

# Airgain®

## AirgainConnect® AC-HPUE and Ethernet Injector User Guide

FIRSTNET MegaRange™



**MobileMustHave**  
MOBILE LIFESTYLE SOLUTIONS



10/04/2021  
Version 1.13

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This document is the User Guide for the AirgainConnect® AC-HPUE products marketed and sold by Airgain, Inc. It is provided to aid in installing and operating the AirgainConnect integrated vehicle modem and antenna. This guide and the subject matter contained within are protected by copyright laws under the Copyright Act of 1976, as amended, and all copyrights in this guide are the exclusive property of Airgain, Inc. The user of the applicable AC-HPUE shall be able to make a limited number of copies of this guide for the sole purpose of properly installing and operating the product, but only such copies as are reasonably necessary for that purpose. If any other copies or distribution of this guide or any of its contents are desired, please contact Airgain, as such rights are only available through written permission. AirgainConnect and Airgain are trademarks or registered trademarks of Airgain, Inc. The AC-HPUE is powered by Assured Wireless HPUE.

## Revision History

Version	Date	Comment
1.0	4/17/2020	First Version
1.1	6/24/2020	Revised: SIM door/tray and SIM installation; LED status table; removed plastic thermal bushing; added 3rd optional Wi-Fi; updated DC voltage and power; updated temperature range; added AT commands to reset the mode of the antenna-modem when connecting it to a laptop.
1.2	9/4/2020	Added note that antenna-modem must be powered by the ethernet injector, not by direct connect to vehicle.
1.3	9/13/2020	Added ethernet injector detail
1.4	10/2/2020	Added FirstNet Ready logo
1.5	10/22/2020	Changed torque on SIM door to 4 inch-pounds
1.5	10/29/2020	Added EI to document title and added image of EI label
1.6	11/17/2020	Changed inline fuse to 5A slow blow
1.6	11/17/2020	Added FCC certification information
1.7	1/27/2021	Added footnote explaining optional cable lengths available
1.8	2/11/2021	Added note about router WAN configuration for DHCP
1.9	2/17/2021	Removed Section 7 on direct connect to laptop
1.10	2/25/2021	Added warning to use a proper DC power supply
1.11	3/23/2021	Added magnetic and suction mount instructions
1.12	4/30/2021	Added Sections for connecting via USB to laptop or router; Custom APN; Static IP address
1.13	10/04/2021	Added additional router configurations

## Safety Warnings

- **SEVERE DAMAGE WARNING.** The AC-HPUE must be powered by the Ethernet Injector (AC-EI) or an ISO 7637-2 compliant power conditioner when connected to a DC power source. Direct connection to the vehicle's battery or electrical system is prohibited and can significantly

damage the AC-HPUE – damage resulting from improper power supply is NOT covered by the warranty.

- **HOT.** Do not touch the antenna-modem 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 20 cm (8 inches) or more away from the antenna modem during normal operation.
- **FUSE.** Use an inline 5A slow blow fuse for over-current protection.
- **GROUND.** Never connect the black ground wire directly to the battery terminal.

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## 1. Welcome

This user guide provides information on the AirgainConnect AC-HPUE integrated vehicle antenna and LTE modem. AirgainConnect AC-HPUE is built for FirstNet® MegaRange™, the high power user equipment (HPUE) solution that transmits at a higher power when connected on Band 14. This results in increased coverage and performance. AC-HPUE optionally includes two Wi-Fi antennas, a GNSS low noise amplified antenna, and the associated coax cables to connect these antennas directly to the vehicle router. Public safety agencies can obtain a FirstNet SIM (Subscriber Identification Module) by opening a FirstNet account at any AT&T sales location or distribution partner. If you have a FirstNet SIM, you will default to band 14 and the higher

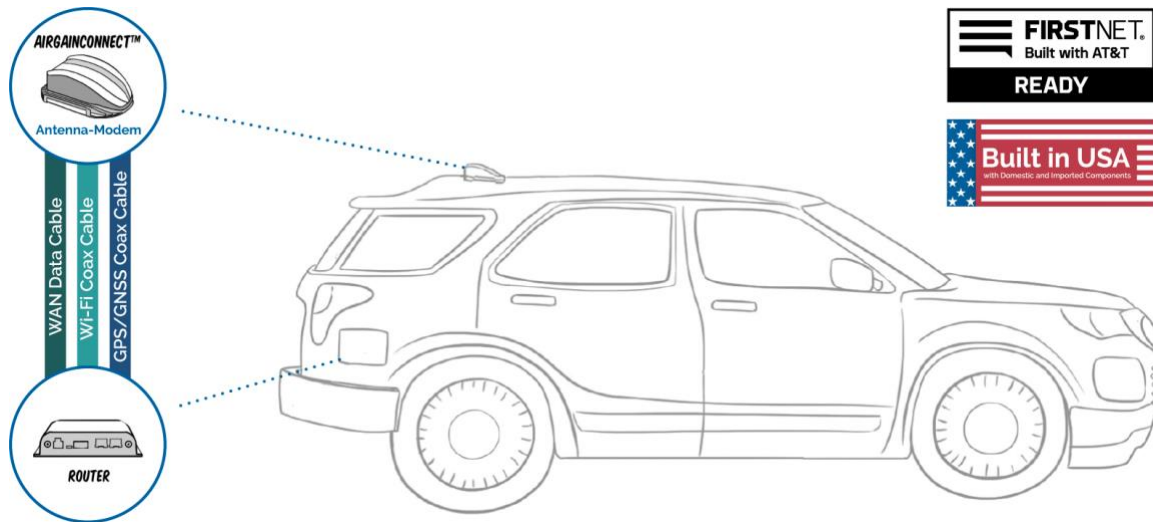


Diagram 1: Active Antenna-Modem with Passive Wi-Fi and GPS

power of the HPUE.

While the AC-HPUE is ideal for public safety vehicles, it also brings performance benefits to enterprise vehicles because it supports all AT&T bands and provides superior performance on those bands when compared to a conventional vehicle router modem and antenna. In addition to vehicle applications, the AC-HPUE can also be used in stationary applications like a dispatch center.

## 2. Package Contents

Description	Quantity
Insert sheet	1
Antenna-modem with cables*	1
Mounting nut	1
Plastic washer	1
FirstNet SIM (factory installed in the antenna-modem)	1
Alcohol wipe	1
Ethernet injector (except when SKU without this part is purchased)	1
- Ethernet Injector mounting screws	2
- Power cable	1
- Ethernet cable	1

\* NOTE: The antenna-modem cables are available in 5-, 7-, and 10-meter lengths (16.4-, 22.9-, and 32.8-foot lengths). Approximately 10cm (4 inches) of cable are not useable because it is on the inside of the device.



### 3. Key Features

- HPUE power class 1 on band 14
- Support of all AT&T bands
- Modem directly attached to antenna, resulting in full transmit power to antenna elements
- Rugged outdoor enclosure
- Power conditioning to protect against voltage spikes in automotive applications
- USB to Ethernet interworking – connects to router WAN port
- LED indicator to easily determine status
- Transparent support of VPNs
- IP passthrough
- Complies with environmental standards
- Sleeps and draws less than 4ma when ignition sense is off AND router sleep sense is off. Awake whenever either ignition sense is on OR sleep sense is on.

### 4. Antenna-Modem Installation

1. The antenna must be installed to maintain a minimum 7.87 in (20 cm) distance between the antenna and nearest person during normal use.
2. The antenna must be mounted at least 18 in (45.72 cm) away from any other communication antenna to maintain specified performance and limit interference to other in-vehicle communication systems.
3. Only the antennas bundled in the device with the RF module may be used. No other antennas are approved.
4. The antenna-modem must be powered by the Airgain-supplied ethernet injector or power supply to protect it from voltage spikes that may occur in vehicle power systems.

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**Important!** Directly connecting the antenna-modem to the vehicle power may result in damage to the antenna-modem.

