

AirgainConnect® Fleet™ 5G Vehicle Gateway

Installation Instructions

Airgain, Inc

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- SEVERE DAMAGE WARNING. The AirgainConnect Fleet (AC-Fleet) 5G Vehicle Gateway must be powered by an approved Airgain 12V adapter, AC/DC adapter, or 12 to 24V vehicle power supply.
- SEVERE DAMAGE WARNING. AC-Fleet is designed to meet IP67 and IP69K water and dust ingress when properly mounted on a vehicle roof. AC-Fleet's bottom threaded bolt is normally inside of a vehicle, hence, the bolt is NOT watertight. Care must be taken during temporary installations where the bolt of AC-Fleet is exposed to the elements. It is the CUSTOMER'S RESPONSIBILITY to ensure that the bolt on the bottom of AC-Fleet is never exposed to water or moisture.
- HOT. Do not touch the AC-Fleet 5G Vehicle Gateway while operating. Power it off and allow it to cool down for 30 minutes to a safe temperature after use before touching it.
- MAINTAIN A SAFE DISTANCE. Stay 21 inches (53 cm) or more away from the AC-Fleet 5G Vehicle Gateway during normal operation.
- AC-Fleet can operate within a temperature range of -30°C to 70°C (-22°F to 158°F). Note, in temperature extremes above 70°C, AC-Fleet may operate at reduced performance.

Any damage, loss, or cost of repair associated with installation other than as provided in this installation guide would not be covered by the limited warranty for this product.

FCC RF Radiation Exposure Statement

To comply with the FCC RF exposure compliance requirements, this device must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 21 inches (53 cm) between the device and the nearest person during normal use.

For more information on consumer issues, visit the FCC's Consumer Help Center at www.fcc.gov/consumers.

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1. Overview

The AC-Fleet 5G Vehicle Gateway is an integrated 5G modem, Wi-Fi 6 router, Gigabit Ethernet, and high-performance antenna solution designed for mounting to the roof of any vehicle.

This installation guide provides an overview of AC-Fleet and provides basic setup and installation instructions.

2. Intended Audience

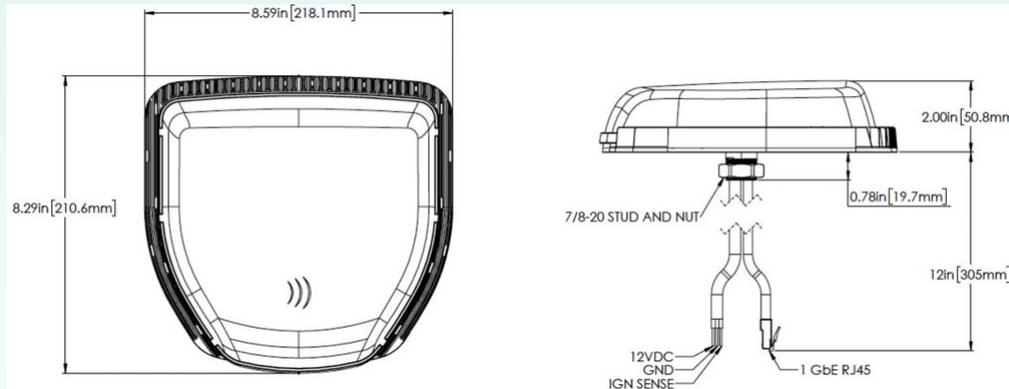
This document is intended for professional vehicle networking equipment installers.

Airgain is committed to the best customer experience with its products. As such, end-customers must use a professional installer due to:

- **Water ingress.**
 - A hole will be drilled in the vehicle's roof for a permanent installation. This presents the potential for water ingress into the vehicle. Care must be taken during installation to ensure the water-tightness of AC-Fleet to the vehicle.
- **Passenger safety.**
 - With newer vehicles, safety airbags are commonly installed in the second row and rear of the vehicle. Proper care must be taken to ensure there is no impact to the airbag system operation due to wiring or installation of AC-Fleet.
- **Proper AC-Fleet operation.**
 - AC-Fleet requires a proper fused power connection to the vehicle's battery and ignition line. AC-Fleet also requires a secure ground mount for proper electrical operation.
- **eSIM activation.**
 - Although eSIMs are not new in the consumer electronics industry, eSIM is new in connected vehicle routers. AC-Fleet needs to be activated by trained fleet managers or installers to ensure proper operation.

