NAL TECHNOLOGIES

ALTM GEN2 Eval Kit

Quick Start Guide

Please read before deployment

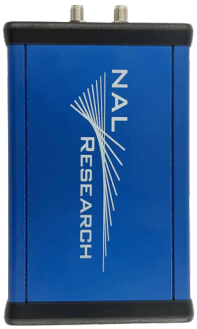
Device Description

ALTM GEN2 Eval Kit enables continuous access to location, velocity, and timing information, even in GNSS/GPS-challenged environments, by leveraging a robust Iridium PNT signal approximately 1,000 times stronger than GNSS/GPS.

This evaluation kit contains a GNSS receiver to allow the user to easily compare ALTM performance with GNSS performance. The ALTM Iridium PNT receiver does not use the GNSS information in any way while generating the $PANAV NMEA messages that are derived solely from the Iridium PNT satellite signals.

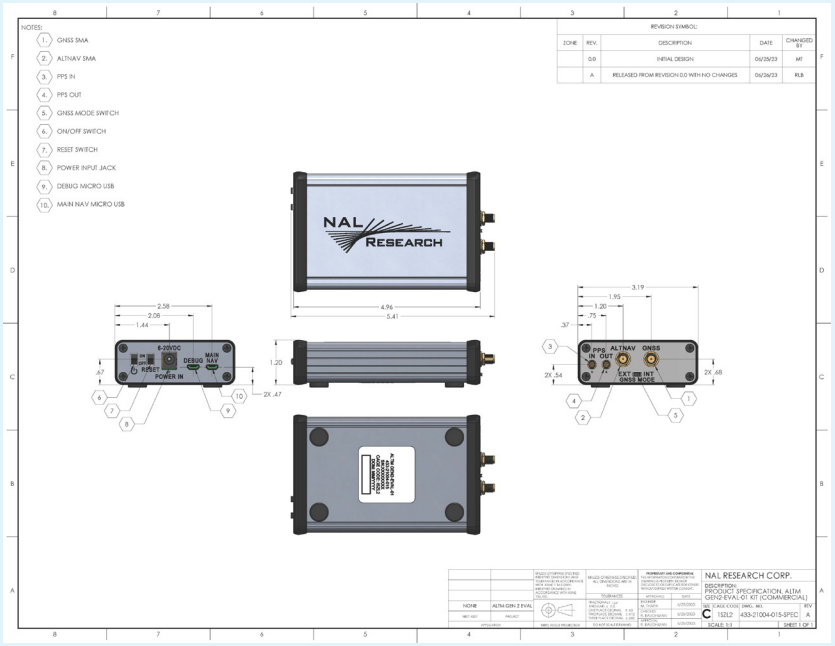
Kit includes:

- ALTM GEN2 Eval enclosure assembly
- Power adapter cable (POWS008)
- PNT/GNSS dual-element antenna (SAF7353-IG-01)
- USB cable (CBLA034)
- BNC to MCX cable (CBLA032)



NOTE: Case color may vary.

Specifications Diagram



Front Panel

POWER

- Power the device by flipping the power switch to *ON*.
- The device can be powered with a nominal 12VDC power adapter (6V, max 20V) to the *POWER IN* interface or 5V USB VBUS through the *DEBUG USB* port via USB-A to USB-C cable.
- WARNING: In some cases, the computer will limit the USB in-rush current, and the device may not be able to boot. In most cases after booting, the device runs sufficiently on USB power alone.

RESET SWITCH

- This switch is always set to *OFF*. Switching it to *ON* performs a hard reset of the device power supply, power cycling the device.
- To use, flip the switch to the *ON* position, leave in place for several seconds, and then return it to the *OFF* position.

Front Panel (continued)

USB-C PORTS

- All messaging and commands takes place through one of the following USB interfaces. Naltec recommends using a USB-C port on the host PC for the most reliable connection.
    - MAIN NAV - This is the primary connection of the ALTM console (AT commands and NMEA data). The data rate is 115.2 kbps. (11500, N, 8, 1, no HW flow control). The behavior of this port depends on the module installed.
        1. ALTM GEN2 Mini: This is a direct connection to the ALTM module. Only one USB port appears in the Windows device manager after connecting to the PC. No additional drivers should be needed.
        2. ALTM Micro-D: This port is not connected because the ALTM Micro-D lacks a native USB port.
    - DEBUG
        1. The behavior of this port is the same regardless of the module inside the Eval Kit. This port connects to an FTDI chip to manage the UART to USB conversion and the port settings are always 115200, N, 8, 1, no HW flow control.
        2. Connecting to this physical USB port instantiates four logical serial ports. The ALTM UART is usually the second of these four ports (i.e., if the user sees COM8, COM9, COM10, and COM11, COM9 is usually the correct port).
        3. If the user does not see four instances of a USB Serial Port (COMxx) where xx is a one- or two-digit number, please see Appendix A for instructions on updating USB drivers.

