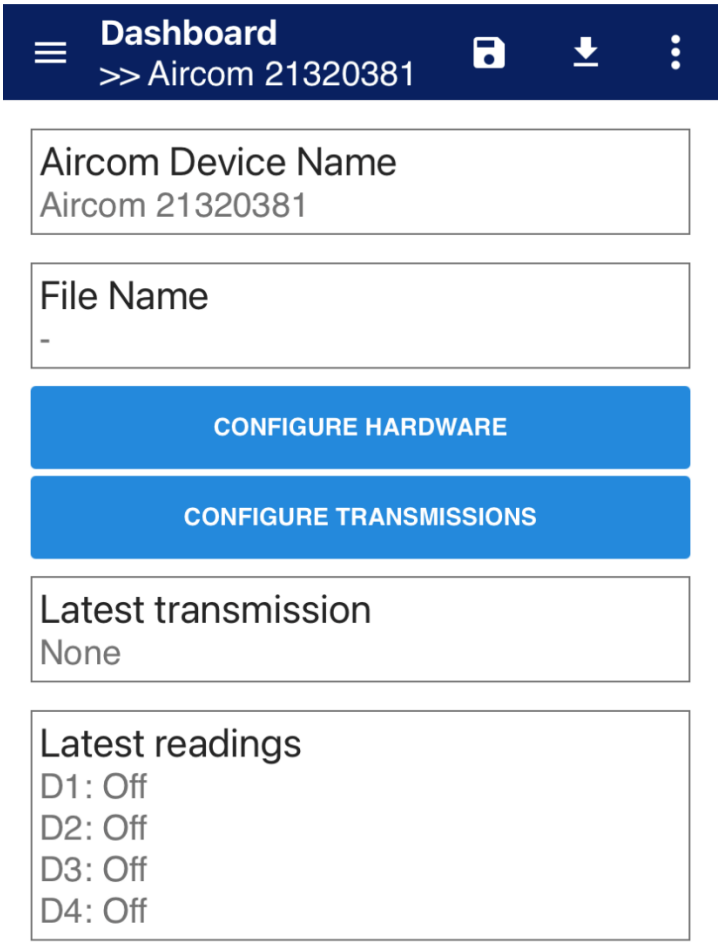


- To connect, tap the desired device in the list. Scanning will stop after 30 seconds; to restart scanning tap the refresh button.

- When prompted, tap "Connect to...":



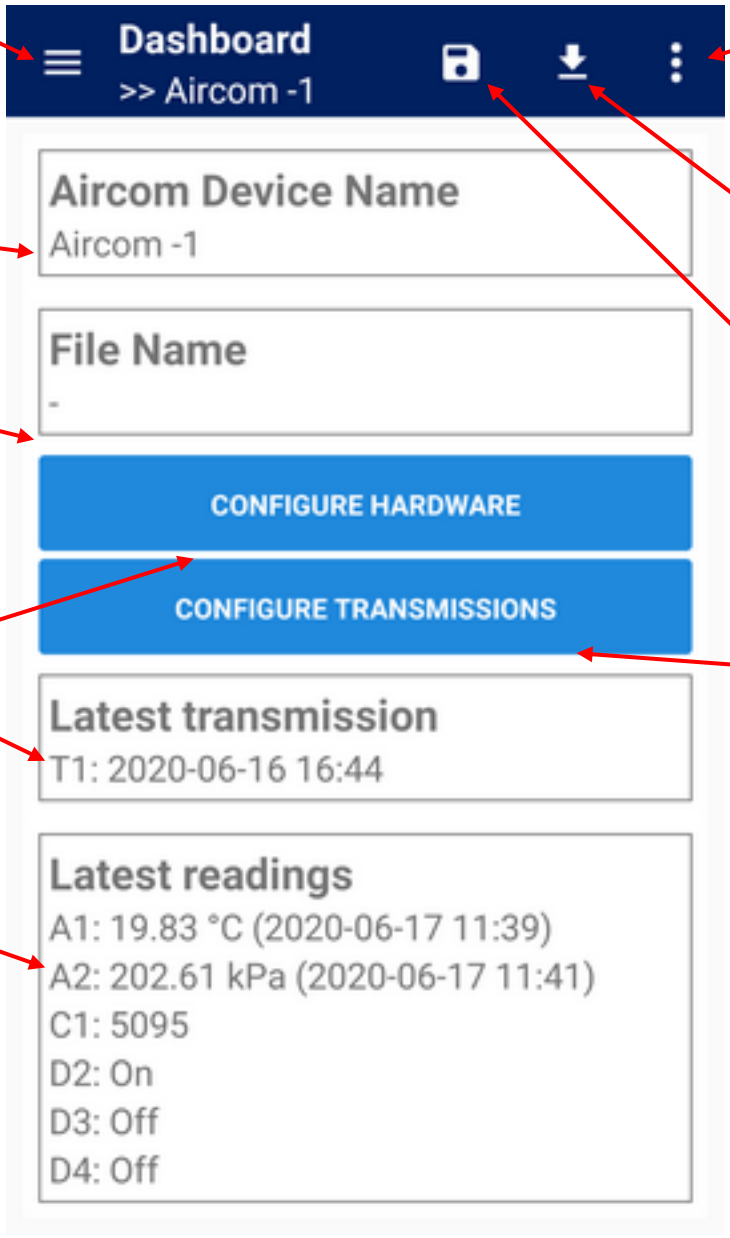
- After a brief delay, the transmitter will be connected, and the Dashboard screen will be displayed:



3.3 Navigating the App

Once you have connected to an Aircom transmitter you can navigate between difference app screens as follows:

3.3.1 App dashboard



Navigation drawer
Opens the navigation drawer to access other App screens.

Device name
Displays the device name.

Config file name
Name of the current saved configuration file.

Hardware configure button
Quick link - Opens the hardware configuration screen.

Latest transmission time
Displays the time of the most recent transmission.

Latest hardware readings
Displays the most recent readings from all hardware channels.

More button
Displays additional options related to the configuration file.

Download config button
Downloads the current configuration to the Aircom device.

Save config button
Saves the current configuration to a file on the user's device.

Transmissions configure button
Quick link - Opens the transmission configuration screen.

Note: *"Quick link" refers to a button that quickly navigates to a certain screen, rather than using the conventional navigation path.*

3.3.2 Navigation drawer

To navigate through the App screens, tap the navigation drawer button:

Once selected the navigation drawer will open:

Dashboard

Returns to the main dashboard screen.

Files

Opens the files screen to retrieve current configuration files.

Hardware

Opens the hardware configuration dashboard.

Polls

Opens the Modbus Polls configuration dashboard.

Transmissions

Opens the transmissions configuration screen.

Readings

Opens the readings screen which displays readings from connected hardware.

LoRaWAN Settings

Opens LoRaWAN settings screen.

Aircom Device Status

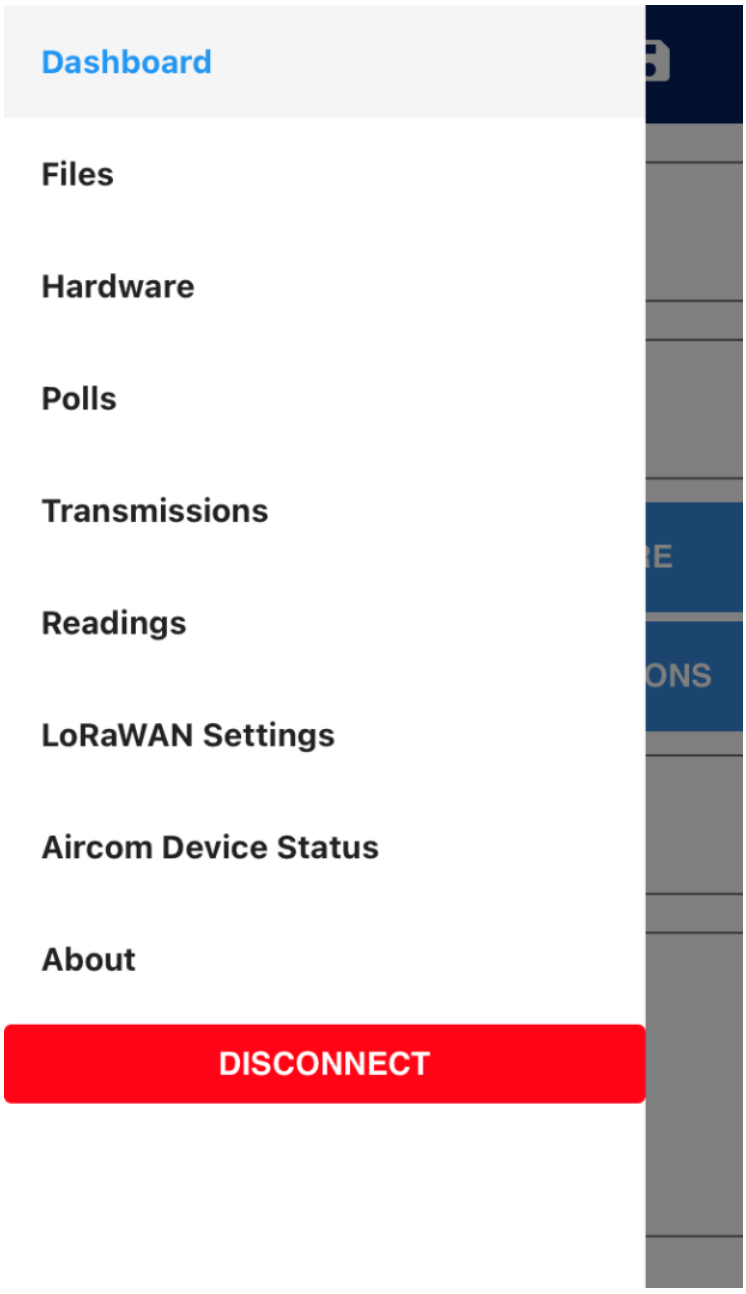
Opens the device status screen which displays general device status (e.g. battery level, clock time, network connectivity).

About

Opens the about screen which displays general device information (e.g. firmware version)

Disconnect

Disconnects from the Aircom and turns off the transmitter's Bluetooth.



3.3.3 Disconnecting from an Aircom

To disconnect from an Aircom and turn off its Bluetooth tap the navigation drawer button:

Once selected the navigation drawer will open, press the "DISCONNECT" button at the bottom of the drawer and the app will disconnect and turn off the Aircom's Bluetooth. Once this is complete the app will send you back to the Welcome screen.

3.4 Messages & warnings

3.4.1 Messages

After tapping a button, you may see one or more messages at the bottom of the screen. These have been received from the Aircom and indicate actions currently taking place or that have succeeded or failed.

There are three types of message, as follows:

Success Messages (Green)

Information Messages (Amber)

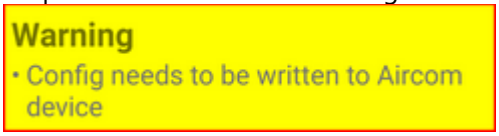
Failure Messages (Red)

3.4.2 Hiding a message

Messages stay on the screen until replaced by another message. Alternatively, you can tap or swipe a message to hide it.

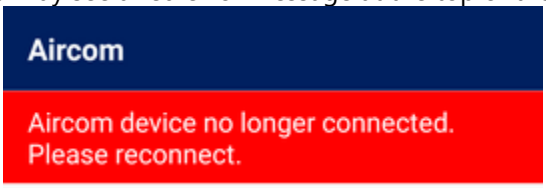
3.4.3 Warnings

When editing an Aircom configuration, you may see yellow warnings at the bottom of the screen. These may suggest possible issues with the configuration or recommend actions.



3.4.4 Errors

Occasionally you may see a red error message at the top of the screen.



(See "Part VI Troubleshooting" for more information.)

Part IV Configuration App – Screens

4.1 Files screen & configuration files

The files screen is a location where Aircom configuration files can be opened, uploaded, saved and deleted. Configuration files can be created offline and when live connected to an Aircom device.

To access the files screen, tap the navigation drawer button on the main dashboard and then select "FILES".