3. Initial Installation Considerations

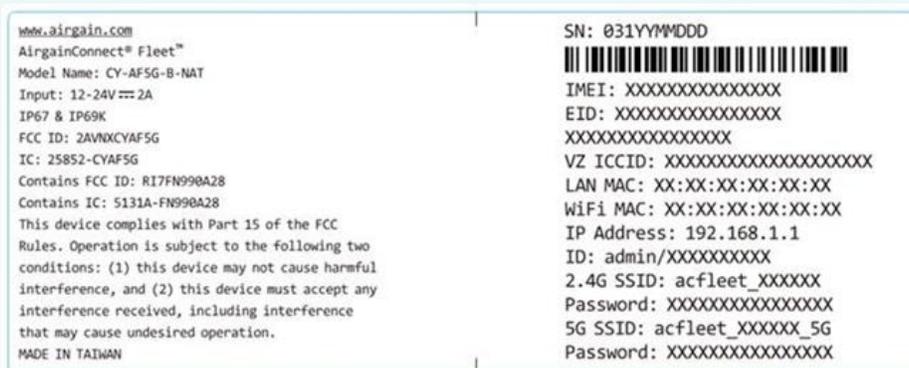
a. AC-Fleet Hardware



- i. Mounting Foam:
 - a. AC-Fleet is shipped with mounting foam installed on the bottom of the device.
 - b. The outer mounting foam is porous and moldable to fit ribbed or sloped rooflines.
 - c. The inner mounting foam ring is dense and includes adhesive on both sides to seal out water from the bolt hole.
- ii. LEDs:
 - a. **There are no LEDs on AC-Fleet.** This is by design. Any device installed on the outside of a vehicle may be subject to vandalism or theft. As such, AC-Fleet was designed based on customer feedback that no LEDs shall be on the unit that could draw unwanted attention.
- iii. No extension cables are included:
 - a. The cables that are pre-attached to AC-Fleet are approximately 12 inches in length. There are no extension wires or cables included. This is by design due to the varying needs of different installations. Airgain offers 20 AWG power (red), ground (black), and ignition sense (white) cables with splicing materials and shielded Cat6 Ethernet cables at various lengths for ease of installation. Not sourcing from Airgain nor using equivalent cables can result in degraded performance and could potentially void the limited warranty for this product. A female-to-female Ethernet coupler is included in the package to assist with adding an Ethernet extension cable.
- iv. There is no SIM card door:

- a. There are no SIM card doors on AC-Fleet. This is by design. AC-Fleet was designed to be a completely sealed IP67 and IP69k rated unit when installed properly on a vehicle. eSIM(s) must be activated for the unit to be operational.
- v. Device activation and login information are included on the product label attached to the Ethernet cable and on the device package label:

Note: Take a picture of the product label and store it in a secure manner for later reference.



- a. On the Ethernet cable there is a product label (shown above) with important information including:
 - i. The device serial number (SN).
 - 1. This is required for Airgain's AC-Cloud registration and warranty.
 - ii. IMEI number (International Mobile Equipment Identify).
 - 1. You will need this to activate service with your chosen carrier.
 - 2. This number uniquely identifies your device to the carrier.
 - iii. EID number (Embedded Identify Document).
 - 1. You will need this to activate eSIMs with your chosen carrier.
 - 2. This number uniquely identifies the eSIM chip inside the device to the carrier.
 - iv. VZ ICCID number (Verizon Integrated Circuit Card Identification).
 - 1. You will need this to activate service if you choose Verizon Wireless.

