



AIRGAINCONNECT® FLEET™ 5G VEHICLE GATEWAY

Installation Guide





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Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

To comply with FCC RF exposure compliance requirement, adhere to the following warnings:

Warning! Antennas used for this product must be fixed mounted on indoor permanent structures, providing a separation distance of at least 320 and above cm from all persons during normal operation. Warning! Each individual antenna used for this transmitter must be installed to provide a minimum separation distance of 320 cm or more from all persons and must not be co-located with any other antenna for meeting RF exposure requirements. Warning! The design of the antenna installation needs to be implemented in such a way to ensure RF radiation safety levels and non-environmental pollution during operation.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.



WARNING: This is NOT a CONSUMER device, it is designed for installation by **FCC LICENSEES** and **QUALIFIED INSTALLERS**. You **MUST** have an **FCC LICENSE**, or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.



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Preface

Audience

This document is intended for professional vehicle networking equipment installers.

This manual uses symbols to call attention to important information to the reader.



Note: Presents nonessential but potentially helpful information to understand a topic.



Important: Presents information to avoid an undesirable result.



Warning: Notifies the reader of a potentially hazardous situation that could damage the device.

1 General

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.

1.1 Precautions



- **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.

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.



- **SAFETY WARNING**

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 53 cm (21 inches) 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.



1.2 Installer Precautions

Airgain is committed to the best customer experience with its products. To ensure this, 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 to ensure that the installation of AC-Fleet to the vehicle is watertight.
- **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 technology is new in connected vehicle routers. AC-Fleet needs to be activated by trained fleet managers or installers to ensure proper operation.

2 Initial Installation Considerations

2.1 AC-Fleet Hardware

Figure 1 shows AC-Fleet's dimensions from top-down and side views:

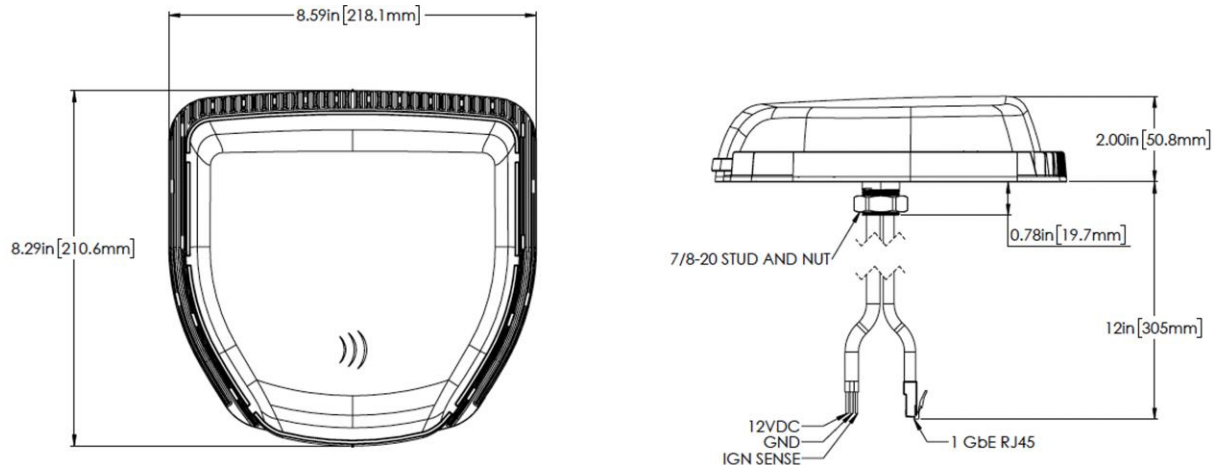


Figure 1 – AC-Fleet hardware dimensions

The following lists key aspects of AC-Fleet:

- **Mounting Foam:** AC-Fleet is shipped with mounting foam installed on the bottom of the device.
 - The outer mounting foam is porous and moldable to fit ribbed or sloped rooflines.
 - The inner mounting foam is dense and includes adhesive on both sides to seal out water from the bolt hole.
- **LEDs:** There are **no LEDs** on AC-Fleet by design, as customer feedback indicated that any LEDs on a device installed outside of the vehicle could draw unwanted attention and subject the vehicle to vandalism or theft.
- **Cables:** The cables that are pre-attached to AC-Fleet are approximately 12 inches in length and there are **no extension wires or cables** included. This is by design due to the varying needs of different installations. A female-to-female Ethernet coupler is included in the package to assist with adding an Ethernet extension cable.

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 or using non-equivalent cables can result in degraded performance and could potentially void the limited warranty for this product.