Alternatively tap the more button and select "FILES".

Or if configuring a file offline you can also select the open file button:

Once completing one of the above actions the files screen will be open:

 Return to main dashboard.

 Refresh button.

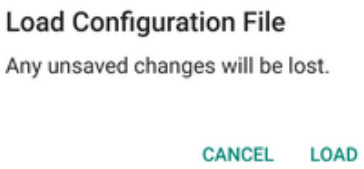
 Delete file button.

 Share file button. E.g. share file externally via email or other application on the user's device.

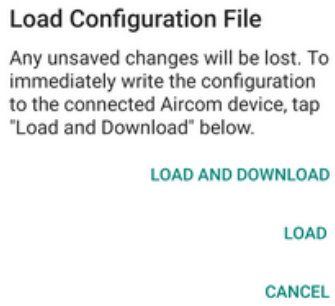
4.1.1 Loading a file

From the files screen tap a file to open it.

If you are not connected to a transmitter you will see the following dialogue. Tap LOAD to load the configuration file.



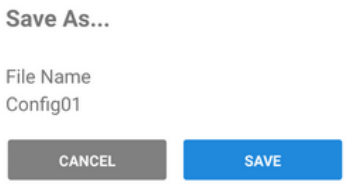
If you are connected to a transmitter you will see the following dialogue. Tap LOAD AND DOWNLOAD or LOAD.



4.1.2 Saving a file

When you wish to save a live configuration, navigate to the main dashboard then tap the save file button or tap the more button then "SAVE FILE AS".

After doing so the current save file will be overwritten. If you use "SAVE FILE AS" the save file screen will be opened and you will be prompted to name the new save file. After which press save and the new file will be stored on your device.



4.1.3 Downloading a file to an Aircom

When you wish to download a configuration file to a connected Aircom navigate to the main dashboard then tap the Download button.

You will receive a message to say the file was downloaded successfully or not.

4.1.4 Further actions

For further configuration file actions tap the more button on the main dashboard:

After which the "more" menu will appear with the following options:

Files...

Opens the Files screen.

Save File As...

Saves the current configuration with a new file name, see 4.1.2 Saving a file.

Push Config to Aircom Device

Push/download the current configuration to the connected Aircom.

Load Aircom Device Configuration

Load configuration from the connected Aircom into the App. Any unsaved changes in the App will be lost.

Clear Configuration

The configuration held in the App and any connected Aircom will be cleared.

Default Configuration

The configuration held in the App and any connected Aircom will be set to default valves.

4.2 Hardware screen & device configuration

The hardware screen displays a dashboard of all the input/outputs, their current configuration and the ability to select an input/output and configure.

To access the hardware screen, tap the navigation drawer button on the main dashboard and then select "HARDWARE".

Alternatively tap the "CONFIGURE HARDWARE" button on the main dashboard:

Once completing one of the above actions the hardware screen will be open:


Return to main dashboard.

A1
Analogue channel 1, select to configure.

A2
Analogue channel 2, select to configure.

A3 – Only HD485 Model
Analogue channel 2, select to configure.

A4 – Only HD485 Model
Analogue channel 2, select to configure.

A5 – Only HD485 Model
Analogue channel 2, select to configure.

D1
Digital channel 1, select to configure.

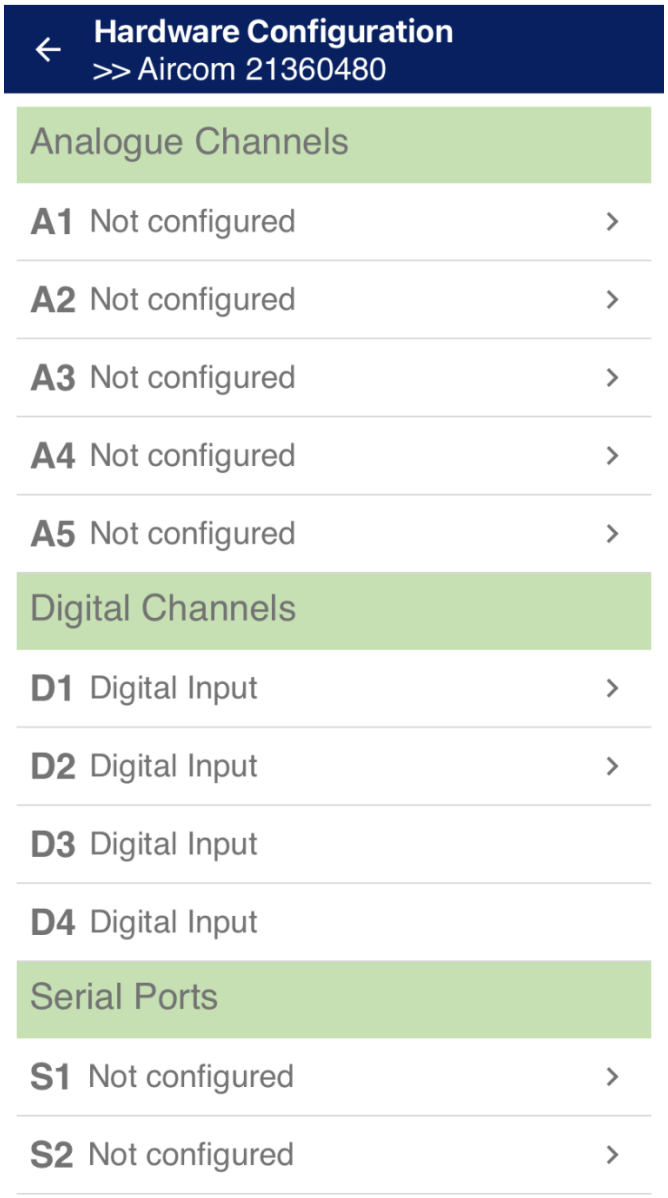
D2
Digital channel 2, select to configure.

D3
Digital channel 3, not configurable, only volt-free input.

D4
Digital channel 4, not configurable, only volt-free input.

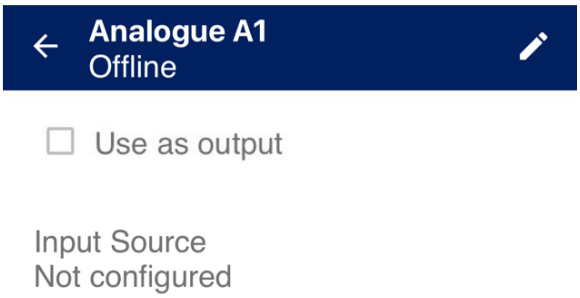
S1
Serial channel 1, select to configure.

S2
Serial channel 2, select to configure.



4.2.1 Configuring an analogue input

To configure an analogue input first navigate to analogue channel 1 or 2 (and 3, 4 or 5 if using the HD485 model), after doing so the selected analogue channel screen will open:



Return to hardware dashboard.

Edit config button. Tap to edit the configuration.

Use as output

Check to configure channel as powered digital output, See 4.2.4.

Input Source

The defined input source.

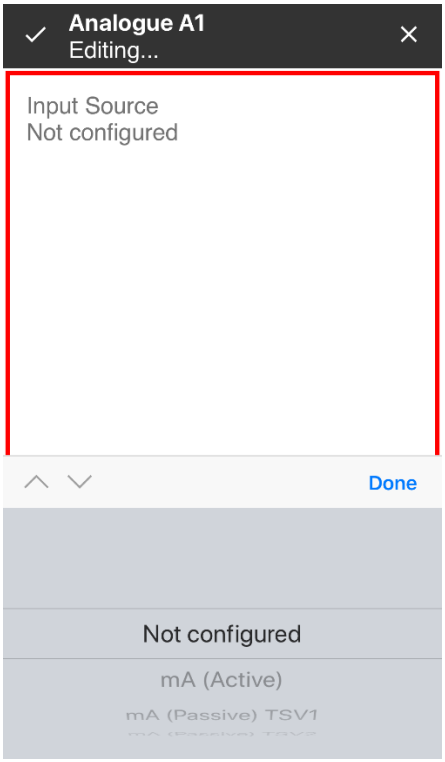
When on the selected analogue channel screen tap the edit config button:

After doing so the screen will be highlighted with a red border to signify editing mode. Once in editing mode tap “INPUT SOURCE”. Doing so will open the analogue options drawer, when the drawer is open select the desired analogue input.

Cancel changes and exit editing mode.

Apply changes and exit editing mode.

When selecting an input ensure wiring is correct. See 2.5.2 Wiring diagrams. 4-20mA channels can monitor 0-22mA.



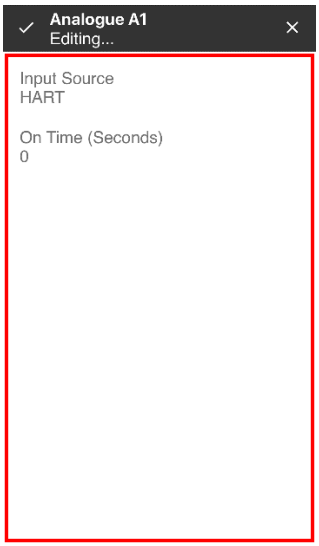
When the desired input is selected further options may be available. Some standard inputs e.g. PT-100 or thermocouple, do not require additional options. See the examples below :

Input Source

HART

On Time

Time to allow the connected transmitter to turn on and stabilise.



Input Source

mA Passive TSV8, 4-20mA loop powered by the Aircom device.

Input Range

4-20mA.

Units

Set the application units (e.g. Barg, ^{0}C).

Process Range Lo

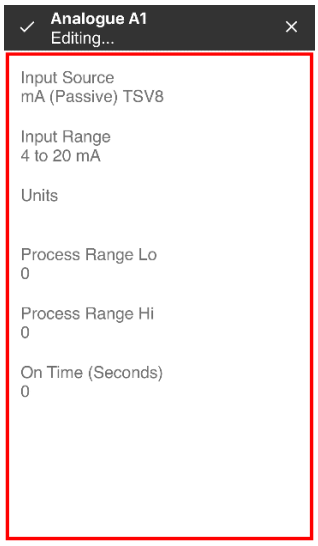
Set the bottom of the process range.

Process Range Hi

Set the top of the process range.

On Time

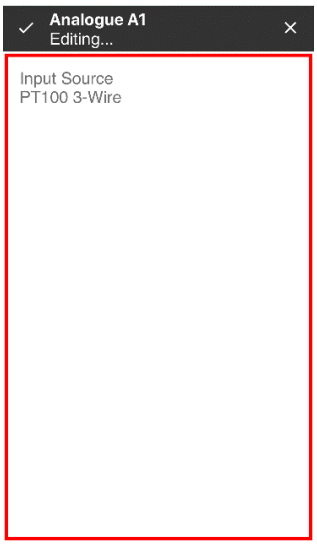
Set time to allow the connected transmitter to turn on and stabilise.



Input Source

PT100 3-Wire

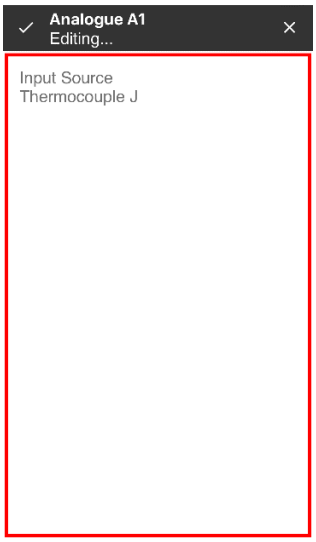
Standard source, no additional options required.



Input Source

Thermocouple J

Standard source, no additional options required.

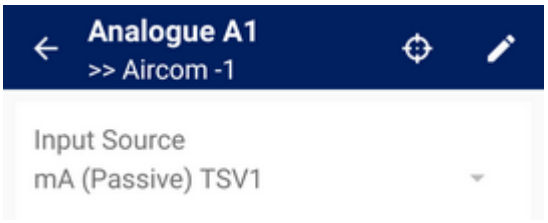


Once you have completed the configuration tap the apply changes button.

