i D I R E C T
TECHNOLOGIES

Installation and Commissioning Guide

iDirect iNFINITI series™

3000 ✦ 5000 ✦ 7000

Satellite Routers

Release 7.0
June 16, 2006

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1 Getting Started

This Quick Reference Guide is intended to help the user quickly install and commission iDirect iNFINITI series™ 3000, 5000 and 7000 Satellite Routers.

Throughout this manual we will refer to an iDirect iNFINITI series™ 3000, 5000 or 7000 Satellite Router as, simply, "the Satellite Router."

Your network must be at iDS version 6.0.1 or later to support iDirect iNFINITI series™ Satellite Routers.

iDirect iNFINITI series™ Satellite Routers have a Linux operating system.

1.1 Required Equipment

You will need the following equipment and software to successfully commission the Satellite Router in the field:

1. A console cable with DB9 adapter ☐

2. A cross over LAN cable ☐

3. Digital (or Analog) Voltmeter plus adaptor from voltmeter to IFL "F" connector ☐

4. A hand held GPS unit or a map that shows your current geographic location coordinates ☐

5. A laptop (or PC) with Windows XP or Windows 2000 Service Pack 3 loaded. (512 MB RAM recommended; 1 GHz processor or more; and at least 50 MB of free disk space) iDirect recommends disabling the firewall to ensure complete functionality. ☐

6. The correct options file provided to you by your Service Provider. ☐

7. The correct remote application and firmware images (or correct "package") provided to you by your Service Provider. ☐

The appendices of this document include additional helpful information.

1.2 When to Use this Guide

Once you have successfully commissioned an iDirect iNFINITI series Satellite Router at a specific location it can be reset at any time. Resetting the Satellite Router will cause it to perform its self-test startup sequence and acquire into the network.

However, if you move your iDirect iNFINITI series™ Satellite Router from one established location to another, it must be re-commissioned by repeating the procedures in this manual.

2 Install iSite Software and Remote Modem Images on your Laptop

These instructions will guide you through the process of installing iSite software and remote images onto your laptop (or PC). The software may be downloaded from the Internet or distributed on a CD.

2.1 Installing Software Downloaded from the Internet or CD

iSite software is usually distributed in a ZIP file format. After receiving the compressed archive file, remote-<version>.zip, copy it to a directory where you can uncompress the files. Be sure to store the files some where on your laptop (or PC) that you can locate them later.

Several tools, such as Info-Zip (at http://www.info-zip.org/), WinZip (at http://www.winzip.com/), or PKZIP (at http://www.pkware.com/), recognize the .zip format.:

1. Uncompress the files by using a utility that understands the .zip format. ☐

2. If desired, create a shortcut on the desktop or Windows taskbar to *iSite.exe* (located in the *iSite* folder). ☐

3. Run the iSite program wizard to install the software on your laptop (or PC). ☐

2.2 Components of the iSite Software and Remote Modem Images

Currently, the Images for iDirect NetModem and Satellite Router remote modem products are bundled together, in addition to the iSite software.

- • The NMS iSite program and support files
- • The NetModem II Remote-Modem application and image files
- • The NetModem II Plus Remote-Modem application and image files
- • The iNFINITI Remote-Modem application and image files

A directory structure similar to the following will be created when the files are uncompressed:

```
NetModem-<7_0_X>/
            iSite/
            Images
                Remote_2plus/
                Remote_iNFINITI
                Remote_NM2/
```

NOTE   **<version> is the software version number in the form '7_X_X'.**

3   Establish a Console Connection to the Satellite Router

You can use any terminal emulator to connect to the Satellite Router console. The HyperTerm application comes pre-installed on all Windows 2000 and XP machines.

3.1   Access your Satellite Router through HyperTerminal

1.   Connect the RJ-45 to DB-9 adapter to the COM1 port of your laptop.

2.   Plug the other end of the cable into the Console port of the iDirect Satellite Router.

3.   Power Up your Satellite Router.

4.   In the Windows Start menu of your Laptop (or PC), select **Programs**, select **Accessories**, select **Communications**, and then select **HyperTerminal**. You may have to answer some questions about your area code and provide dialing information.