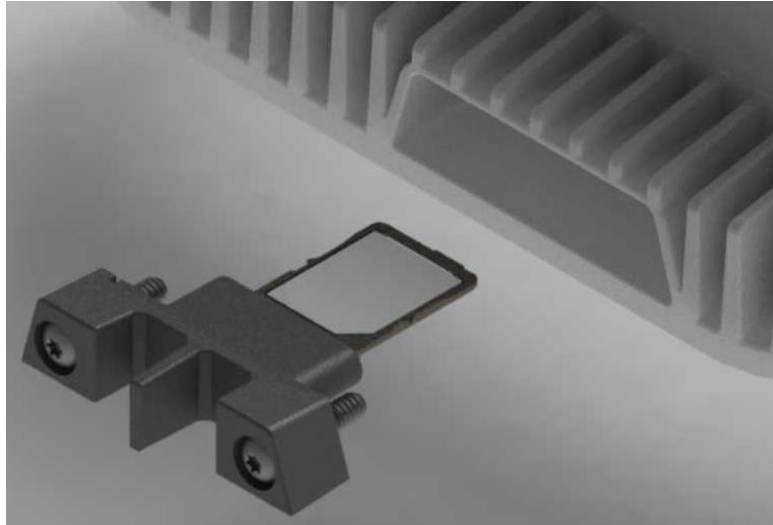
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In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid, and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

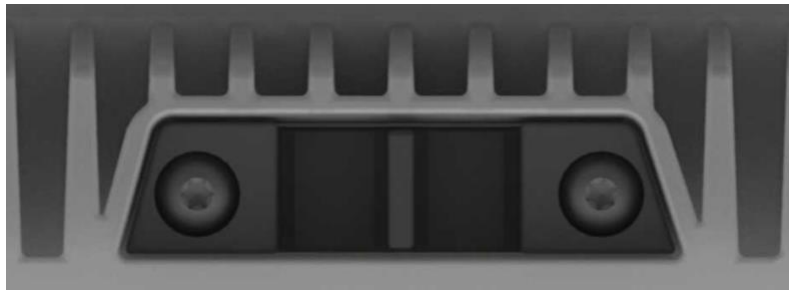
#### 4.1 SIM Installation

The antenna-modem is shipped from the factory with a FirstNet SIM installed. The ICCID of the SIM is on the label attached to USB cable of the antenna-modem. There is no need to remove the SIM tray – simply add the ICCID of the SIM to your FirstNet account. If the SIM must be removed and replaced, please follow the procedure below.

1. Disconnect power from the modem housing.
2. Remove the SIM door retaining screws using a Torx size T8 wrench. The screws are self-retained in the SIM door to prevent accidental loss.
3. Pull the door out using needle-nose pliers.
4. Remove the SIM tray from the modem.



5. Install the 3FF micro SIM in the SIM tray.
6. Install the SIM tray in the modem.
7. Secure the SIM door with the screws. DO NOT OVER-TWIST – torque to 4 inch-lbs.



## 4.2 Antenna-Modem Housing Installation

8. Airgain offers temporary mounting via magnetic mount and suction mount accessories that can be purchased separately. When using these mounting options, DO NOT REMOVE the

backing from the bottom of the AC-HPUE foam pad. Doing so will make a permanent adhesive connection to the mount.

9. Choose a location on vehicle roof.

Select a location on the vehicle roof that has a flat area large enough for the base of the AirgainConnect housing.

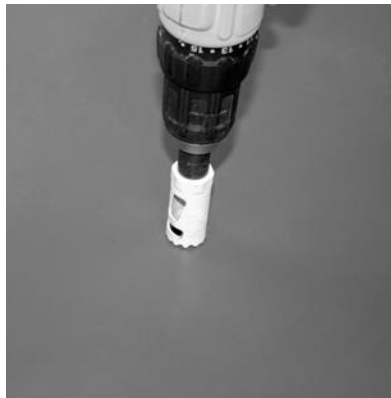
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**Important!** Prior to mounting, the mounting surface must be heated to a temperature of between 85 to 100F (30C to 38C). Use a heat gun and a laser temperature reading gun to make ensure the surface is heated properly.

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Note: Ford Interceptor Utility model 2020 and later may require mounting on top of a roof rib due to the tight spacing between ribs. Contact your distributor or Airgain for the appropriate base gasket if needed.

10. Drill a 1 in (2.54 cm) diameter hole where the center of the antenna-modem housing will be located on the vehicle. Verify the hole will not interfere with headliner mounted accessories, such as dome lighting.



11. Clean the mounting surface with the provided alcohol wipe to remove dust, dirt, and oil. Allow surface to dry.



12. Insert the cables through the hole.



13. Removing the backing on the bottom of the housing exposing the adhesive pad to permanently mount the AC-HPUE to the vehicle roof. DO NOT remove the backing if temporarily mounting to a magnetic or suction mount.



14. Position the housing and adhere it to the vehicle using firm hand pressure.



15. Place the plastic thermal washer on the threaded lug and then install the nut on the threaded lug. Tighten the nut two turns after contact to inside surface. Attach the Wi-Fi and GNSS cables to the vehicle router Wi-Fi and GPS ports.



Notes:

- The Installer may encounter various obstacles with individual vehicle designs that may require different placement, routing of cables or drilling of holes to complete the mounting procedure.
- Mount the housing on the outside of the vehicle (roof or trunk).
- The housing must be mounted horizontally, parallel to the ground (not mounted on a vertical surface).
- The housing must be mounted to a flat, clean dry surface. Avoid mounting the housing near panel seams or rivets so the foam pad can seal properly.
- The housing should be installed with a minimum distance of 18 inches from existing antennas, light bars or obstacles protruding from the roof or trunk lid of the vehicle.
- The antenna must be mounted at least 18 inches away from any other communication antenna to maintain specified performance and limit interference to other in-vehicle communication systems.
- When routing cables, pull on the body of the cable only!
- When routing cables, DO NOT PULL ON CONNECTORS! Pulling directly on connectors may cause damage and loss of the signal at the radio receiver, GPS, or modem.
- When mounting, make sure that the surface temperature where the housing is to be mounted is between 85°F to 100°F (30°C to 38°C)! Cooler surface temperatures will cause improper adhesion to the surface.

## 5. Ethernet Injector

- The ethernet injector's primary purpose is to perform Ethernet-to-USB-C interworking. Additionally, it provides power conditioning to protect the antenna modem from voltage spikes. The AC-HPUE must be powered by the Ethernet Injector (AC-EI) or an ISO 7637-2 compliant power conditioner when connected to a DC power source. Direct connection to the vehicle's battery or electrical system is prohibited and can significantly damage the AC-HPUE – damage resulting from improper power supply is NOT covered by the warranty.

View	Item	Description
Rear	Power In	Connects to vehicle power, ground, ignition sense, and router USB sleep sense
Rear	Ethernet LAN connector	Connects to the router WAN port
Front	Power out	Connects power to the modem housing
Front	Modem	Connects LTE data over USB to the modem
Front	Status indicator	Displays operational status
Front	Reset switch	Press to reset the ethernet injector