After doing so a warning message will appear stating "Config needs to be saved to file". The file can be saved to the user's device or downloaded to the connected Aircom from the main dashboard by tapping the save or download button. See 4.1.2 and 4.1.3.

4.2.2 Calibrating an analogue input

Once the analogue channels are configured they can be calibrated up to 20 points to ensure the highest possible accuracy. To calibrate an analogue input, navigate to the desired analogue channel:



Then tap the calibration button.

After doing so the calibration screen will open:


Return to analogue channel.


Edit config button. Tap to edit the configuration.

To add, edit or delete a calibration point tap the Edit config button.

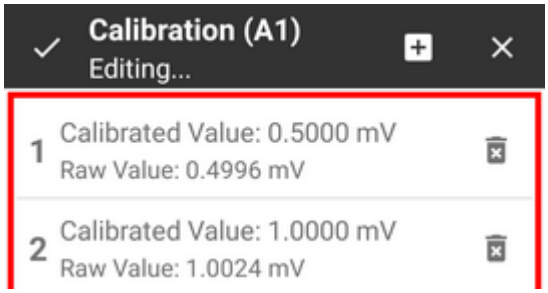
After doing so the screen will be highlighted with a red border to signify editing mode. At this point calibration points can be added, edited or deleted.


Cancel changes and exit editing mode.


Keep changes and exit editing mode.


Add calibration point.


Delete calibration point.



When you add / edit a calibration point the following screen will appear:

Set the desired calibration point in the app and then ensure the input is also set to the same desired value. When ready tap calibrate, the raw value and calibrated value will be saved.

When you have added all the needed calibration points tap the apply changes button. The new calibration points will be automatically downloaded directly to the connected Aircom.

Please note only the following input sources can be calibrated: mA, Voltage, mV and Ohms.

4.2.3 Configuring a digital input

To configure a digital input first navigate to the hardware screen. The screen will display the four possible digital inputs. The only configurable digital inputs are D1 and D2. D3 and D4 are Volt-free inputs only. The possible configurations are:

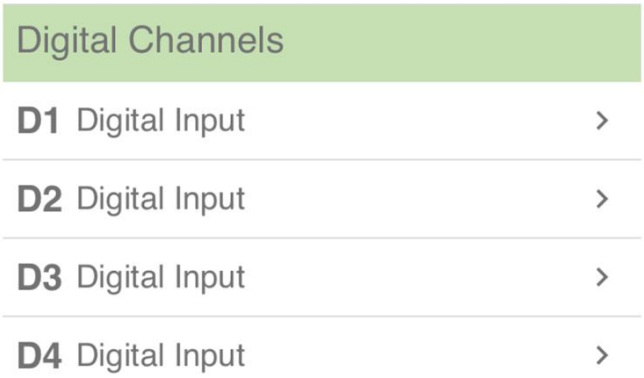

Return to main dashboard.

D1
Digital channel 1, select to configure. Volt-Free, Counter or NAMUR.

D2
Digital channel 2, select to configure. Volt-Free, Counter or NAMUR.

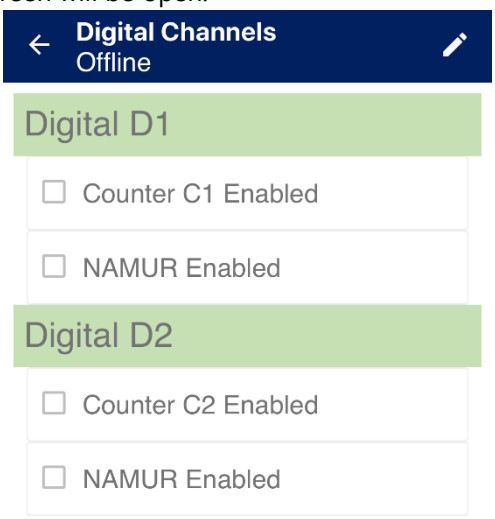
D3
Digital channel 3, select to configure digital alarm LoRaWAN packet.

D4
Digital channel 4, select to configure digital alarm LoRaWAN packet.



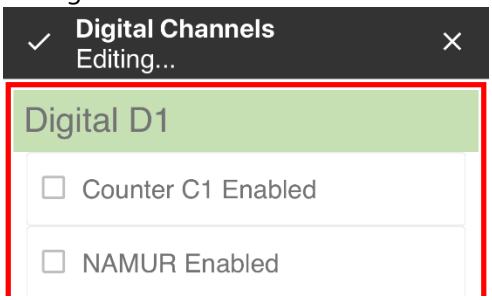
When selecting an input ensure wiring is correct. See 2.5.2 Wiring diagrams.

To configure D1 or D2, leave as "Digital Input" for Volt-Free, or tap the desired channel and the digital configuration screen will be open.

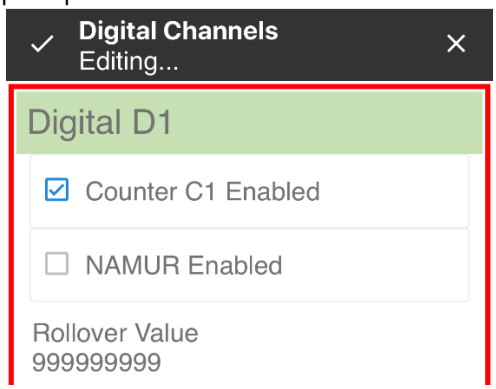


Once in the digital configuration screen tap the edit button.

After doing so the screen will be highlighted with a red border to signify editing mode. At this point D1 or D2 can be configured to either counters or NAMUR inputs.



If the counter input option is selected a rollover value between 1 – 999999999 can be set.

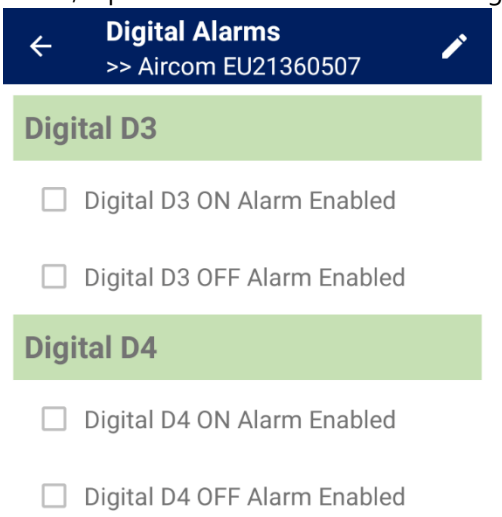


Once you have completed the configuration tap the apply changes button.

After doing so a warning message will appear stating "Config needs to be saved to file". The file can be saved to the user's device or downloaded to the connected Aircom from the main dashboard by tapping the save or download button. See 4.1.2 and 4.1.3.

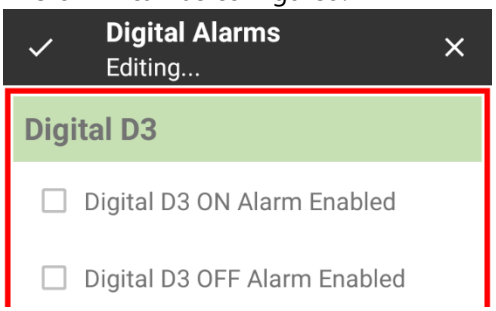
Counter inputs have a maximum frequency input of 3-5Khz..

To configure D3 or D4, tap the desired channel and the digital alarms screen will open.

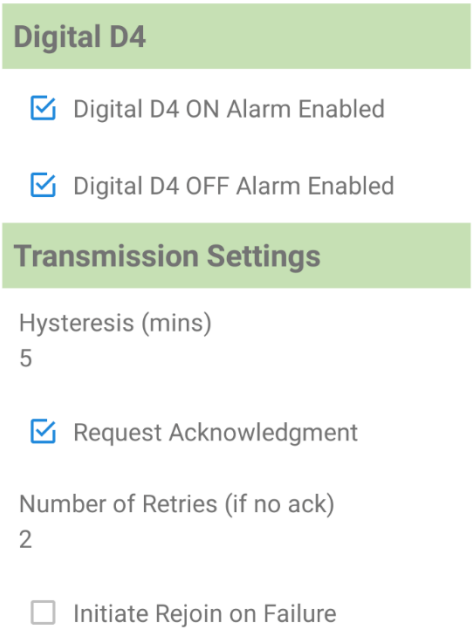


Once in the digital alarms screen tap the edit button.

After doing so the screen will be highlighted with a red border to signify editing mode. At this point digital alarms for D3 or D4 can be configured.



If one or more option is checked, other options can also be configured.

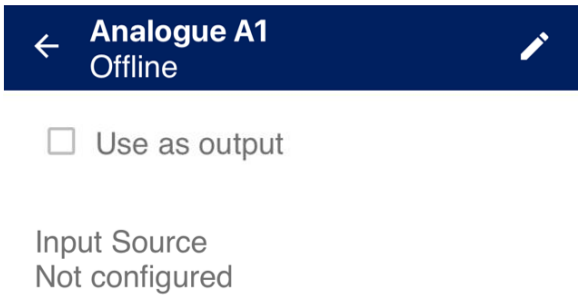


When an alarm has been triggered, e.g., Digital D4 ON, and the same event occurs again during the specified hysteresis time, a new alarm transmission will not be sent.
For an explanation of the other options, please see section 4.3.1 about transmission admin settings.
Once you have completed the configuration tap the apply changes button.

After doing so a warning message will appear stating "Config needs to be saved to file". The file can be saved to the user's device or downloaded to the connected Aircom from the main dashboard by tapping the save or download button. See 4.1.2 and 4.1.3.

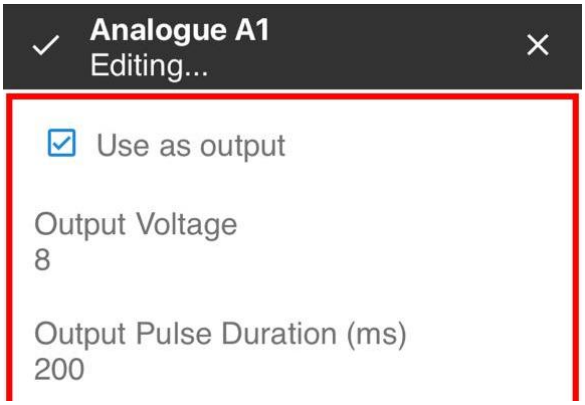
4.2.4 Configuring a digital output

To configure a digital output first navigate to ***analogue*** channel 1 or 2 (and 3, 4 or 5 if using the HD485 model), after doing so the selected analogue channel screen will open:



Tap the edit button then check the "use as output" box and the analogue input will be changed to a digital output. When changed to a digital output the output voltage can be set by selecting from option 1 – 8. The duration of the output pulse can also be set between 1 – 5000ms:

Output Voltage	
1	10.5VDC
2	11.3VDC
3	12.2VDC
4	13.0VDC
5	13.9VDC
6	14.7VDC
7	15.6VDC
8	16.4VDC



Once you have completed the configuration tap the apply changes button.

When returning to the main dashboard a new button will appear:

Tapping this button will open the output schedule configuration screen:

 Return to main dashboard.

 Edit config button. Tap to edit the configuration.

 Retrieve output schedule from connected server. Contact YZ Systems for advanced support.

Once in the digital output schedule configuration screen tap the edit button.

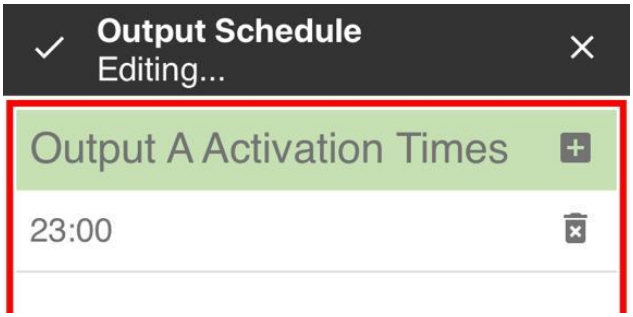
After doing so the screen will be highlighted with a red border to signify editing mode. At this point output activation times can be set, edited and deleted.

