

AW12 and AW12-EI

## Hardware Troubleshooting Guide



# Assured Wireless

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### Troubleshooting Guide Introduction

This Troubleshooting Guide applies to AW12 devices. This Guide expects that you or a trusted party has physical access to the AW12. AW12-EI (“Ethernet Injector”) is a companion product for the AW12 which provides an ethernet interface and conditions the vehicle power for use by the AW12.

Please complete the troubleshooting steps outlined in this guide before requesting an RMA for a device. Requests for RMA Authorization should be made to the party that sold you your device and include:

- For AW12 include the serial number and IMEI.
- For Ethernet Injector AW12-EI include the serial number.
- A description of problem symptoms identified with this Troubleshooting Guide.

RMA guidelines:

- Do not ship products without RMA Authorization.
- Only ship the AW12 or the AW12-EI
- Do not ship SIM cards, cables, power supplies, antennas, or other accessories.

## Section 1: Troubleshooting the AW12 Power Input When Ethernet Injector (AW12-EI) is Installed

**User Experience: The AW12 does not power on.** When power is supplied to the Ethernet Injector (EI), which provides power to the AW12, the Ethernet Injector LED indicator does not show solid blue when power is applied, check the following:

- ❑ Verify DC power to the Ethernet Injector is 9vDC to 36vDC, or if connected via AC power, then 120vAC outlet, when the AW12 is connected. If power source voltage is correct, check the following,
- ❑ The DC or AC power-source is rated at least 3 Amps.
- ❑ When there is an inline fuse, check the inline fuse to ensure the fuse is not blown.
  - Inline power protection, such as a 5 Amp slow-blow fuse is recommended.
  - A vehicle power-block, regulated power supply, or AC/DC power inverter may be where the inline fuse is located.
- ❑ Power-source wire is in good condition.
- ❑ Power plug is not damaged or faulty.
- ❑ Replace any suspect components such as the power-source wire or power plug.

Note: An intermittent power connection is most commonly due to a bad power cable, not a faulty EI power connector. Try the EI with a preferably new, or known good, power-source and cable.

- ❑ Verify DC power output from Ethernet Injector is nominally 12vDC, at the 2-pin Molex port.
  - Unloaded, the EI output proper range is from 11.0vDC to 12.5vDC.
  - When EI output voltage is outside that range, RMA the Ethernet Injector.
- ❑ For the AW12, verify DC power from the EI at the AW12 M8 barrel connector is nominally 12vDC.
  - When EI output does not appear at the M8 barrel connector, replace the AW12 Power Cable and test for 12vDC again.

When any of the above steps resolve the problem, you will observe the Ethernet Injector LED show solid blue upon powering the EI.

When the EI LED is not illuminated, request an RMA authorization for the EI from your point of purchase. If the EI powers on, but the EI LED does not proceed to solid green, proceed to *Section-2:*

*Troubleshooting AW12 Boot Up.*

## Section 2: Troubleshooting AW12 Boot Up

**User Experience: The AW12 powers up but fails to pass data - any EI LED indication except solid green.**

### Check the LED indication on the Ethernet Injector (EI) while booting

#### 1. When power is supplied,

- When EI begins booting and the EI LED shows solid blue, proceed to Step-2.
- When the EI LED does not illuminate,
  - If power input verification in Section-1 has not been performed, please follow the procedures in Section-1.
  - Otherwise, RMA the Ethernet Injector, AW12-EI.

#### 2. After booting up, the HPUE modem enters an initialization sequence.

- a. EI LED is blinking green while the modem is initializing and connecting to the network.
- b. Once the modem connects to the network, the EI LED shows solid green. The time to see a solid green LED can vary. The first connection for a given installation could take 2-5 minutes, and the second/additional connections take typically 20 to 45 seconds.
- c. If connection is not achieved within 5 minutes, power-cycle the EI.
- d. Power-cycle up to 3 times if needed.
- e. Subsequent boot-ups should be much faster.

#### 3. When EI LED is solid green the AW12 is operational, there should be no need for an RMA, and troubleshooting is complete.