Table 1: Ethernet Injector Interface Descriptions

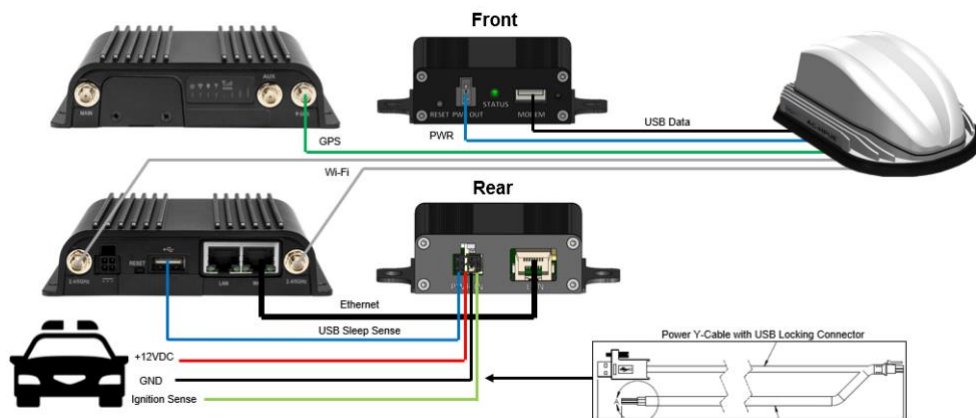


Diagram 2: Ethernet Injector Connection to Router Ethernet WAN Port

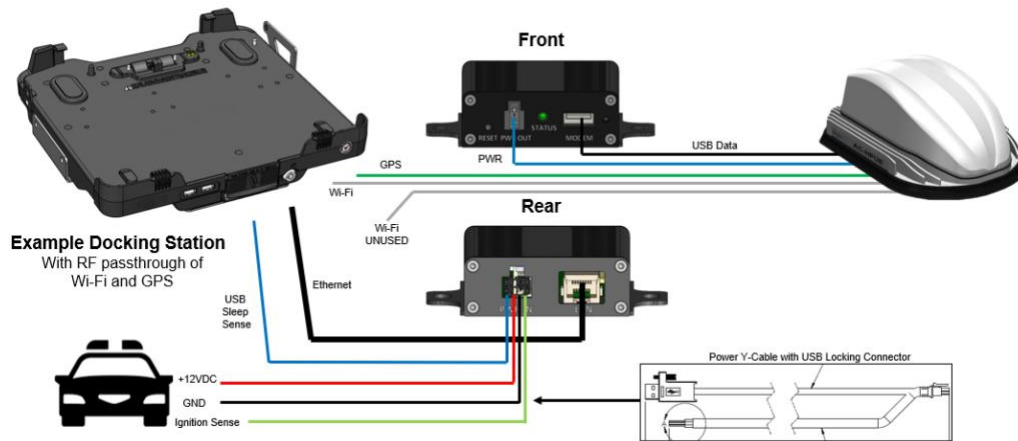


Diagram 3: Ethernet Injector Connection to Laptop Docking Station Ethernet Port

## 5.1 Status Indicator

The multi-color LED on the ethernet injector indicates operational status.

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

Table 2: Status Indicator

## 5.2 Ethernet Injector Label

The part number, serial number and MAC address are shown on the label on the bottom of the Ethernet Injector.



### 5.3 Installation

1. Mount the ethernet injector near the vehicle router using the included screws. Orient it with the LED facing in a direction that enables it to be easily viewed.
2. Connect USB data cable and 2-pin power cable from the roof-top antenna-modem housing to the ethernet injector.
3. Connect the ethernet injector 4-pin power cable to the vehicle power and ignition before connecting the cable to the ethernet injector. Make sure that the cables have slack, are tucked away, and secured so they are not accidentally pulled out when placing and removing items in the vehicle trunk.

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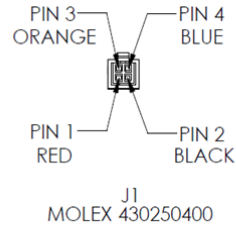
**Important!** Use an inline 5A slow blow fuse for over-current protection.

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Connect the following:



- Red wire to +12VDC that is always-on, even when the ignition is off.
- Black wire to ground (not directly to the vehicle battery)
- 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.



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

Diagram 4: Ethernet Injector Cable Pinout and Wire Color

**Important!** Never connect the black ground wire directly to the battery terminal.

- Optional: Connect the USB sleep sense connector to the vehicle router USB port. For the MG90 model router (second image below), be sure to connect to USB 1 because only this USB port cycles power on when the router awakens.
  - This step is optional and enables the ethernet injector to detect when the router is sleeping.
  - It is only required if delayed shutdown is used in the router configuration and you would like the antenna-modem and ethernet injector to sleep at the same time the router sleeps.

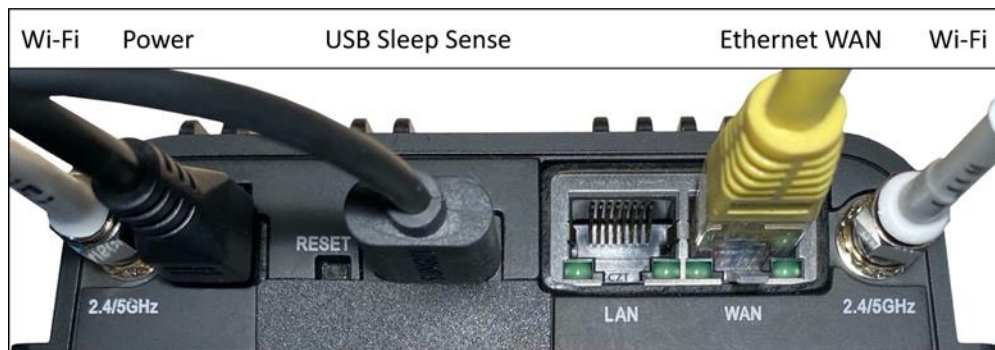


Diagram 5: Connections to Cradlepoint IBR900 Router

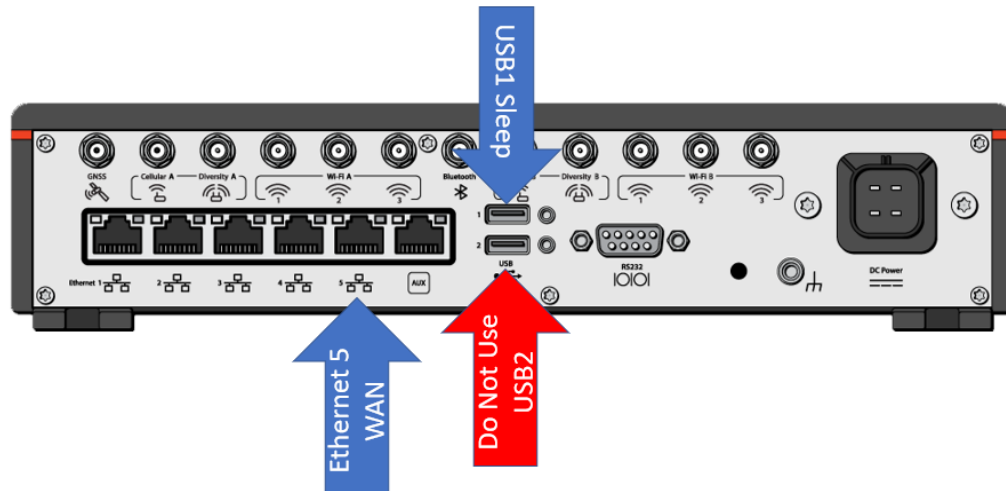


Diagram 6: Connections to Sierra Wireless MG90 Vehicle Routers

5. Connect the Ethernet cable from the ethernet injector to the vehicle router WAN port.
6. Connect the Wi-Fi and GNSS coax cables to the vehicle router Wi-Fi and GPS ports.

## 5.4 Ethernet Injector Reset

Press the **Reset** button on the front of the ethernet injector for one second to reset the ethernet injector.

## 6. Vehicle Router Configuration

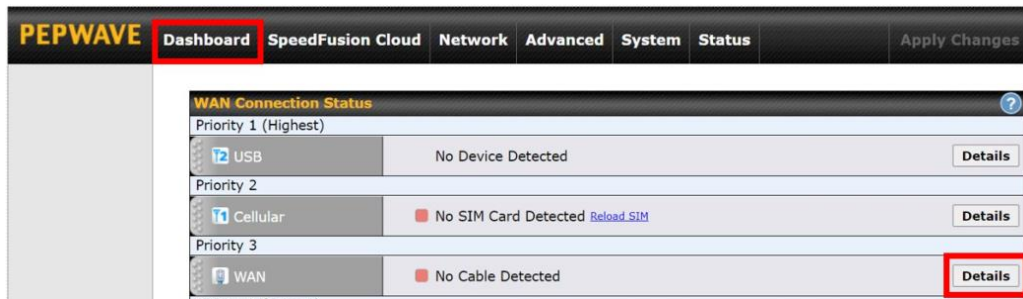
AC-HPUE provides high performance LTE coverage compared to a conventional modem in the vehicle router and therefore should be the primary LTE connection. Below are two examples of how to set the router WAN port as the primary LTE connection.

### 6.1 MTU size

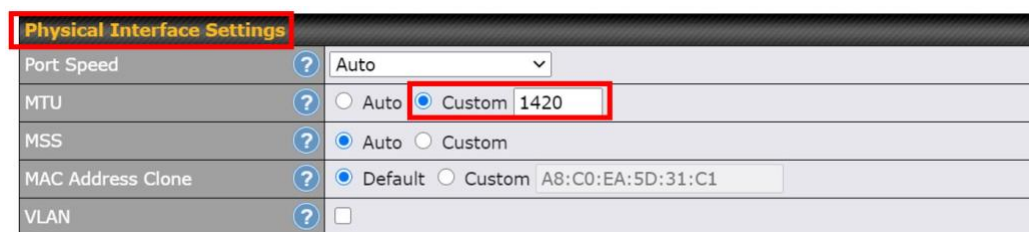
Most router WAN ports, regardless of interface type, are set to a maximum transmission unit (MTU) default size of 1500 bytes, which is larger than cellular networks can handle without fragmentation. Some payloads will fail in the IP network if fragmented. Others will suffer delay due to fragmentation in the network.

