

AoFrio

INSTALLATION GUIDE

Network Pro ONE Retrofit Installation Guide

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Warnings

Warnings	Important do's and don'ts
Installation The Network Pro ONE is mains electricity powered. Therefore, it should only be installed in a suitable location within the cooler, and by an installer with appropriate qualifications in the country of installation. The Network Pro ONE must only be installed and configured by trained and authorized staff. Please follow the instructions provided in this Guide otherwise the warranty may be void.	- Only authorised and appropriately qualified staff should install the Network Pro ONE. - Mount the Network Pro ONE and the power connector in an environment that is not subject moisture or high humidity.
USB-C port 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.	Do not connect anything to the USB-C port.
No serviceable parts There are no serviceable parts inside the Network Pro ONE. Do not attempt to open the housing. Opening of the electronics housing, altering, or modifying the Network Pro ONE may invalidate the warranty and damage the device.	- There are no serviceable parts inside the Network Pro ONE. - Do not open the housing.
Fit for purpose The Network Pro ONE 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 ONE (where such a relationship may exist), no liability, responsibility or risk is accepted in determining if the Network Pro ONE 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.	The Network Pro ONE must only be used for the purposes described in this manual.
Cellular connection, ownership, and activation The Network Pro ONE requires a cellular connection, either LTE-M or 2G to set up and upload data to the Cloud. A cellular connection might not be available in all locations. The presence of LTE does not guarantee LTE-M signal being available. LTE-M is intended for low bandwidth Internet of Things (IoT) products where LTE is for mobile high bandwidth applications. Because this device is shipped in a non-active state, ownership is established as part of the setup process. Permission to manage pairing with other AoFrio hardware can be granted through User Roles within AoFrio's User Manager software. To use AoFrio's Field app as part of the configuration process, the Network Pro ONE feature needs to be activated for the database that you are working in.	- The Network Pro ONE requires a clear cellular connection - Each device needs to be registered with AoFrio as part of setup and activated to the correct database - Pairing requires additional user role permissions through User Manager.
Power supply - Installation should be done by a qualified technician. - Do not expose the power supply to water or moisture. - Do not use the power supply if it is damaged or if the cord is frayed. - Do not attempt to repair the power supply yourself. Contact a qualified technician if repairs are needed.	- Only authorised and appropriately qualified staff should install the power supply - Mount the power supply in an environment that is not subject moisture or high humidity.

Warnings continued

Warnings	Important do's and don'ts
Correct disposal The Network Pro ONE 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 ONE must not be disposed of in municipal collections, it must be disposed of through an approved WEEE collection point. Alternatively, Network Pro ONE should 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. 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. Once the device's battery is depleted, remove the device from equipment and dispose of it according to local requirements. Leaving Network Pro ONE installed in the equipment presents risks due the potential for battery housing corrosion leading to chemical leakage.	• The Network Pro ONE 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 ONE devices contain a lithium battery. This may be hazardous if incinerated or physically damaged. • Do not leave an old Network Pro ONE installed in field equipment after it has reached its end of life.
Chemicals The Network Pro ONE 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.	• Do not expose to liquids. • Any installation should be adequately assessed by the customer to meet the applicable end product standards for Hydrocarbon refrigerant environments.
Temperature The Network Pro ONE must not be subjected to temperatures outside its specified temperature limits. 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.	• Do not expose to high or low temperatures.
Vibration and impact 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 ONE to become unsafe. Damage caused by impact is not covered by warranty.	• Do not drop or install the Network Pro ONE in locations with vibration. • Mount the Network Pro ONE and its power connector in an environment that is not subject to movement.
Continuous development AoFrio undertakes to continuously develop and improve products and services. The design and specification of Network Pro ONE 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.	• The design and specification of the Network Pro ONE is subject to change and new firmware may be released without notice.

Introduction

The Network Pro ONE is one of the communications devices in the AoFrio IoT ecosystem. It provides real-time automated one-to-one data acquisition from either an AoFrio SCS Controller, Monitor or Click installed in an asset or equipment 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 cooler owners to make site visits to acquire data from their fleet. (NB. For this manual, we will use “cooler” as the asset type and “SCS Controller” as the AoFrio IoT device.)



Network Pro ONE 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 the other AoFrio IoT device it is paired with.
- **Cellular connectivity** – A global cellular module 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

Each 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 ONE 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 ONE, and therefore the equipment it is installed into. NOTE: Network Pro ONE is not able to establish a WiFi connection to transfer data.