5.   In the **Connection Description** dialog box, enter a name for the connection, such as "Satellite Router Console".

      (You may also select an icon other than the default icon.)
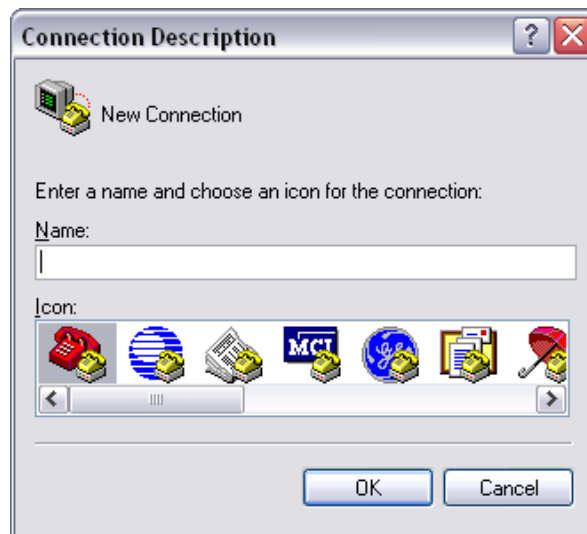
6. Select COM1 in the **Connect To** dialog box

7. Using the default variables illustrated in the COM1 Properties dialog box below, enter the session properties.

iDirect iNFINITI series Installation and Commissioning Guide, Release 7.0
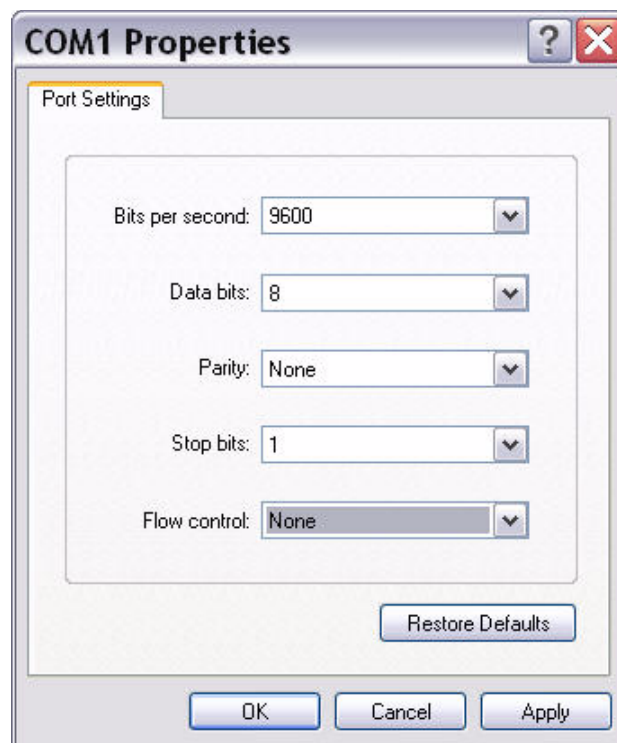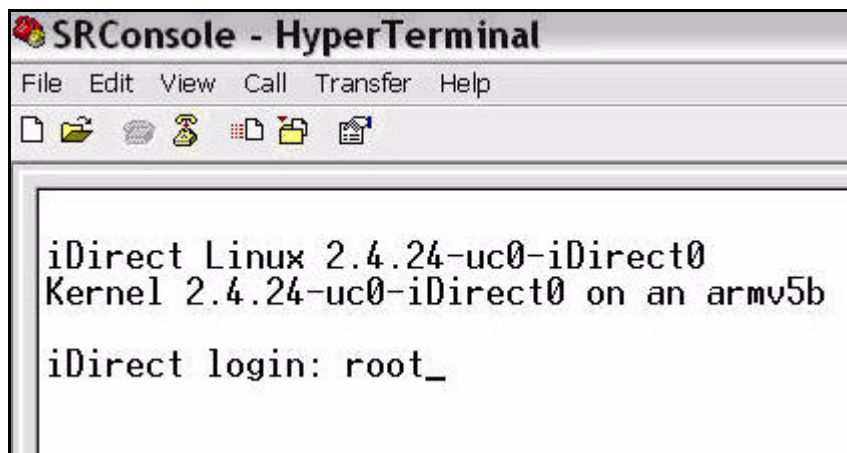
	NOTE	If this is a mobile remote and you lose contact with it, the console port settings will change during the boot process to 4800 bps. (All other settings will remain the same.) To re-establish communication with the console port, you must change your serial port settings to match those in the dialog box above.

