

AirgainConnect® AC-HPUE™ Field Upgrade Instructions



Upgrade Instructions - Overview

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1. Installation Tools

Signal Conditioner Install

- Torx Screwdriver : 2mm hex
- Phillips Head Screwdriver

Radome Plug Install

- Torx Screwdriver : T8

Software Upgrades

- Laptop with Ethernet cable

Ethernet Injector Mounting

- (Optional) Socket Wrench
- (Optional) Metal file or heavy sandpaper

2. Electrostatic Discharge Protection

- The Ethernet Injector and the internal components of the AC-HPUE are ESD sensitive.
- Please take precautions handling the Ethernet Injector at all times and when handling the AC-HPUE while the SIM door is removed.
- It is recommended that work is completed on an anti-static workstation and that the technician is grounded using an anti-static wrist strap.

Figure 1

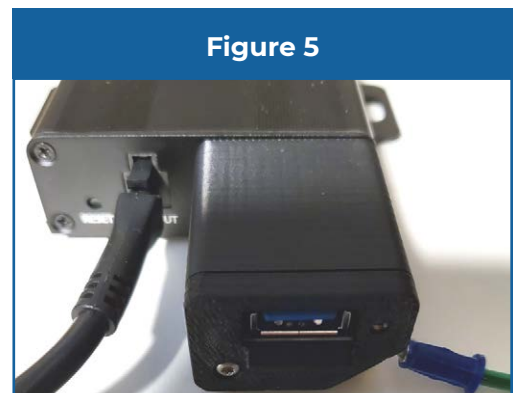
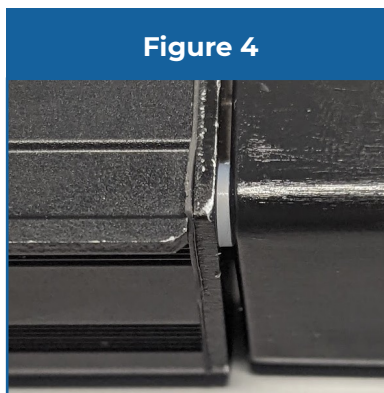
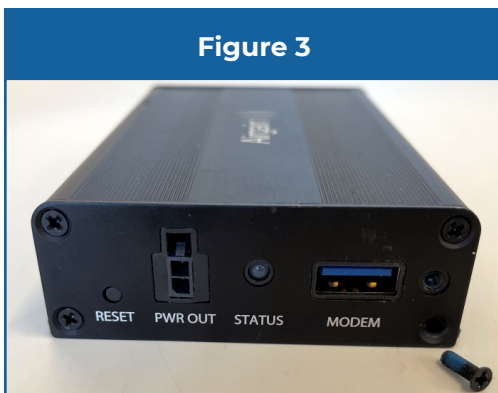


Figure 2



3. Installing the Signal Conditioner

1. Remove all cables from the Ethernet Injector and unmount if needed
2. Remove the bottom right screw from the face of the Ethernet Injector. Discard screw. **(Figure 3)**
3. Plug the Signal Conditioner into the USB port of the Ethernet Injector
4. Secure the Signal Conditioner to the Ethernet Injector using the open screw hole where the screw was removed in step 2.
 - a. Do not reuse the original screw. Use the longer screw provided with the Signal Conditioner.
 - b. Add the provided nylon washer onto the long screw between the USB redriver and the EI body **(Figure 4)**
 - c. Optional: Slide the grounding wire loop between the screw head Signal Conditioner. This step is not needed if the Ethernet Injector is to be mounted onto a grounded surface using grounding method #2. **(Figure 5)**



5. Plug the USB cable into the Signal Conditioner **(Figure 6)**
6. Secure the USB cable using the attached thumb screw
7. Mount the Ethernet Injector as described in the installation instructions
8. Apply the supplied yellow stickers to each side of the signal conditioner **(Figure 7)**

Figure 6



Figure 7



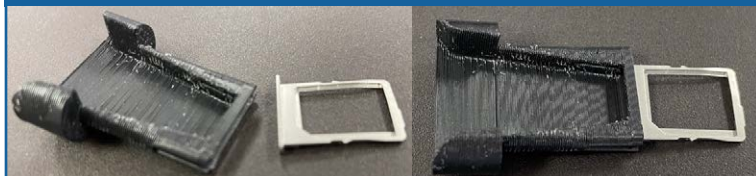
4. Installing the Radome Plug

1. Loosen screws on the SIM door using T8 driver (**Figure 8**)
2. Remove the SIM door
3. Remove the SIM card found in the tray attached to the SIM door
4. Discard the SIM door, you will not use it again
5. Place the SIM card into provided SIM tray (not pictured)
6. Place the SIM tray into the insertion tool (**Figure 9**)