- **SIM Card Door:** There are **no SIM card doors** on AC-Fleet, as it was designed to be a completely sealed IP67- and IP69k-rated unit when correctly installed on a vehicle. eSIM(s) must be activated for the unit to be operational.
- **Device Activation and Login Information:** This information is 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.

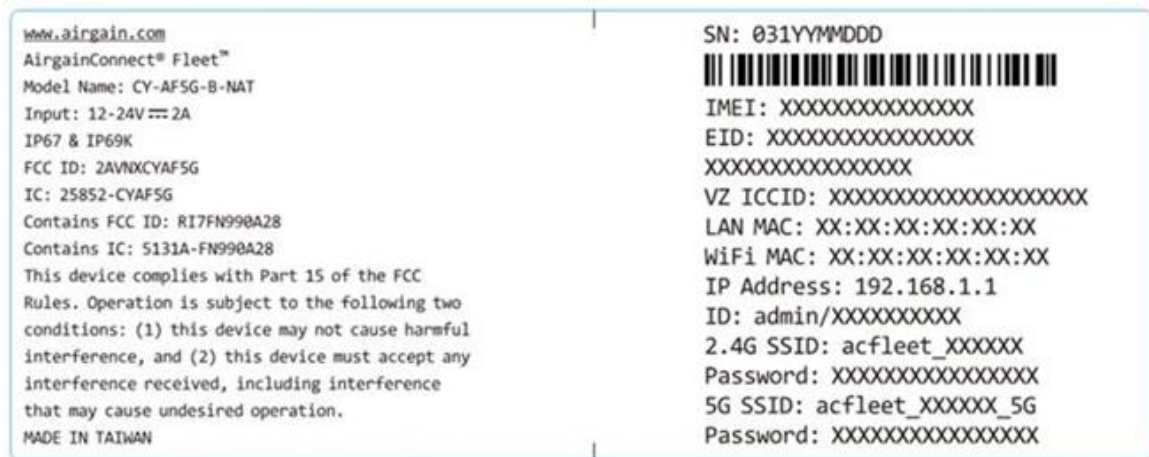


Figure 2 – Device activation and login information on the Ethernet’s product label.

The product label attached to the Ethernet cable includes the following information:

- **SN** (device serial number): Required for Airgain’s AC-Cloud registration and warranty.
- **IMEI** (International Mobile Equipment Identify): Uniquely identifies your device to the carrier and is required for you to activate service with your chosen carrier.
- **EID** (Embedded Identify Document): Uniquely identifies the eSIM chip inside the device to the carrier and is required for you to activate eSIMs with your chosen carrier.
- **VZ ICCID** (Verizon Integrated Circuit Card Identification): Identifies the pre-loaded eSIM profile for Verizon and is required for you to activate service if you choose Verizon Wireless.
- **IP Address:** Address to log into the local GUI webpage for device management. After connecting to AC-Fleet with your computer or laptop, navigate your web browser to <http://192.168.1.1>.
- **ID:** Factory default local GUI login username and password. Per Figure 2, the values are:

Username: admin



Password: XXXXXXXXXXXX

Note: Do not enter the “/” when logging in to the device’s local GUI.

- **2.4G SSID:** Factory default 2.4GHz Wi-Fi access point (AP) name.
 - **Password** (directly underneath 2.4G SSID): Password for connecting to the 2.4GHz Wi-Fi AP.
 - **5G SSID:** Factory default 5GHz Wi-Fi access point (AP) name.
 - **Password** (directly underneath 5G SSID): Password for connecting to the 5GHz Wi-Fi AP.
-
- **Factory Reset:** You can only perform a factory reset to default settings 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.

2.2 Installation Location

Adhere to the following location requirements and recommendations during installation:

- Ensure AC-Fleet is positioned to receive an optimal signal.
 - It must be located at least 46cm (18 inches) away from vehicle windows (or sun/moon-roof panels), other antennas or obstacles protruding from the roof.
- AC-Fleet must be mounted horizontally – parallel to the ground – for proper operation.
- 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.
- If installing on a ribbed roof line, Airgain recommends drilling the hole **in the center on the top of the rib** as shown in Figure 3 below. This ensures the inner adhesive mounting foam ring on AC-Fleet provides sufficient adhesion to the roof to seal out water.



Figure 3 – Installing AC-Fleet on top of a rib..