8. Press **Enter** a few times to see if you can generate a response from the Satellite Router. If you are successful, you will see the console prompt. If you are unable to generate a response from the Satellite Router, reexamine your settings to be certain that they are correct. ☐

9. At the iDirect login prompt, enter the default login "**root**". ☐
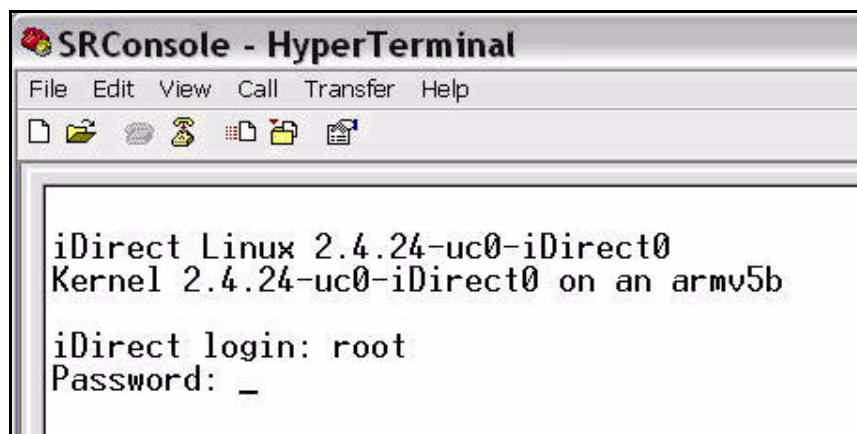
```
SRConsole - HyperTerminal
File  Edit  View  Call  Transfer  Help


iDirect Linux 2.4.24-uc0-iDirect0
Kernel 2.4.24-uc0-iDirect0 on an armv5b

iDirect login: root_
```

10. At the Password prompt, enter the default login "**iDirect**". ☐
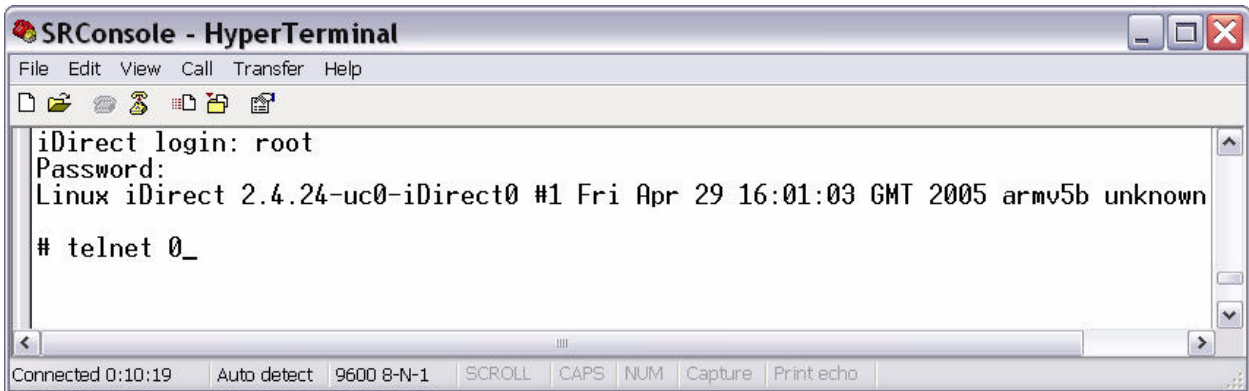
```
SRConsole - HyperTerminal
File  Edit  View  Call  Transfer  Help


iDirect Linux 2.4.24-uc0-iDirect0
Kernel 2.4.24-uc0-iDirect0 on an armv5b

iDirect login: root
Password: _
```