2. This number identifies the pre-loaded eSIM profile for Verizon.
- v. IP address
 1. You will need this address to log into the local GUI webpage for device management.
 2. i.e. after connecting to AC-Fleet with your computer or laptop, navigate your web browser to <http://192.168.1.1>.
- vi. ID
 1. This is the factory default local GUI login username and password.
 2. Per the above image:
 - a. Username = admin
 - b. Password = XXXXXXXXXXX
 3. Do not enter the "/" when logging in to the device's local GUI.
- vii. 2.4G SSID
 1. This is the factory default 2.4GHz Wi-Fi access point (AP) name.
- viii. Password (directly underneath 2.4G SSID):
 1. This is the password for connecting to the 2.4GHz Wi-Fi AP.
- ix. 5G SSID
 1. This is the factory default 5GHz Wi-Fi access point (AP) name.
- x. Password (directly underneath 5G SSID):
 1. This is the password for connecting to the 5GHz Wi-Fi AP.

vi. Factory Reset:

- a. A factory reset to default settings can only be performed through the local GUI, or the remote AC-Cloud interface to the device. There is no button or physical reset method on the device itself.

b. Installation Location

- i. Ensure AC-Fleet is positioned to receive optimal signal.

- a. Located at least 18 inches (46cm) away from vehicle windows (or sun/moon-roof panels), other antennas or obstacles protruding from the roof.
- ii. AC-Fleet must be mounted horizontally – parallel to the ground – for proper operation.
- iii. AC-Fleet must be mounted to a clean and dry surface. Avoid drilling the mounting hole near panel seams and/or rivets so the adhesive gasket can seal properly.
- iv. If installing on a ribbed roof line – it is recommended to drill the hole **in the center on the top of the rib** (as shown below).
 - a. This is to ensure that the inner adhesive mounting foam ring on AC-Fleet will make sufficient adhesion to the roof to seal out water.



- v. Ensure that the nut/bolt mount can be properly torqued to ensure adhesion of the inner adhesive mounting foam ring to seal out water.
 - a. Above the headliner, ensure there are no metal crossbars that could block the installation of the nut to secure the device to the roof.
 - b. The installer may encounter various obstacles with individual vehicle designs that may require different placement, routing of cables or drill-hole location.
- vi. Avoid installing the device in enclosed spaces.
- vii. Follow all necessary precautions such that the installation of AC-Fleet does not affect passenger safety.
- viii. When routing cables, do not pull on AC-Fleet's cables. Pulling directly on the cable pigtail may cause internal damage to AC-Fleet.

- ix. Make sure the surface temperature where AC-Fleet is to be mounted is between 85°F to 100°F (30°C to 38°C). Cooler surface temperatures will cause improper adhesion of the inner adhesive foam ring to the surface of the vehicle.
- x. Extra pieces of heat shrink are included for covering the Ethernet connectors (if desired). It is recommended that heat shrink is “shrunk” only after all tests have been completed.

c. A wireless broadband data plan is required for AC-Fleet.

- i. Mobile network providers must provision or activate at least one eSIM inside of AC-Fleet to provide connectivity.
- ii. Contact your mobile network provider to activate.

4. Minimum Required Tools for Installation

- a. Safety glasses.
- b. Tape measure.
- c. Blue tape.
- d. A drill with 1 inch hole saw bit.
- e. An adjustable wrench.
- f. A CAT6 shielded Ethernet extension cable.
- g. 20 AWG stranded wire to connect power, ground, and ignition sense to the vehicle.
- h. Wire connectors (or solder and soldering iron).
- i. Heat shrink.

5. Prior to Installation

a. Verify the box contents

- i. AC-Fleet
- ii. Slotted hex nut
- iii. 1x 4:1 heat shrink, 7/8” diameter, 5” long
- iv. 2x 4:1 adhesive heat shrink, 3/4" diameter, 1.5” long
- v. A quick-start card with a QR code – this is your link to all AC-Fleet documentation on the web.

b. Activate one or more eSIMs

- i. Refer to the Quick Start Guide for instructions on eSIM activation.