 Cancel changes and exit editing mode.

 Keep changes and exit editing mode.

 Add time button.

 Delete setpoint point.



Tap the add time button or tap a current scheduled time to edit. After doing so set the desired time to turn on the output (multiple on times can be set for each channel). Once you have completed the configuration tap the apply changes button.

After doing so a warning message will appear stating "Config needs to be saved to file". The file can be saved to the user's device or downloaded to the connected Aircom from the main dashboard by taping the save or download button. See 4.1.2 and 4.1.3.

4.2.5 Configuring the serial channels

To configure a serial channel first navigate to serial channel 1 or 2, after doing so the selected serial channel screen will open:


Return to hardware dashboard.


Edit config button. Tap to edit the configuration.

Port Enabled (RS485)

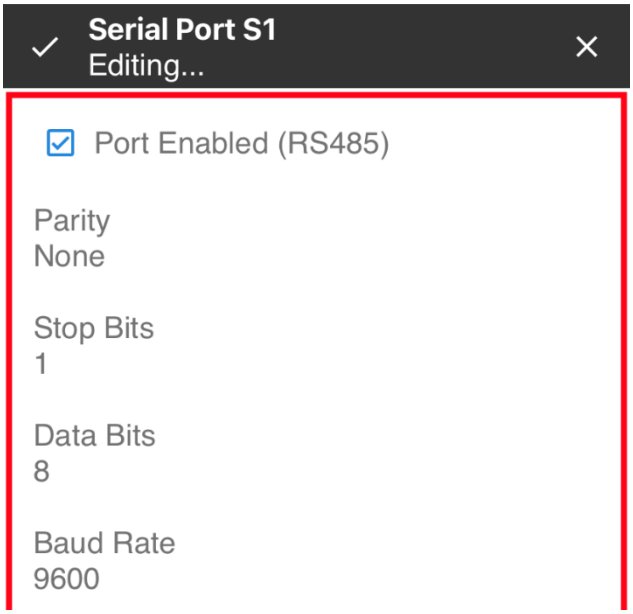
Check to enable the serial port and open the setting page.

When on the selected serial channel screen tap the edit config button:

After doing so the screen will be highlighted with a red border to signify editing mode. Once in editing mode the Modbus settings can be configured.


Cancel changes and exit editing mode.


Keep changes and exit editing mode.



Port Enabled (RS485)

Check to enable the serial port and open the setting page.

Parity

Set Modbus Parity.

Stop Bits

Set the Modbus stop bit.

Data Bits

Set the Modbus data bits.

Baud Rate

Set the Modbus baud rate.

Please note that the Aircom will pass the Modbus data unaltered to the server. To correctly display individual registers, the user must be aware of the data type of the instrument or end device.

Once you have completed the configuration tap the apply changes button.

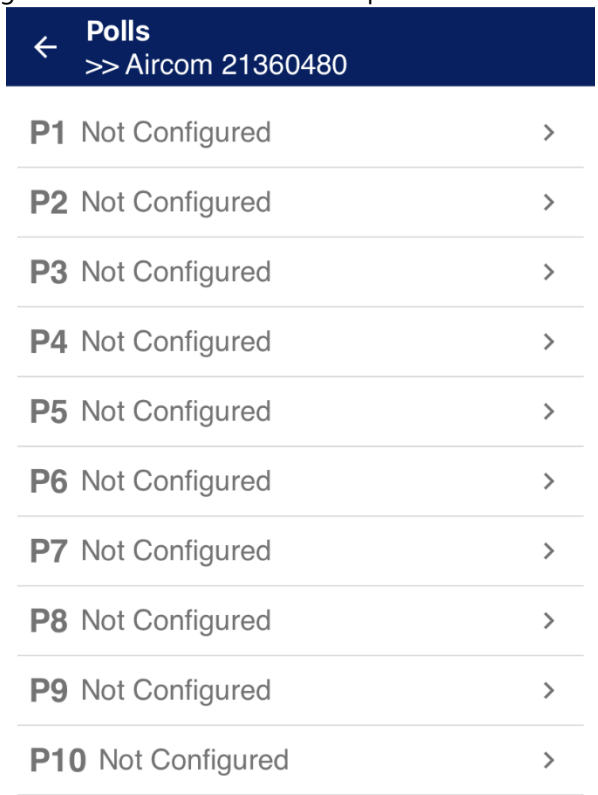
After doing so a warning message will appear stating "Config needs to be saved to file". The file can be saved to the user's device or downloaded to the connected Aircom from the main dashboard by tapping the save or download button. See 4.1.2 and 4.1.3.

4.2.6 Configuring Modbus Polls

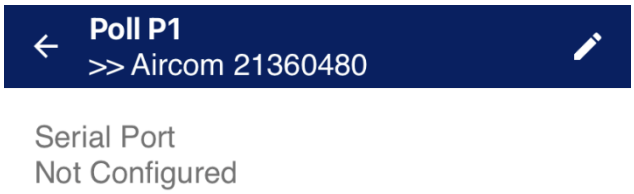
To configure Modbus Polls first navigate to the Polls screen, tap the navigation drawer button on the main dashboard and then select "POLLS".

Alternatively tap the "CONFIGURE POLLS" button on the main dashboard. Please note this button will only show when one of the serial channels are configured, see 4.2.5:

Once completing one of the above actions the polls screen will be open:



A maximum of 10 Modbus polls can be configured. To configure a poll, select one from P1 – P10, after which the poll configuration screen will be opened and a poll can be configured as follows:



 Return to hardware dashboard.

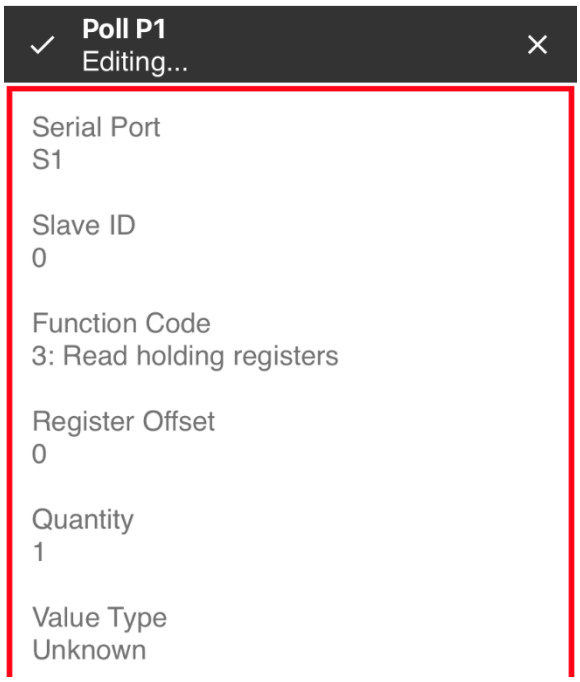
 Edit config button. Tap to edit the configuration.

Serial Port

Select serial port S1 or S2 to be utilised for the configured poll.

When on the selected poll screen tap the edit config button:

After doing so the screen will be highlighted with a red border to signify editing mode. Once in editing mode the Modbus settings can be configured.



 Cancel changes and exit editing mode.

 Keep changes and exit editing mode.

Serial Port

Selects the serial port (S1 or S2) to be used for this poll.

Slave ID

Sets the salve ID of the device.

Function Code

Sets the Modbus function code of this poll.

Register Offset

Sets a register offset.

Quantity

Sets the number of registers to be polled.

Value Type

Sets the data value type (e.g. integer, floating bit etc).

Once you have completed the configuration tap the apply changes button.

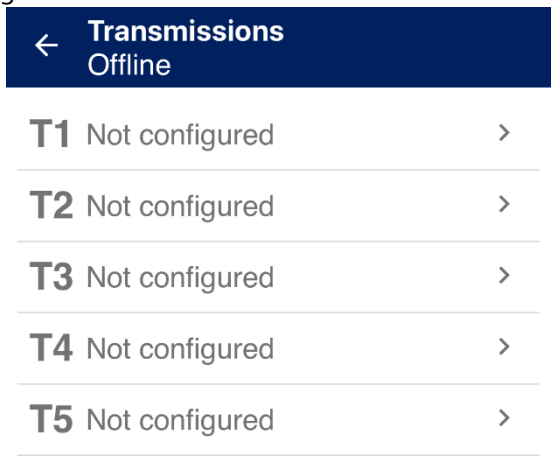
After doing so a warning message will appear stating "Config needs to be saved to file". The file can be saved to the user's device or downloaded to the connected Aircom from the main dashboard by tapping the save or download button. See 4.1.2 and 4.1.3.

4.3 Transmissions screen & transmission configuration

The transmissions screen displays a dashboard of all the transmissions, their current configuration and the ability to select a transmission and configure. To access the transmissions screen, tap the navigation drawer button on the main dashboard and then select "TRANSMISSIONS".

Alternatively tap the "CONFIGURE TRANSMISSIONS" button on the main dashboard:

Once completing one of the above actions the transmissions screen will be open:



A maximum of 5 transmissions can be configured. To configure a transmission, select one from T1 – T5, after which the transmission configuration screen will be opened and a transmission can be configured as follows:

 Return to transmissions dashboard.

 Edit config button. Tap to edit the configuration.

 Manually send transmission.

Schedule

Frequency

Set the frequency at which transmissions are sent (e.g. ever 1 hour, 2 minutes etc).

Start Date/Time

Set date and time that transmissions will being from.

Set Seconds

Set seconds time to transmission to stagger transmissions of multiple devices utilising the same gateway.

Has End

Check this box to add an end date for transmissions, after which set the end date and time.

Retrieve Output Schedule

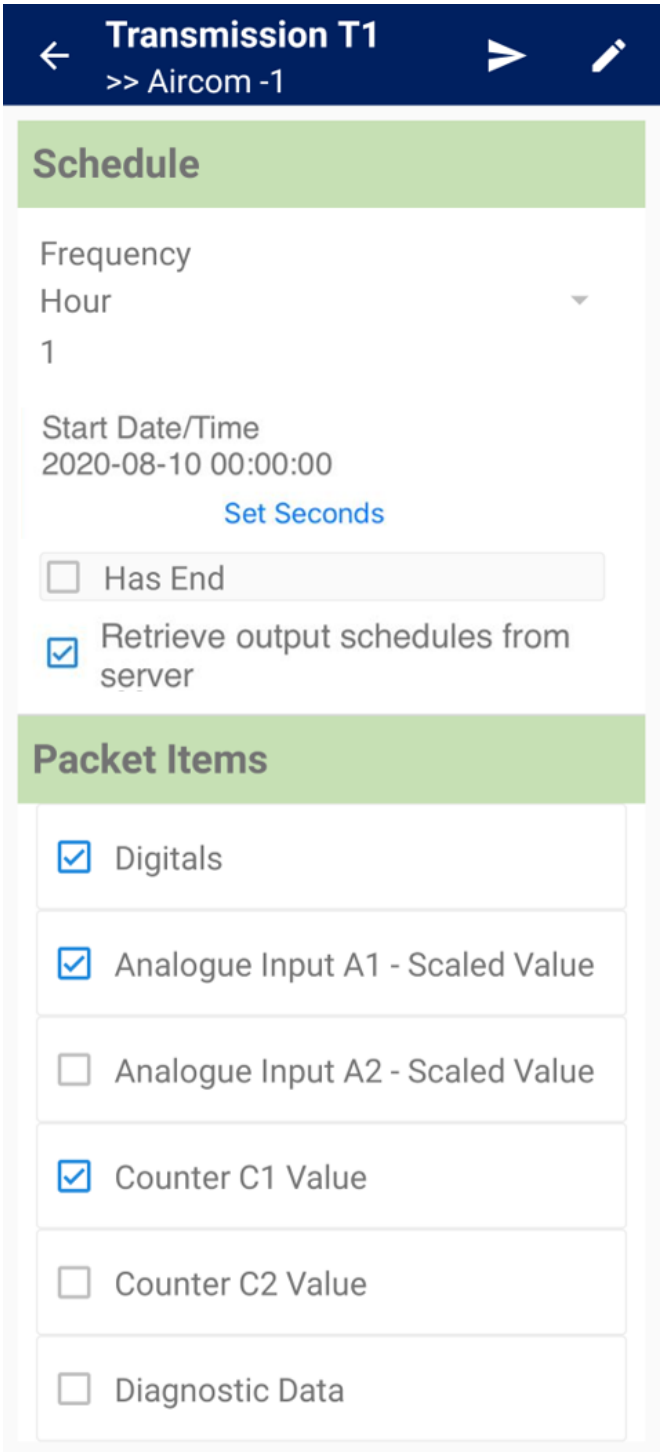
Advanced setting for receiving output schedule from connected server. Contact YZ Systems for advanced support.