You are now in the Linux software running on the Satellite Router. You can access the iDirect application running on the Satellite Router by telneting to it from Linux.
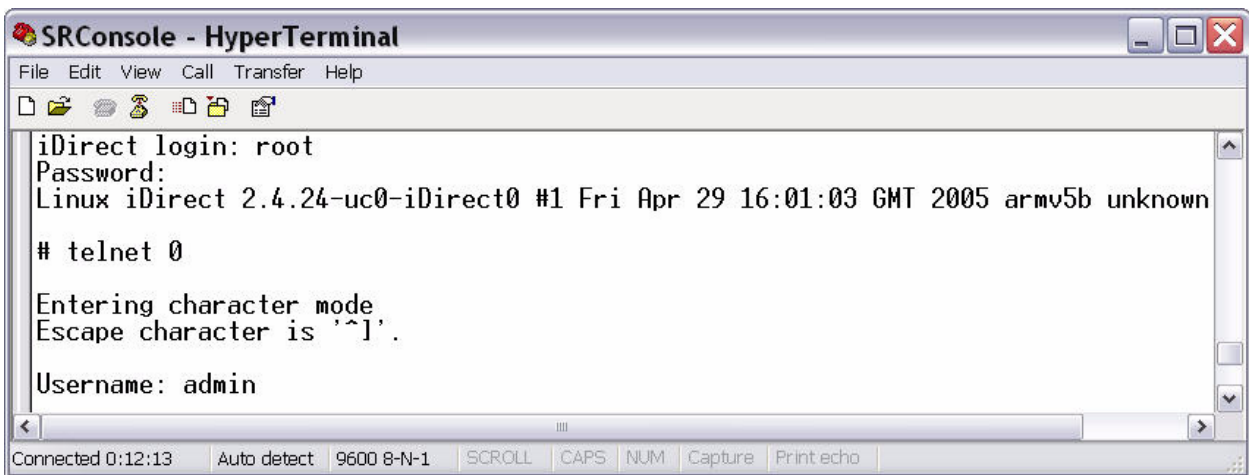
3.2 Telnet to the iDirect Application

1. At the Linux prompt, enter **"telnet 0"** to telnet to the iDirect application.

2. At the Username prompt, type the default user name "**admin"**.

3. At the Password prompt, type the default password "**iDirect"**.
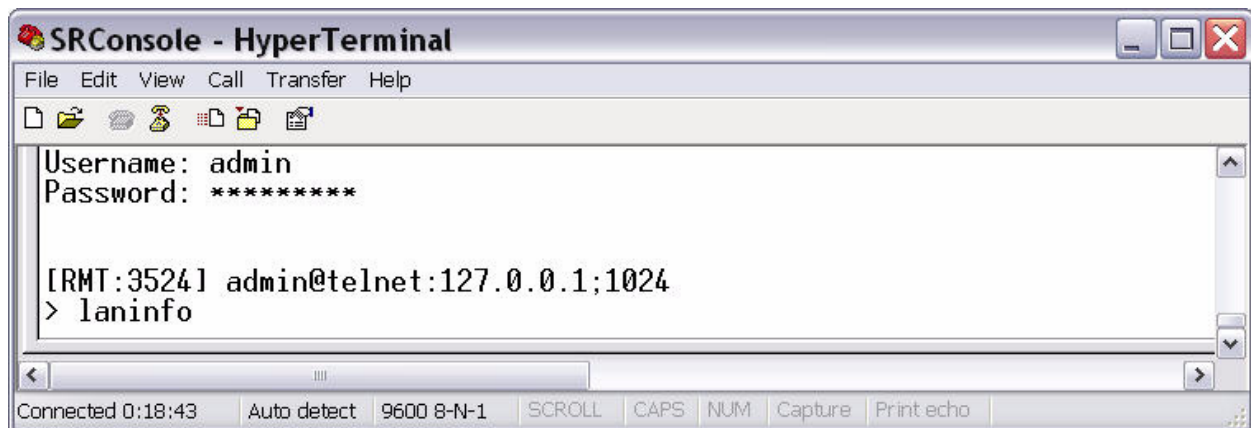
You will now be in the iDirect application. To find out the IP address of the Satellite router, complete the following procedure.