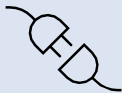
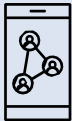
What you need

- AoFrio Network Pro ONE
- AoFrio AC to DC power supply
- Hardware (screws, cable ties, tape etc.) to mount the Network Pro ONE and AC/DC power supply



Key steps

When planning how to make a retrofit installation into a bottle cooler, these are the main steps to consider:

	1. Plan where to mount the Network Pro device within the cooler
	2. Pair the Network Pro ONE with the SCS Controller
	3. Connect to the power supply
	4. Mount the Network Pro ONE
	5. Test 1-1 pairing with Field app verification
	6. (Optional) Use the LEDs to confirm operation

Plan where to mount the Network Pro ONE within the cooler

While the mounting location can vary widely depending on the asset type (e.g., Open Deck cooler, Bottle cooler, Ice cream chest freezer), we would recommend the following:

- **Ensure the device will be in a position to successfully use Bluetooth** to pair with the SCS Controller inside the cooler.
- **Mount the device at or near the top of the cooler** to improve connection strength to a Cellular Network (LTE-M or 2G) for data upload to the Cloud. This is especially relevant when paired with an SCS Controller that may be mounted closer to the equipment's motor or compressor.
- **Identify a suitable AC connection point.** We normally recommend connection to the cooler's power source rather than a separate AC connection. Ideally the Network Pro ONE will be no further than 2.5 meters from the AC connection point inside the cooler.

Pair the Network Pro ONE with the SCS Controller

If the 1-to-1 association between the Network Pro ONE and the SCS Controller hasn't been configured, or if you are retrofitting/swapping devices, Field app can be used to do the configuration.

Before you start

- **Network Pro ONE**
 - Ensure you are in a location with a clear cellular network signal to set up and upload data to the Cloud.
- **Field app**
 - You will need a user role with permission to manage pairing with other AoFrio hardware. This can be granted through User Roles within AoFrio's User Manager software.
 - Field app must be version 5.28 or later. You can check the Field app version from the menu within the app and download the latest version if required.
 - Your device must have an active internet connection to perform this configuration.
- **SCS Controller**
 - The controller must be powered to allow pairing. If you are installing a new SCS Controller, refer to the SCS Controller manual.

Download Field app

Use these QR codes to download AoFrio's Field app or visit the iOS store or Google Play to find the downloads.

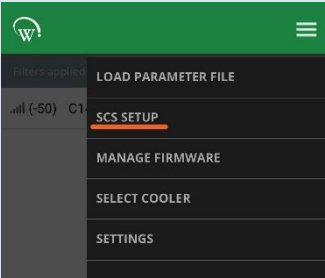
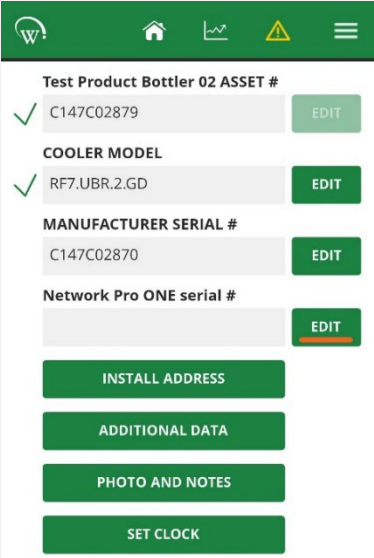
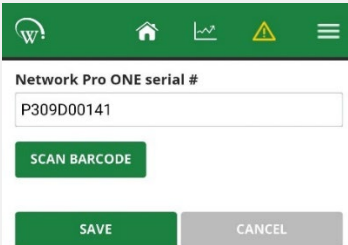


Apple Store



Google Play

Field app - Configuration

Step	Details
1. To pair the SCS Controller with a Network Pro ONE, go to Field app and select the SCS Controller from the list of visible devices and click CONNECT. NOTE: The list of available devices is filtered by your activation permission. Devices you are not authorized to connect to will not display.	
2. Open the main menu and select SCS SETUP.	
3. Click EDIT in the relevant rows to add details for the ASSET #, COOLER MODEL, and MANUFACTURER SERIAL #. Leaving the ASSET # field empty means the device will not be tracked.	
4. Click EDIT in the row for Network Pro ONE serial #. Either type in the Network Pro ONE serial number or scan the QR code by clicking SCAN BARCODE. Click SAVE to complete the configuration. If this process fails, refer to the section Configuration Troubleshooting. You are ready to power up the Network Pro ONE. If it is already plugged in, unplug for at least 2 minutes, then plug again for it to download the latest configuration.	 