Rear Panel

PPS IN Connector Port

- This port can receive a 1-PPS timing pulse signal from an external GPS receiver.

PPS OUT Connector Port

- This port can receive a 1-PPS timing pulse signal from the Iridium PNT receiver. It is intended as an alternative to the timing signal supplied by a GPS receiver.

Iridium PNT Antenna Connector Port

- The Iridium antenna cable of a dual-Iridium/GPS antenna plugs into this port.

GNSS Antenna Connector Port

- The GNSS SMA connector is connected to the internal Ublox GNSS.

EXT / INT GNSS Mode Switch

- The switch selects between the use of the internal GNSS receiver and a user-connected external GNSS receiver.

Eval Kit Accessories

1. Cable Assembly (CBLA032), BNC - MCX Plug-PLG
This cable plugs into the 1-PPS port (*IN/OUT*) to send/receive the 1-PPS signal.

2. Cable Assembly (CBLA034), USB Type-A to Type-C 6'
This cable plugs into the Debug port or Main NAV port.

3. Power Adapter, Wall Mount
12V 25W AC/DC external wall mount (Class II) adapter. The power adapter connector plugs into the *POWER IN* port on the device.

4. Iridium/GPS Antenna
This small, dual Iridium/GPS antenna provides continuous coverage from 1610.0 - 1626.5 MHz specifically for the Iridium network and 1575.42 ± 13 MHz (L1) for GPS.

Activate Device

The unit is configured to start the ALTM GEN2 app with default settings when it boots.

1. Attach the Iridium gold connector on the Iridium/GPS antenna to the Iridium PNT antenna connector port on the rear panel of the device.

NOTE: Do not connect the silver connector on the Iridium/GPS antenna to the GNSS/GPS antenna connector port.

2. Slide the GNSS Mode switch on the front panel to the *RIGHT INT* position.

3. Verify the Reset switch on the front panel is in the *OFF* position.

4. Connect the (wall mount) DC power supply to the *POWER IN* connector port, and then plug the power supply to an electrical outlet.

5. Set the Power switch to the *ON* position.

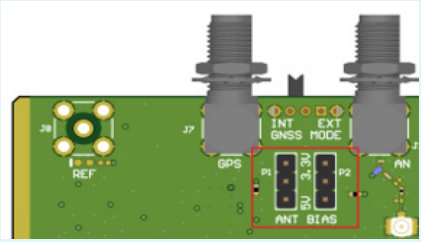
6. Connect USB A to USB C cable to MAIN NAV USB connector on the device and then connect to a terminal console.

IMPORTANT: The device streams PNT data via NMEA messages to the terminal console. The terminal console also provides an AT command interface.

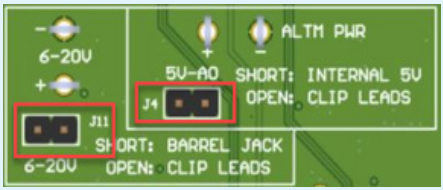
Jumper Settings on the Eval PCBA

There are six jumpers on the Eval PCBA.

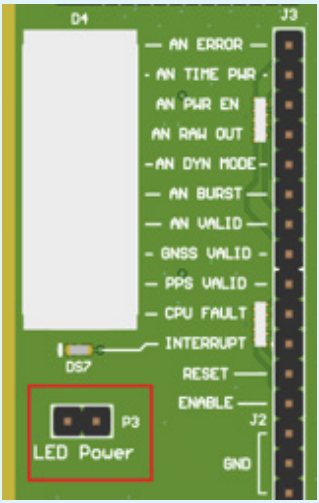
- **P5:** Not currently used.
- **P6 and P7:** Select the antenna bias voltage for the GPS and Iridium PNT SMA connectors, respectively, for active antennas. The default setting is 3.3V bias for GPS (P1) and no bias for PNT (P2).
- **P8:** The LED power jumper, which is supplied but not connected by default because the board is inside an enclosure and the LED is not normally visible. If the user wishes to enable the LED, Naltec recommends using the DC power jack connector to ensure proper operation due to the increased power draw.
- **J4:** The ALTM power selection jumper, which is connected by default. When shorted, the ALTM is powered by the internal 5V on the Eval Kit. If the user wants to measure ALTM power, they can either connect a current probe here or an external power supply and power only the ALTM and not the other Eval Kit items.
- **J11:** The DC input selection and is connected by default. If connected, the DC jack on the front panel is used. If the jumper is left open, it will allow the use of powering the device from the test points.