3.3   Discovering the Satellite Router's IP Address

1.   At the Satellite Router prompt, enter the command "**laninfo***".*

The Satellite Router's IP address and Netmask will be displayed.
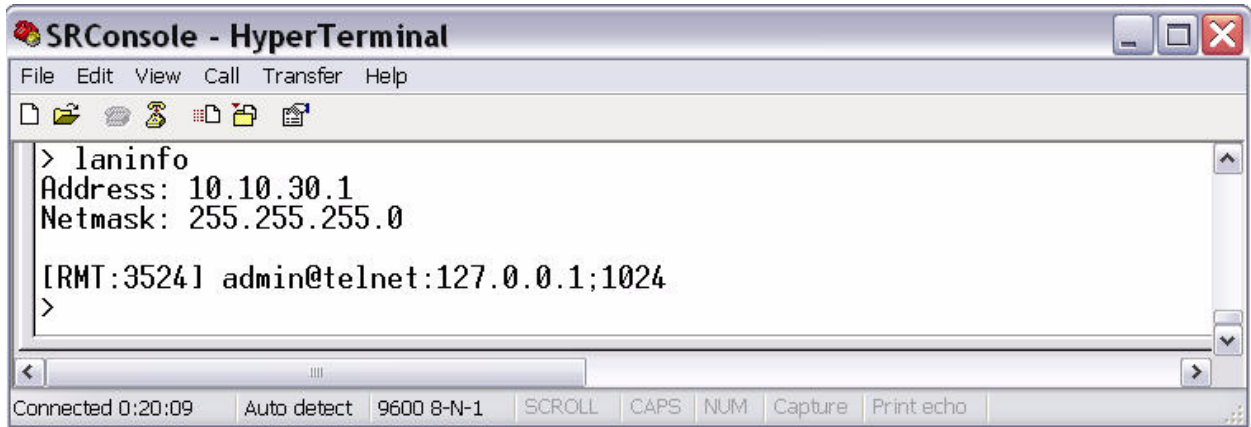
Use this information to configure your laptop (or PC) to be in the same subnet as the Satellite Router. In this example, the IP address is 10.10.30.1 and the subnet is 255.255.255.0.

3.4 Modifying Your Laptop's IP Address and Subnet Mask

To modify your laptop's IP address, you must bring up the Network Connections window to launch TCP properties.

1. From your computer's Control Panel, double-click Network Connections. This screen's appearance is different in Windows 2000 and Windows XP.

2. Launch the status dialog box for your Local Area Connection object by double-clicking on the icon.

The dialog box should look similar to the one displayed below.
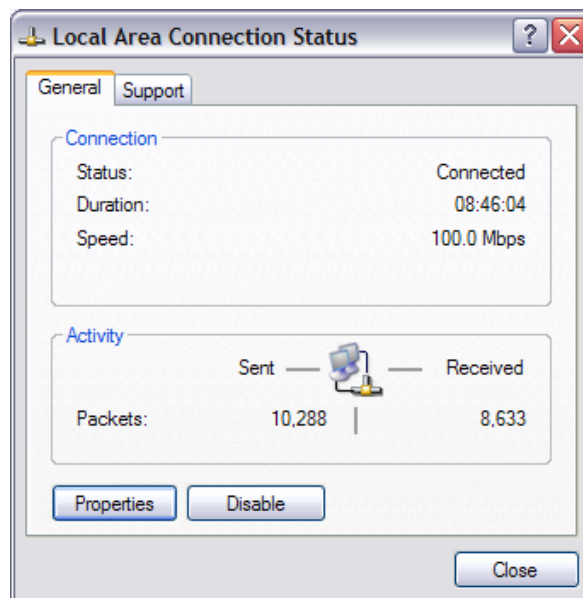
3.   Click the **Properties** button.

4.   In the **Local Area Connection Properties** dialog box, select **Internet Protocol** in the scroll-down box, and then click the **Properties** button.
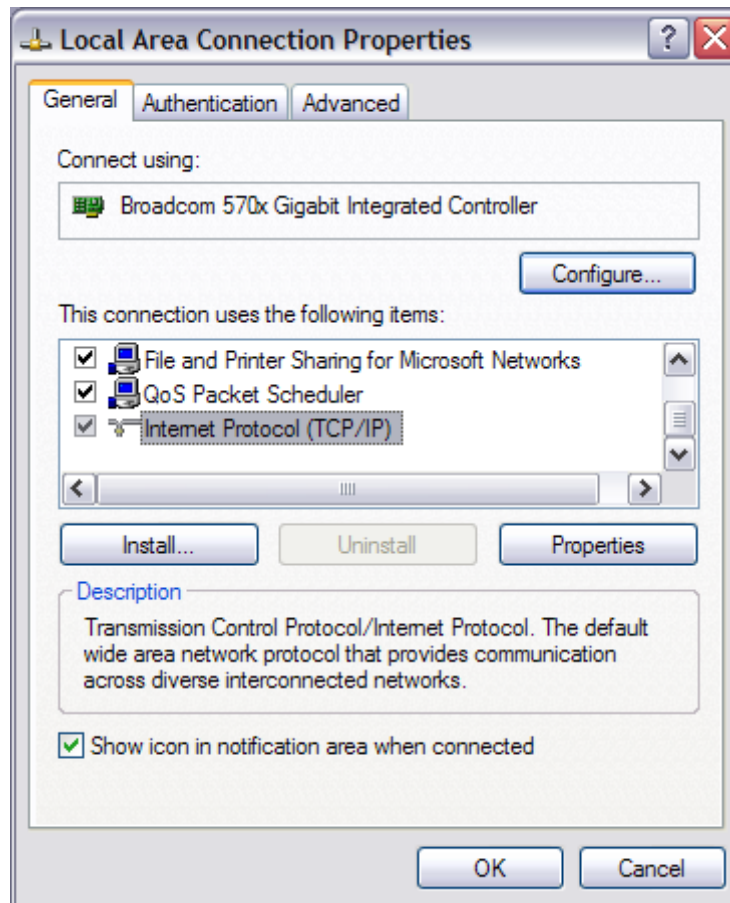
5. In the **Internet Protocol (TCP/IP) Properties** dialog box, select **Use the following IP address**, and then enter an IP address that is inside the range specified by the Satellite Router's IP address and subnet mask.