- Ensure that the nut/bolt mount can be properly torqued to ensure adhesion of the inner adhesive mounting foam ring to seal out water.
 - Above the headliner, ensure there are no metal crossbar(s) that could block the installation of the nut to secure the device to the roof.
 - The installer may encounter various obstacles with individual vehicle designs that may require different placement, routing of cables or drill-hole location.
- Avoid installing the device in enclosed spaces.
- Follow all necessary precautions so that the installation of AC-Fleet does not affect passenger safety.
- When routing cables, do not pull on AC-Fleet's cables. Pulling directly on the cable pigtail may cause internal damage to AC-Fleet.
- Ensure 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.
- Extra pieces of heat shrink are included for covering the Ethernet connectors (if desired). Airgain recommends that heat shrink only be shrunk after all tests have been completed.

2.3 Broadband Data Plan

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

Mobile network providers must provision or activate at least one eSIM inside of AC-Fleet to provide connectivity.

Contact your mobile network provider to activate.



3 Minimum Required Tools for Installation

The following tools and materials are required for installation:

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

4 Prior to Installation

Perform the following prior to starting the installation:

1. Verify the box contents:
 - AC-Fleet device
 - Slotted hex nut
 - RJ45 female-to-female Ethernet coupler
 - 1x 4:1 heat shrink, 7/8" diameter, 5" long
 - 2x 4:1 adhesive heat shrink, 3/4" diameter, 1.5" long
 - A quick-start card with a QR code – this provides access to all AC-Fleet documentation on the web.
2. Activate one or more eSIMs. Refer to the [Quick Activation Guide](#) for instructions on eSIM activation.
3. Perform a bench power-up – it is MUCH easier to troubleshoot on a bench prior to installation:
 - a. Airgain HIGHLY RECOMMENDS connecting AC-Fleet to the exact type of devices it may be deployed with and verifying the configuration on a benchtop BEFORE final installation.
 - b. Connect a laptop to the Ethernet cable of AC-Fleet.
 - c. Set a benchtop power supply's output to between 12V and 24V DC. Airgain recommends you set the power supply voltage to the same voltage as the vehicle AC-Fleet will be installed on.
 - d. Connect the ground line to a benchtop power supply ground.
 - e. Connect the power and ignition sense lines together, and then connect to the power line of a benchtop power supply. Tying the power and ignition lines together signals that the "vehicle" is powered on for benchtop testing.
 - f. Turn on the benchtop power supply to power-up AC-Fleet.
 - g. Wait for approximately one minute for AC-Fleet to boot up.
 - h. Login to the local GUI at 192.168.1.1 with the username and password as shown on the device's label.
 - i. Verify that AC-Fleet connects to the network with all activated eSIM profiles.

5 Install AC-Fleet on the Vehicle

Follow the steps below to install AC-Fleet on the vehicle:

1. Drop the headliner inside the vehicle.



Figure 4 – Headliner removal.

Note:

- 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.
- Measure and make a note of where the hole can be safely drilled.

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

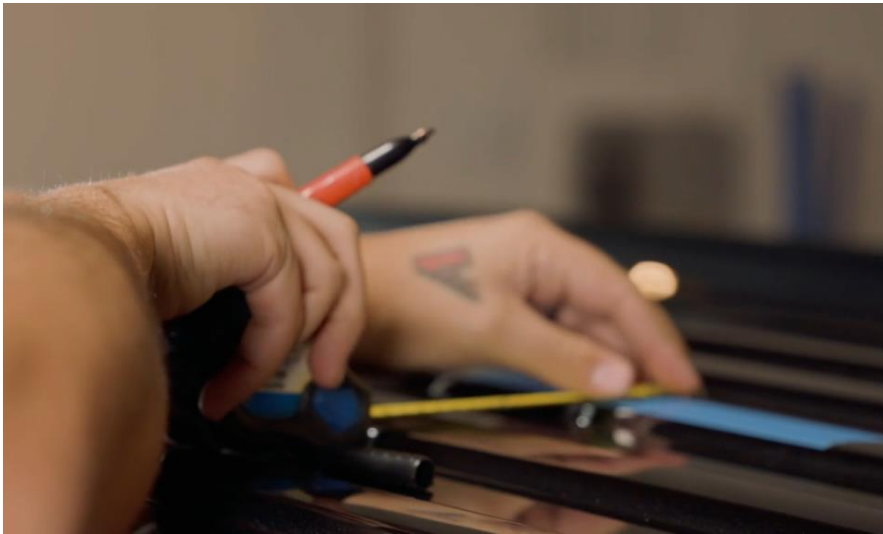


Figure 5 – Marking the drill hole location on the roof.

- i. Measure on top of the roof and locate the center point for the hole.

Note: Blue painter's tape may be used to mark the drill location.

3. Drill the hole using a drill equipped with a one-inch hole saw bit.



Figure 6 –Drilling the hole.

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



Figure 7 – Protecting the cables with tape.

- i. Connect power, ground, and ignition sense extension cables:
 - I. Use the appropriate length and gauge of extension wires for the vehicle application.

