

AoFrio

AoFrio
NETWORK PRO
Connect™ IoT

INSTALLATION GUIDE

Network Pro Installation Guide

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Warnings

Please read the following warnings to maintain the safe operation and continued performance of the **AoFrio Network Pro**.

Warnings	Important do's and don'ts
<p>Installation</p> <p>The Network Pro must be installed in accordance with the instructions provided in the Network Pro Installation Guide otherwise the warranty may be void. The Network Pro must only be installed and configured by trained and authorized staff.</p>	<ul style="list-style-type: none">• Only authorised staff should install the Network Pro.
<p>USB-C port</p> <p>Do not connect anything to the USB-C port. The port is a non-standard USB-C and is only intended to be used by AoFrio during manufacturing. Connecting anything to this port may damage the product and void the product warranty.</p>	<ul style="list-style-type: none">• Do not connect anything to the USB-C port.
<p>No serviceable parts</p> <p>There are no serviceable parts inside the Network Pro. Do not attempt to open the housing. Opening of the electronics housing, altering, or modifying the Network Pro will invalidate the warranty and damage the device.</p>	<ul style="list-style-type: none">• There are no serviceable parts inside the Network Pro.• Do not open the housing.
<p>Fit for purpose</p> <p>The Network Pro must only be used for the purposes and functions described in this manual. While AoFrio may provide technical support on suitable applications and configurations of the Network Pro (where such a relationship may exist), no liability, responsibility or risk is accepted in determining if the Network Pro is fit for purpose for any particular application. No liability, responsibility or risk is accepted by AoFrio for the operational function of any particular installation or configuration.</p>	<ul style="list-style-type: none">• The Network Pro must only be used for the purposes described in this manual.
<p>Continuous development</p> <p>AoFrio undertakes to continuously develop and improve products and services. The design and specification of Network Pro and contents of this manual are subject to change without notice. While every endeavour is made to ensure that all specifications and documents are current and complete, AoFrio accepts no liability, responsibility, or risk due to omissions or changes caused by continuous improvement and design changes.</p>	<ul style="list-style-type: none">• The design and specification of the Network Pro is subject to change and new firmware may be released without notice.



Warnings continued

Warnings	Important do's and don'ts
<p>Correct disposal</p> <p>The Network Pro is subject to EU Directive 2012/19/ EU (WEEE) for e-waste. It may also be subject to other national legislation for the safe disposal of e-waste. The Network Pro must not be disposed of in municipal collections, it must be disposed of through an approved WEEE collection point. Alternatively, Network Pro may be returned to an authorised AoFrio distributor at the end of its working life. Penalties may be applicable for incorrect disposal, as specified by national legislation.</p> <p>The device contains a lithium battery. This may be hazardous if incinerated or physically damaged. The circuit board may contain hazardous substances which could affect health and the environment if disposed of incorrectly.</p> <p>Once the device's battery is depleted, remove device from equipment and dispose of it according to local requirements. Leaving Network Pro installed in the equipment presents risks due the potential for battery housing corrosion leading to chemical leakage.</p>	<ul style="list-style-type: none">• The Network Pro must not be disposed of in municipal collections; it must be disposed of through an approved e-waste collection point.• Safety warning: The Network Pro devices contain a lithium battery. This may be hazardous if incinerated or physically damaged.• Do not leave an old Network Pro installed in field equipment after it has reached its end of life.
<p>Chemicals</p> <p>The Network Pro must not be exposed to any liquids, solvents or chemicals, as this may damage the housing and lead to unsafe operation. Exposure to such chemicals invalidates the warranty.</p>	<ul style="list-style-type: none">• Do not expose to liquids.
<p>Temperature</p> <p>The Network Pro must not be subjected to temperatures outside its specified temperature limits.</p> <p>Exceeding these ranges in operation, installation, transportation, or storage, will invalidate the warranty and may damage electronic circuits and housing components, leading to premature failure.</p>	<ul style="list-style-type: none">• Do not expose to high or low temperatures.
<p>Vibration and impact</p> <p>The unit must be installed in such a way as to be protected from vibration and impact during operation. Exposure to impact and mechanical shock, either in operation, installation, transportation, or storage, may damage electronic circuits and housing components, leading to premature failure, and may cause the Network Pro to become unsafe. Damage caused by impact is not covered by warranty.</p>	<ul style="list-style-type: none">• Do not drop or install the Network Pro in locations with vibration.



