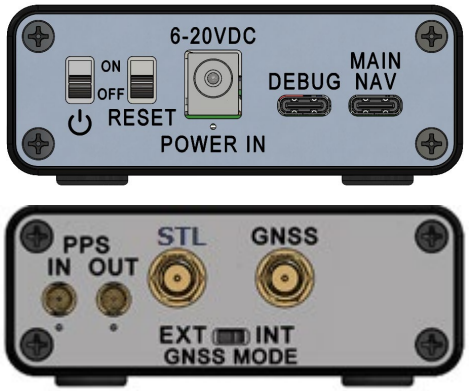
ALTM GEN2 EVAL KIT QUICK START GUIDE

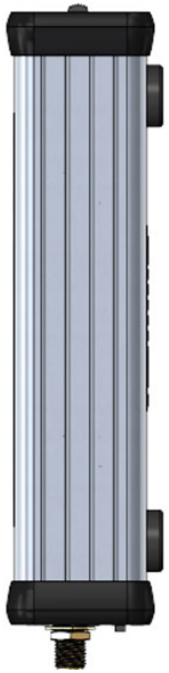
Support Phone#: 571-833-2169
Support@NALResearch.com
451-21004-012F
2025-06-18

DEVICE DESCRIPTION: ALTM GEN2 Eval Kit enables continuous access to location, velocity, and timing information, even in GPS-challenged environments, by leveraging a robust Iridium STL® signal approximately 1,000 times stronger than GPS. This kit includes an ALTM GEN2 Eval enclosure assembly, STL/GNSS dual-element antenna (SAF7352-IG-01), power adapter cable (POWS008), USB cable (CBLA034), and a BNC to MCX cable (CBLA032).

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

NOTE: Color of case may vary.





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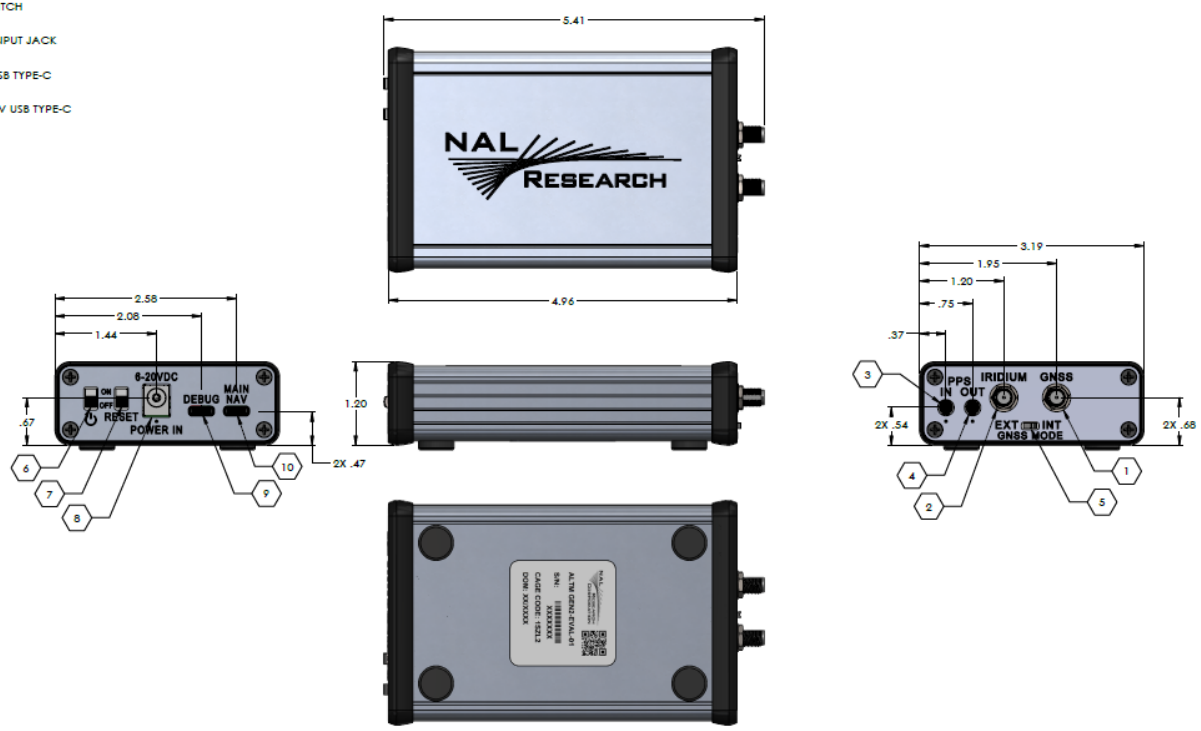
NOTES:

1. GNSS SMA
2. IRIDIUM SMA
3. PPS IN
4. PPS OUT
5. GNSS MODE SWITCH
6. ON/OFF SWITCH
7. RESET SWITCH
8. POWER INPUT JACK
9. DEBUG USB TYPE-C
10. MAIN NAV USB TYPE-C

REVISION SYMBOL:				
ZONE	REV.	DESCRIPTION	DATE	CHANGED BY
	0.0	INITIAL DESIGN	03/05/25	RLB
	A	RELEASED FROM REVISION 0.0 WITH NO CHANGES	03/06/25	RLB



NONE	ALTM GEN 2 EVAL	UNLESS OTHERWISE SPECIFIED: INTERPRET DIMENSIONS AND TOLERANCES IN ACCORDANCE WITH ASME Y 14.5-2009. INTERPRET DRAWING IN ACCORDANCE WITH ASME Y14.100.	UNLESS OTHERWISE SPECIFIED: ALL DIMENSIONS ARE IN INCHES. TOLERANCES: FRACTIONAL ± 1/64" ANGULAR: ± 0.5° ONE PLACE DECIMAL ± .03 TWO PLACE DECIMAL ± .010 THREE PLACE DECIMAL ± .005	PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS PROPRIETARY. DO NOT DISCLOSE TO OR DUPLICATE FOR OTHERS WITHOUT EXPRESS WRITTEN CONSENT. APPROVALS: ENGINEER R. BAUGHMAN 3/5/2025; CHECKED M. THAPA 3/6/2025; APPROVAL R. BAUGHMAN 3/6/2025	NAL RESEARCH CORP. DESCRIPTION: PRODUCT SPECIFICATION, ALTM GEN2 MINI-01 DEV KIT (DEVKIT-03)
NEXT ASSY	PROJECT				SIZE C; CAGE CODE 15ZL2; DWG. NO. 433-21004-020-SPEC; REV A
APPLICATION		THIRD ANGLE PROJECTION	DO NOT SCALE DRAWING		SCALE: 1:1; SHEET 1 OF 1

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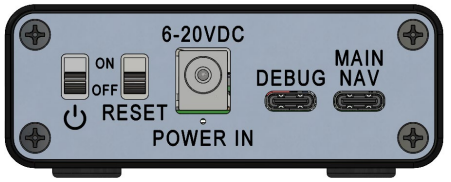
FRONT PANEL



- ❑ **Power**: The device can be powered with a nominal 12V DC power adapter (min 6V, max 20V) to the **POWER IN** interface or 5V USB VBUS through the DEBUG USB port via USB-A to USB-C cable. It is highly recommended to use **POWER IN**, versus relying fully on the USB cables. **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 fine on USB power alone.
  - **Power Switch**: This switch is located furthest left to the power connector. To power the device, flip to **ON**.
- ❑ **Reset Switch**: This switch is located between the **POWER IN** port and the power switch and is always set to **OFF**. Switching to **ON** performs a hard reset of the device power supply, power cycling the device. To use, flip it from the **OFF** to **ON** position and leave it for several seconds before returning it to the **OFF** position.
- ❑ **USB-C Ports**: All interaction takes place through one of the following port interfaces.
  - **MAIN NAV:** This is the primary connection of the ALTM console (AT commands and NMEA data). Baud rate is 115.2 kbps.
  - **DEBUG:** Connecting to this physical USB port instantiates four logical serial ports.
    - **Debug**: This port provides a proprietary debug interface which is normally disconnected in user equipment.
    - **Main Nav**: This is the ALTM console where the AT command interface and NMEA messages appear. Set the speed at 115.2 kbps in the application on the host computer. There is no practical difference between using this port and the MAIN NAV port.
    - **External GNSS**: This port provides the external GNSS interface.
    - **Unused**: This port is unconnected on the circuit board.

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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 send a 1-PPS timing pulse signal generated from the Iridium STL receiver. It is intended as an alternative to the timing signal supplied by a GPS receiver.
- ❑ **Iridium STL 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**: This 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.

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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 STL antenna connector port on 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 to the **RIGHT INT** position. 

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

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 STL data via NMEA messages to the terminal console.
- ❑ The terminal console also provides an AT command interface.

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JUMPER SETTINGS ON THE EVAL PCBA

There are six (6) jumpers on the EVAL PCBA.

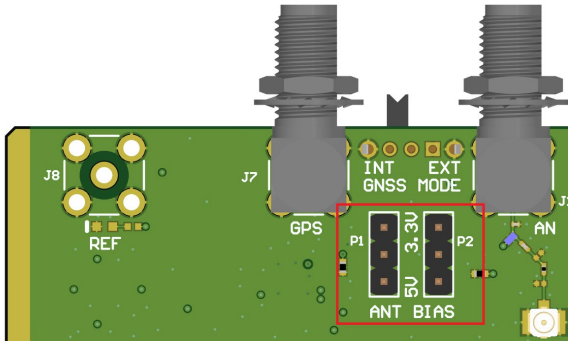
- ❑ **P5**: Not currently used.