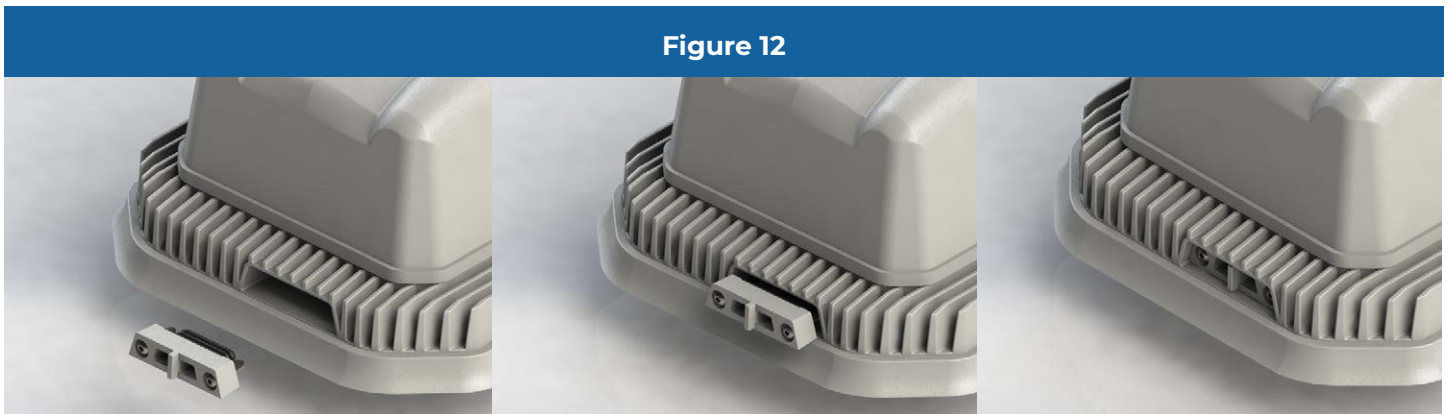
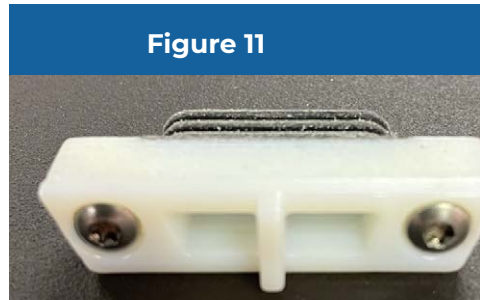
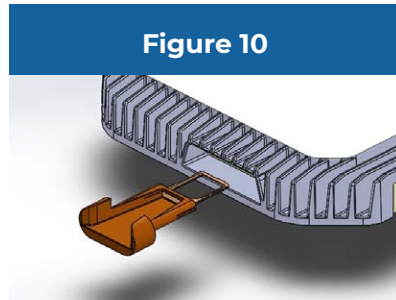
Figure 8



Figure 9



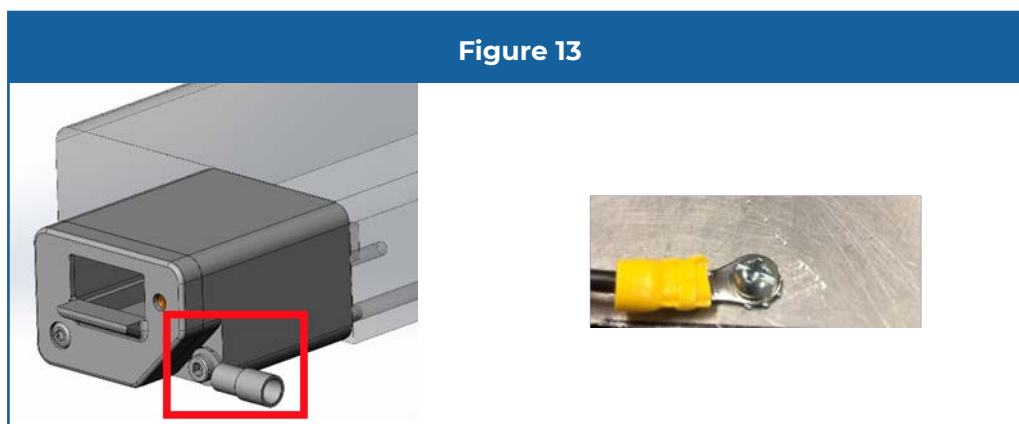
7. Guide the SIM tray through the opening and into the SIM tray connector (**Figure 10**)
8. Push lightly until a click is felt
9. Remove the Insertion Tool ensuring that the tray is locked into the Sim tray connector
10. Locate the new Radome Plug (**Figure 11**)
11. Push the Radome plug into the opening where the SIM door was removed (**Figure 12**)
12. Apply torque screws to 4 inch-lbs using a T8 bit
13. The Radome Plug is now installed