c. Perform a bench power-up

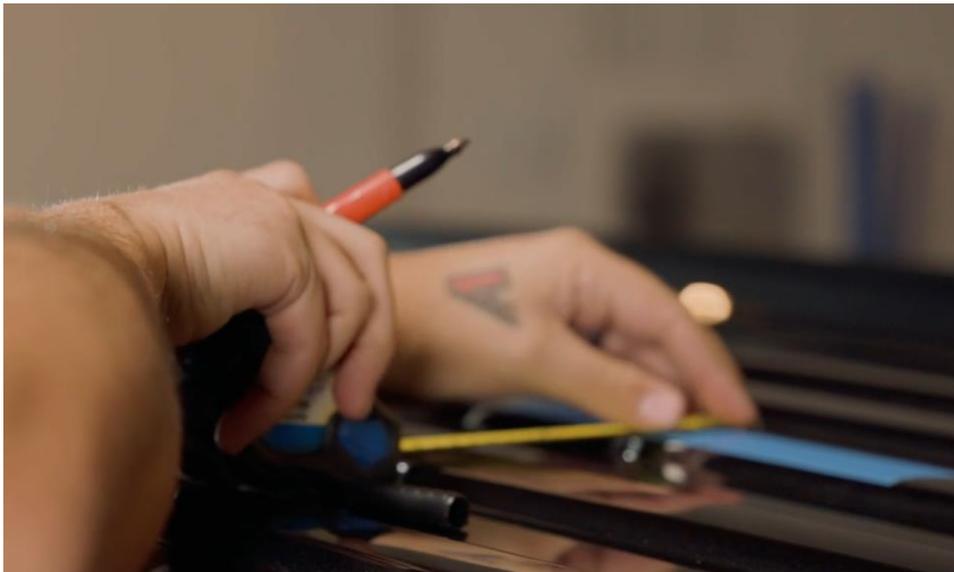
- i. It is MUCH easier to troubleshoot on a bench prior to installation.
- ii. It is HIGHLY RECOMMENDED to connect AC-Fleet to the exact type of devices it may be deployed with and verify the configuration on a benchtop BEFORE final installation.
- iii. Connect a laptop to the Ethernet cable of AC-Fleet.
- iv. Set a benchtop power supply's output to between 12V and 24V DC.
 - a. It is recommended to set the power supply voltage to the same voltage as the vehicle AC-Fleet will be installed on.
- v. Connect the ground line to a benchtop power supply ground.
- vi. Connect the power and ignition sense line together, and then connect to the power line of a benchtop power supply. Tying the power and ignition lines together will signal that the "vehicle" is powered on for benchtop testing.
- vii. Turn on the benchtop power supply to power-up AC-Fleet.
- viii. Wait for approximately 1 minute for AC-Fleet to boot up.
- ix. Login to the local GUI at 192.168.1.1 and using the username and password as shown on the device's label.
- x. Verify that AC-Fleet connects to the network with all activated eSIM profiles.

6. Install AC-Fleet to the Vehicle**a. Drop the headliner inside the vehicle.**



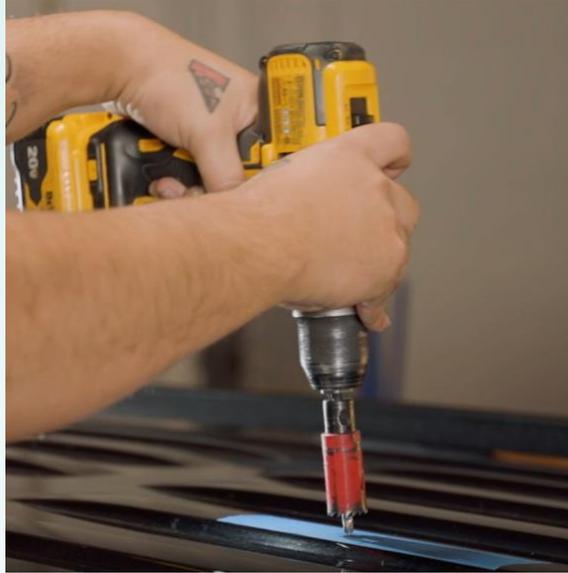
- i. Dropping the headliner must be completed before drilling the hole in the roof. This is important to do first, so the installer doesn't drill through the headliner. It is also important to survey the inside of the roofline for crossbars, airbags, etc. that may obstruct the drill-hole and/or nut from being adequately tightened.
- ii. Measure and make a note of where the hole can be safely drilled.

b. Mark the drill hole location on the top of the roof.



- i. Measure on top of the roof and locate the hole center point.
- ii. Blue painter's tape may be used to mark the drill location.

c. Using a drill and 1 inch hole saw bit, drill the hole.



d. On the benchtop, attach all cable extensions to AC-Fleet.



- i. Connect power, ground, and ignition sense extension cables:
 1. Use the appropriate length and gauge of extension wires for the vehicle application.
 2. Note, it is recommended to use solder and heat-shrink for the individual wire splices – and wire-loom / Tesa tape to protect the harness.