Packet Items

Displays all configured hardware. Check each value to be sent on the transmission.

Diagnostic Data

Includes battery voltage, PCB temperature, clock time.

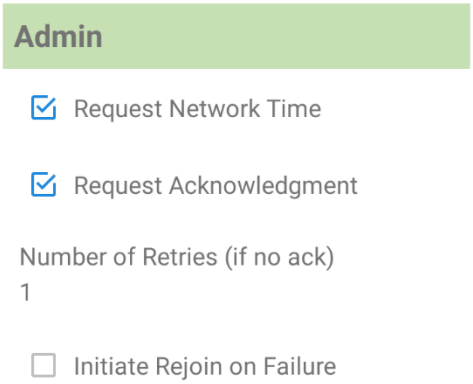


Once you have completed the configuration tap the apply changes button.

After doing so a warning message will appear stating "Config needs to be saved to file". The file can be saved to the user's device or downloaded to the connected Aircom from the main dashboard by tapping the save or download button. See 4.1.2 and 4.1.3.

4.3.1 Transmission admin settings

Admin options can also be set for each transmission.



Request Network Time

The transmission will request the current time from the server and adjust its internal clock from the received reply. (Available where the server supports LoRaWAN specification 1.0.3 or above.)

Request Acknowledgement and Retries

The transmission will request an immediate acknowledgement from the server to confirm that the packet has been received. If an acknowledgement is not received, the specified number of retries will be attempted.

Initiate Rejoin on Failure

If the requested acknowledgement is not received after the specified number of retries, the device will immediately enter "Rejoin" mode and will made periodic attempts to rejoin the LoRaWAN network. (See section 4.5.1)

4.4 Readings screen

The readings screen displays the current readings from all configured input sources along with battery voltage, temperature and transmitter serial number. To access the readings screen, tap the navigation draw button on the main dashboard and then select "READINGS".

After doing so the readings screen will be opened:


Navigation drawer button.


Refresh all readings. Get latest reading from all input sources.


Refresh individual reading. Get latest reading from selected input source.

Analogue Input A1 or 5 – Scaled Value
Displays the calibrated value.

Analogue Input A1 or 5 – Raw Value
Displays the raw input value.

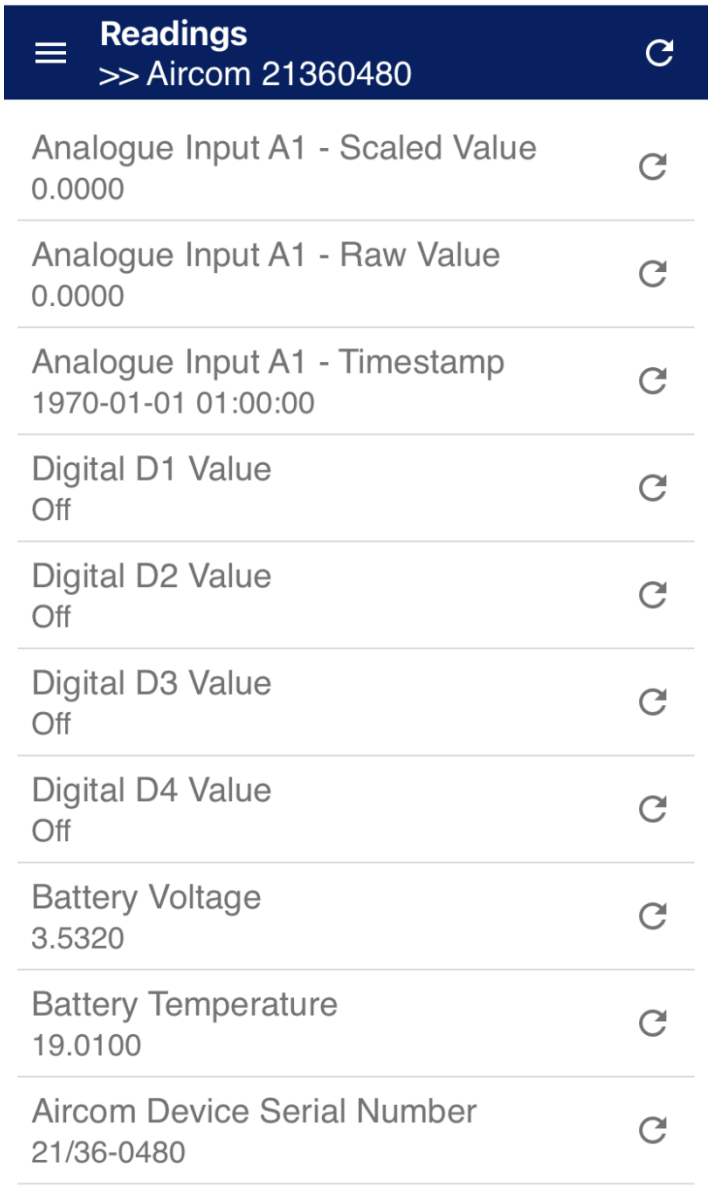
Analogue Input A1 or 5 – Time Stamp
Displays the time of the reading.

Digital D1 – D4
Displays the input values for the digitals.

Battery Voltage
Displays internal battery voltage.

Battery Temperature
Displays battery / transmitter temperature.

Aircom Device Serial Number
Displays Aircom serial number.



4.5 LoRaWAN settings screen

The LoRaWAN settings screen allows you to view the transmitter's LoRaWAN device EUI and to set the App Key and App EUI. Please note that for security reasons the LoRaWAN EUI and APP key cannot be read from the transmitter and will show on the screen as "Value hidden". To access the LoRaWAN settings screen, tap the navigation drawer button on the main dashboard and then select "LORAWAN SETTINGS".

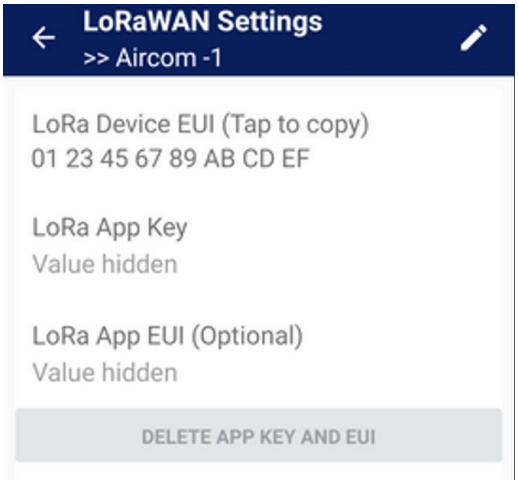
After doing so the LoRaWAN settings screen will be opened:

 Return to transmissions dashboard.

 Edit config button. Tap to edit the configuration.

Delete App Key and EUI

Deletes the stored App Key and EUI. New values will need to be entered to connect to a LoRaWAN network.



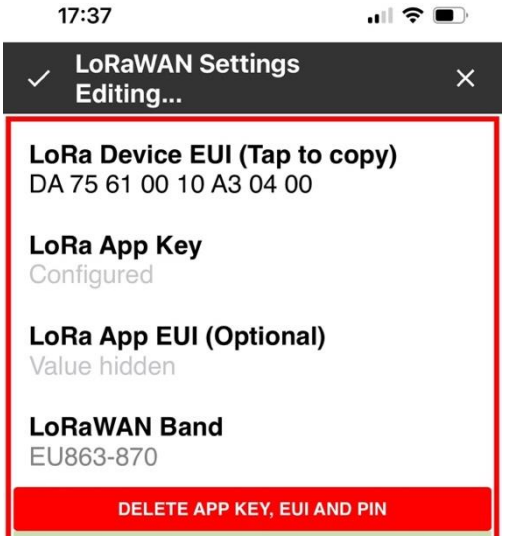
To edit the EUI or App Key tap the edit config button:

After doing so the screen will be highlighted with a red border to signify editing mode and you can edit the EUI and App key:

Once you have completed the configuration tap the apply changes button.

After doing so a warning message will appear stating "Config needs to be saved to file". The file can be saved to the user's device or downloaded to the connected Aircom from the main dashboard by tapping the save or download button. See 4.1.2 and 4.1.3.

After applying new values, you will be able to see the new values. However, when reconnecting to the transmitter in the future, the values will be hidden.



When in 'edit mode' an optional red button 'DELETE APP KEY, APP EUI AND PIN' will be displayed. This

will blank the Aircom's join settings and PIN if set (note: LoRa Device EUI will be retained).

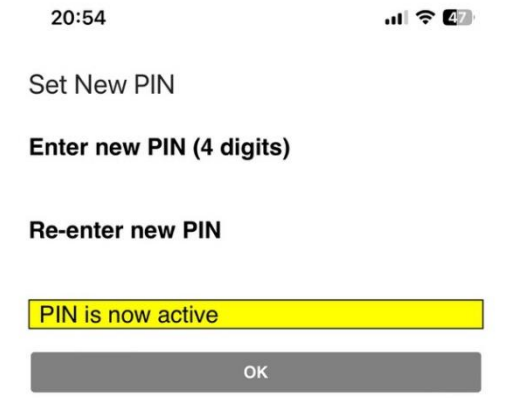
4.5.1 Setting a Security PIN

A 4-digit security PIN can optionally be set.

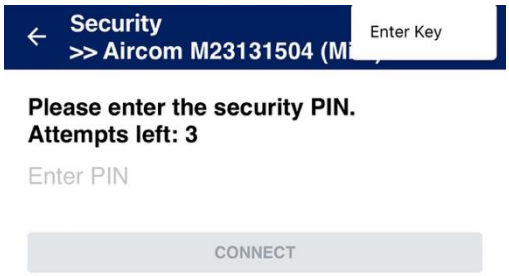
This PIN can only be set when configuring an AppKey **and** successfully being able to join a network.

When an AppKey is input and configured, a blue button 'SET NEW PIN AND JOIN NETWORK' will be displayed.

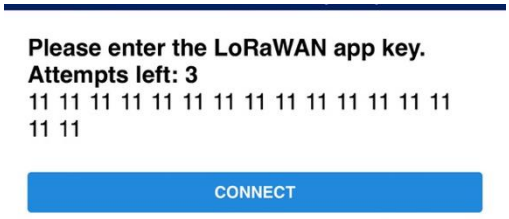
This will request a 4-digit PIN to be entered and **immediately** try to join. If the join fails, then the PIN will not be set. If the join is successful then the PIN will be set and active. There is no need to join again from the 'Status' page as the Aircom is now already joined to the LoRaWAN network.



From now on, each time a Bluetooth connection is attempted to the Aircom, a security login will appear, to enter the 4-digit PIN configured. There are 3 attempts to enter the correct PIN, at which point the connection will be disconnected. The device will need to be connected to again to retry. There is no lockout period.

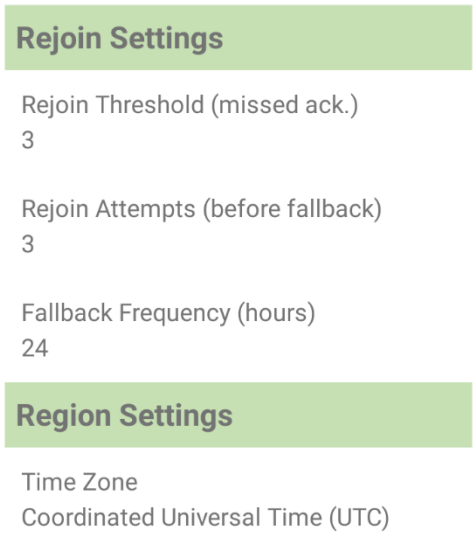


If the 4-digit PIN has been forgotten, then an alternate method of access is to use the configured AppKey, by navigating to the 3 dots menu and selected 'Enter Key'. Then follow the process through again from the LoRaWAN settings screen to configure/update to a new 4-digit PIN and rejoin.