5. Installing the Ethernet Injector

1. Record the Serial Number and Password from the back of the Ethernet Injector along with a unique identifier for the vehicle. Save for your records.
 - *The serial number is required for software upgrades.
 - *The password is required to access the configuration interface of the Ethernet Injector.
2. Locate a spot in the vehicle where the Ethernet Injector can be securely mounted. The Ethernet Injector is an ESD and EMI sensitive device. Placement is important for proper operation.
 - a. Do not mount on other electronics
 - b. Do not mount on carpet
 - c. Do not use velcro
3. Orient the Ethernet Injector so that the status LED can be viewed post installation
4. Follow either of the 2 recommended grounding methods
 - a. Method #1: Grounding via the supplied ground wire (**Figure 13**)

1. Use the provided grounding wire or an equivalent with terminated connectors matching assembly requirements; 14AWG or thicker gauge and a max length of 2 feet. Confirm that the grounding wire is attached to the screw in the Signal Conditioner.
2. If needed, add the grounding wire by removing the screw then sliding on the loop terminal
3. Locate a grounding point inside the vehicle within reach of the grounding wire
4. Secure the loose end of the grounding wire to the vehicle chassis
5. Use the supplied screws to secure the Ethernet Injector through the mounting tabs



- b. Method #2: Grounding via the Ethernet Injector mounting tabs
 1. Mount AC-EI on a sturdy surface. Preferably a metallic surface with good electrical connection to chassis ground.
 2. Use the provided grounding cable or an equivalent with terminated connectors matching assembly requirements; 14AWG or thicker gauge and a max length of 2 feet. **(Figure 14)**
 3. Locate a grounding point inside the vehicle within reach of the grounding wire
 4. Secure the loose end of the grounding wire to the vehicle chassis **(Figure 15)**

5. Secure the Ethernet Injector to the grounded surface using stainless steel bolts passed through mounting tabs. Use a tooth locking washer to penetrate the chassis coating. **(Figure 16)**
 - a. Alternately, scuff the protective coating on a mounting tab on the Ethernet Injector using a metal file or heavy sandpaper. Avoid power tools due to the possibility of ESD.

