GENERAL DESCRIPTION OF MODEL 9602-AB

Version 1.0

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1.0 PURPOSE

The 9602-AB is a 9602-LP with internal Iridium antenna, GPS antenna and LiIon battery. When a data terminal equipment (DTE) is connected to the 9602-AB with SatTerm software installed (or any terminal emulator software), the DTE can be used to setup the operating parameters of the 9602-AB via a USB port. A DTE can be a desktop computer, a laptop computer or a micro-controller. Users are referred to the 9602-LP operating manuals on how to set the 9602-AB operating parameters.

2.0 GENERAL SPECIFICATIONS

Dimensions:	3.75" L x 2.16" W x 1.23" D (95 mm x 55 mm x 31 mm)
Weight:	8.0 oz. (227 g)
Enclosure:	Hard Anodized Enclosure, ABS Lid
Multi-Interface Connector:	USB
OFF/ON Switch:	Push Button
Emergency Switch:	Guarded Button
Status LED Displays:	Power, GPS, Iridium, SBD status and Emergency

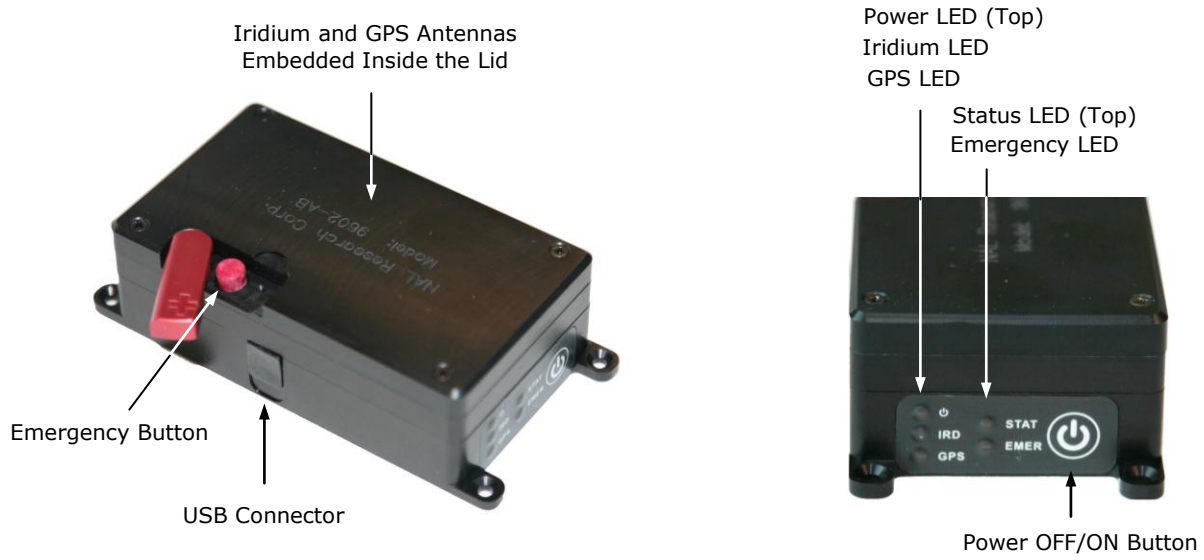


Figure 1. Description of the 9602-AB.

3.0 CHARGING THE 9602-AB

The 9602-AB is designed with an internal 1.95 A-Hr rechargeable Li-Ion battery. It is shipped with the internal battery partially charged. User should fully charge the 9602-AB before use. There are two ways of charging the 9602-AB. One is to use the supplied AC wall adapter. The other is to connect to a standard USB device—make sure to use the USB cable provided with the 9602-AB. With the AC wall adapter, the charging time is approximately five hours. Charging time using a USB port depends on the type of USB port. USB 1.0 should be able to charge the 9602-AB in about a day assuming the port is capable of producing an output current of 100mA. USB 2.0 can charge in about four hours assuming the current output of 1.5A.

