

HOW TO USE MODEL A3LA-DG

TECHNICAL NOTE

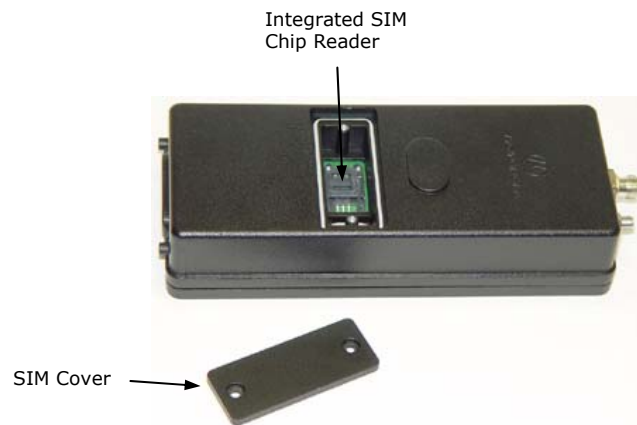
February 20, 2007



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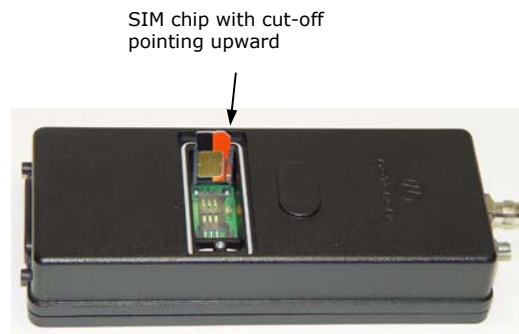
1. Remove the SIM cover located on top of the A3LA-DG Iridium modem by unscrewing two hex bolts.



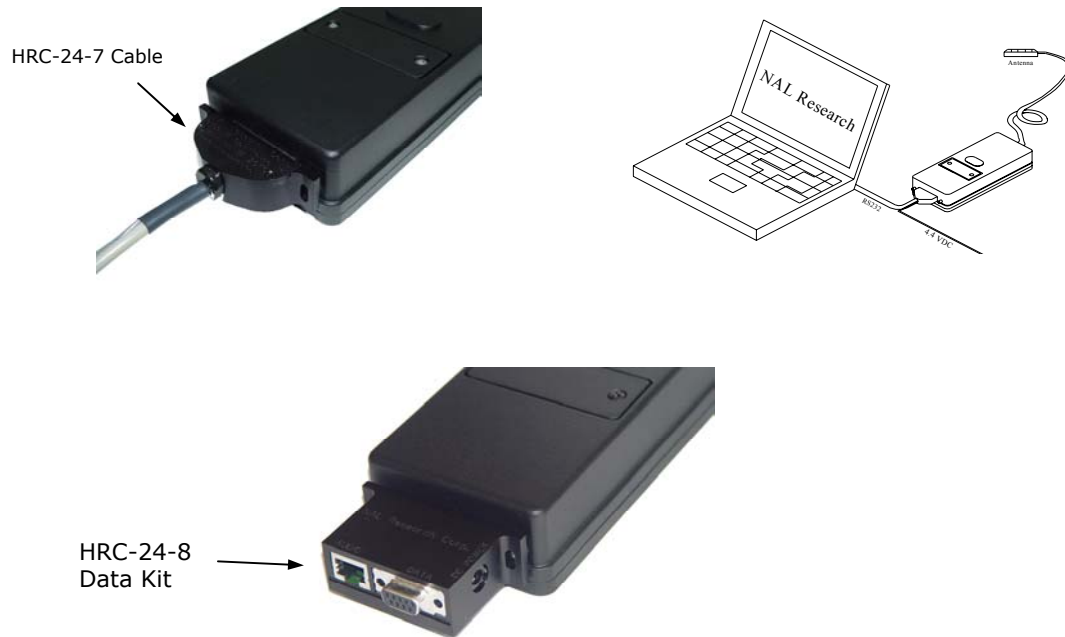
2. Under the SIM cover is an integrated SIM Chip Reader. The modem uses and requires an Iridium SIM chip for operation. The SIM chip should be detached from the full-size SIM card as shown in picture below.