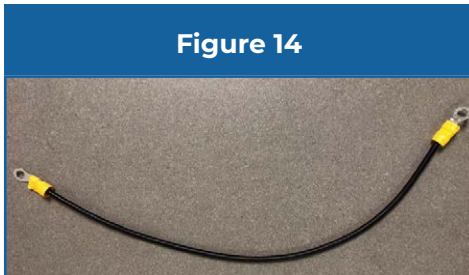


Figure 14

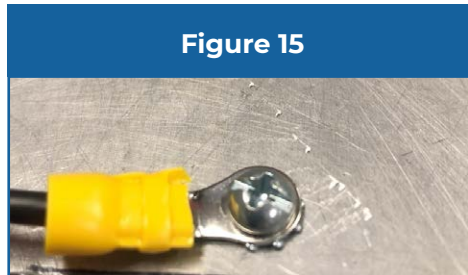


Figure 15

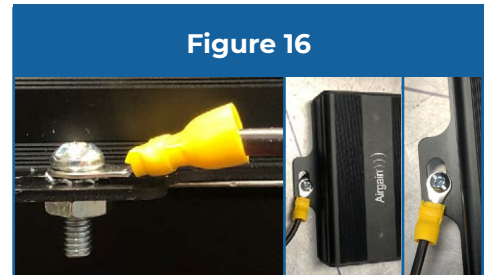


Figure 16

5. Verify that the Ethernet Injector case is now grounded using a multimeter. Set the multimeter to the continuity test setting **(Figure 17)**
 - a. Set multimeter to continuity test
 - b. Unplug the 4-pin power cable from the Ethernet Injector
 - c. Follow directions for setting your specific multimeter ([e.g., How to Test for Continuity with a Digital Multimeter | Fluke](#))
 - d. Place one lead on
 1. Any of the Ethernet Injector chassis screws or
 2. The scuffed surface of the Ethernet Injector tab
 - e. Place the other lead on the vehicle chassis near the grounding point
 - f. If the test does not pass:
 1. Check the grounding connections at all points
 2. Ensure that the mounting fasteners are made from a conductive material
 3. Ensure that the connection point to the vehicle chassis is conductive (no rust, paint, etc)
 4. If grounding method #2 is used then ensure the mounting tab is sufficiently scuffed

Figure 17



6. Use an inline 5A slow blow fuse for over-current protection.
7. Connect the following (**Figure 18**):
 - a. Red wire to +12VDC that is always-on, even when the ignition is off
 - b. Black wire to ground (not directly to the vehicle battery)
 - c. Orange wire to the vehicle ignition or accessory circuit. For applications where the device is always on (non-vehicular applications), connect the orange ignition sense wire to the red +12VDC wire.
 - d. Never connect the black ground wire directly to the battery terminal

Figure 18

J1
MOLEX 430250400

WIRING MAP			
PIN	COLOR	FUNCTION	TO
J1.1	RED	12VDC	LW1
J1.2	BLACK	GND	LW2
J1.3	ORANGE	IGN SENSE	LW3
J1.4	BLUE	USB INPUT	J2.1

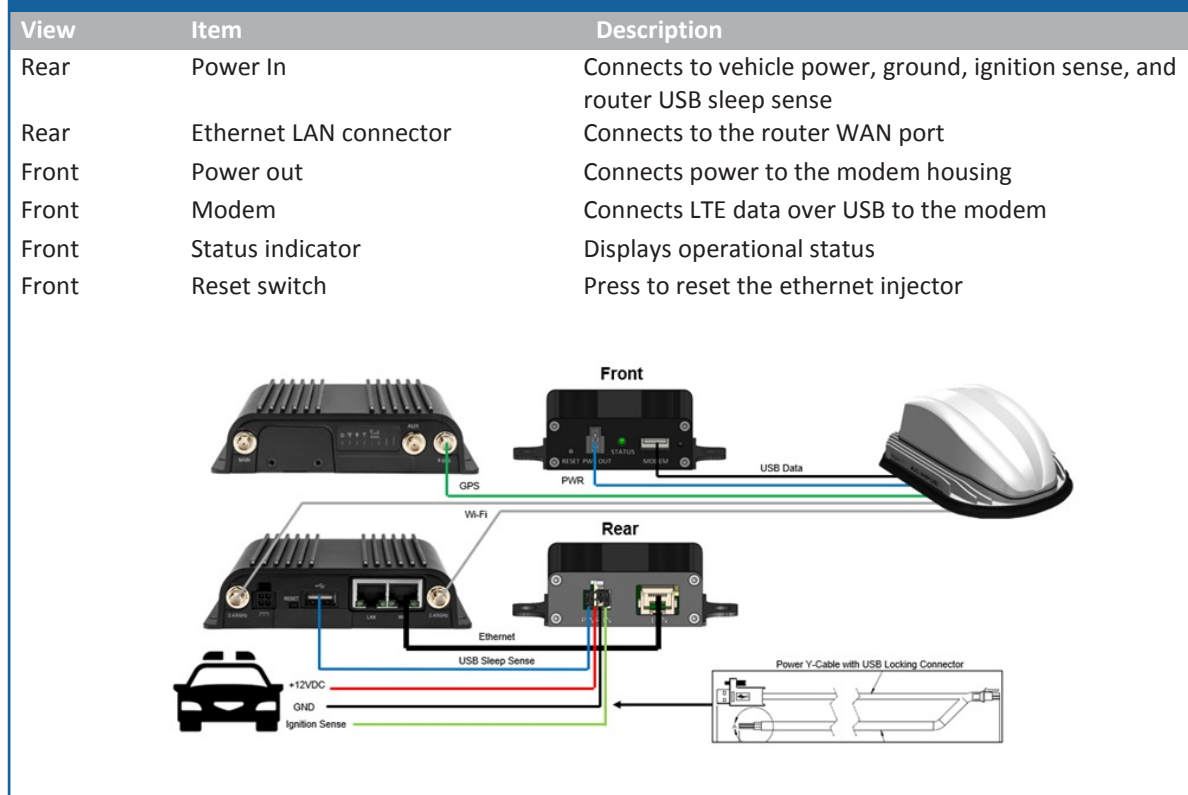
Connections to a Cradlepoint IBR900 Router