Introduction

The **Network Pro** is one of the communications devices in the AoFrio IoT system. It provides real-time automated data acquisition from AoFrio SCS controllers, Monitors and Clicks installed in your coolers in the field, adding a cellular connectivity option to the existing portfolio of data acquisition solutions provided by AoFrio. Connectivity over the cellular network eliminates the need for site visits to acquire data from the asset fleet, or update the firmware on the Network Pro.



Communications

Network Pro is equipped with 2 different types of radio connectivity:

- **Bluetooth** - The device is fully compatible with the AoFrio IoT system and uses Bluetooth to acquire data from up to 16 AoFrio IoT devices.
- **Cellular connectivity** - Network Pro is equipped with a global cellular module that provides connectivity using LTE Cat M1 with 2G fallback. Cellular SIMs are installed at the time of manufacture and the data plan is managed by AoFrio unless an alternative arrangement has been made.

Battery

The device has a rechargeable internal battery that is used for backup if the external power supply is removed. The battery life is approximately 12 hours during which time the **Network Pro** will continue to operate fully as though still connected to its external power supply.

Location Reporting

Wi-Fi positioning is used to help determine the location of the **Network Pro**, and therefore also the coolers that are within Bluetooth range. WiFi is not used to transfer data i.e. Network Pro is not capable of establishing a WiFi connection.

DO NOT USE THE USB-C PORT

The port is a non-standard USB-C and is only intended to be used by AoFrio during manufacturing. Connecting anything to this port may damage the product and void the product warranty.



What's in the box?



Planning where to install your Network Pro

Network Pro can be installed as a hub to connect up to 16 AoFrio IoT devices in the point-of-sale that are within Bluetooth range. Make the following decisions:

1. Determine the quantity and location of AoFrio IoT devices within the point-of-sale
2. Download the Field App and verify the connection
3. Decide the mounting position in accordance with the requirements in this manual
4. Identify a suitable power source for the Network Pro (maximum of 2 meters from the mounting position)
5. Mount the Network Pro device using the appropriate mounting method for your field conditions or location

Mounting position

Install **Network Pro** *as close as possible* to the coolers being tracked, ideally not more than 5 meters away. For best results, install with clear line of sight between Network Pro and the devices being tracked (SCS or Monitor for example).

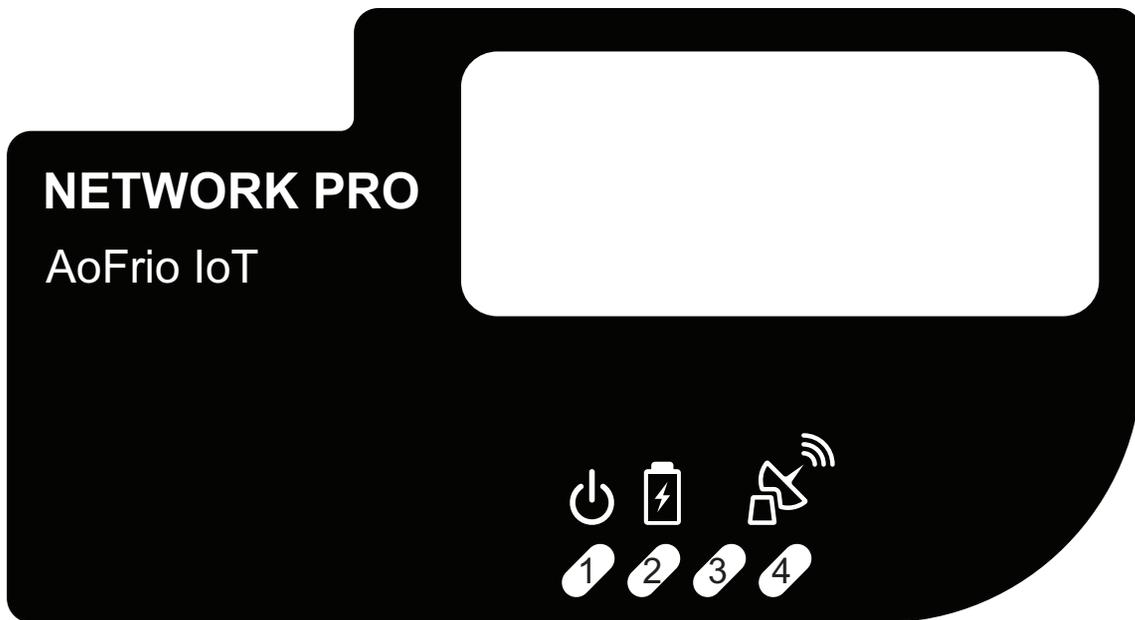
With clear line of sight, connections of up to 10 meters away may be possible.