4.5.2 Rejoin and Region Settings

When connected to an Aircom, rejoin and region settings can be configured. Rejoin settings allow the Aircom to detect when communication with the network server may have been lost. In such cases, when configured, the device enters "Rejoin" mode and attempts to rejoin the server. If such steps fail, it enters "Rejoin Fallback" mode and, if configured, makes periodic attempts to rejoin the server.



Rejoin Threshold

When acknowledgement has not been received for the specified number of transmissions, the device will enter "Rejoin" mode. This indicates that communication with the server may have been permanently lost, such as when the server was restarted without retaining the required "join" information for the device.

If the rejoin threshold is set to zero, the device will not enter rejoin mode unless a transmission has the "Initiate Rejoin on Failure" option set. In that case "Rejoin mode" will be entered as soon as the specified transmission fails without receiving an acknowledgment.

Rejoin Attempts

After entering "Rejoin" mode, the specified number of scheduled transmissions will include a request to join the server. If any of these rejoin attempts is successful, the device will exit "Rejoin" mode and scheduled transmissions will continue as normal. If all attempts are unsuccessful or rejoin attempts are set to zero, the device will enter "Rejoin Fallback" mode.

Fallback Frequency

If the fallback frequency is greater than zero, after entering "Rejoin Fallback" mode the device will attempt to rejoin the network server at the specified frequency. If a rejoin attempt is successful, the device will resume normal operation, sending scheduled transmissions.

When the fallback frequency and LoRaWAN settings are configured and the Aircom is powered up, such as after changing the battery, it will attempt to join the server immediately. If successful, the normal transmission schedule will resume. If not, rejoin attempts will be made periodically as described in the paragraph above.

Time Zone

By default, the transmission schedule operates according to Coordinated Universal Time (UTC) and ignores any local daylight savings adjustments. If another time zone is specified, transmission times will be adjusted to allow for any daylight savings arrangements in the time zone. For example, if the time zone is set to "United Kingdom (GMT/BST)", a transmission scheduled for 6am in winter (GMT) will be also be sent at 6am in summer (BST). (Using UTC, the transmission would be sent at 6am in winter and 7am in summer, local time.)

When programming transmission times, the times shown on the screen are for the current region and time zone of the phone or tablet being used to configure the Aircom. (Please note: If you have set the time zone to "United Kingdom (GMT/BST)" and it is currently summer (BST), add one hour to the scheduled time. For example, to set a transmission to occur at 8am each day, enter it as 9am, local time.)

4.6 Aircom device status screen & joining a LoRaWAN network

The device status screen displays status information such as battery voltage, time and network status. It also allows you join the LoRaWAN network and to update the transmitter time and adjust the speed of the transmitter's real-time clock. To access the device status screen, tap the navigation drawer button on the main dashboard and then select "AIRCOM DEVICE STATUS".

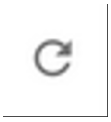
After doing so the device status settings screen will be opened:

 Navigation drawer button.

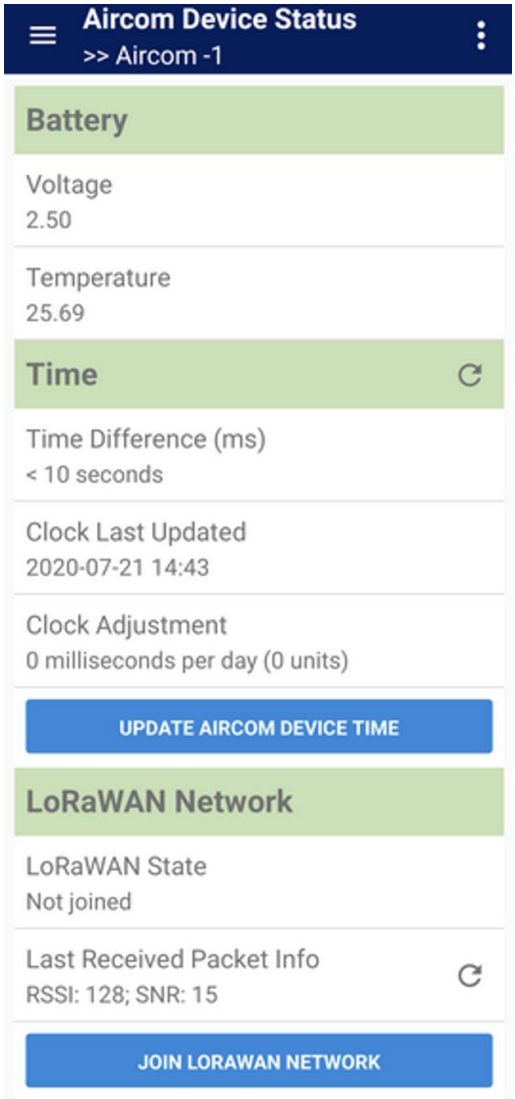
 More button. Opens menu to set clock adjustment.

 Refresh and display current time difference between connected Aircom and user's device.

Updates the connected Aircom with the time from the user's device.

 Refresh last received packet information.

Attempts to join LoRaWAN network.

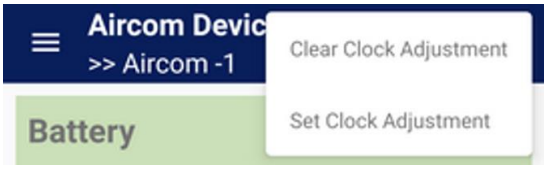


When setting the time on the Aircom transmitter ensure the time on the device used to set the time is accurate or the inaccuracy will be passed onto the Aircom unit.

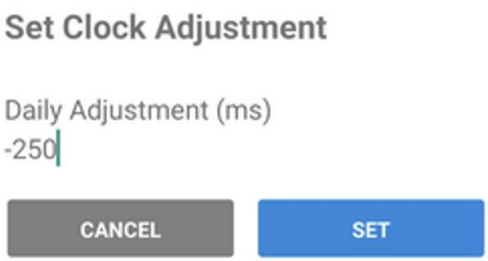
4.6.1 Setting clock adjustment

The Aircom clock can be adjusted to increase or decrease the clock speed. To set an adjustment figure tap the more button:

After which a menu will appear, and the clock time can be cleared or set:



Tap set clock adjustment from the menu and then set the required adjustment figure:

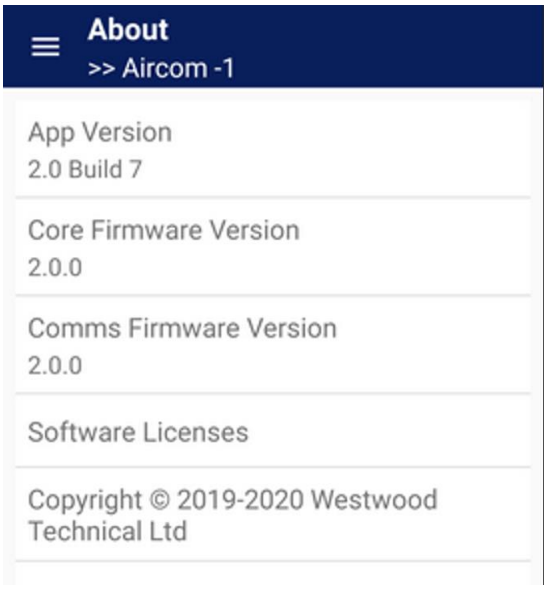


If the transmitter loses time, then enter a positive adjustment. If it gains time, then enter a negative adjustment. When complete tap set and the adjustment will be downloaded automatically to the connected Aircom.

4.7 Aircom device status screen

The about screen displays the version number of the app and firmware of the connected Aircom. To access the about screen, tap the navigation draw button on the main dashboard and then select "ABOUT".

After doing so the about screen will be opened:



Part V Maintenance

The Aircom transmitter has been designed to function with almost no maintenance. The only maintenance requirements are:

Calibration

Calibration may be required for certain input sources. This can form part of the user's typical calibration routine for the instruments used (e.g. pressure, flow, temperature, level). During routine calibrations simply check the readings form the Aircom device match those expected from the input. See 4.2.2 Calibrating an analogue input.

Battery

At some point the internal battery will require changing, when will depend on the connected input sources and transmission rates. When the battery reaches a voltage of 3.2V the remaining life will typically be 1-2 weeks. For instructions on changing the battery see 2.5.3 Battery.

Part VI Troubleshooting

6.1 Common problems

Transmitter Not Detected
If you have tapped the "CONNECT TO AIRCOM DEVICE" button but no transmitter is detected, one of the following may be the cause:

- **The transmitter was not switched on or has automatically entered sleep mode.** The transmitter automatically enters sleep mode if no connection is made within a certain time.
  SOLUTION:
  (1) Press the back button to return to the Connection screen.
  (2) Switch on the transmitter.
  (3) Tap "CONNECT TO AIRCOM DEVICE". (See 3.2 Connecting to an Aircom)
- **The configuration app does not have location access.** When your app has been installed and is opened for the first time, it requests permission to access your device's location. If permission is not granted, no devices will be detected.
  SOLUTION:
  (1) Uninstall the app.
  (2) Install the app following the instructions in 2.6 Installing the configuration App.
- **The device running the app does not have the necessary Bluetooth functionality or has a Bluetooth issue.** (See 2.6.1 System requirements)
  SOLUTION: Try restarting the device. (For many mobile devices this can be done by keeping the "Power" button pressed for several seconds.) If the problem continues, it may be best to use a different mobile device.
- **When tapping the magnet square the Aircom doesn't wake up.** If the Aircom is running a schedule or has just recently been turned on it may not respond to magnet taps to turn on the Bluetooth. This is because the Aircom needs time to finish is current operations before acknowledging the magnet taps.
  SOLUTION:
  (1) Wait 5-10 seconds for the Aircom to finish its process then re-try tapping the magnet.
  (2) Remove and re-insert the battery, wait a few seconds then re-try tapping the magnet.

6.2 Warnings

Here is some further information about warnings and how to resolve them.

Warning	Screen(s)	Comments
Bluetooth is off.	Welcome Screen	To connect to an Aircom transmitter, you need to switch on Bluetooth on your phone or tablet.
Config needs to be saved to file.	Various	You have made configuration changes in the app that have not yet been saved to file. Navigate to the Dashboard screen and click the "Save" button.
Config needs to be written to Aircom device.	Various	You have made configuration changes in the app that have not yet been downloaded to the connected transmitter. Navigate to the Dashboard screen and click the "Download" button.
Enabling NAMUR for counters not recommended unless using auxiliary power source.	Various	To conserve the battery of the Aircom transmitter, it is not recommended to enable NAMUR for a counter unless it has its own auxiliary power source.
If two or more packets become due at the same time, only one will be transmitted.	Transmission Summary Screen	Two or more transmission packets are scheduled. If, in the future, two packets are due to be sent at exactly the same time, only one will be transmitted. If possible, try to arrange schedules so that collisions do not occur. For example, you could set an hourly transmission to be transmitted on the hour (start time 00:00); a daily transmission could be sent at 10 past the hour (e.g. start time 05:10). This way you can be sure both transmissions will always be sent. (The warning will still show.)
Location permission has not been granted.	Welcome Screen (Android only)	To use Bluetooth on an Android phone or tablet, location permission must be granted. If you deny permission when running the app for the first time you will see this message.
Storage permission has not been granted.	Welcome Screen (Android only)	To access the file system on an Android phone or tablet, storage permission must be granted. If you deny permission when running the app for the first time you will see this message.
The Aircom device has not been configured.	Various	No configuration details are held in the connected transmitter. It is either a brand new transmitter or the configuration has been cleared.
The frequency of one/some packets is higher than recommended.	Transmission Summary Screen	One or more packets may be too big to be transmitted at the configured frequency. Try to reduce the size of packets or make them less frequent.
The LoRaWAN App Key of the Aircom device has not been set.	Various	The LoRaWAN App Key has not been set on the Aircom transmitter. The key is needed for the device to transmit packets.
The time of the Aircom device is out by n seconds.	Various	The date and time held by the Aircom transmitter differ from that of the phone or tablet by the specified number of seconds. To correct the time held on the transmitter navigate to the Aircom Device Status Screen and tap UPDATE AIRCOM DEVICE TIME.
Two or more packets have same frequency. Consider merging them.	Transmission Summary Screen	Two or more of the packets are scheduled with the same frequency. It is more efficient to send one larger packet than several smaller packets.