Configuration troubleshooting

Problem	Possible Solution
Internet Connection Required an internet connection	Check the Internet connection on your mobile device
SCS Controller FW not supported This feature is only enabled for SCS controllers with FW version 4020 or later.	Update the SCS Controller firmware.
Network Pro's wrong SKU The Network Pro you are trying to associate is not a ONE, and therefore cannot be used in a 1-to-1 association.	Make sure the device is a Network Pro ONE by checking it has a "ONE" sticker.  If the device is a Network Pro ONE, contact AoFrio support.
Network Pro ONE already belongs to someone else The Network Pro ONE you are trying to associate has already been claimed to another bottler or company.	Contact AoFrio support.
Network Pro ONE already tracking. The Network Pro ONE appears to be tracking an SCS Controller already.	Click OK to proceed and override the association.
SCS Controller already being tracked The SCS Controller appears as its being tracked by another Network Pro ONE already	Click OK to proceed and override the association.

Connect to the power supply

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.

The Network Pro ONE system is supplied with an AC to DC power adaptor which must be connected to a 100-240V AC, 50/60Hz power source. The power adaptor outputs 5V DC via the 3.5mm connector to power the Network Pro ONE device.

Note that the Network Pro ONE will remain in a deep sleep mode until the power is connected. Once connected to power, the device will turn on and start charging its internal back-up battery.



Installation overview

1. Connect the AC wires to the AC distribution point using AC terminations as per local regulations.
2. Connect the output of the power supply to the Network Pro ONE and make other connections. (Refer to the pages that follow for more detail).
 - Before or after mounting, plug the 3.5mm connector from Network Pro ONE into the supplied cable. Check that the plug is inserted all the way in.
 - Wire the AC side of the power supply to the cooler mains using your preferred connectors. 100-240V AC, 50/60Hz.
 - (Optional) Secure the position of the device and cables with cable ties to avoid unplugging when the cooler is moved.
3. Ensure that the voltage and current requirements of the device are within the specifications of the power supply.

Troubleshooting

If the power supply fails to operate, please check the following:

- Ensure that the power supply is connected to the AC outlet.
- Ensure that the output of the power supply is connected to the Network Pro and 3.5mm connector is fully inserted.
- Ensure that the voltage and current requirements of the device are within the specifications of the power

Connect the cables

Step

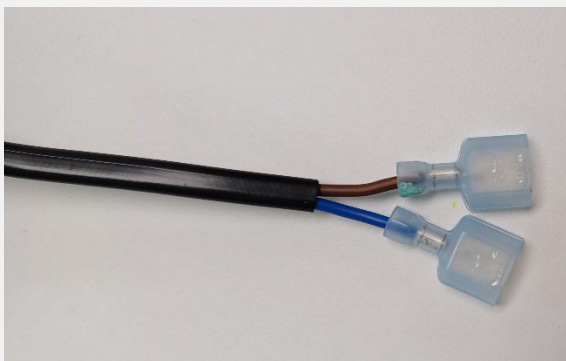
1. Before or after mounting, plug the 3.5mm connector from Network Pro ONE into the supplied cable.



2. Check that the plug is inserted all the way in.



3. Wire the AC side of the power supply to the cooler mains using your preferred connectors. 100-240V AC, 50/60Hz



4. (Optional) Secure the position of the device and cables with cable ties to avoid unplugging when the cooler is moved.



Mount the Network Pro ONE

Things to avoid

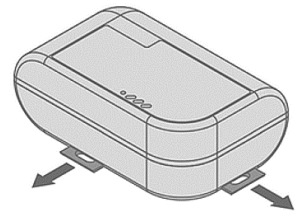
	Avoid mounting the device where it is fully surrounded by metal surfaces as this may prevent successful communications.
	Avoid external mounting on the side or back of a cooler where the device can be damaged during cooler movement.
	Avoid mounting the device inside a cold or warm space as this will impact the communications and device battery. The mounting location must be an area where the temperature is maintained between 0°C (32°F) and 40°C (104°F).
	Avoid mounting in areas where there is a high risk of condensation or moisture.
	Avoid mounting the power supply at or near a heat source. The power supply mounting location must be an area where the temperature is maintained between -10°C (14°F) and 40°C (104°F).