Connections to a Sierra Wireless MC90 Router

Ethernet 5
WAN

8. Connect USB data cable and 2-pin power cable from the roof-top antenna-modem housing to the ethernet injector (**Figure 19**)
9. Ensure power has been terminated to vehicle power system as reviewed in step 7 of

Figure 19



this installation guide before terminating 4 Pin power cable to ethernet injector

- a. Route the cables securely through the vehicle with enough slack so that they will not be accidentally tugged when placing and removing items in the vehicle trunk

10. Connect the Ethernet cable from the Ethernet Injector to either the vehicle router WAN port or directly to user equipment requiring Internet connectivity (e.g., laptop)
11. If your model of AirgainConnect includes Wi-Fi and GNSS then attach those coax cables to the appropriate vehicle router ports.
12. The multi-color LED on the ethernet injector indicates operational status. After at least 1 minute, the LED should turn solid green (**Figure 20**)

Figure 20		
State	Indicator Color	Description
Power off & sleeping	Off	The LED is off when the power is off, or the device is sleeping
Booting up	Blue	Solid blue while booting up
No SIM card	Red	Solid red after bootup when there is no valid SIM card
No signal	Red/Green/Blue	Blinking red after bootup when there is no cellular coverage signal, followed by blinking green, followed by reboot solid blue
No USB connection	Red	Blinking red after bootup when there is no connection to the antenna-modem
Connecting	Green blink	Blinking green while connecting to the cellular network
Connected	Green	Solid green when connected to the cellular network

6. Upgrading the Software

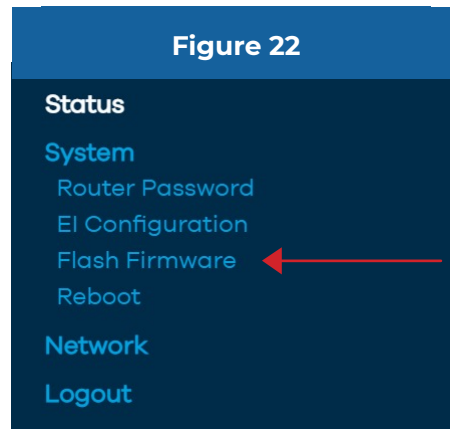
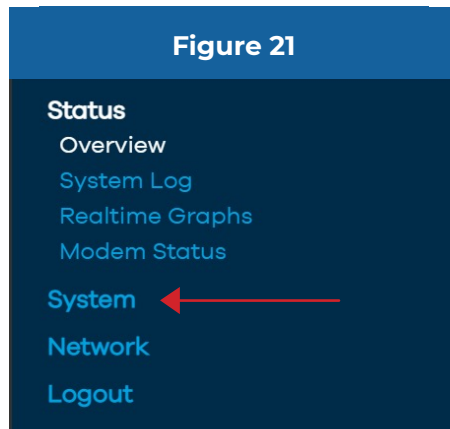
There are two methods for software upgrade

Recommended method, local file update. Steps:

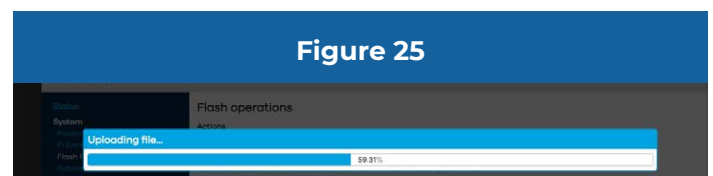
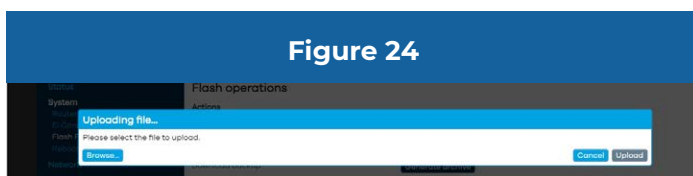
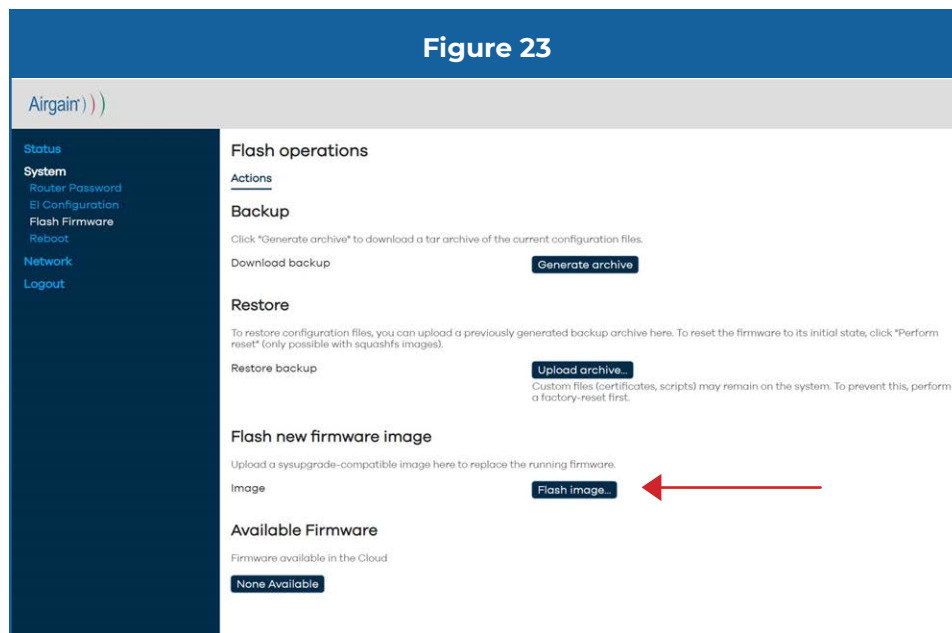
1. Download the latest software from the Field Upgrade Informational Webpage
2. Plug the Ethernet cable exiting the Ethernet Injector into your laptop. Open a browser on the connected laptop and navigate to 192.168.113.1. The default username is “admin” and the default password is printed on the label of the Ethernet Injector.
 - a. Fill out the disclaimer form if one pops up (First Name, Last Name, and email address)
 - b. If you have trouble reaching the webpage then confirm that the laptop Ethernet port is set to DHCP.
 - c. If you still cannot reach the webpage then your software may be outdated version 1.0.5. Please follow this guide to upgrade the software:

Older Firmware

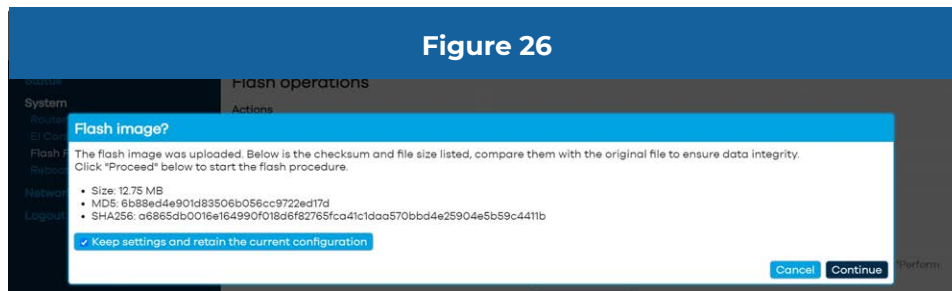
3. Select “System” in the menu on the left (**Figure 21**)
4. Select “Flash Firmware” in the menu on the left (**Figure 22**)



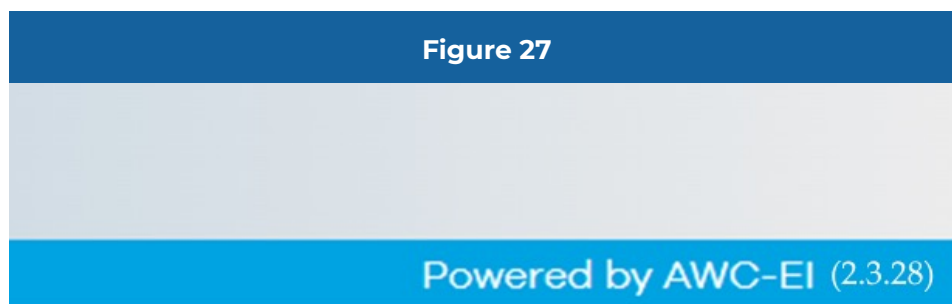
5. Select “Flash Image” from the section of the webpage titled “Flash new firmware image” **(Figure 23)**
6. Select “Browse” in the popup menu then navigate to the software .bin file that you downloaded to your PC **(Figure 24)**
7. Select “Upload” and wait a few seconds for the file to be verified **(Figure 25)**