6. Enter the same subnet mask that you retrieved from the Satellite Router using the "**laninfo**" command. For the purposes of a local connection, you do not need to specify DNS server addresses.

7. Enter the Satellite Router's IP address as the Default Gateway address
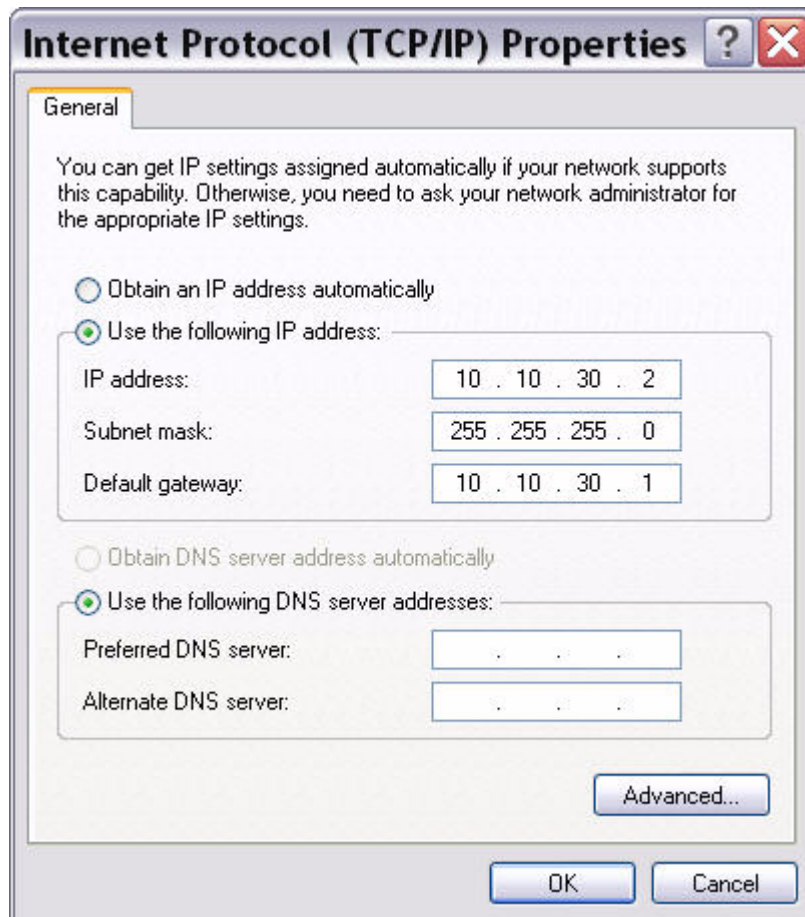
8. Click **OK** to save your changes.

You should now be able to connect to the Satellite Router using the iSite GUI.

4   Download the Application and Images Package to the Satellite Router

Follow the steps in this section to download the image package containing software and firmware for the current release from your laptop to the remote.