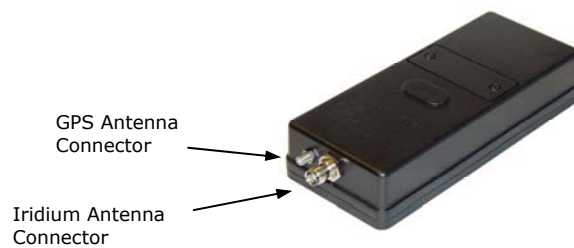
3. Slide the SIM Chip Reader's plastic bracket in the direction indicated by the arrow and lift up the bracket. Place the SIM chip (facing down) into the SIM bracket as shown in picture below. There is a small cut-off on one of the corners of the SIM chip. Make sure that the cut-off is pointing upward which should align the SIM chip with the SIM Chip Reader. Lower the bracket and lock the SIM bracket by sliding in the reverse direction. Replace the SIM cover.



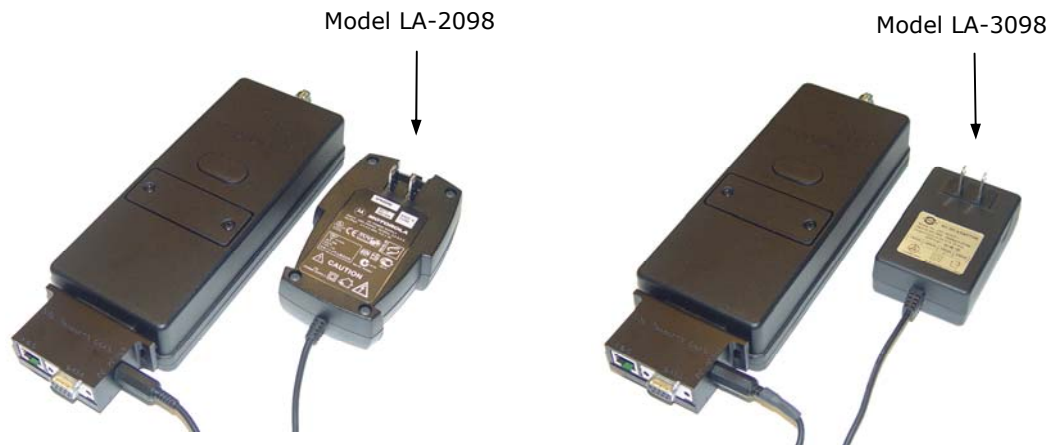
4. Connect a DTE (data terminal equipment such as a computer, a data logger, a microcontroller, etc.) to the modem DB25 port using either the RS232/data cable model HRC-24-7 or the DB25 data kit model HRC-24-8. Both of these models can be purchased separately from NAL Research. The HRC-24-7 cable consists of a full DB-9 serial connector and two terminal leads for DC power input. The HRC-24-8 data kit consists of a full DB-9 serial connector/cable, an RJ-45 for the DPL audio handset and a DC power plug. Three-wire (TX, RX and GND) serial cable can also be used (see document TN2007-15-V3.4.0) if flow control is not required. Set the DTE serial port baud rate to the modem's default baud rate of 19.2 kbits/sec. NOTE: FOR THE MODEM TO OPERATE PROPERLY, DO NOT CHANGE THE DEFAULT BAUD RATE OF THE MODEM.



5. Connect an Iridium antenna into the TNC connector (not included with the modem) and the GPS antenna provided with the modem into the SMA connector. Any of the four types of Iridium antennas offered by NAL Research is appropriate. Make sure both antennas have full view of the sky and the cable loss between the A3LA-DG and Iridium antenna is less than 3 dB.



6. Supply DC power of $\sim 4.4\text{V}$ (can range from 4.0VDC to 4.8VDC) to the power input of the HRC-24-7 cable or of the HRC-24-8 data kit. Highest current drawn will be at power-up and approximately $2.2\text{A}@4.4\text{VDC}$ for less than 500 milliseconds. The modem will automatically be ON/OFF when DC power is applied/removed. If power to the modem is cycled, make sure the elapsed time between each power cycle is approximately 10 seconds. NAL Research's AC adapter model LA-2098 or model LA-3098 (purchase separately) can be used to power the A3LA-DG (see pictures below).



IMPORTANT: GPS antenna should only be connected to the A3LA-DG when it is not powered. Do not connect or disconnect the GPS antenna when A3LA-DG is powered. The internal GPS receiver calibrates the noise-floor on power-up, and by connecting the GPS antenna after power-up can result in prolonged acquisition time. To test GPS signal reacquisition, physically block the signal to the antenna rather than disconnect and reconnect the antenna is recommended.

