

# Establishing Iridium Communications from an XP Computer to a UNAVCO Polar Remote GPS Station

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This document contains instructions on how to establish an Iridium communications link between an XP computer and a remote Trimble NetRS GPS receiver. An Iridium test call must be performed before leaving newly-installed remote GPS site, or a site which has had its communications hardware modified during a site visit.

You should configure your computer and Iridium modem before going to the field. Various bugs have been observed with specific Iridium modems and XP computers, and it is not guaranteed that the procedure below will hold for all cases. Also, these instructions also assume a connection made using NSF-supplied DOD Iridium SIM cards, which are not compatible with commercially-available SIM cards. In short, be sure you know how to establish an Iridium comms link with your equipment before going to the field; do not assume that you will simply figure it out once you get there.

Finally, although this procedure assumes the call is originated from an Iridium data modem (e.g. NAL Research A3LA series), an Iridium telephone handset can also be used, but requires the Data Kit accessories.

## I. Configure the Iridium PPP Dialup Connection

### A. Install the modem driver

1. Turn on your modem and connect its serial cable to your computer, either to the computer's serial port or through a USB-serial adapter.

Note: it has been found that certain USB-serial adapters can lock up certain XP machines, and there is no assurance a USB-serial device will work with a given PC until it is tested. However, no issues have been found with Trendnet devices where as problems have been seen with those from Belkin and Keyspan.

1. Choose *Start > Control Panel*.
2. Double click on *Phone and Modem Options*.
3. Select the *Modems* tab and click *Add...*
4. Check "*Don't detect my modem; I will select it from a list.*" Then, click *Next >*.
5. Click *Standard 19200 bps Modem*, and then click *Next>*.

6. Click the “*Selected ports*” button. Select the port to which your Iridium modem is connected. A computer’s serial port is usually COM1, however a USB-serial adapter will appear as some other COM port number, say COM3 or COM4. Click *Next >*.

7. Click *Finish*.

8. Click the *Standard 19200 bps Modem* to highlight it and then click *Properties*.

9. Select the *Advanced* tab.

10. In the “*Extra initialization commands*” box, enter AT&F0&D0&K0

11. Click *OK, OK*.

## B. Configure Dial-up Networking

1. Choose *Start > All Programs > Accessories > Communications > Network Connections*.

2. Click “*Create a new connection*” then *Next>*.

3. Select “*Connect to the Internet*” and click *Next>*.

4. Select “*Set up my connection manually*” and click *Next>*.

5. Select “*Connect using a dial-up modem*” and click *Next>*.

6. If a “*Select a Device*” window appears, check the box next to “*Standard 19200 bps modem*”, and uncheck all other devices. Click *Next>*.

7. Enter a connection name (e.g., “*Iridium PPP*”) and click *Next>*.

8. In the *Phone Number* box, enter 00881676300000 and click *Next>*. This is a placeholder phone number for a US DOD Iridium SIM card. You can enter the site’s unique phone number (last 5 digits) later, when dialing the site.

9. If using XP Professional Edition, a window may appear to select either “*Anyone’s use*” or “*My use only*”. Choose either selection and click *Next>*.

10. A username and password are not necessary. Uncheck the “*Use this account name and password...*” and “*Make this the default internet connection*” boxes. Click *Next>* then *Finish*.

## II. Place Iridium Phone Call and Verify Connectivity to GPS Receiver

### A. Set up Iridium modem and antenna.

Connect the Iridium antenna to the modem. Iridium hardware is sensitive to sky view so locate the antenna so it has an unobstructed view of the sky. Iridium modems are also sensitive to cable loss so be sure the antenna cable plus any connectors do not add up to more than 3 dB loss. For example, a 5-meter RG58 or 10-meter LMR400 cable will be more than adequate. In general, shorter, thicker cable is better

### B. Place an Iridium phone call.

1. Choose *Start > Connect To*, then select your Iridium dial-up connection, e.g. *Iridium PPP*.
2. Do not enter a username or password and uncheck the “*Save this username and password...*” box.
3. Enter 14-digit Iridium phone number and click *Dial*. Include leading zeros, e.g. 008816763xxxxx.
4. It may take several attempts to establish a connection. Once you receive a message saying your computer is connected to the network, you can find the IP address of the remote computer (e.g. the Trimble NetRS) under *Start > Control Panel > Network Connections*. Click on the Iridium connection and look on the left panel under *Details*. At present, all UNAVCO-configured Trimble NetRS receivers will have an IP address of 192.168.xxx.2.
5. At this point you can pull up any web browser to contact the GPS receiver. There are two ways to query the receiver.
  - i. Enter the NetRS IP address in the navigation bar and hit Enter. This will pull up the receiver’s web interface. The web interface loads very slowly over Iridium, but you will be able to navigate through it and perform normal system checks, such as verifying satellite tracking, data logging, input voltage on its power ports, etc.
  - ii. Use the NetRS Programmatic Interface. The NetRS will respond to a set of HTTP command entered directly into the browser’s navigation bar. This is a much faster way to verify NetRS operation as compared to loading the entire web interface. Programmatic Interface commands typically used by UNAVCO to verify receiver operation are:

*http://192.168.xxx.2/prog/show?systemname*

*http://192.168.xxx.2/prog/show?voltage&input=1*

*http://192.168.xxx.2/prog/show?voltage&input=2*  
*http://192.168.xxx.2/prog/show?temperature*  
*http://192.168.xxx.2/prog/show?loggingstatus*  
*http://192.168.xxx.2/prog/show?trackingstatus*

Note: when reading output of the *show?trackingstatus* command, the only way to tell if the system is tracking satellites is to observe the signal-to-noise fields, e.g. L1snr, L2snr. Receivers with later firmware will also have an L2Csnr column. All other columns will be populated with almanac information regardless if the receiver is tracking satellites or not.

C. Dropped calls are a fact of life with Iridium, and it may take several dialing attempts to establish successful communications with the GPS receiver. Also, if the Iridium modem appears unresponsive during a call attempt, it may be necessary to reboot it. Allow the modem to remain off for 20 seconds before powering it again.