Note: Airgain recommends using solder and heat-shrink for the individual wire splices – and wire-loom / Tesa tape to protect the harness as shown in Figure 7 above.



Figure 8 – Sliding the included heat shrink onto the cable assembly.

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

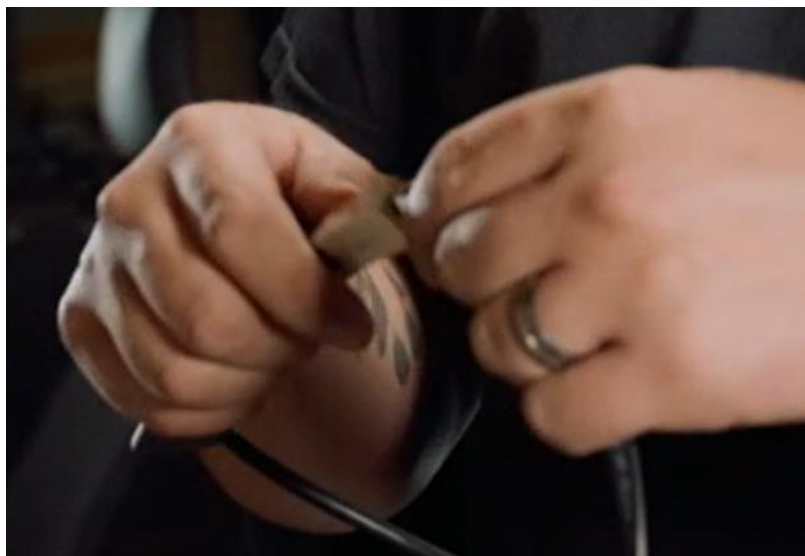


Figure 9 – Connecting the Ethernet extension cable to the coupler.

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



Figure 10 – Applying heat to the heat shrink.



ii.

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.

- I. Airgain recommends using the included 7/8" diameter, 5" long heat shrink as it ensures the Ethernet cables do not come detached from the coupler after installation.
- II. If AC-Fleet will be tested with temporary mounting equipment that might expose the cables to the environment, Airgain recommends covering the ends of above heat shrink with the included 3/4" diameter, 1.5" long adhesive heat shrink to seal out water.

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



Figure 11 – Routing the cables through the hole.

6. Remove adhesive tape from the inner foam ring. This adhesive provides a watertight seal with the vehicle.

- **Note:** For maximum adhesion, the bonding surfaces must be clean, 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 with the vehicle roof.**

7. While holding AC-Fleet, guide the wires into the hole and make sure AC-Fleet is properly aligned on the vehicle.



Figure 12 – Ensure the inner adhesive foam contacts the roof.

8. Press down firmly on AC-Fleet so that the thinner inner adhesive foam contacts the roof.



- i. **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.**



Figure 13 – Installing the nut inside the vehicle.

9. 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).

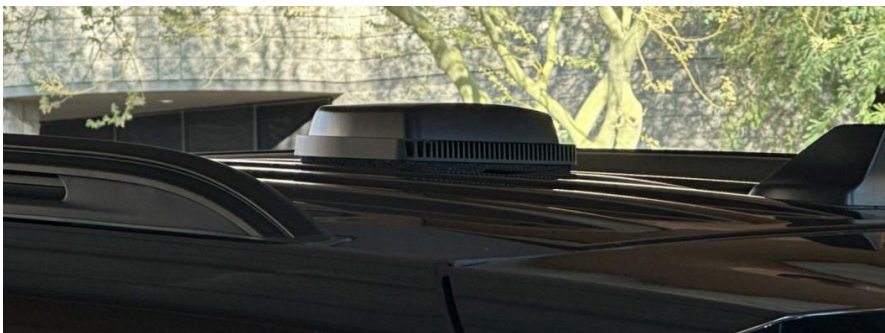


Figure 14 – Ensure the foam ring is fully engaged and compressed against the roof.

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

10. Run the cables in the vehicle:



- i. The red 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. The white ignition sense wire must be connected through less than a 1A fuse to the vehicle's ignition.



- iv. **SEVERE DAMAGE WARNING: Do not splice the power and ignition sense wires together or AC-Fleet will always remain on and drain the vehicle battery.**
- v. Connect the black ground wire to a secure ground mount.
- vi. Connect the Ethernet cable as required.

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



6 Troubleshooting

If AC-Fleet's Wi-Fi access points or Ethernet take longer than five minutes to become active, please contact connectivity.support@airgain.com to start the troubleshooting process.

Note: You must be with the vehicle to troubleshoot.

7 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.

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