Part VII Certification

7.1 ATEX

Certificate Number
SGS20ATEX0005X
Issue 3

Issued 13 December 2021
Page 1 of 10

1 EU - TYPE EXAMINATION CERTIFICATE

2 Equipment or Protective System Intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3	EU - Type Examination Certificate Number:	**SGS20ATEX0005X – Issue 3**
4	Product:	**Aircom Ex**
5	Manufacturer:	**Westwood Technical Ltd**
6	Address:	**Unit J Doddington Park Farm, London Road, Doddington, Bridgemere, CW5 7PU**

7 This re-issued certificate extends EU Type Examination Certificate No. **SGS20ATEX0005X** to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 SGS Fimko Oy, Notified Body number 0598, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. **See Certificate History**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0: 2018 EN 60079-11: 2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following :

Ⓔx II 1 G Ex ia IIC T4 Ga ($-20 \leq T_a \leq +60°C$)

SGS Fimko Oy Customer Reference No. **7967** Project File No. **21/0638**

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13 **Schedule**

14 **Certificate Number SGS20ATEX0005X – Issue 3**

15 Description of Product

Aircom Ex is a self-contained battery-powered communication device capable of collating data from suitably certified equipment located in the hazardous area and transmitting the data via LoRaWAN Radio communication link to a command centre located in the non-hazardous area.

Aircom Ex provides four configurable digital inputs, up to 5 configurable analogue inputs and two serial RS232 & RS485 communication ports (depending on model number) for connection to the suitably certified equipment located in the hazardous area. The equipment can be configured via a Bluetooth communication link.

The equipment comprises a single printed circuit board encapsulated in an ABS enclosure with an antenna mounted on top. Cable gland entries are provided in the base of the equipment to permit external connections to be made via spring clamp terminals located inside the enclosure.

The equipment is designed to be powered by an Aircom Type WTP03-BEx Lithium Thionyl Chloride Replaceable Battery Pack mounted inside the enclosure, that can be changed in the hazardous area. The equipment can be alternatively powered by a suitably certified auxiliary supply.

The Aircom Ex is available with different configurations of Digital and Analogue I/O, with or without RS232 or RS485 communication ports fitted. The following model configurations are covered by this certificate:

Product Code	Product Configuration
WTP03-Ex-A0000-XXXX-XXX	Analogue I/O Fitted only
WTP03-Ex-0D000-XXXX-XXX	Digital I/O Fitted only
WTP03-Ex-AD485-XXXX-XXX	Analogue & Digital I/O Fitted with RS485 Communication Ports
WTP03-Ex-AD232-XXXX-XXX	Analogue & Digital I/O Fitted with RS232 Communication Ports
WTP03-Ex-HD485-XXXX-XXX	High Density 5 Channel Analogue & Digital I/O Fitted with RS485 Communication Ports

Where "XXXX-XXX" is a configuration code appended to the base product code and is used to designate a specific configuration including, but not limited to software version and regional LoRaWAN parameters. It does not affect the physical hardware.

The WTP03-Ex-HD485 is electronically identical to WTP03-Ex-AD485 with the exception that it has an additional three 4-20mA outputs enabled in software. The terminals for these additional outputs are present on all models except the WTP03-Ex-AD232 models.

NB: The term "output" means the Aircom outputs a supply for a 4-20mA transmitter and measures the current drawn.

The input / output and load parameters of the various interfaces are defined below:

Input / Output Parameters – WTP03-Ex-A0000, WTP03-Ex-0D000, WTP03-Ex-AD485, & WTP03-Ex-HD485 Models Only

I/O Description	Terminal	Pin No's.	U_o (V)	I_o (mA)	P_o (mW)	C_i (µF)	L_i (µH)	U_i (V)	I_i (mA)	P_i (mW)
RS485 Port 1	J3	9 & 10 w.r.t. 11	4.2	109	104	0	0	4.2	-	250
RS485 Port 2	J3	7 & 8 w.r.t. 11	4.2	109	104	0	0	4.2	-	250
Volt-Free Digital I/P 1	J3	16 w.r.t. 12	7.15	7.3	13	0	0	-	-	-

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I/O Description	Terminal	Pin No's.	U_o (V)	I_o (mA)	P_o (mW)	C_i (µF)	L_i (µH)	U_i (V)	I_i (mA)	P_i (mW)
Volt-Free Digital I/P 2	J3	15 w.r.t. 12	7.15	7.3	13	0	0	-	-	-
Volt-Free Digital I/P 3	J3	14 w.r.t. 12	7.15	7.3	13	0	0	-	-	-
Volt-Free Digital I/P 4	J3	13 w.r.t. 12	7.15	7.3	13	0	0	-	-	-
RTD / Thermocouple / mV I/P Ports A & B*1	J3	Port A: 21, 22, 23, 24 Port B: 17, 18, 19 & 20	3.7	16.6	15.3	0	0	-	-	-
4-20mA Analogue I/P Port A*2	J7	1 & 3	-	-	-	0	0	28	-	-
4-20mA Analogue I/P Port B*2	J7	2 & 4	-	-	-	0	0	28	-	-
4-20mA Analogue O/P Port A*3	J7	6 w.r.t. 5	23.1	118.9	686	0	0	-	-	-
4-20mA Analogue O/P Port B*3	J7	8 w.r.t 7	23.1	118.9	686	0	0	-	-	-
4-20mA Analogue O/P Port C*3	J3	6 w.r.t 5	23.1	118.9	686	0	0	-	-	-
4-20mA Analogue O/P Port D*3	J3	4 w.r.t 3	23.1	118.9	686	0	0	-	-	-
4-20mA Analogue O/P Port E*3	J3	2 w.r.t 1	23.1	118.9	686	0	0	-	-	-
4-20mA Analogue O/P Port A*5	J7	6 w.r.t. 5	23.1	99.2	572.5	0	0	-	-	-
4-20mA Analogue O/P Port B*5	J7	8 w.r.t 7	23.1	99.2	572.5	0	0	-	-	-
4-20mA Analogue O/P Port C*5	J3	6 w.r.t 5	23.1	99.2	572.5	0	0	-	-	-
4-20mA Analogue O/P Port D*5	J3	4 w.r.t 3	23.1	99.2	572.5	0	0	-	-	-
4-20mA Analogue O/P Port E*5	J3	2 w.r.t 1	23.1	99.2	572.5	0	0	-	-	-
Voltage I/P Port A	J7	10 w.r.t 9	-	-	-	0	0	30	-	-
Voltage I/P Port B	J7	12 w.r.t 11	–	–	–	0	0	30	-	-
NAMUR Digital I/P Port A	J7	16 w.r.t. 15	10.5	28	72	0	0	-	-	-
NAMUR Digital I/P Port B	J7	18 w.r.t. 17	10.5	28	72	0	0	-	-	-
Digital I/P Port A (Supplied from Ext. IS Source)*4	J7	15 w.r.t. 19	7.15	0	0	0	0	30	-	-

I/O Description	Terminal	Pin No's.	U_o (V)	I_o (mA)	P_o (mW)	C_i (µF)	L_i (µH)	U_i (V)	I_i (mA)	P_i (mW)
Digital I/P Port B (Supplied from Ext. IS Source)*4	J7	17 w.r.t. 20	7.15	0	0	0	0	30	-	-
Auxiliary IS Power Supply Input	J7	24 w.r.t. 23	-	-	-	0	0	23	380	2100

Notes:

Where the above terminals permit the connection of a separate intrinsically safe source, the capacitance, and either the inductance or inductance to resistance ratio (L/R) of the hazardous area cable attached must not exceed the values specified on the certificate associated with the separate intrinsically safe source.

*1 The output parameters for the two RTD / Thermocouple / mV I/P Ports are specified for the two ports combined.

*2 The 4-20mA Analogue I/P Port A & Port B are not isolated and therefore must be fed from the same intrinsically safe source.

*3 Functionally only one of the five 4-20mA Analogue O/P's can be normally be energised at one time.

*4 The U_o specified for the Digital I/P Port A & B (Supplied from Ext. IS Source) does not contribute to the spark ignition risk but must be considered for the calculation of load capacitance.

*5 The output parameters specified for the 4-20mA Analogue outputs are only applicable if the output is fitted with the limiter accessory.

Load Parameters

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the hazardous area load connected to the various I/O connections must not exceed the following values:

GROUP	CAPACITANCE (µF)	INDUCTANCE OR (mH)	L/R RATIO (µH/ohm)
RS485 Port 1 & Port 2 (Aircom Ex Model WTP03-Ex-AD485 only)			
IIC	100	2.99	280
IIB	1,000	11.97	1,120
IIA	1,000	23.94	2,241
Volt Free Digital I/P 1, I/P 2, I/P 3 & I/P 4			
IIC	13.5	210	1,530
IIB	240	841	6,120
IIA	1,000	1,000	12,240
RTD / Thermocouple / mV I/P Ports A & B			
IIC	100	129	2,315
IIB	1,000	516	9,262
IIA	1,000	1,000	18,524
4-20mA Analogue O/P Ports A, B, C, D & E			
IIC	0.14	2.51	51.7
IIB	1.02	10.0	207
IIA	3.67	20.1	414
NAMUR Digital I/P Port A & Port B			
IIC	2.41	45.3	483
IIB	16.8	181	1,935
IIA	75	362	3,869
Digital I/P Port A & Port B (Supplied from Ext. IS Source)			
IIC	13.5	-	-
IIB	240	-	-
IIA	1,000	-	-

Notes:

1) The above load parameters apply when one of the two conditions below is given:
- the total L_i of the external circuit (excluding the cable) is < 1% of the L_o value or
- the total C_i of the external circuit (excluding the cable) is < 1% of the C_o value.

2) The above parameters are reduced to 50% when both of the two conditions below are given:
- the total L_i of the external circuit (excluding the cable) is ≥ 1% of the L_o value and
- the total C_i of the external circuit (excluding the cable) is ≥ 1% of the C_o value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1µF for Groups IIB & IIA and 600nF for Group IIC.

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductances in the circuit and the sum of all of the C_i plus cable capacitances respectively.