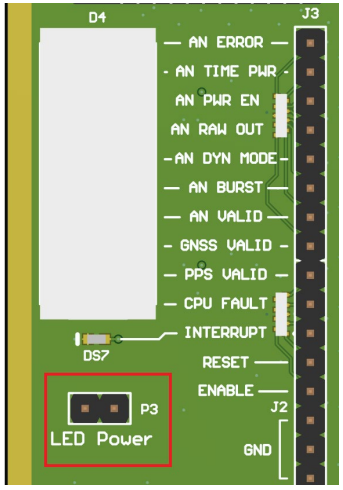
- ❑ **P6 and P7**: Select the antenna bias voltage for the GPS and Iridium STL SMA connectors, respectively, for active antennas. The default setting is 3.3V bias for GPS (P1) and no bias for STL (P2).

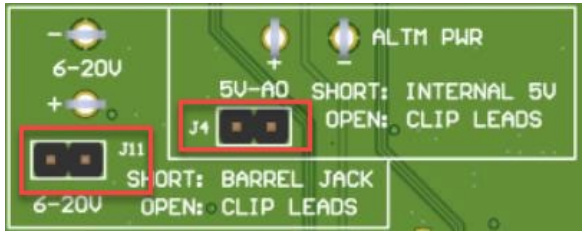
- ❑ **P8**: This is the LED power jumper. The jumper is supplied but is not connected by default, because the board is inside an enclosure and the LED is not normally visible. If the user wishes to enable the LED, NAL recommends using the DC power jack connector to ensure proper operation due to the increased power draw.

- ❑ **J4:** This is 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.

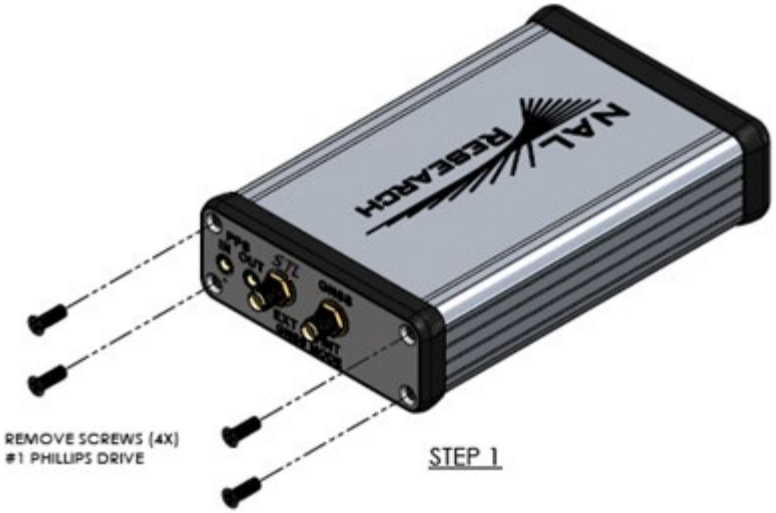
- ❑ **J11:** This is the DC input selection and is connected by default. If connected, the DC jack on the front panel is used. If the jumper is left open, it will allow the use of powering the device from the test points.