### When EI LED is not solid green after 5 minutes, possible causes and what will be observed:

- AW12 Antenna not attached or out of range. After booting up, the EI LED will blink red, then blink green, then solid blue while EI re-initializes the Modem.
- AW12 is not correctly connected by USB port/cable, or the power input port/cable of the AW12 is not properly connected.
  - After booting up, the EI LED will blink red.
- AW12 SIM card not inserted. After booting up, the EI LED will be solid red.
  - Refer to the product user guide for details on how to remove and re-install a SIM card.
  - Power-cycle the EI after re-installing the SIM.
- AW12 SIM card not activated. If the SIM card has never been activated, or has been deactivated by the cellular network operator,
  - EI LED will blink red, then blink green, then solid blue when it re-initializes the Modem.
  - Contact FirstNet to verify FirstNet SIM is activated and has FirstNet HPUE data-plan.

Note: There is no Ethernet Injector configuration needed while troubleshooting.

If a solid green EI LED is observed but the AW12 fails to pass data:

- Possible AW12 SIM problems
  - FirstNet SIM (ICCID) is not matched to correct AW12 IMEI or there may be a problem with FirstNet Subscriber account.
  - Contact FirstNet to verify SIM is correctly activated as a data-only SIM and has a FirstNet HPUE data plan.

If, after verifying the SIM card, power, USB, and cable connections, the AW12 still does not show a solid green LED, please complete the RMA authorization process with your point of purchase vendor for the AW12.

## Section 3: Troubleshooting LTE Network Connections

**User Experience:** In an area with good AT&T LTE coverage, the AW12 fails to connect to the network and illuminate a solid green LED.

Note: For LED color code, please see Appendix B: Ethernet Injector LED Legend.

Check the following:

- Ensure the AW12 SIM card is properly installed.
  
- Contact AT&T/FirstNet technical support to verify that SIM data-plan is in good standing. If necessary, initiate a DMU Key reset, and/or AT&T/FirstNet Account reset.
  
- The AW12 may need to be reset to factory default settings.
  - See Appendix A: Resetting the AW12 to Factory Default Settings.
  - If reset to factory default settings fails to resolve connection problem, request an RMA authorization for the AW12 from your point of purchase vendor.

**User Experience:** The AW12 has low signal strength, or no connection indicated by the EI LED.

- Check that AW12 antenna connectors are in good condition and not damaged or faulty.
  
- Confirm that the AW12 antenna covers the correct cellular bands, has the correct antenna connectors, and the connections are tightened appropriately. Please use only Assured Wireless recommended antennas for best AW12 performance.
  
- Check that AW12 LTE/DIV/B14 antennas are securely attached and that the AW12 GNSS port is attached to a GPS antenna.
  
- Confirm that the AW12 is in area with known FirstNet service and the antennas are not shielded or obstructed.

NOTE – Although HPUE (PC1) modems provide coverage well beyond standard LTE (PC3) modems, there may be areas where FirstNet service is not available. If there is no FirstNet service, the modem should be moved to an area of known coverage to confirm proper operation.

After these steps, if the EI LED is not solid green, request an RMA authorization for the AW12 from your point of purchase vendor.

## Section 4: Troubleshooting Interfaces

### Ethernet Port of Ethernet Injector AW12-EI

**User Experience:** The EI has no connection to the Ethernet host.

Check the following:

- Verify EI LED is illuminated, any color, to insure the EI is powered on.
- Verify ethernet port is not physically damaged on the Ethernet Injector.
- Verify ethernet cable and connectors are in good condition and not damaged or faulty.
- Verify the host WAN/Ethernet port LEDs are illuminating and flashing.
- Verify the host WAN/Ethernet port is configured for DHCP.

### USB Port: Ethernet Injector & AW12

**User Experience:** The Ethernet Injector has no connection to the USB port AW12.

Check the following:

- Verify EI LED is illuminated, any color, to insure the EI is powered on.
- Verify USB port is not physically damaged.
- Verify USB cable is in good condition and not damaged or faulty.
- AW12 is shipped with a USB 3.0 cable 2 meters long or less, with no USB repeaters. Other USB cables may be used but may operate at lower performance.