Recommended actions

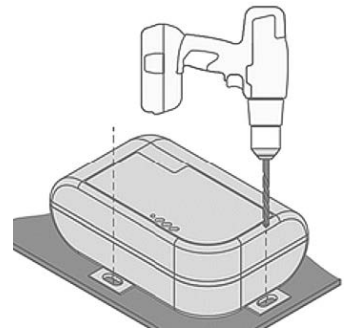
	Mount the device inside the cabinet. While mounting can vary depending on cooler type, in most situations we recommend that the Network Pro ONE is mounted inside the cabinet, but not in a place where it is fully enclosed by metal.
	Mount the device behind plastic paneling or a grid as these are less likely to interfere with communications.
	Mount the device where it is out of sight from customers to minimize the risk of theft or tampering.
	Mount the device at or near the top of the cooler to ensure the best connection strength to a Cellular Network (LTE-M or 2G) for data upload to the Cloud.
	Use the supplied screws and/or the double-sided tape to ensure secure mounting on metal or plastic surfaces. We also recommend that you use cable ties to secure the power cable in place.
	Position the device to avoid debris and moisture ingress from above. It doesn't matter if the device is horizontal or vertical, but the tail should be facing down or to the left, to avoid ingress through the USB-C port.
	If you plan to configure the device after you have completed the cooler build, make sure you remove and store the additional supplied QR code sticker from the device separately so you can scan it later.
	Secure the power supply and power cables using cable ties and/or double-sided tape to avoid damage during transport and operation of the cabinet.
	The power supply is supplied with open ends on the AC cable. We recommend that you terminate the AC cable with an appropriate connector to allow easy integration with the cabinet AC wiring.

Screw mounting

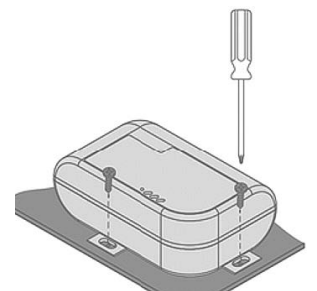
1. Pull out the screw mounting tabs from the bottom of the device.



2. Mark and drill pilot holes.



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



Tape mounting

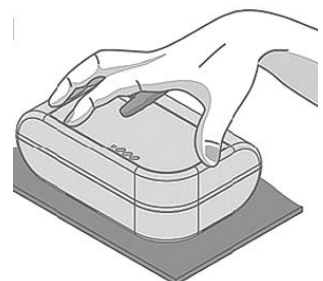
1. Ensure the mounting surface and the back of the device are clean and dry.



2. Stick the adhesive pad to the back of the device.



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



Test 1-1 pairing with Field app verification

The Field app can be used to verify that the Network Pro ONE is working and that the 1-to-1 association with the SCS Controller has been properly configured. Depending on the battery level of the Network Pro ONE and the cellular network status, the Network Pro ONE may take several minutes to activate and start operating.

NOTE: The Network Pro ONE will not start advertising or communicating over Bluetooth until it is activated. We recommend that you always configure the Network Pro ONE first and then plug it in while working on the mounting process to reduce this wait time.

Step	Detail
1. To verify the Network Pro ONE with Field app, open Field app and either: Scan the QR code on the Network Pro ONE with your mobile device camera OR Select the Network Pro ONE from the list of available devices displayed on the Field app homepage and click CONNECT.	
2. Click REFRESH button to retrieve the latest data from the AoFrio Cloud then read through the CHECKLIST screen to verify each function is operating as expected. • a dark green check mark shows the function is operating as expected. • a yellow check mark highlights a potential problem. • a red cross shows that the function is not working, and installation is incomplete. If all items are marked with a dark green check mark then the device is fully operational. For assistance with functions marked with a yellow check mark or a red cross refer to the section on Verification troubleshooting.	
3. To check cellular connectivity, click NETWORK PRO DETAILS and review the signal strength and the connection between AoFrio's Cloud and the Network Pro ONE.	