The recommended mounting location is on top and slightly back from the front of the cooler, where it is high up for best signal quality, but out of sight of customers.



LED purpose and behaviour

Network Pro is equipped with 4 LEDs, numbered 1 through 4 from left to right with behaviour as described.

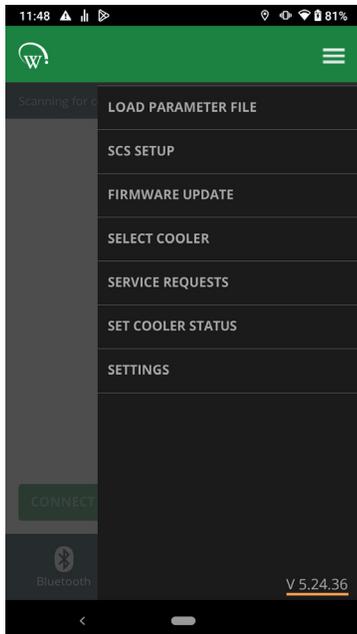


LED	Purpose	Behaviour
LED 1	External power status	<ul style="list-style-type: none"> ON = good input voltage (between 4.6V and 6.4V) OFF = no external power, or outside allowed range
LED 2	Battery charging status	<ul style="list-style-type: none"> ON = battery charging OFF = battery not charging <p>When the battery is fully charged the LED may turn off.</p>
LED 3	Cellular module power status	<ul style="list-style-type: none"> ON = cellular module on OFF = cellular module off
LED 4	Cellular network connectivity status	<p>Slow short blink - searching for cellular network</p> <p>Slow long blink - connected to a cellular network, idle</p> <p>Fast blink - connected to a cellular network, sending data</p>

Note: When running from the battery alone only LED 3 and 4 will be active.



Field App Verification



The Field App provides a self-test feature to verify that the Network Pro is fully functional and the installation is complete. Access to the Network Pro feature is controlled by Roles in the User Manager. If a user's Role type does not include the Network Pro permission, then they will not have access to the feature. Adding the Network Pro permission to a Role can currently only be performed by AoFrio Support.

Note: Network Pro features are available in version 5.24.40 or later of the Field App. Check the Field App version from the menu within the App.