1.   Connect the LAN port of the laptop (or PC) to the LAN B port of the Satellite Router using a crossover LAN cable. (Newer laptops (or PCs) will adjust when you use a straight through cable, but older machines will not.)   ☐

2.   Launch iSite. iSite will automatically discover the Satellite Router.   ☐
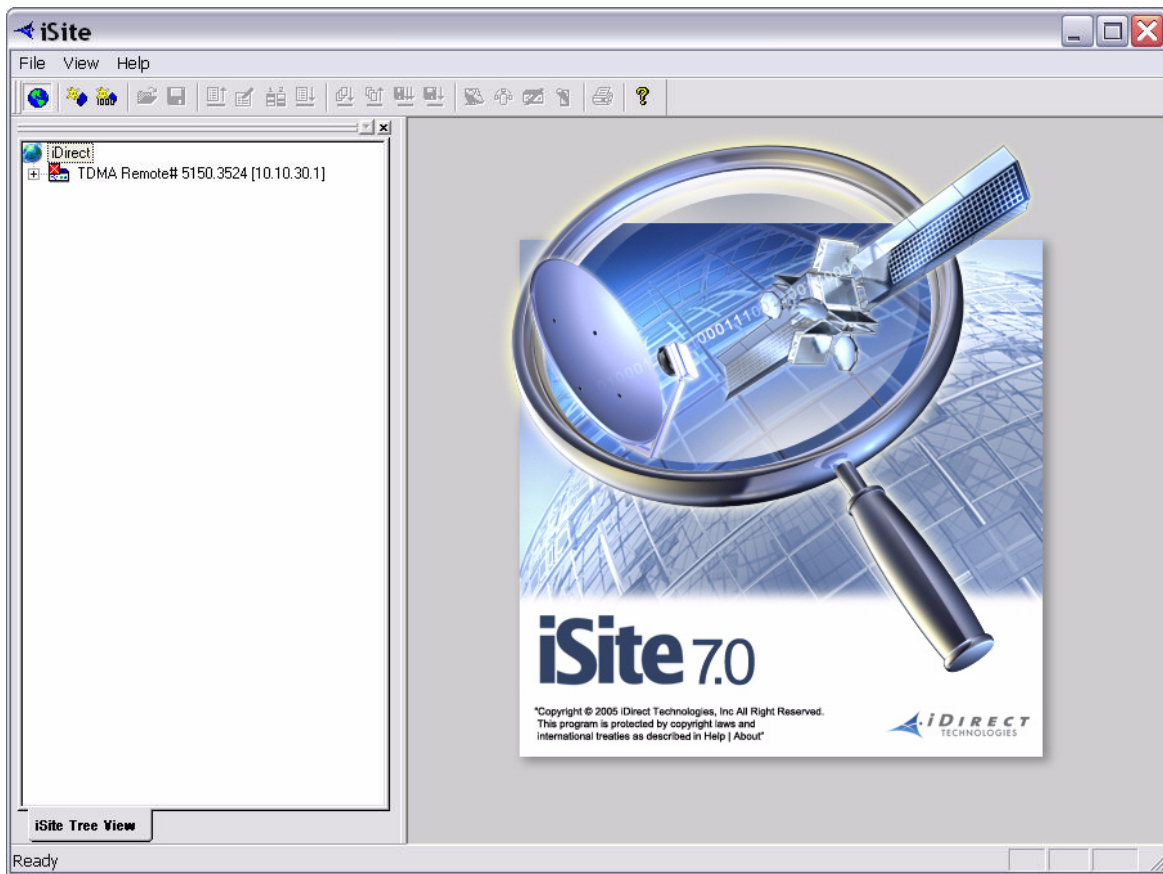
3.   Right-click the Satellite Router and select **Login**
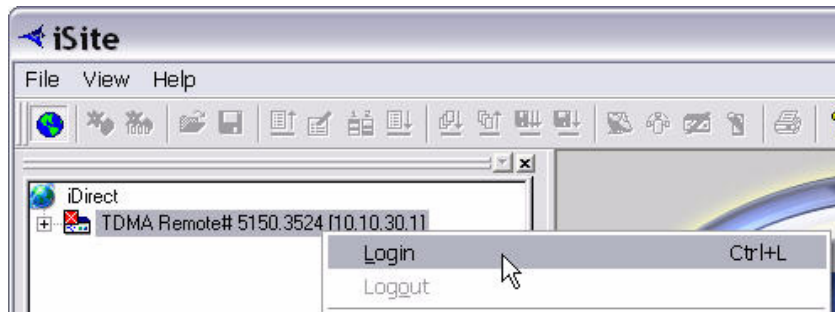
4.   Enter the default password "iDirect" and click **OK**.
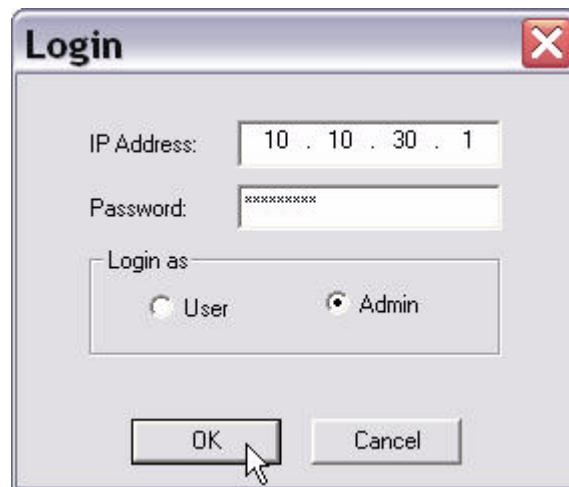
5. Select the remote, right-click and select **Download Package**