## Section 5: Troubleshooting AW12 GPS

**User Experience:** The AW12 does not obtain a GPS fix.  
Check the following:

- Verify the EI LED is illuminated, any color, to insure the EI is powered.
  
- Verify the AW12 GNSS SMA antenna port is connected to an active GPS antenna and not one of the AW12 LTE (PRI, B14, or DIV) ports.
  
- Verify the AW12 GPS antenna and cable are in good condition.
  
- Verify the AW12 GPS antenna covers the correct band (1575.42 MHz) and has the correct connector (SMA Male).
  
- Verify the appropriate antenna is installed. Active GPS antennas are recommended with the AW12.
  
- Verify GPS antenna has a good clear sky view.

## Appendix A: Reset an AW12 or Ethernet Injector to Factory Default Settings

**NOTE: FACTORY RESET SHOULD ONLY BE PERFORMED BY PEOPLE EXPERIENCED WITH MODEM “AT” COMMAND PROCEDURES. IMPROPER AT COMMANDS CAN MAKE AW12 UNUSABLE.**

AT commands are used to configure and control the operation of an AW12 modem. They are called AT commands because the characters AT must precede each command to get the ATtention of the modem. To send AT commands to the modem you must use a communications program, such as Putty or Minicom (Windows/Mac/Linux).

### □AW12 factory reset

1. Directly attach the AW12 by its USB cable to a PC using the following steps:
  - When available, use the Ethernet Injector (EI) as a reliable power-source for the modem.
  - When EI is not available, provide an appropriate 12vDC 3A power-source to the AW12.
  - Remove AW12 USB cable from Ethernet Injector and plug into PC USB port.
  - PC USB port does not need to be USB 3.0 port, AT commands are not high-speed data.
2. Establish TTY connection to modem with terminal program such as Putty or Minicom.
  - Terminal program may require the PC system USB port be identified to connect.
  - With a Windows PC you may need to put the modem into MBIM mode (Mobile Broadband Interface Model) to work correctly.
  - For MBIM mode, issue AT command “**AT+QCFG=“usbnet”,2**”. (no spaces)
3. Issue factory reset command to modem, “**AT&F**”.
4. Exit terminal program.
5. Power-off AW12 while still attached to PC.
6. Return AW12 to operational configuration and resume use.

Note: For EI software, there is no Factory Reset for Ethernet Injectors.



## Appendix B: Ethernet Injector LED Legend

State	LED Color	Description
Power off & sleeping	<b>Off</b>	<b>The LED is off</b> when the power is off or the EI is sleeping
Booting up	<b>Blue</b>	<b>Solid blue</b> while booting up
No SIM card	<b>Red</b>	<b>Solid red</b> after bootup when there is no valid SIM card
No signal	<b>Red/Green/Blue</b>	<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	<b>Red</b>	<b>Blinking red</b> after bootup when there is no data connection via the USB cable between the EI and the AW12
Connecting	<b>Green blink</b>	<b>Blinking green</b> while connecting to the cellular network
Connected	<b>Green</b>	<b>Solid green</b> when connected to the cellular network

## Appendix C: AW12 AT Commands for Troubleshooting

AT Commands may be used from a laptop with appropriate terminal software such as Putty and Minicom. See more information under Appendix A for AW12 device configuration and connecting via a terminal program.

Note: Using the AW12 modem for LTE network data connections under Windows (with a direct USB connection between the PC and AW12) requires the modem to be configured to MBIM mode. The EI automatically sets the modem to QMI mode after boot, therefore moving a modem between the EI and Windows host requires modem reconfiguration.

Note: Windows 10 is the only Windows OS supported. The Windows 10 device driver for the AW12 can be found on the Assured Wireless website ([www.assured-wireless.com/support](http://www.assured-wireless.com/support))

### **Configure device for MBIM (for Windows PC)**

AT+QCFG="usbnet",2

### **Configure device for QMI (used by Ethernet Injector, Linux Computers, Linux Routers)**

AT+QCFG="usbnet",0

### **Interrogate device for mode**

AT+QCFG="usbnet" // returns either a zero (0), or a 2. A "0" means it is in QMI mode, and a "2" means it is in MBIM mode

### **Modem IMEI request**

at+gsn

### **SIM ICCID query**

at+qccid

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