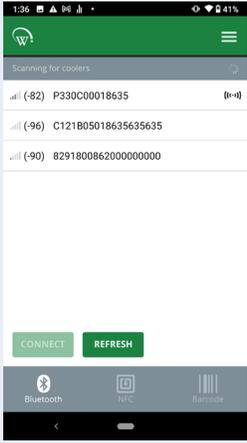
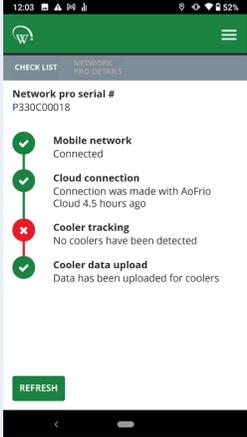
Field App can be downloaded from the Google Play or Apple App Store:



Apple Store

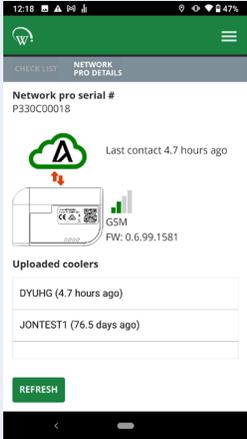
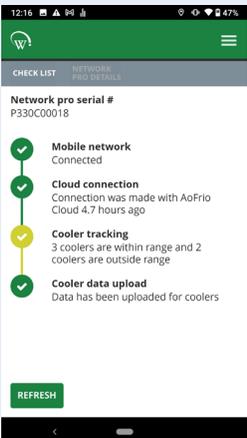
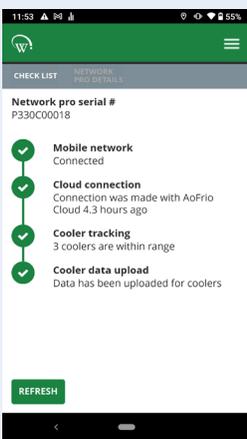


Google Play

	Step	Details
1	Select the Network Pro in the Field App	<p>Use the Barcode option and camera on the phone to scan the QR code on the Network Pro;</p> <p>Or</p> <p>Select the Network Pro from the cooler list. Network Pro devices show the  icon</p> 
2	Fix Check List items showing 	<p>The installation cannot be completed if any Check List items are showing a </p> <p>Refer to the Troubleshooting section for assistance if required.</p> <p>Press the Refresh button to retrieve the latest data from the AoFrio Cloud.</p> 



Field App Verification continued

	Step	Details
3	Troubleshoot	<p>Use the Network Pro Details screen if necessary to assist with any troubleshooting steps.</p> 
4	Investigate Check List items showing a 	<p>Items with a  highlight a potential problem. In this example 1 cooler is detected by the Network Pro but is out of range. In some cases, a  may be expected and may not need to be resolved.</p> 
5	The Network Pro is fully functional if there are  marks in each of the four Check List items.	

Mounting your device

Note

- Metal and other obstacles between **Network Pro** and the devices being tracked may cause connection reliability issues
- Installation is not recommended on the side or back of a cooler
- Do not install **Network Pro** inside the cooler or compressor HOT space
- If multiple coolers are being tracked, find a central installation position in the store
- Install location must be an area where the temperature is maintained between 0°C (32°F) and 40°C (104°F) to ensure the internal battery can be charged
- Do not install **Network Pro** in an area where there is a risk of condensation or liquid



Mounting Method

Once you have connected to the Field app to the Network Pro and confirmed your BLE and Network connections, select a suitable location to mount your Network Pro that has a clear line of sight to your connected refrigeration assets. Mount the device using either the screws or double-sided tape supplied with the product.

If mounted vertically it must be mounted with the tail facing down or to the left, to avoid any debris or moisture ingress unplugged from the power cable.

We recommend that you take a photo of the device once installed. This can help to troubleshoot any connectivity issues in the future.

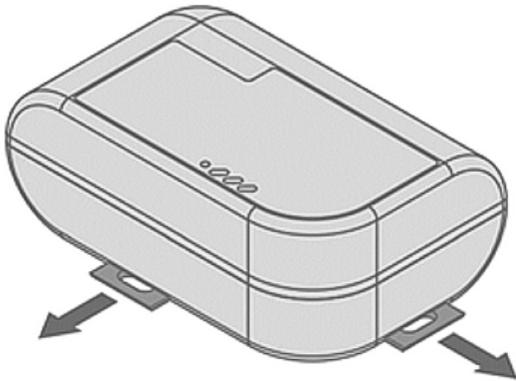
WARNING:

Mount the Network Pro in a way that avoids moisture or debris build up in the USB-C connector.