Always set the MTU size in the router to 1420 to avoid IP network performance issues. An example of where to set it on the Peplink BR1 ENT router is shown below.

1. On the Dashboard, click on the USB or WAN (the one to which the AC-HPUE is connected) Details button.

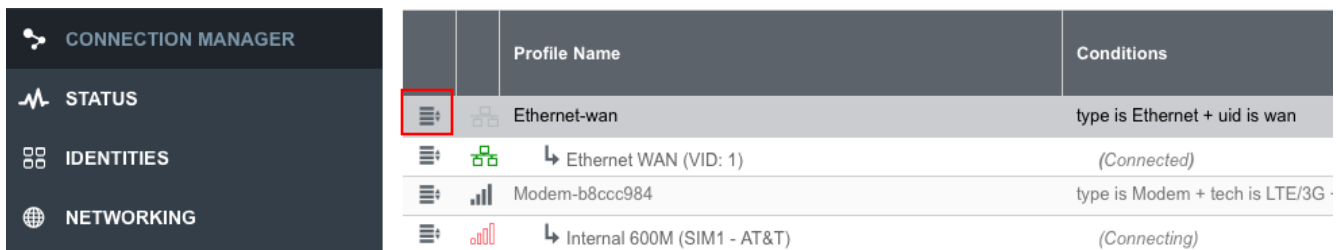


2. Then under Physical Interface Settings, select custom and set the value to 1420.



## 6.2 Cradlepoint IBR900/IBR1700/R1900 Configuration

1. Select the Connection Manager tab
2. Click on the Ethernet-WAN up/down arrow icon.
3. Drag and drop the icon to the top to make Ethernet-WAN the primary mobile network connection.
4. Click on the internal modem up/down arrow icon.
5. Drag and drop the internal modem icon to just below the Ethernet-WAN to make it the backup mobile network connection.



Check the WAN port setting and confirm it is set to DHCP. The router will get an IP address from the Ethernet Injector via DHCP. The IP address from the mobile network will be passed through to the router.

## 6.3 Sierra Wireless MG90 Configuration

To configure the WAN port (Ethernet 5) a higher priority than the internal modem, do the following steps:

- 1.

Status ▾

Devices ▾

Security ▾

LAN ▾

WAN ▾

GPS ▾

General ▾

Logs ▾

Applications ▾

Logout

Links

Monitors

VPNs

WiFi Networks

Networking Rules

Recovery

SIM Configuration

Friendly Name	Device Type	Enabled	Actions
Panel Ethernet 5	Device Built-in Ethernet Port	<input checked="" type="checkbox"/>	<a href="#">Configure Policies</a> <a href="#">Networking Rules</a>
Sierra Wireless EM75XX @ MiniCard USB3 CA (Cellular A)	Sierra Wireless EM75XX	<input checked="" type="checkbox"/>	<a href="#">Configure Policies</a> <a href="#">Networking Rules</a>
WLE900VX 802.11AC @ MiniCard PCIe WiFi A	WLE900VX 802.11AC	<input checked="" type="checkbox"/>	<a href="#">Configure Policies</a> <a href="#">Networking Rules</a>

2.

Status ▾

Devices ▾

Security ▾

LAN ▾

WAN ▾

GPS ▾

General ▾

Logs ▾

Applications ▾

Logout

Links

Monitors

VPNs

WiFi Networks

Networking Rules

Recovery

SIM Configuration

WAN Link Policy Configuration

(Panel Ethernet 5)

Enabled	Policy	Actions
<input checked="" type="checkbox"/>	Dynamic Priority Policy	<a href="#">Configure</a>
<input type="checkbox"/>	Geographical Regions Policy	<a href="#">Configure</a>

3.

Status ▾	Devices ▾	Security ▾	LAN ▾	WAN ▾	GPS ▾	General ▾	Logs ▾	Applications ▾	Logout
Links	Monitors	VPNs	WiFi Networks	Networking Rules	Recovery	SIM Configuration			
WAN Link Priority Policy Configuration (Panel Ethernet 5)									
Enable this policy	<input checked="" type="checkbox"/>								
Priority Score	<input type="text" value="200"/>								
Enable Dynamic Priority	<input checked="" type="checkbox"/>								
Link Down Penalty	<input type="text" value="120"/>								
Recovery Period (Seconds)	<input type="text" value="60"/>								
		<a href="#">Save</a>	<a href="#">Cancel</a>						

To configure the internal modem lower priority, do the following:

1.

Status ▾

Devices ▾

Security ▾

LAN ▾

WAN ▾

GPS ▾

General ▾

Logs ▾

Applications ▾

Logout

Links

Monitors

VPNs

WiFi Networks

Networking Rules

Recovery

SIM Configuration

Friendly Name	Device Type	Enabled	Actions
Panel Ethernet 5	Device Built-in Ethernet Port	<input checked="" type="checkbox"/>	<a href="#">Configure Policies Networking Rules</a>
Sierra Wireless EM75XX @ MiniCard USB3 CA (Cellular A)	Sierra Wireless EM75XX	<input checked="" type="checkbox"/>	<a href="#">Configure Policies Networking Rules</a>
WLE900VX 802.11AC @ MiniCard PCIe WiFi A	WLE900VX 802.11AC	<input checked="" type="checkbox"/>	<a href="#">Configure Policies Networking Rules</a>

2.

Status ▾

Devices ▾

Security ▾

LAN ▾

WAN ▾

GPS ▾

General ▾

Logs ▾

Applications ▾

Logout

Links

Monitors

VPNs

WiFi Networks

Networking Rules

Recovery

SIM Configuration

WAN Link Policy Configuration

(Sierra Wireless EM75XX @ MiniCard USB3 CA (Cellular A))

Enabled	Policy	Actions
<input checked="" type="checkbox"/>	Dynamic Priority Policy	<a href="#">Configure</a>
<input type="checkbox"/>	Geographical Regions Policy	<a href="#">Configure</a>

3.

**Status** ▾ **Devices** ▾ **Security** ▾ **LAN** ▾ **WAN** ▾ **GPS** ▾ **General** ▾ **Logs** ▾ **Applications** ▾ **Logout**

Links Monitors VPNs WiFi Networks Networking Rules Recovery SIM Configuration

### WAN Link Priority Policy Configuration

(Sierra Wireless EM75XX @ MiniCard USB3 CA (Cellular A))

Enable this policy ☒

Priority Score

Enable Dynamic Priority ☒

Link Down Penalty

Recovery Period (Seconds)

Check the status of the two links. In this example, the WAN port and the internal modem are both up. However, the traffic goes over the WAN port only and this is shown by it being placed it at the top of the status list and highlighting it.

**Status** ▾ **Devices** ▾ **Security** ▾ **LAN** ▾ **WAN** ▾ **GPS** ▾ **General** ▾ **Logs** ▾ **Applications** ▾ **Logout**

**WAN** General Broadcast

### WAN Link Status

Self-Update: ☐ Period:   Show Extended Status: ☐

Status	Score	Friendly Name	Up Time	Type
UP	1200	Panel Ethernet 5	0d 00h 09m 33s	Ethernet
UP	1100	Sierra Wireless EM75XX @ MiniCard USB3 CA (Cellular A)	0d 00h 03m 16s	Cellular
DOWN	-	WLE900VX 802.11AC @ MiniCard PCIe WiFi A	Not Connected	WiFi

## 7. Connect Directly to a Router via USB

The AC-HPUE antenna-modem can be connected directly to a router if the router supports USB modems. This allows the router's ethernet WAN port to be used for other purposes, such as a satellite uplink or fiber backhaul.

### 7.1 Peplink Pepwave Max BR1 ENT

The Pepwave Max BR1 ENT and other Peplink routers that support USB modems can be directly connected to the AC-HPUE. However, the AC-HPUE still requires the Ethernet Injector to provide power conditioning to the HPUE modem when used in vehicle installations.