Input / Output Parameters – WTP03-Ex-AD232 Model Only

I/O Description	Terminal	Pin No's.	U_o (V)	I_o (mA)	P_o (mW)	C_i (µF)	L_i (µH)	U_i (V)	I_i (mA)	P_i (mW)
RS232 Port 1	J3	9 & 10 w.r.t. 7	8.8	62	118	0	0	20	-	250
RS232 Port 2	J3	5 & 6 w.r.t. 8	8.8	62	118	0	0	20	-	250
Volt-Free Digital I/P 1	J3	16 w.r.t. 12	7.15	7.3	13	0	0	-	-	-
Volt-Free Digital I/P 2	J3	15 w.r.t. 12	7.15	7.3	13	0	0	-	-	-
Volt-Free Digital I/P 3	J3	14 w.r.t. 12	7.15	7.3	13	0	0	-	-	-
Volt-Free Digital I/P 4	J3	13 w.r.t. 12	7.15	7.3	13	0	0	-	-	-
RTD / Thermocouple / mV I/P Ports A & B*1	J3	Port A: 21, 22, 23, 24 Port B: 17, 18, 19 & 20	3.7	16.6	15.3	0	0	-	-	-
4-20mA Analogue I/P Port A*2	J7	1 & 3	-	-	-	0	0	28	-	-
4-20mA Analogue I/P Port B*2	J7	2 & 4	-	-	-	0	0	28	-	-
4-20mA Analogue O/P Port A*3	J7	6 w.r.t. 5	23.1	118.9	686	0	0	-	-	-
4-20mA Analogue O/P Port B*3	J7	8 w.r.t 7	23.1	118.9	686	0	0	-	-	-
4-20mA Analogue O/P Port A*5	J7	6 w.r.t. 5	23.1	99.2	572.5	0	0	-	-	-
4-20mA Analogue O/P Port B*5	J7	8 w.r.t 7	23.1	99.2	572.5	0	0	-	-	-
Voltage I/P Port A	J7	10 w.r.t 9	–	–	–	0	0	30	-	-
Voltage I/P Port B	J7	12 w.r.t 11	–	–	–	0	0	30	-	-
NAMUR Digital I/P Port A	J7	16 w.r.t. 15	10.5	28	72	0	0	-	-	-

I/O Description	Terminal	Pin No's.	U_o (V)	I_o (mA)	P_o (mW)	C_i (µF)	L_i (µH)	U_i (V)	I_i (mA)	P_i (mW)
NAMUR Digital I/P Port B	J7	18 w.r.t. 17	10.5	28	72	0	0	-	-	-
Digital I/P Port A (Supplied from Ext. IS Source)*4	J7	15 w.r.t. 19	7.15	0	0	0	0	30	-	-
Digital I/P Port B (Supplied from Ext. IS Source)*4	J7	17 w.r.t. 20	7.15	0	0	0	0	30	-	-
Auxiliary IS Power Supply Input	J7	24 w.r.t. 23	-	-	-	0	0	23	380	2100

Notes:

Where the above terminals permit the connection of a separate intrinsically safe source, the capacitance, and either the inductance or inductance to resistance ratio (L/R) of the hazardous area cable attached must not exceed the values specified on the certificate associated with the separate intrinsically safe source.

*1 The output parameters for the two RTD / Thermocouple / mV I/P Ports are specified for the two ports combined.

*2 The 4-20mA Analogue I/P Port A & Port B are not isolated and therefore must be fed from the same intrinsically safe source.

*3 Functionally only one of the two 4-20mA Analogue O/P's can be normally be energised at one time.

*4 The U_o specified for the Digital I/P Port A & B (Supplied from Ext. IS Source) does not contribute to the spark ignition risk but must be considered for the calculation of load capacitance.

*5 The output parameters specified for the 4-20mA Analogue outputs are only applicable if the output is fitted with the limiter accessory.

Load Parameters

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the hazardous area load connected to the various I/O connections must not exceed the following values:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
RS232 Port 1 & Port 2				
IIC	5.5	9.24		260
IIB	46	36.9		1,042
IIA	730	73.9		2,085
Volt Free Digital I/P 1, I/P 2, I/P 3 & I/P 4				
IIC	13.5	210		1,530
IIB	240	841		6,120
IIA	1,000	1,000		12,240
RTD / Thermocouple / mV I/P Ports A & B				
IIC	100	129		2,315
IIB	1,000	516		9,262
IIA	1,000	1,000		18,524
4-20mA Analogue O/P Port A & Port B				
IIC	0.14	2.51		51.7
IIB	1.02	10.0		207
IIA	3.67	20.1		414

NAMUR Digital I/P Port A & Port B			
IIC	2.41	45.3	483
IIB	16.8	181	1,935
IIA	75	362	3,869
Digital I/P Port A & Port B (Supplied from Ext. IS Source)			
IIC	13.5	-	-
IIB	240	-	-
IIA	1,000	-	-

Notes:

1) The above load parameters apply when one of the two conditions below is given:
- the total L_i of the external circuit (excluding the cable) is < 1% of the L_o value or
- the total C_i of the external circuit (excluding the cable) is < 1% of the C_o value.

2) The above parameters are reduced to 50% when both of the two conditions below are given:
- the total L_i of the external circuit (excluding the cable) is ≥ 1% of the L_o value and
- the total C_i of the external circuit (excluding the cable) is ≥ 1% of the C_o value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1µF for Groups IIB & IIA and 600nF for Group IIC.

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all of the L_i plus cable inductances in the circuit and the sum of all of the C_i plus cable capacitances respectively.

16 Report Number

See Certificate History

17 Specific Conditions of Use

1. Only replace battery with Aircom Type WTP03-BEx Lithium Thionyl Chloride Replaceable Battery Pack.
2. The plastic enclosure may constitute a potential electrostatic ignition risk and must not be rubbed or cleaned with a dry cloth.

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject
1.2.7	Protection against other hazards (LVD type requirements, etc.)
1.2.8	Overloading of equipment (protection relays, etc.)
1.4.1	External effects
1.4.2	Aggressive substances, etc.

7.2 UK-Type Examination

Certificate Number
BAS21UKEX0358X
Issue 1

Issued 13 December 2021
Page 1 of 9

1 **UK-TYPE EXAMINATION CERTIFICATE**

2 **Equipment or Protective System Intended for use in Potentially Explosive Atmospheres UKSI 2016:1107 (as amended by UKSI 2019:696) – Schedule 3A, Part 1**

3 UK-Type Examination Certificate Number: **BAS21UKEX0358X – Issue 1**

4 Product: **Aircom Ex**

5 Manufacturer: **Westwood Technical Ltd**

6 Address: **Unit J Doddington Park Farm, London Road, Doddington, Bridgemere, CW5 7PU**

7 This re-issued certificate extends UK-Type Examination Certificate No. **BAS21UKEX0358X** to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 SGS Baseefa, Approved Body number 1180, in accordance with Regulation 43 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended by UKSI 2019:696), certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Schedule 1 of the Regulations.

The examination and test results are recorded in confidential Report No. **See Certificate History**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0: 2018 EN 60079-11: 2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This UK-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Regulations apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following:

Ⓔx **II 1 G Ex ia IIC T4 Ga (-20 ≤ T_a ≤ +60°C)**

SGS Baseefa Customer Reference No. **7967** Project File No. **21/0638**

SGS Baseefa Limited
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e-mail baseefa@sgs.com web site www.sgs.co.uk/sgsbaseefa
Registered in England No. 4305578.
Registered address: Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN

UKAS PRODUCT CERTIFICATION
0191

(pp)
R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

7.3 North American Hazardous Area

Please note the following regarding ORDINARY LOCATION approval:

- YZ Systems Ltd have conducted a risk assessment on the equipment and have considered sources of injury that may arise not covered by standards or through misuse and have taken the required precautions including warnings to mitigate or remove the risk of these factors.
- Close the openings at the bottom of the enclosure with plugs, when the openings are not used for wiring.
- Maximum altitude of 5000m, temperature of -20^{0}C - 60^{0}C / -4^{0}F - 140^{0}F, pollution degree 3 internally and 4 externally. Suitable for outdoor use, type 4X.

CERTIFICATE OF COMPLIANCE

Certificate Number: SGSNA/22/SUW/00057X

Contract Number: 801619
Certificate Project Number: SUW-CERT220500073

Certified Product: self-contained battery-powered communication device
Trademarks: Aircom
Model(s): WTP03-Ex-A0000, WTP03-Ex-0D000, WTP03-Ex-AD485, WTP03- Ex-AD232, WTP03-Ex-HD485
Technical Data: 3.6VDC; 19Ah Battery Operated
Auxiliary power supply: 12VDC, 85mA, 1W max

Certificate Holder: Westwood Technical Ltd
48 Mill Moor Road, Meltham, HD9 5JY, Holmfirth, West Yorkshire, United Kingdom

This certificate supercedes previous certificates issued with the same certificate number. Certification is valid when products are indicated on the SGS directory of certified products at www.sgs.com or using the QR code below. The product is certified according to ISO/IEC Guide 17067, Conformity assessment - Fundamentals of product certification, System 3, and in accordance with:

UL 61010-1, 3rd Ed., Rev. July 19, 2019
UL 61010-2-201, 2nd Ed., May 14, 2018
CAN/CSA C22.2 No. 61010-1-12 Am. 1 (July 19, 2019)
CAN/CSA C22.2 No. 61010-2-201:18
Conditions of Acceptability:
Auxiliary power should be supplied from a class II power supply certified/ recognized by an accredited body.

Authorized by: Effective date: 08 July 2022

Paul Krauss
Certifier

Page 1 of 1

Certification Body

Connectivity & Products, a division of SGS North America Inc.
620 Old Peachtree Road, Ste. 100, Suwanee, GA 30024, USA
t +1 770 570 1800 f +1 770 277 1240 www.sgs.com

Part VIII Declaration of Conformity

EU DECLARATION OF CONFORMITY

Declaration Number:	WTP03-EDC-001, Rev 1.4
Address:	Station House, Station Road, Barlaston, Stoke on Trent, ST12 9DQ
Product:	**Aircom** Aircom Ex is a self-contained battery-powered communication device capable of collating data from suitably certified equipment located in the hazardous area and transmitting the data via LoRaWAN Radio communication link to a command centre located in the non-hazardous area.
Trade Mark:	**Aircom ®**

Applicable Standards:

Reference	Description
EN IEC 60079-0: 2018	Equipment or Protective System Intended for use in Potentially Explosive Atmospheres.
EN 60079-11: 2012	Equipment or Protective System Intended for use in Potentially Explosive Atmospheres.
EN 301 489-1 V2.2.3 EN 301 489-3 V2.2.1	Protection requirements with respect to electromagnetic compatibility.
EN 300 220-1 V3.1.1 EN 300 220-2 V3.1.1	Means of the efficient use of the radio frequency spectrum

CE

Andrew Ridge Director

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Part IX Technical data

9.1 Data sheet

General	
Material	ABS
Aircom Weight	1.14kg
Battery Weight	0.19kg
Aircom Dimensions	467mm H x 120mm W x 75mm D
Battery Dimensions	83mm H x 51mm D
Ingress Protection	IP68, NEMA 4X*
Permissible ambient temperatures	-20^{0}C - 60^{0}C / -4^{0}F - 140^{0}F
Approvals / Certification	
ATEX	Ⓔx II 1G Ex ia IIC T4 Ga (-20 ≤ Ta ≤ +60°C)
US Hazardous Area	Class 1 Div 1 Grps A-D, T4 & Class 1 Zone 0 AEx ia IIC T4 Ga (-20 ≤ Ta ≤ +60°C)
Canada Hazardous Area	Ex ia IIC T4 Ga (-20 ≤ Ta ≤ +60°C)
Directives	EN IEC 60079-0: 2018, EN 60079-11: 2012, ISA/UL 60079-0, ISA/UL60079-11, CSA-C22.2 No ISA/UL 60079-0, CSA-C22.2 No ISA/UL60079-11, UL 61010-1, UL 61010-2-201, CAN/CSA C22.2 No. UL 61010-1, CAN/CSA C22.2 UL 61010-2-201
Power	
Battery	3.6V, 19Ah, Lithium Thionyl Chloride
Auxiliary Power	12-23VDC, 2.1W Max
Communications	
LoRaWAN	EU868MHz, US915MHz, AU915MHz, AS1, AS2, IN865
Inputs / Outputs	
x2 or x5 Analogue Channels	x2 HART, x2 **or x5 4-20mA Passive**, x2 4-20mA Active, x2 -10-10V, x2 PT100 3-Wire, x2 PT100 4-Wire, x2 PT1000, x2 Ohms, x2 POT, x2 mV
x4 Digital Input Channels	x4 Volt-Free, x2 Voltage input, x2 PRX NAMUR, x2 Counter
x2 or x5 Digital Outputs	x2 **or x5** 20mA @ 16.4VDC
x2 Serial Comms Channels	RS485

Note: **IP68 only if IP68 glands and plugs are correctly installed.*

AD/HD USER MANUAL

WTP03

Document Information

Document date: 19th February 2025
Document title: AD/HD User Manual
Document reference: WTP03-UM-001
Document version: 1.4

Manufacturer Information

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An Ingersoll Rand Business