Mounting continued

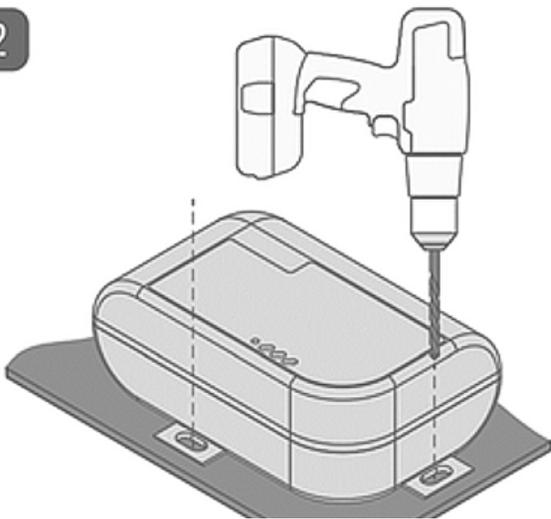
Screw mount

1



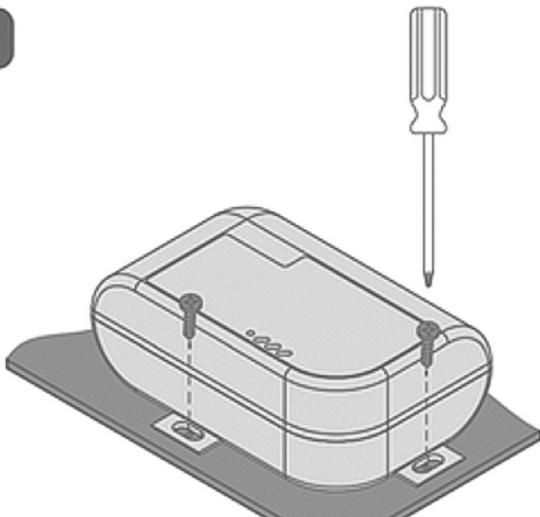
Pull out the screw mounting tabs from the bottom of the device.

2



Mark and drill pilot holes.

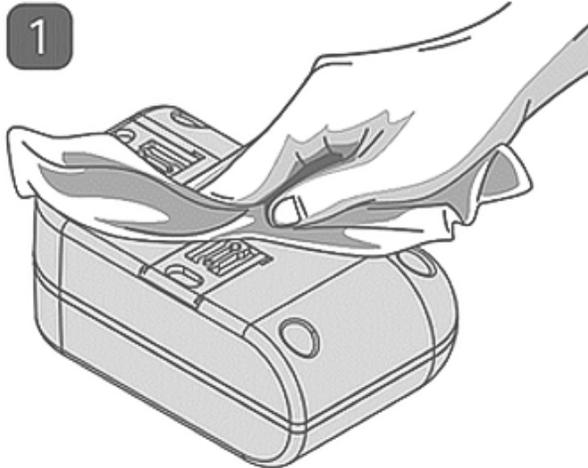
3



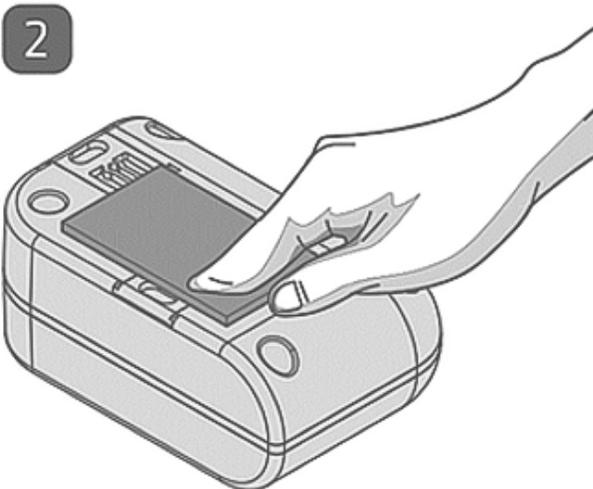
Using a screwdriver, tighten the two screws to secure the device to the surface.