8. Ensure that the value listed next to SHA256 ends in "4411b". If you see any other value, select "cancel" and download the file again at step 1. Also ensure that the checkbox on the bottom left is checked. Then select "Continue". Please wait 5 minutes for the software to upgrade. **(Figure 26)**
 - a. **Do not remove power to the EI during the upgrade process. Doing so may render the EI inoperable. Wait at least 30 minutes before powering down the Ethernet Injector**



9. The webpage will display the new software version (2.3.28) in the bottom right corner of the screen. **(Figure 27)**
 - a. Some browsers will not recover on their own. Do not refresh the browser. If the webpage never returns then please open a new tab and navigate to 192.168.113.1.



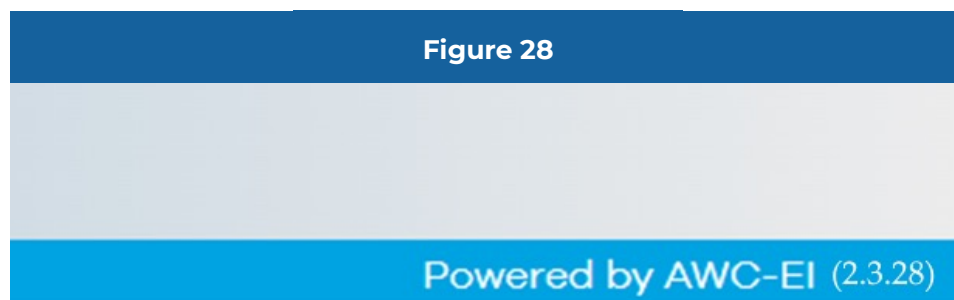
Alternative Method, Cloud Update. Steps:

1. Provide the Ethernet Injector serial number to your Airgain representative or to support@airgain.com
2. Your Ethernet Injector will be queued for a remote upgrade. Your Airgain representative will confirm with you.

3. Power cycle your Ethernet Injector by pulling the 4 pin molex power connector then replacing it
 - a. The LED sequence will rotate between green, red, and magenta as the upgrade is applied
 - b. The Ethernet Injector will reboot itself during this process.
 - c. Do not remove power to the EI during the upgrade process. Doing so may render the EI inoperable. Wait at least 30 minutes before powering down the Ethernet Injector.**
4. Wait for the LED to turn solid green indicating that the AirgainConnect is reconnected to the cellular network.
5. Plug the Ethernet cable exiting the Ethernet Injector into your laptop. Open a browser on the connected laptop and navigate to 192.168.113.1. The default username is “admin” and the default password is printed on the label of the Ethernet Injector.
 - a. Fill out the disclaimer form popup (First Name, Last Name and email address)
 - b. If you have trouble reaching the webpage then confirm that the laptop Ethernet port is set to DHCP.
 - c. If you still cannot reach the webpage then your software may be outdated version 1.0.5. Please follow this guide to upgrade the software:

Older Firmware

6. The webpage will display the new software version (2.3.28) in the bottom right corner of the screen. **(Figure 28)**



7. Replacing the SIM Card at a Later Date

A SIM card ejection tool and anti-static tweezers have been provided in the event that the SIM card later needs replacement. **(Figure 29)**

Note that these tools and procedures are not required for the installation of the enhancement kit.

1. Unscrew the radome plug using a T8 driver then gently remove it from the radome **(Figure 30)**
2. Eject SIM Card by poking the Ejection tool into the small hole beside the SIM tray **(Figure 31)**
3. Use the supplied anti-static tweezers to reach inside and pull the SIM card out of the SIM tray connector
4. Follow steps 6-13 from “Installing the Radome Plug”

Figure 29



Figure 30



Figure 31



8. Verification Checklist

1. Confirm that all 4 cables are secure in the Ethernet Injector
2. Confirm that the Ethernet Injector LED stays solid green
3. Confirm that the grounding wire is attached in a safe location
4. Confirm the vehicle is online via the systems inside the cabin