The Max BR1 ENT software version which supports the AC-HPUE modem via USB is 8.1.0s038 build 4965. This build also supports the HD4 model. The firmware can be found [here](#).

For other Pepwave router models, please see [this post](#) in the Peplink support forum to find or request the appropriate firmware version.

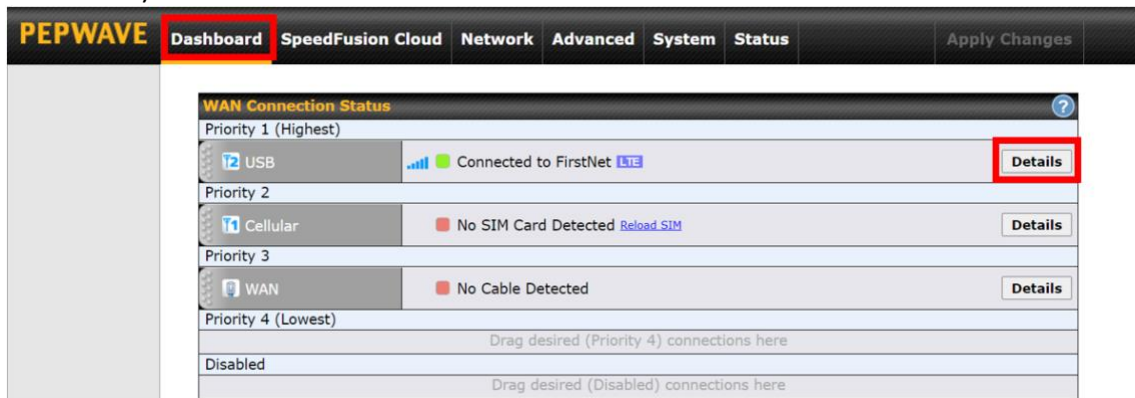
Follow the steps below to connect the router USB interface.

1. While the **power source is off**, connect the antenna-modem power cable to the ethernet injector.
2. Connect the ethernet injector power input connections as described in Section 5 above.
3. Connect the antenna-modem USB cable to a USB port on the router.

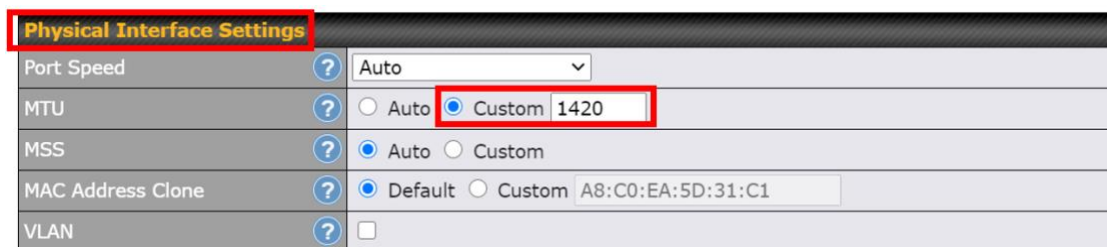
**Warning!** The power to the AC-HPUE modem must be off when connecting or disconnecting the USB cable from any device.

4. Turn on the power and ignition sense input to the ethernet injector. Allow the antenna-modem 60 seconds to boot up.
5. Set the router's USB port MTU size to 1400.

On the Dashboard, click on the USB or WAN (the one to which the AC-HPUE is connected) Details button.



Enter the MTU size of 1420 in the Custom field.



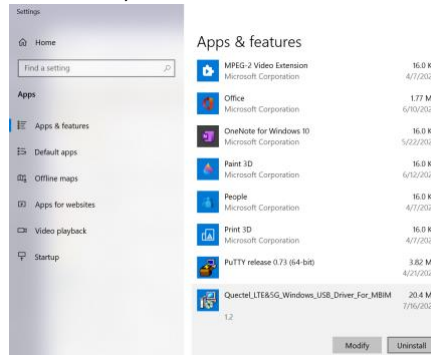
6. If the modem does not connect, it may be due to previously having its operation mode changed if previously connected to a laptop. See Section 8.3 for steps to reset the operation mode.

## 8. Connect Directly to a Windows Laptop PC via USB

The AC-HPUE antenna-modem can be connected directly to a laptop via USB for testing during the installation process, or for applications that do not require the use of a router or local area network.

### 8.1 Device Driver

1. Request a copy of the USB device driver for Windows by sending an email to [support@airgain.com](mailto:support@airgain.com).
2. If you already have a driver installed, please use the following instructions to update it.
  - To uninstall the existing driver, type “**Add or remove programs**” in the windows search bar at the bottom left of your screen, select the driver from the list, and click “Uninstall”.



- Follow instructions below to install the new driver.
3. Double click on the folder containing the driver and then double click on the .exe file. If the laptop has any security software to prevent the installation of .exe files, it must be disabled. An example of this is shown below. Click on **More Info** to allow installation.

### Windows protected your PC

Microsoft Defender SmartScreen prevented an unrecognized app from starting. Running this app might put your PC at risk.  
[More info](#)

4. Proceed through the installation prompts and click **Finish**.
5. Reboot the laptop to ensure the drivers are fully installed.

### 8.2 Connecting to a Laptop USB interface

Connecting to a laptop USB interface requires a change to the modem operation mode. **Be sure to change the operation mode back before moving the modem's USB cable to another device** (e.g. a router). See the following section for details regarding changing the operation mode back.

Configuration steps:



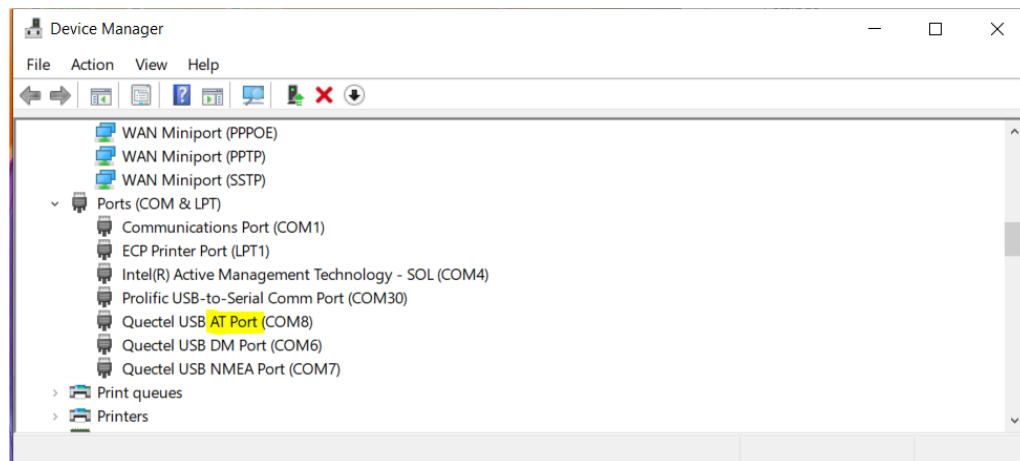
1. While the **power source is off**, connect the power cable to the ethernet injector.
2. Connect the ethernet injector power input connections as described in Section 5 above.
3. Connect the antenna-modem USB cable to a USB port on the laptop.

---

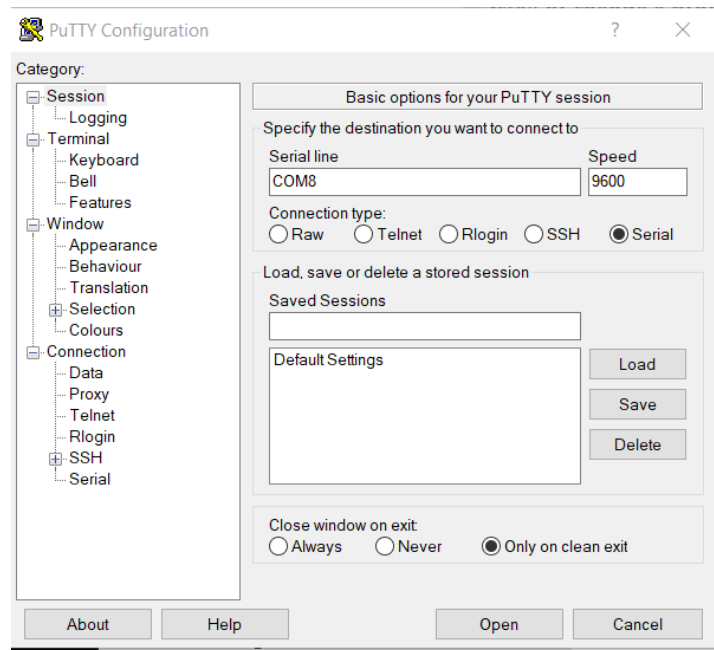
**Warning!** *The power to the AC-HPUE modem must be off when connecting or disconnecting the USB cable from any device.*

---

4. Turn on the power and ignition sense input to the ethernet injector. Allow the antenna-modem 60 seconds to boot up.
5. Open the **Device Manager** on the laptop and expand the **Ports (COM & LPT)** to verify the laptop is communicating with the modem device as shown below.
6. Identify the AT Port. In the example below it is COM8.