Mounting continued

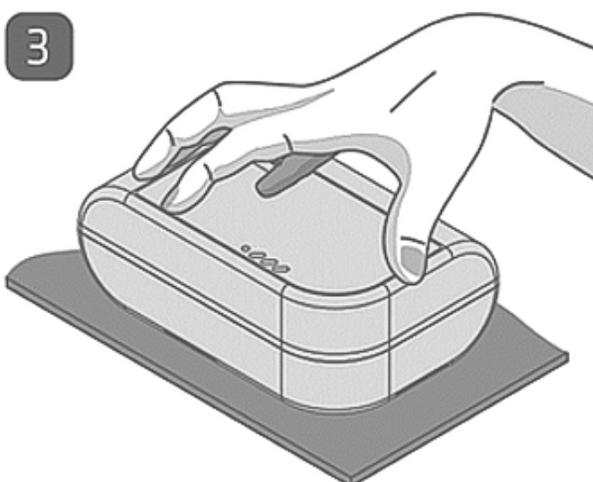
Tape mount



Ensure the mounting surface and the back of the device are clean and dry.



Stick the adhesive pad to the back of the device.



Firmly press the device into position, ensuring it is secured to the surface.

Mounting continued

Power source

Network Pro requires external mains power to function (100-240V AC, 50/60Hz). The power cable provided is 2.0 meters (6.5ft) long, and attaches to a 5V USB power adaptor.

The device will not be powered on when you receive it. Once plugged in to external power it will immediately activate and also start to charge its internal battery.



1. Plug the 3.5mm connector from **Network Pro** into the supplied cable.

Make sure the plug is inserted all the way in.

NOTE: Heat shrink is recommended to secure and protect the connection.



Mounting continued

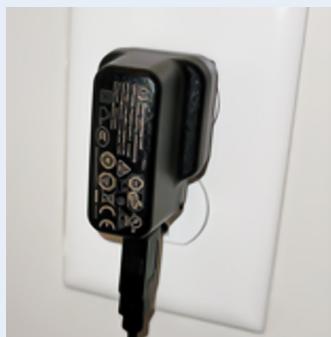
2. Plug the USB side of the power cable into the USB adaptor supplied.



Make sure the plug is inserted all the way in.



3. Connect the USB charger to AC power (100-240V AC, 50/60Hz).



4. The device should get registered on the cellular network within a few minutes which is indicated by LEDs. See LED Purpose and Behaviour

⚠ WARNING:

Do not attempt to power Network Pro using the USB-C connector, as it may permanently damage the device. The interface is not a standard USB-C.



Troubleshooting

Problem Observed	Possible Cause	Possible Solution
No LEDs are on	No power to the device	Swap the USB power adaptor Swap the 2m power cable Check that the 3.5mm plug is fully pushed into the jack
LED 2 is not on, meaning that the battery is not charging	Battery might be fully charged	No issue. This is normal behaviour
Network Pro is new, or hasn't been connected to power for some time, and the LED 2 light is still on after several hours	Supply voltage might be too low	Replace USB power supply if faulty
LEDs 3 and 4 are off	The cellular module is not being powered - the Network Pro may be in a low power state	Wake the cellular module by removing and reconnecting external power to the Network Pro
Can't see the Network Pro serial number in the list of devices in the Field App	User may not have the Network Pro feature enabled for their role type	Contact Technical Support and request Network Pro access in the Field App
 Mobile network	The Cellular account has not been activated. This may mean the mobile network provider is not available in the area.	Contact Technical Support
 Mobile network	Network Pro is in a location with poor cellular coverage	Move the Network Pro to another location where it has a stronger signal reception
 Cloud connection	Network Pro has not been able to connect with the AoFrio cloud system. It needs a connection to the mobile network. Check that the 'Mobile network' test shows a green check mark: 	Wait for a few seconds and press the Refresh button
 Cooler tracking	Network Pro is located too far from all coolers	Move the Network Pro to another location where it is closer to the cooler/s to be tracked
 Cooler tracking	Network Pro is within range of some coolers, but out of range of others.	Use the Field App to check that the number of coolers in range is the number of coolers expected to connect to the Network Pro
 Cooler data upload	No cooler data has successfully been uploaded to the cloud.	Wait a few seconds and press Refresh