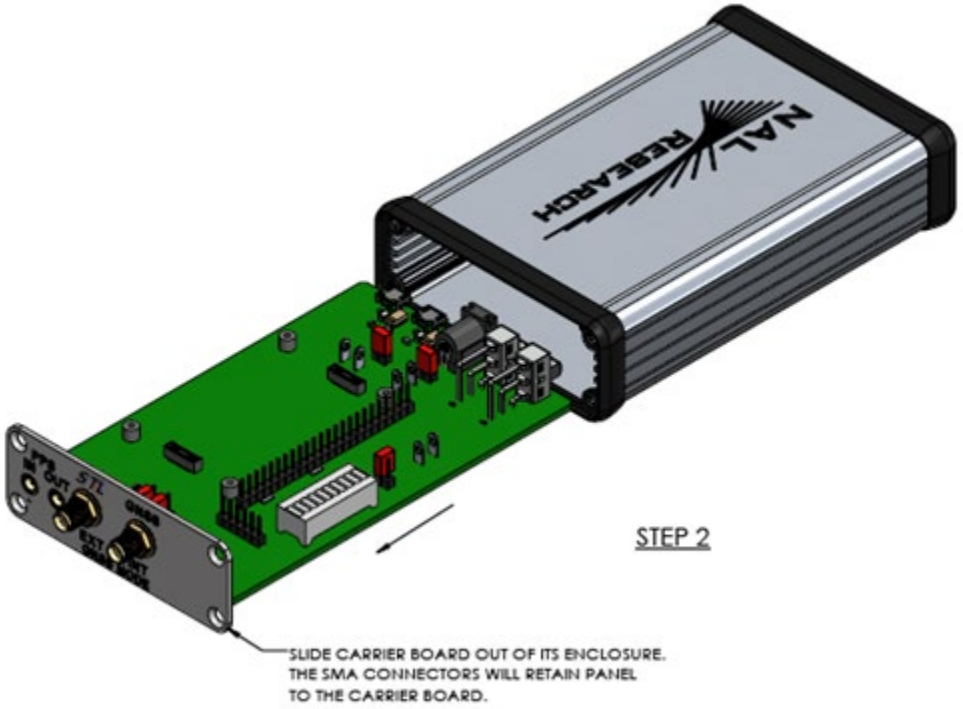




INSTALL ALTM GEN2 PCBA

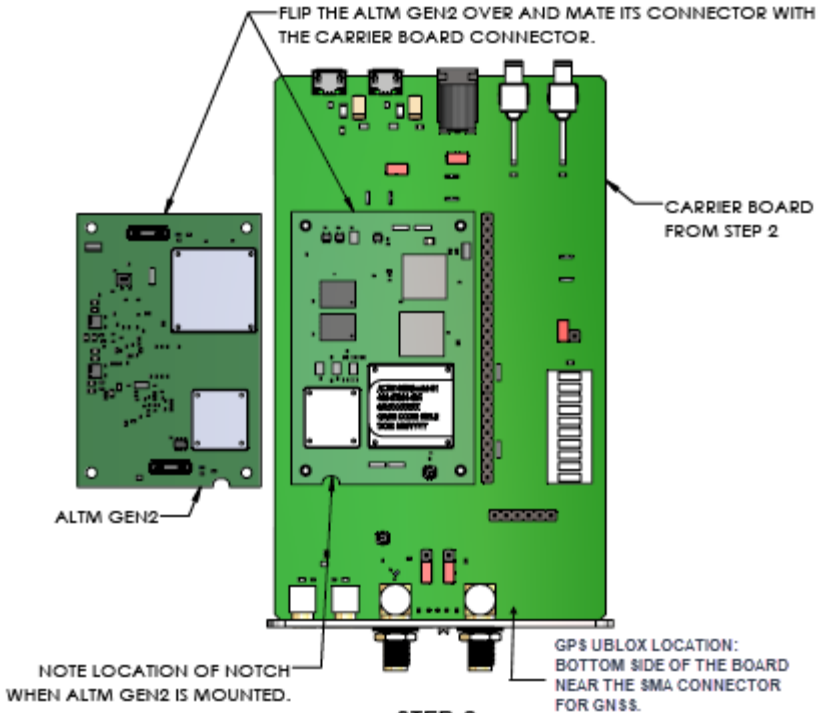


STEP 1

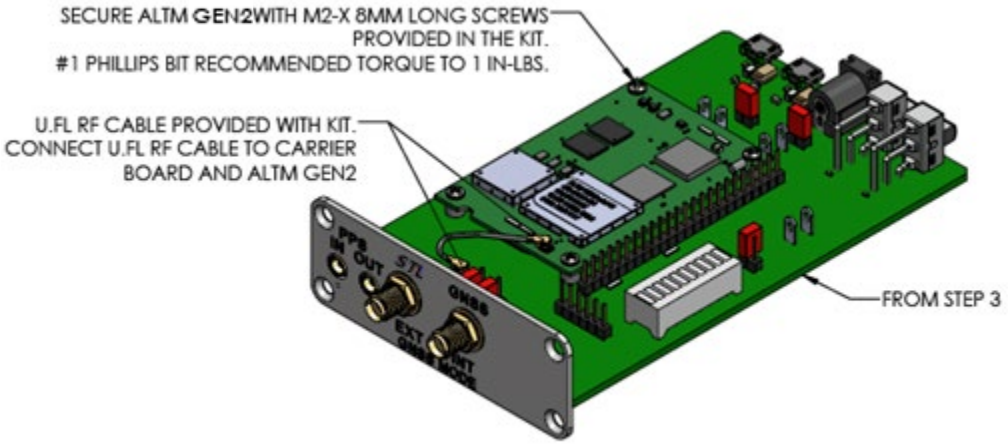


STEP 2

INSTALL ALTM GEN2 PCBA (Continued)



STEP 3



STEP 4

INSTALL ALTM GEN2 PCBA (Continued)