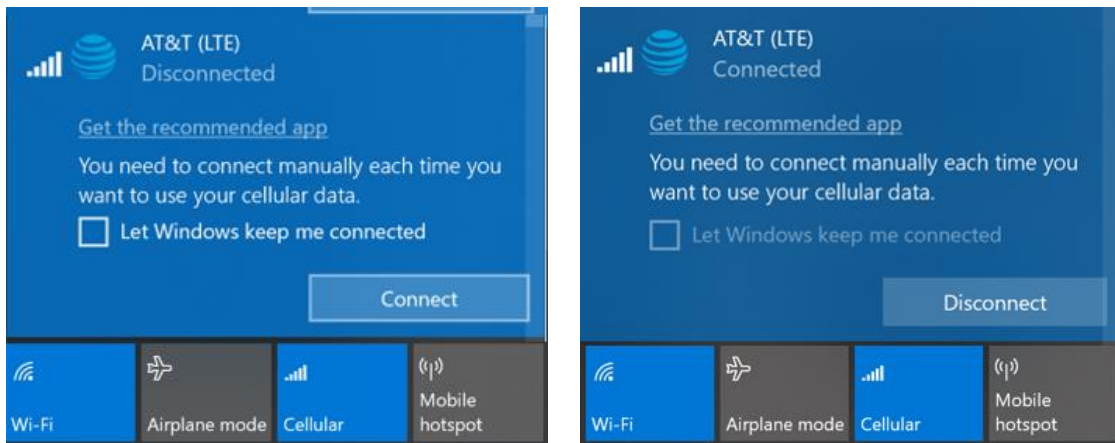


7. Download and install Putty or another serial console package.
8. Open the Quectel USB AT Port by entering the COM port number in the Serial line box. Click Serial and set speed to 9600. Click Open.

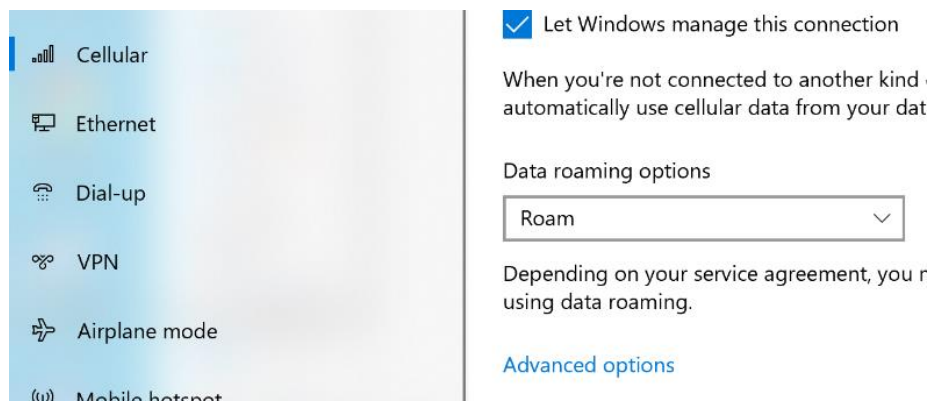


9. Type the following AT Commands
  - Set character echo on: ATE
    - o response is: OK
  - Check to see if the mode is QMI(0) or MBIM (2): AT+QCFG="usbnet"
    - o response is: +QCFG: "usbnet",0
    - o or the response is: +QCFG: "usbnet",2
      - NOTE: 0 = QMI and 2 = MBIM
    - o and another response of OK
  - If the response above was 0 (QMI)
    - o set MBIM Mobile Broadband Interface Model mode: AT+QCFG="usbnet",2
    - o response is: OK
    - o the modem will reboot – that takes approximately 15 seconds
    - o the connection with Putty is lost. Close the active Putty window and re-launch. Follow instructions on step 6 to verify AT port. This may have changed. Then follow step 8 to re-connect.
  - Check again to confirm the mode is MBIM (2): AT+QCFG="usbnet"
    - o the response is: +QCFG: "usbnet",2
10. In the Windows search box bottom left, enter *network status*, and click on **Network status** (system settings) at the top.
11. Click on **Cellular** to see the image below.
12. Check the box Let Windows keep me connected.
13. Click **Connect** and the laptop will connect to **AT&T (LTE)** as shown below.

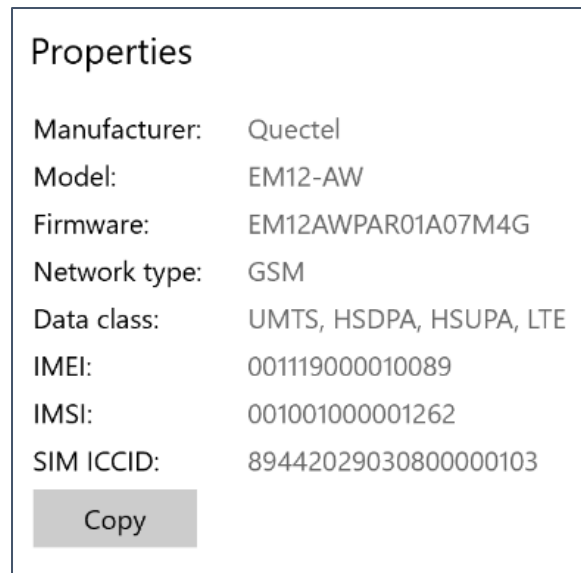
14. When you see *Connected* use a web browser to confirm internet communications. Make sure other connections to the internet (e.g., Wi-Fi) are turned off.



15. In the Cellular menu, click “Advanced Options”.



16. Scroll to the bottom of the Cellular Settings to find the cellular device information.



### 8.3 Disconnecting from a laptop USB interface

Before moving the USB cable from a laptop to another device (e.g., a router or ethernet injector) follow the steps below.

Type the following AT Commands

- Set character echo on: ATE
  - o response is: OK
  - o set QMI mode: AT+QCFG="usbnet",0
  - o response is: OK
  - o the modem will reboot – that takes approximately 30 seconds
  - o verify that the connection with Putty is lost.

### 8.4 Reset the Modem to Factory Settings

The modem can be reset to factory settings by connecting to a laptop PC as described above and entering the following command. NOTE THAT RESETTING THE MODEM SEVERAL TIMES CAN DESTROY THE FLASH MEMORY and thereby destroy the modem. This command should only be used as a last resort.

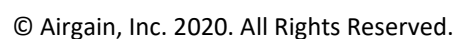
- Follow steps 1 through 9 from section 8.2 “Connecting to a Laptop USB interface”.
- In Putty, type in the command AT+QPRTPARA=3
- Power cycle Ethernet Injector & AC-HPUE.