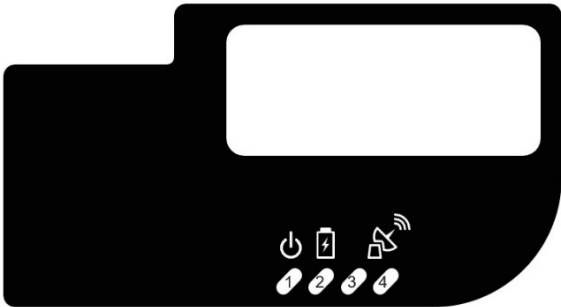
Field app verification troubleshooting

Problem Observed	Possible Cause	Possible Solution
Can't see Network Pro ONE serial number in the list of devices in the Field app	1. User role may not have access to the Network Pro ONE feature. 2. Network Pro ONE hasn't been activated and therefore is not advertising over Bluetooth yet	1. Make sure the Network Pro ONE is powered. See section Troubleshooting with LEDs if required. 2. The Network Pro ONE can take several minutes to activate. Please wait and try again. 3. Contact Technical Support and request Network Pro ONE access in the Field app.
 Red cross next to Mobile Network	The cellular account has not been activated. This may mean the mobile provider is not available in the area.	1. See Troubleshooting with LEDs to check the cellular network status. 2. Contact AoFrio support.
 Yellow check mark next to Mobile Network	Network Pro ONE is in a location with poor cellular coverage	Move the Network Pro ONE to another location where it has a stronger signal reception
 Red cross next to Cloud connection	Network Pro ONE has not been able to connect with the AoFrio cloud. 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 click REFRESH .
 Red cross next to Cooler Tracking	If you see the message "Network Pro ONE has not been configured to connect to any cooler" this means that the pairing process has not completed.	Wait for a few minutes and click REFRESH. If the problem persists, try to pair the devices again.
 Red cross next to Cooler Tracking	If you see the message "Network Pro ONE is not connected to any cooler. Network Pro ONE is assigned to track cooler XXXXX" this means that Bluetooth communications with the paired controller is not possible.	1. Check that the SCS controller is powered. 2. Move the Network Pro ONE to another location where it is closer to the SCS controller you want to pair it with. 3. Wait for a few minutes and click REFRESH.
 Red cross next to Cooler Data Upload	No cooler data has successfully been uploaded to the cloud.	Wait for a few minutes and click REFRESH .

Use the LEDs to confirm operation

Network Pro ONE is equipped with 4 LEDs, numbered 1 through 4 from left to right with behaviour as described below. When you switch on mains power – you may choose to use these 4 LEDs to test power and cellular connections. Note that this step doesn’t establish connection or pairing with the other device inside the cooler.

If you are running the device from the battery alone, only LED 3 and 4 will be active.



LED	Purpose	Behaviour
LED 1	External power status	- ON = good input voltage (between 4.6V and 6.4V) - OFF = no external power, or outside allowed range
LED 2	Battery charging status	- ON = battery charging - OFF = battery not charging The LED will slowly flash (5 seconds on, 1 second off) while the device is charging, and the battery level is not high enough yet to turn on the module. When the battery is fully charged the LED may turn off.
LED 3	Cellular module power status	- ON = cellular module on - OFF= cellular module off
LED 4	Cellular network connectivity status	Slow short flash - searching for cellular network Slow long flash - connected to a cellular network, idle Fast flash - connected to a cellular network, sending data

Troubleshooting with LEDs

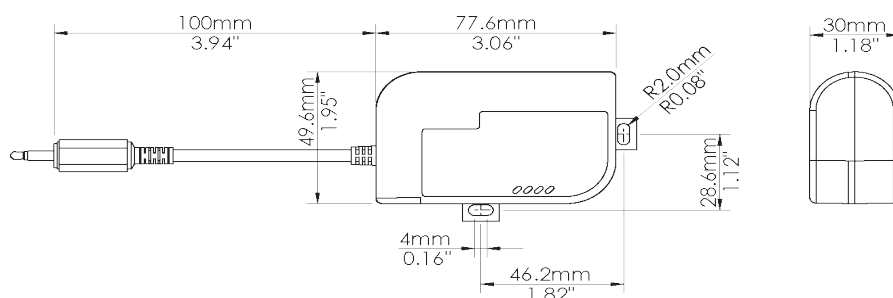
Problem Observed	Possible Cause	Possible Solution
No LEDs are on	No power to the device	- Check that the cooler power is on. - Check that the 3.5mm plug is fully pushed into the jack. - Swap the power supply.
LED 2 is not on, meaning that the battery is not charging	Battery might be fully charged	No issue. This is normal behaviour
LEDs 3 and 4 are off	The cellular module is not being powered - the Network Pro ONE may be in a low power state OR the battery has not charged enough to allow successful communications. This can take up to 10mins after powering the device.	Wait 10mins for the battery to charge if needed. LEDs 3 and 4 will show activity once the battery voltage is sufficiently charged.

Technical Specifications

Specifications	
AC to DC input power supply - voltage and current	- Input 100-240V, 50/60Hz 0.8A - Output 5V DC 2.0A
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
Power supply	The AC cable is 1M long and DC cable is 2m (6.5ft) long.
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 plug
Mounting method	2 x self-tapping screws or double-sided adhesive pad
Ingress protection	IP43
Operating temperature*	-20°C to +60°C (-4°F to 140°F)
Storage temperature	-20°C to +60°C (-4°F to 140°F)
Weight	Main unit: 63g (2.2oz) AC/DC Power adaptor: 188g (6.6oz)
Approvals†	   

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

† NOM approval pending



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