P6 and P7

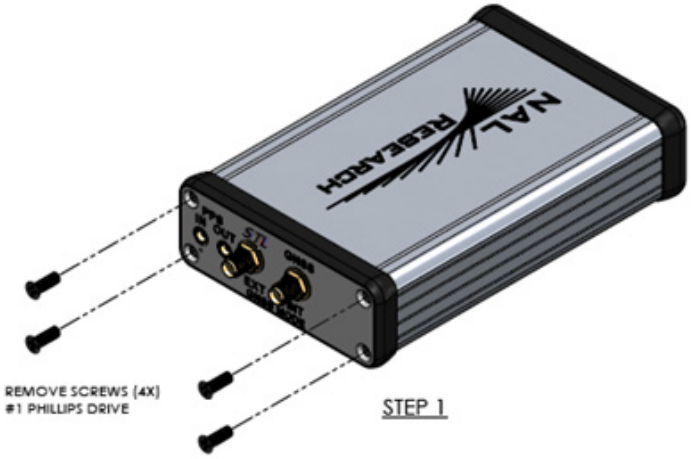


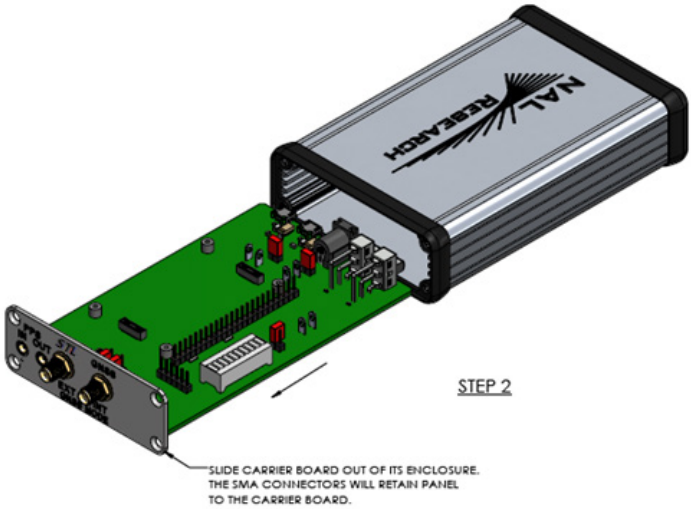
J4 and J11

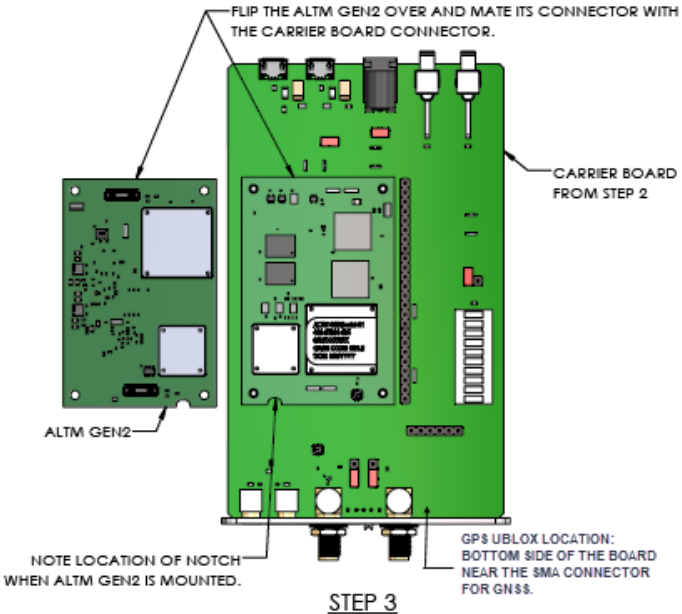


P8

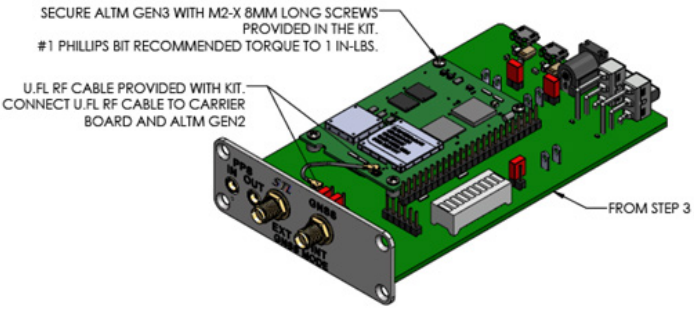
Install ALTM GEN2 PCBA





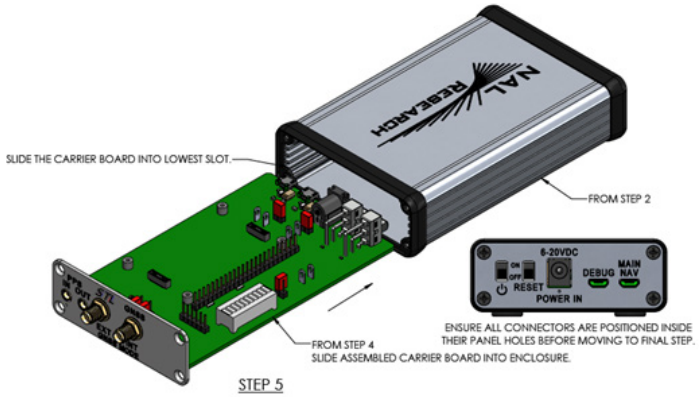


STEP 3

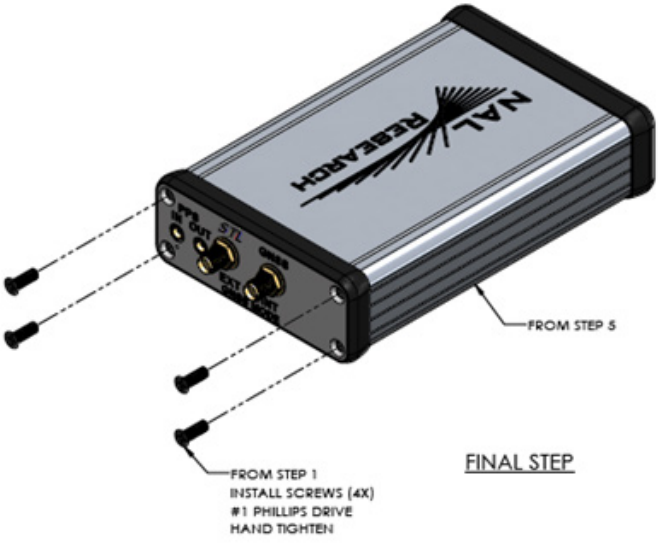


STEP 4

Install ALTM GEN2 PCBA (continued)



STEP 5



FINAL STEP

Appendix A

Installing Updated USB Device Drivers

1. Connect the ALTM Eval Kit *DEBUG* Port to a USB-C port on the host PC. Use a USB-A port if USB-C is unavailable.

2. Download the drivers for the desired device from https://ftdichip.com/drivers/d2xx-drivers/. Scroll to the "Processor Architecture" table of drivers, ensuring you download the correct drivers that match the version and architecture of Windows, as well as the processor architecture (e.g., ARM vs Intel). Once downloaded, if necessary, uncompress the downloaded drivers. Note where the drivers are located on the Windows device.

3. Right-click on the **Start** menu and select **Device Manager**.

4. In the **Device Manager** window, choose the arrow next to **Ports (COM & LPT)** to expand the category. Select the arrow next to the category to expand it.

5. There should be four USB ports when this category is expanded--all four ports must be updated individually. For each USB port, right-click on the desired device and select **Update Drivers**.

6. In the **Update Drivers** window, select **Browse my computer** for drivers.

7. When the **Browse for drivers on your computer** window appears, select **Browse...**

8. In the **Browse for Folder** window, locate where the drivers were downloaded to and select **OK**.

9. Verify the correct path to the drivers in the **Browse for drivers on your computer** window, then press **Next**.

10. Windows will install the drivers if it finds that the drivers are updated versions. If updated drivers are already installed, the message *"The best drivers for your device are already installed"* displays.

11. Select **Close** to exit the **Update Drivers** window.

12. Repeat these steps for each COM port in the **Ports (COM & LPT)** category.

13. After updating each USB Serial Port, the user should see **USB Serial Port (COMxx)** where **xx** is a one- or two-digit number under the **Ports (COM & LPT)** category. The user may need to disconnect and reconnec the ALTM Eval Kit.