4.0 STATUS LEDS

The 9602-AB has five status LEDs as shown in Figure 1. These include power indicator, GPS availability, Iridium signal strength, SBD transmission status and Emergency mode alert. They offer users a quick visual check to ensure proper operations. These LEDs provide the following information:

- Power LED:
    - Solid: when battery level is at +80% or when battery is fully charged with power cable plugged in.
    - Rapid blinking (on 0.5 second, off 0.125 second): when battery level is between 50% – 80% or when battery level is between 50% – 90% with power cable is plugged in.
    - Slower blinking (on 1 second, off 0.25 second): when battery level is between 20% – 50%.
    - Slow blinking (on 2 seconds, off 0.5 second): when battery level is between 0% – 20%.
    - Very slow blinking (on 0.1 seconds, off 5 seconds): sleeping between reports.
    - Off: when the device is off.
- GPS LED:
    - Solid: when there is a valid 3-D position fix.
    - Blinking: when there is 2D position fix.
    - Off: when unable to obtain a position fix or only able to obtain time or GPS receiver is off.
- Iridium LED:
    - Solid: when the Iridium signal strength is between 3–5 bars.
    - Blinking: when the Iridium signal strength is between 1–2 bars.
    - Off: when the Iridium signal strength is at 0 bar or Iridium transceiver is off.
- Status LED:
    - Solid: when the most recent SBD transmission succeeded.
    - Blinking: when an SBD transmission was successful in the past, but the most recent transmission failed.
    - Off: no successful SBD transmission yet.
- Emergency LED:
    - Solid: when emergency is enabled.
    - Off: when emergency is disabled.

5.0 POWER CONSUMPTION

The 9602-AB has an internal 1.95 A-Hr Li-Ion rechargeable battery. When both the Iridium and GPS antennas have clear view of the sky and the battery is fully charged, the 9602-AB is capable of sending more than 1,500 tracking reports with report rate set to less than two hours. Blocked or partially blocked antennas will force the 9602-AB to retry multiple SBD transmissions for each report and, as a result, can significantly reduce the overall number of reporting cycles.

The 9602-AB saves valid ephemeris data after each 3-D fix. The data is used to reduce acquisition time in the next reporting cycle from cold-start to hot-start. If the ephemeris data is older than two hours (time between reports is set for more than two hours), the GPS receiver will go through cold-start each time it wakes up to send a report. As a result, the 9602-AB configured for report rate of more than two hours can only send ~750 tracking reports.

IMPORTANT: Data presented here are only estimates and are highly dependent on the operating environment. Data are based on measurements made with multiple 9602-Abs placed on the roof of NAL Research's facility with no blockage.