## 9. Custom APN

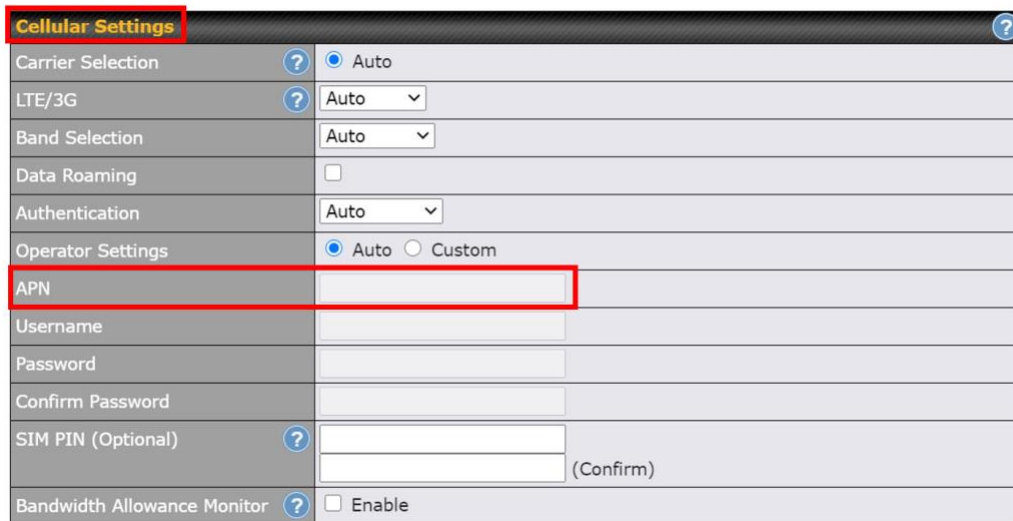
The end users that have an AT&T account with a custom APN, the APN can be configured by following the steps below.

- 
- ```
COM4 - PuTTY
at+cgdcont?
+CGDCONT: 1, "IPV4V6", "firstnet-broadband", "0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0", 0, 0,
0, 0
+CGDCONT: 2, "IPV4V6", "ims", "0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0", 0, 0, 0, 0
+CGDCONT: 3, "IPV4V6", "SOS", "0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0", 0, 0, 0, 1
OK
```

- On the Dashboard, click on the USB or WAN (the one to which the AC-HPUE is connected) Details button.



Insert the custom APN in the field shown.



The screenshot shows the 'Cellular Settings' menu. The 'APN' field is highlighted with a red rectangle. The settings are as follows:

| Setting                     | Value                           |
|-----------------------------|---------------------------------|
| Carrier Selection           | Auto                            |
| LTE/3G                      | Auto                            |
| Band Selection              | Auto                            |
| Data Roaming                | <input type="checkbox"/>        |
| Authentication              | Auto                            |
| Operator Settings           | Auto (selected), Custom         |
| APN                         | [Empty field]                   |
| Username                    | [Empty field]                   |
| Password                    | [Empty field]                   |
| Confirm Password            | [Empty field]                   |
| SIM PIN (Optional)          | [Empty field] (Confirm)         |
| Bandwidth Allowance Monitor | <input type="checkbox"/> Enable |

11. Reboot the router and the AC-HPUE antenna-modem.

## 10. Static IP Address

If you use static IP addresses with an AT&T subnet, contact your AT&T account representative and provide the IMEI and ICCID information at the end of Section 8.2. This information is also on the cable label of the AC-HPUE. They may also request your phone number associated with this SIM ICCID – that can be retrieved from your online FirstNet account. The static IP address will be pushed over the air by AT&T to the modem and stored in the SIM card.

## Appendix A: Specifications

### Electrical Data

- Ethernet Injector +12VDC
- Ignition sense
- Sleep sense (sleeps when the router sleeps)
- Power conditioning in compliance with automotive standard ISO 7637-2

### LTE Modem

- CAT 12, 3GPP Release 12+
- Band 14 output power: 1.25W (Class 1)
- Bands 2, 4, 5, 12, (17), 29, 30, 66 output power: 200mW (Class 3)
- MIMO: 2 x 2, 4 x 2
- Transmit bandwidth: 1.4 MHz through 20 MHz
- WCDMA capabilities on bands 2, 4, 5

### Antenna Elements

- 3x LTE connected via 15ft USB cable (other cable lengths available)
- 2x Wi-Fi with 15ft cables and RP-SMA connectors (other cable lengths available)
- Optional: 3x Wi-Fi cables and RP-SMA connectors
- 1x GNSS with 15ft cable and SMA connectors (other cable lengths available)

### Temperature

- Operating: -30°C to 70°C (-22°F to 158°F)

### Humidity (non-condensing)

- Operating: 5% to 95%
- Storage: 5% to 95%

### Power

- Ethernet injector +12VDC (requires 5A slow blow inline fuse for vehicle installations)
- Reverse polarity and transient voltage protection per ISO 7637-2
- Ignition sensing
- Router sleep sensing
- Power consumption:
  - Idle: 1W
  - Active: 25W
  - Sleep: <4mA
  - 12VDC / 3A adapter recommended when not installed in a vehicle

## Regulatory Compliance

| Product Compliance                    |                              |
|---------------------------------------|------------------------------|
| Dust & Waterproof Rooftop Housing     | IP67                         |
| Vibration                             | MIL-STD-810G                 |
| Shock                                 | IEC 60068-2-27-2008          |
| Temperature & Humidity                | IEC 60068-2-30-2008          |
| Solar Loading                         | IEC 60068-2-5                |
| Road Vehicles Electrical Disturbances | ISO 7637-2                   |
| AC-HPUE FCC ID                        | Includes FCC ID: 2AUZ8AW12HP |
| Ethernet Injector FCC ID              | 2AXLQAW12EI                  |

## Mounting Data

| Description |                        |
|-------------|------------------------|
| Dimensions  | Height 3.0" (76.8 mm)  |
|             | Width 5.8" (147.0 mm)  |
|             | Length 7.9" (201.9 mm) |
| Weight      | 1.7lbs (771g)          |
| Mount       | Bolt Mount             |
| Color       | White (WH)             |



## Appendix B: Safety Warnings

- **SEVERE DAMAGE WARNING.** The AC-HPUE must be powered by the Ethernet Injector (AC-EI) or an ISO 7637-2 compliant power conditioner when connected to a DC power source. Direct connection to the vehicle's battery or electrical system is prohibited and can significantly damage the AC-HPUE – damage resulting from improper power supply is NOT covered by the warranty.
- **HOT.** Do not touch the antenna-modem while operating. Power unit off and allow it to cool down for 30 minutes to a safe temperature after use before touching it.
- **MAINTAIN A SAFE DISTANCE.** Stay 20 cm (8 inches) or more away from the antenna-modem during normal operation.
- **FUSE.** Use an inline 5A slow blow fuse for over-current protection.
- **GROUND.** Never connect the black ground wire directly to the battery terminal.

### FCC RF Radiation Exposure Statement

To comply with the FCC RF exposure compliance requirements, this device and its antenna 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 minimum distance 20 cm between the antenna and the nearest person during normal use. Furthermore, the FCC Consumer Guide provides the following information regarding exposure the RF fields from vehicle-mounted antennas:

“Vehicle-mounted antennas used for wireless communications normally operate at a power level of three watts or less. These wireless antennas are typically mounted on the roof, trunk or rear window of a car or truck.”

Studies show that, in order to be exposed to RF levels that approach the safety limits adopted by the FCC, it would be necessary to remain very close to a vehicle-mounted wireless antenna for a significant amount of time. Studies have also shown that the metal body of the vehicle can effectively shield occupants. Proper installation of a vehicle-mounted antenna to maximize this shielding effect is a good way to minimize exposure. Some companies recommend that antennas be installed either in the center of the roof or center of the trunk of a vehicle. In response to concerns expressed over the commonly used rear-window mounted wireless antennas, a minimum separation distance of 1-2 feet has been suggested as a way to minimize exposure to vehicle occupants.

From data gathered to date, properly installed, vehicle-mounted, personal wireless antennas using up to three watts of power result in maximum exposure levels in or near the vehicle that are typically well below the FCC's safety limits, assuming that the transmitting antenna is 6 inches or more from vehicle occupants.”

For more information on consumer issues, visit the FCC's Consumer Help Center at [www.fcc.gov/consumers](http://www.fcc.gov/consumers).

## Appendix C: Limited Warranty, Support

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**Warning:** *Removing or damaging the anti-tamper screw cover label will void the warranty. Due to potential for injury and damage to the product that may not be covered by warranty, Airgain recommends that any service or repair of the unit be performed by Airgain or its authorized service representatives. Please contact the authorized distributor or technical support and warranty service. Airgain provides support directly to end users only after referral from authorized distributors.*

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The AirgainConnect® AC-HPUE is covered by a limited warranty.