- ii. Connect the Ethernet coupler and extension cable:
 1. Connect the RJ45 female-to-female Ethernet coupler to AC-Fleet's Ethernet cable.
 2. Slide the included heat-shrink onto that cable assembly.



3. Connect the Cat6 shielded Ethernet extension cable to the other end of the RJ45 female coupler.



iii. SEVERE DAMAGE WARNING: The Ethernet cables may be damaged if overheated during the application of the heat shrink tubing. Use special care when applying heat. Using a heat-gun or torch, move the hot stream of air slowly back and forth over the heat shrink that covers the Ethernet coupler and connectors. Avoid focusing the hot air stream in the same location. Do not apply heat directly to the exposed Ethernet cables.

1. It is recommended to use the included 7/8" diameter, 5" long heat shrink as it will ensure the Ethernet cables do not come detached from the coupler after installation.
2. If AC-Fleet will be tested with temporary mounting equipment that might expose the cables to the environment, then it is recommended to cover the ends of above heat shrink with the included 3/4" diameter, 1.5" long adhesive heat shrink to seal out water.

e. Lay the AC-Fleet device on the roof. Route the cables through the hole.



- f. **Remove adhesive tape from the inner foam ring. This adhesive is what seals water out of the vehicle.**
- Note: For maximum adhesion, the bonding surfaces must be clean and dry, and free from debris that could prevent a seal.
 - SEVERE DAMAGE WARNING: If the adhesive tape is not removed from the foam pad, there will not be a water-tight seal for the vehicle roof.**
- g. **While holding AC-Fleet, guide the wires into the hole and make sure AC-Fleet is properly aligned on the vehicle.**



- h. **Press down firmly on AC-Fleet such that the thinner inner adhesive foam contacts the roof.**
- SEVERE DAMAGE WARNING: If the inner adhesive foam does not make contact and seal with the roof, there will not be a water-tight seal.**
- i. **Install the nut inside the vehicle.**



- i. Tighten the nut 1 ½ turns after the nut contacts the inside surface (Not to exceed 20 ft-lbs).



- ii. The inner adhesive foam ring must be fully engaged and compressed with the roof of the vehicle to prevent water ingress.

j. Run the cables in the vehicle.

- i. The power wire **MUST** be connected through a 3A fuse.
- ii. **SEVERE DAMAGE WARNING: Do not directly connect AC-Fleet's power to a vehicle battery without a fuse.**
- iii. Connect the Ethernet cable as required.

7. Start the vehicle and test AC-Fleet

- a. AC-Fleet should be operational the next time the vehicle starts.

8. Troubleshooting

If AC-Fleet takes longer than 5 minutes for the Wi-Fi access points or Ethernet to be active, please contact support@airgain.com to start the troubleshooting process. You will need to be with the vehicle to troubleshoot.

9. Disclaimer and Limitation of Liability

- a. Disclaimer:
 - i. Airgain does not warrant that the hardware will work properly in all environments or applications, and makes no warranty or representation, either implied or expressed, with respect to the quality, performance, merchantability, or fitness for a particular purpose of AC-Fleet even when installed in accordance with this installation guide.
 - ii. This installation guide is provided “AS IS,” without any warranty of any kind.
 - iii. Information in this guide or the AC-Fleet device is subject to change without notice.
 - iv. Airgain makes no commitment to update information in this installation guide.
 - v. Airgain expressly disclaims all representations, warranties and conditions in this installation guide.
 - vi. Airgain has made every effort to ensure this installation guide is accurate. But, Airgain disclaims liability for any inaccuracies or omissions that may be in this installation guide – and shall not be liable for any adverse results caused, in whole or in part, by the installer’s reliance upon the instructions in this guide.
- b. Installer responsibility:
 - i. Airgain disclaims any liability for failure of the installer to perform the installation of AC-Fleet properly and for any other acts or omissions of the installer.
 - ii. By using this guide, you agree to indemnify and hold Airgain harmless from and against any and all liabilities, losses, damages, costs, and expenses (including without limitation attorneys’ fees and costs) incurred by Airgain.
- c. Limitation of liability:
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