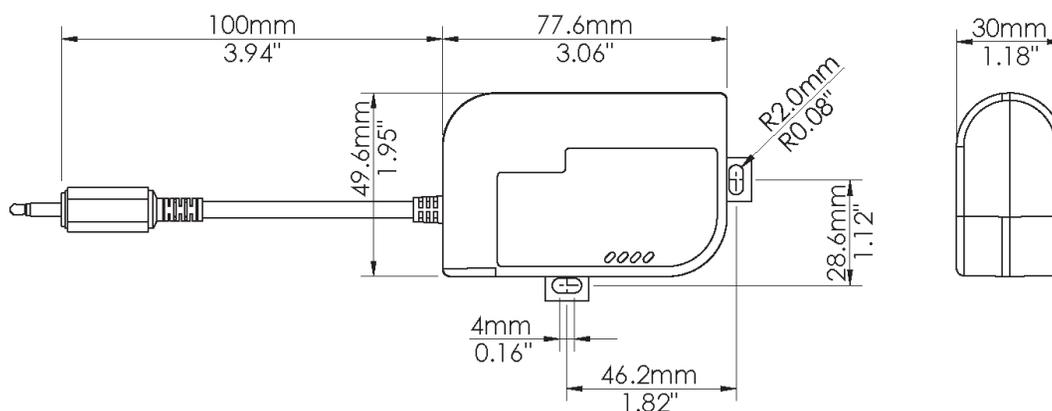


Technical Specifications

Specifications	
Input voltage and current	4.5V – 6.4V DC, 300mA max
Cellular communications	LTE Cat M1 with 2G (GPRS) fallback
Cellular bands	B1, B2, B3, B4, B5, B8, B12, B13, B18, B19, B20, B25, B28, B39
Connectivity	Bluetooth (BLE 4.1)
Wi-Fi (Geo-location only)	2.4GHz, 802.11 b/g/n
Battery	750mAh, 3.7V, Li-Po (approx. 12 hrs full product operation)
Status LEDs	1 x Power Status ; 1 x Battery Status ; 2 x Cellular status
Connector/Interface	3.5mm 4 pole audio plug
Mounting method	2 x self-tapping screws or double sided adhesive pad
Ingress protection	IP43
Operating temperature ¹	-20°C to +60°C (-4°F to 140°F)
Storage temperature	-20°C to +60°C (-4°F to 140°F)
Weight	63g (2.2oz)
Approvals ²	CE FC  NOM

¹ Backup battery charging only occurs between 0°C and 40°C

² NOM approval pending





USA

Jorge Civeira

VP Commercial North America

P: +1 (847) 922 5098

E: jorge.civeira@aofrio.com

Mexico

Sebastian Jaramillo

Senior Customer Manager – Mexico

P: +52 1 427 112 9101

E: sebastian.jaramillo@aofrio.com

Brazil

Cheryl Camargo

Regional Manager - South America

P: +55 47 3028 3858

E: cheryl.camargo@aofrio.com

Europe

Ali Karahasanoglu

Sales Director - Europe / Eurasia

P: +90 (216) 420 12 02

E: ali.k@aofrio.com

Asia Pacific

St. John Vuetilovoni

Commercial Director APAC

P: +64 9 477 4500

E: stjohn.vuetilovoni@aofrio.com

Rest of World

Postal Address:

P.O. Box 302-533

North Harbour

Auckland 0751, New Zealand

E: sales@aofrio.com

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