### What Does This Limited Warranty Cover?

Airgain, Inc. (Airgain) warrants that the AirgainConnect® AC-HPUE is free from any defect in materials or workmanship. This warranty only extends to the original purchaser (or first purchaser in the case of resale by an authorized distributor) and is not transferable (Some laws or regulations do not allow restriction of warranty coverage to the original buyer, so this restriction may not apply to you.).

If you purchased your Airgain product as part of another product, this warranty in no way replaces or is an extension of the warranty of the manufacturer of that product, which warranty is the sole responsibility of that product's manufacturer.

### How Long Does This Warranty Last?

The warranty period lasts one year from the date of original purchase from Airgain, or the date of purchase from its authorized distributor if applicable, unless applicable law or regulation requires a longer period and, in that event, then only for such longer period of time as required by such applicable law or regulation.

### Extended Warranty

An extended warranty is available if purchased while your product is still covered under factory one-year warranty. Please contact your distributor for more information.

### What Will Airgain do?

Airgain will, at Airgain's sole option, repair, replace or refund the defective unit.

### What Does this Warranty Not Cover?

This warranty does not apply to any of the following:

- Damage determined by Airgain to be caused by improper repair or service. Airgain recommends that any service or repair of this device be performed by Airgain or its authorized service representatives.
- Labor required to remove, re-fit or re-adjust the product other than to service a warranty issue.
- A product that has been incorrectly installed and/or not adjusted according to the user guide, which can be found at <https://www.airgain.com/products/antenna-modem/airgainconnect-product-support/>
- Damage to a unit that has been determined to have been caused by use of the product in a manner that is not consistent with its intended use, such as that described in this User Guide.
- Damage to the product determined by Airgain to be caused by a crash, impact, abuse or mishandling of the product.

### How to Get Warranty Service

Claims under this warranty must be made through Airgain's service center or through an authorized AirgainConnect distributor. Please contact Airgain or the distributor (as applicable) and have the original, dated invoice or receipt ready. The distributor will contact Airgain customer service to handle your warranty claim. Do not return the product to Airgain or the distributor without prior approval.

Distributors requesting a warranty claim should contact Airgain customer service to obtain a warranty return authorization. The distributor will then need to return the product to Airgain together with satisfactory proof of the date of purchase.

Airgain customer support email: [support@airgain.com](mailto:support@airgain.com)

Address:

Airgain, Inc.  
Attn: Customer Service  
8350 E. Evans Road, Suite D-2  
Scottsdale, AZ 85260 USA  
Main: +1 480 657 7354

### Limitations of Warranty

Implied warranties (including, without limitation, warranties of merchantability or fitness for a particular purpose) shall not apply to the product, except where local law prohibits the exclusion of such implied warranties, in which case the duration of such implied warranties shall be limited to the duration of the express warranty set forth above. Airgain makes no warranty that the product will meet your requirements or be error free. In no event shall Airgain be liable for any loss, inconvenience, or damage, whether direct, indirect, incidental, and consequential or otherwise, resulting from breach of any express or implied warranty with respect to the product except as expressly set forth herein. Laws in some locations may not permit (i) the exclusion of implied warranties, (ii) limitations in duration of an implied warranty, or (iii) the exclusion or limitation of certain kinds of damages. In those locations, the above limitations and exclusions may not apply to you. To the extent that this warranty statement is

inconsistent with local law, this warranty shall be deemed modified only to the extent necessary to obey law.

THIS LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY MADE BY AIRGAIN WITH RESPECT TO THE PRODUCT AND IS GIVEN IN LIEU OF ANY OTHER WARRANTY. AIRGAIN LIABILITY UNDER THIS LIMITED WARRANTY IS LIMITED SOLELY TO THOSE LIABILITIES SET FORTH HEREIN. IN THE EVENT THAT ANY PROVISION OF THIS LIMITED WARRANTY, OR PORTION THEREOF, SHOULD BE OR BECOME INVALID OR UNENFORCEABLE UNDER APPLICABLE LAW, THAT PROVISION SHALL BE ENFORCED TO THE MAXIMUM EXTENT PERMISSIBLE SO AS TO EFFECT THE INTENT OF THE WARRANTY, AND THE REMAINDER OF THESE WARRANTY PROVISIONS SHALL CONTINUE IN FULL FORCE AND EFFECT.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Except during the warranty period provided herein, Airgain reserves the right to revise the terms of the limited warranties without notice, and such revision shall become effective as of the effective date indicated on the revised warranty statement available from Airgain's website <https://www.airgain.com/products/antenna-modem/airgainconnect-product-support/>

### Limitation of Liability

The information contained in this User Guide is subject to change without notice and does not represent any commitment on the part of Airgain, Inc. or its affiliates. AIRGAIN, INC. AND ITS AFFILIATES HEREBY SPECIFICALLY DISCLAIM LIABILITY FOR ANY AND ALL: (A) DIRECT, INDIRECT, SPECIAL, GENERAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES, INCLUDING WITHOUT LIMITATION FOR LOSS OF PROFITS OR REVENUE OR OF ANTICIPATED PROFITS OR REVENUE ARISING OUT OF USE OR INABILITY TO USE THE DEVICE, EVEN IF AIRGAIN, INC. AND/OR ITS AFFILIATES HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND EVEN IF SUCH DAMAGES ARE FORESEEABLE; OR (B) CLAIMS BY ANY THIRD PARTY. Notwithstanding the foregoing, in no event shall the aggregate liability of Airgain, Inc. and/or its affiliates arising under or in connection with the device, regardless of the number of events, occurrences, or claims giving rise to liability, exceed the price paid by the original purchaser of the device.

## Appendix D: Compliance

### Statement of FCC Compliance

The AC-HPUE includes FCC ID: 2AUZ8AW12HP.

The Ethernet Injector FCC ID is 2AXLQAW12EI.

**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 for 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 or more 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:** Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. 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.

### IMPORTANT NOTE

**FCC Radiation Exposure Statement:** This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the antenna and your body. Under no circumstances should the AC-EI ethernet injector or AC-HPUE modem be used in any areas (a) where blasting is in progress, (b) where explosive atmospheres may be present, or (c) that are near (i) medical or life support equipment, or (ii) any equipment which may be susceptible to any form of radio interference. In such areas, the AC-HPUE modem and AC-EI ethernet injector **MUST BE POWERED OFF AT ALL TIMES** (since the modem could otherwise transmit signals that might interfere with such equipment). In addition, under no circumstances should the AC-HPUE modem and AC-EI be used in any aircraft, regardless of whether the aircraft is on the ground or in flight. In any aircraft, the AC-HPUE modem **MUST BE POWERED OFF AT ALL TIMES** (since the modem could otherwise transmit signals that might interfere with various onboard systems on such aircraft).

Due to the nature of wireless communications, the transmission and reception of data by the AW12 modem can never be guaranteed, and it is possible that data communicated or transmitted wirelessly may be delayed, intercepted, corrupted, contain errors, or totally lost. Warning: This product is only to be installed by qualified personnel.

## Appendix E: Terms of Use and Privacy

### Applicable Terms

By activating or using your AC-HPUE, you agree to be bound by the Airgain Terms of Use, User License, and other Legal Policies, all as posted at Airgain.com. Please read these documents carefully.

### Trademark, and Patent

The AirgainConnect AC-HPUE is covered by one or more patents and pending applications. For a list of the patents covering this product please visit

<https://www.airgain.com/products/antenna-modem/patents/>. Airgain reserves all rights in its patents covering the products not exhausted by its purchase by the purchaser and infringement of its patent rights is prohibited.

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### Privacy Statement

Airgain may collect data pertaining to the use of Airgain products via the Internet including, by way of example, IP address, device ID, operating system, browser type and version number, and may collect certain personal information in order to respond to warranty requests or to provide other service, in each case only when requested by a customer, and you give Airgain permission to use this information. For service requests, Airgain shall only collect information that is needed to fulfill customer requests. Airgain shall collect and process that information in accordance with the Airgain Privacy Policy available at <https://www.airgain.com/privacy-policy> and in accordance with applicable laws and regulations applying to such information including European directive Regulation (EU) 2016/679 (General Data Protection Regulation) and the California Consumer Privacy Act (CCPA).

### EULA

The software and firmware provided with the AirgainConnect devices, including the AC-PC ethernet injector, is provided under, and subject to, the AirgainConnect® End User License Agreement (EULA), available at <https://www.airgain.com/products/antenna-modem/airgainconnect-eula/>

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