IMPORTANT: Never feed supply voltage into the active GPS antenna. Always use the bias voltage supplied by the A3LA-DG SMA antenna connector to power an active GPS antenna. Feeding voltage to the GPS antenna other than the provided bias voltage will damage the 9601-DG.

7. Wait for about 15 seconds for the modem to register with the Iridium satellite network.
8. The A3LA-DG is basically a "black box" with no indicators of any kind (power on light, satellite registration status, satellite signal strength, etc.). This can pose great difficulties to first-time users who are not familiar with satellite modems. For application developers, NAL Research recommends the use of a DPL handset DPLS0401-412 and a DB25 Data Kit HRC-24-8 in combination with the A3LA-DG. This setup can be a useful diagnostic tool allowing the modem status to be displayed on LCD of the handset.



9. Use any terminal emulator software (such as Windows® HyperTerminal) and AT commands to communicate between the modem and the DTE. Again, the baud rate of the DTE must be set at 19.2 kbits/sec for proper communications with the modem. The A3LA-DG is also shipped with a CD labeled "Manuals/Software for Model A3LA-DG." There is a terminal emulator software package on the CD called SatTerm-G. NAL Research recommends the use of SatTerm-G with the A3LA-DG since it provides a complete reference manual for all AT commands through user selected buttons for quick and easy access.
10. Examples using commercial SIM chips (instructions are different for DoD SIM chips):
 - a. To make a phone call to a land-line phone execute the following:
ATD 001 + phone number or
ATD 0017033921136
 - b. To make a phone call to another Iridium modem (or phone) execute the following:
ATD 00 + phone number or
ATD 00881631049875
11. Check the followings if a connection cannot be made:
 - a. Iridium antenna has a full view of the sky
 - b. The PIN number has been removed from the SIM chip
 - c. Power source provides enough current
12. Check the followings if using the DPL handset:
 - a. LCD screen on the DPL handset is ON with the word "Iridium" written across the LCD screen. If not, check for appropriate power input.
 - b. <Enter PIN> message is not displayed on the LCD. Enter appropriate PIN number if requested by the modem (the default PIN is 1111). The handset can be used to remove the PIN permanently.
 - c. Displayed satellite signal strength on the LCD must be at least 3 bars. Re-arrange/re-located the Iridium antenna if the signal strength remains at 3 bars or below.

13. If the DPL handset is not available, use the following steps to check if the SIM or the Phone Control is locked:

- a. If using the SatTerm-G software, open the AT Command Table for the AT+CPIN command and click the Read button. If NOT using the SatTerm-G software, enter the command "AT+CPIN?"
- b. If the response from the A3LA-DG is "SIM PIN", then the SIM is currently locked (or activated). To remove the SIM, do the followings:

If using the SatTerm-G software:

- i. Enter the SIM PIN code (each SIM is shipped with the default code of 1111) in the "p" box, and then click the Send button. If the PIN code is correct, the response from the A3LA-DG should be "OK".
- ii. Open the AT Command Table for the AT+CLCK command, and then choose "SC" from the "f" box, choose "0" from the "m" box and enter the PIN code (again the default code is 1111) in the "p" box. Then, click the Send button. If the PIN code is correct, the response should be "OK".
- iii. Now, the SIM is removed and ready to be used.

If NOT using the SatTerm-G software:

- i. Enter the following command AT+CPIN="PIN code" (where the default PIN code is 1111). If the PIN code is correct, the response from the A3LA-DG should be "OK".
 - ii. Enter the following command: AT+CLCK="SC",0,"PIN code". If the PIN code is correct, the response should be "OK".
 - iii. Now, the SIM is removed and ready to be used.
- c. If the response is "PH PIN", then the surface control for the A3LA-DG is currently locked and the phone PIN code needs to be entered in order to use the commands that operate the A3LA-DG. To unlock the A3LA-DG surface control, do the same procedure in part b above except "CS" should be chosen instead of "SC" in step ii.
 - d. If the response is "READY" or "SIM PIN2", then the SIM is not locked and the A3LA-DG is ready to be used. No PIN code needs to be entered.
 - e. If the response is "SIM PUK" or "SIM PUK2", contact your service provider.

TECHNICAL SUPPORT INFORMATION

For technical support, please contact us at:
Phone: 703-392-1136 x200 or
E-mail: contact@nalresearch.com

Technical documents are also available to download on NAL Research's website www.nalresearch.com
under <http://www.nalresearch.com/AnonymousFTPSite.html>