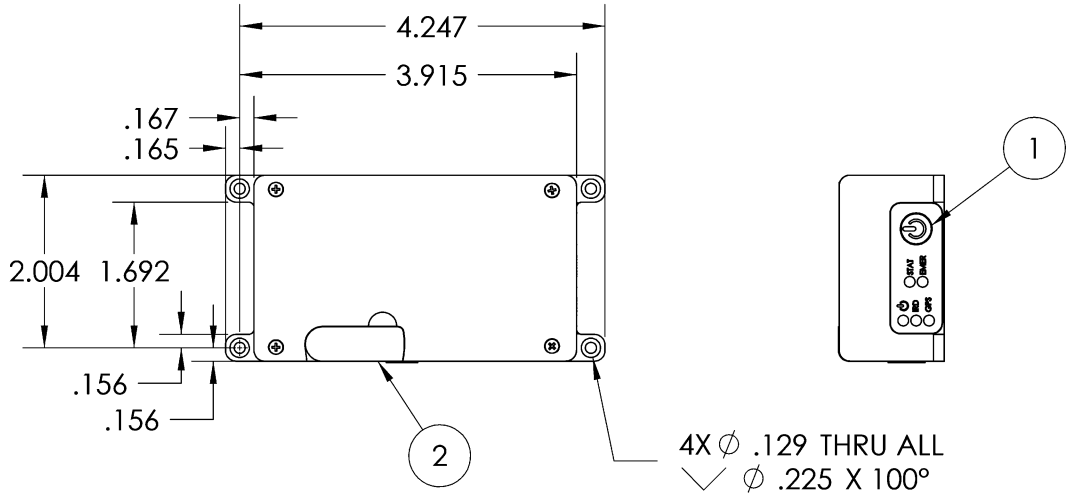
6.0 TECHNICAL SUPPORT

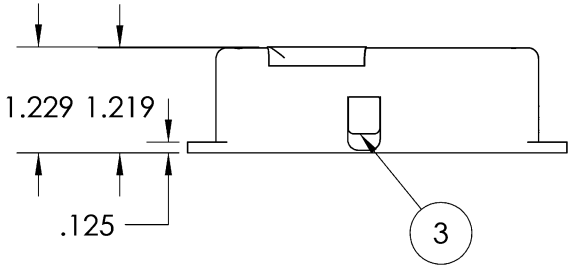
For technical support, please contact us at:
Phone: 703-392-1136 Ext. 200 or
E-mail: contact@nalresearch.com

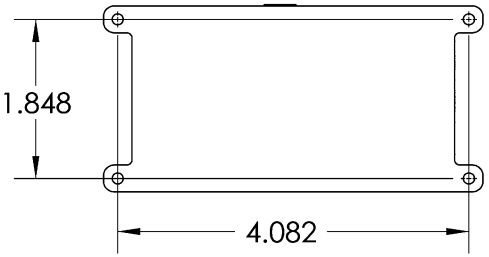
Technical documents are also available to download on NAL Research's website
www.nalresearch.com

DWG. NO.	SHEET	REV
92363	1	1.0

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	1.0	INITIAL RELEASE	5/23/12	DG







NOTES:

1. POWER SWITCH
2. EMERGENCY SWITCH ACCESS
3. MINI B USB ACCESS

DWG. NO.	SHEET	REV
92363	1	1.0

UNLESS OTHERWISE SPECIFIED:	CONTRACT NO.		NAL RESEARCH CORP.			
DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL DECIMALS ANGLES .XX ± .01" .XXX ± .005"	APPROVALS	DATE	DRAWING NAME 9602-AB			
MATERIAL	DESIGNER E. RODERICK	3/26/2012				
FINISH	CHECKER		A	CAGE CODE	DWG. NO. 92363	REV 1.0
	PROJECT ENGINEER		SCALE: 1:2		SHEET: 1 OF 1	
	APPROVED D. GAIBROIS	5/23/12				

DRAWING FILE NAME: 9602-AB
CAD GENERATED DRAWING. MANUAL CHANGES NOT ALLOWED

APPENDIX A: STANDARDS COMPLIANCE

The 9602-AB comprises of an Iridium 9602 transceiver. The 9602 transceiver is designed to meet the regulatory requirements for approval for FCC, Canada, and CE assuming an antenna with a gain of ~3 dBi and adequate shielding. The 9602 transceiver is tested to the regulatory and technical certifications shown in table below.

Regulatory Approvals	Radio Tests	EMC Tests	Mechanical/ Electrical Tests
CE	ETSI EN 301 441 V1.1.1 (2000-05)	ETSI EN 301 489-1 V1.8.1 (2008-04) ETSI EN 301 489-20 V1.2.1 (2002-11)	EN60950-1:2006 Part 1
FCC	FCC CFR47 Parts 2, 15, and 25	EN61000-4-2: 1995/A2: 2001 Part 4.2 EN61000-4-3: 2002 Part 4.3 EN61000-4-4: 2004 EN61000-4-6: 1996/A1: 2001 Part 4.6 EN55022: 2006	
Industry Canada	Industry Canada RSS170 Issue 1, Rev 1, November 6, 1999		

APPENDIX B: EXPORT COMPLIANCE INFORMATION

The 9602-AB is controlled by the export laws and regulations of the United States of America (U.S.). It is the policy of NAL Research to fully comply with all U.S. export and economic sanction laws and regulations. The export of NAL Research products, services, hardware, software and technology must be made only in accordance with the laws, regulations and licensing requirements of the U.S. Government. NAL Research customers must also comply with these laws and regulations. Failure to comply can result in the imposition of fines and penalties, the loss of export privileges, and termination of your contractual agreements with NAL Research.

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