☐
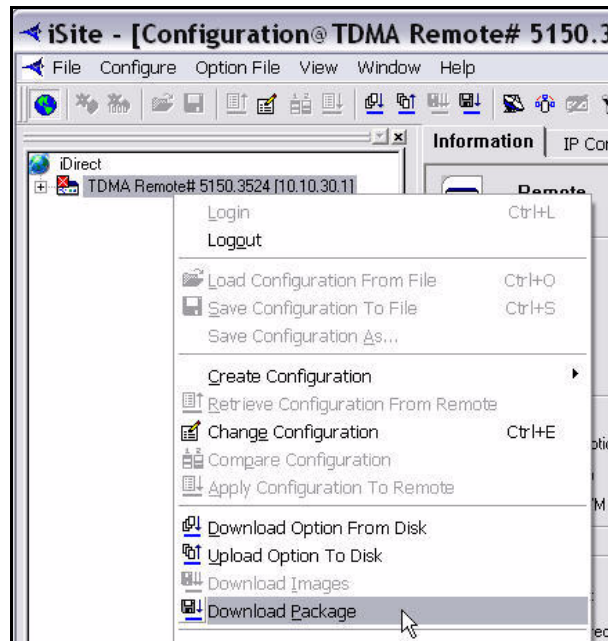
6. In the **Download Package** dialog box select the **Open** button**.**

☐

iDirect iNFINITI series Installation and Commissioning Guide, Release 7.0
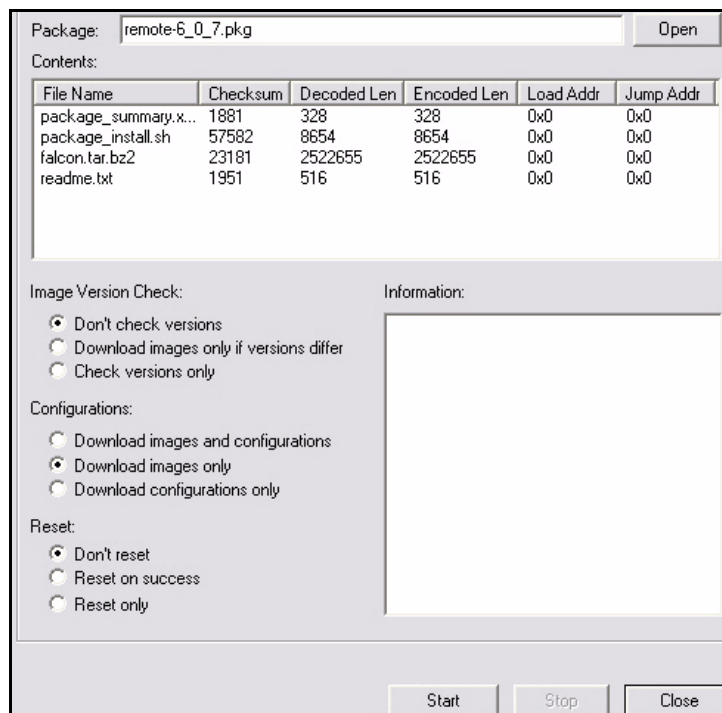
7. Locate and select the Remote_iNFINITI image package on your laptop. ☐

8. In the **Download Package** dialog, select: ☐

 - **Don't check versions**
 - **Download images only**
 - **Don't reset**
 -

9. Click Start ☐
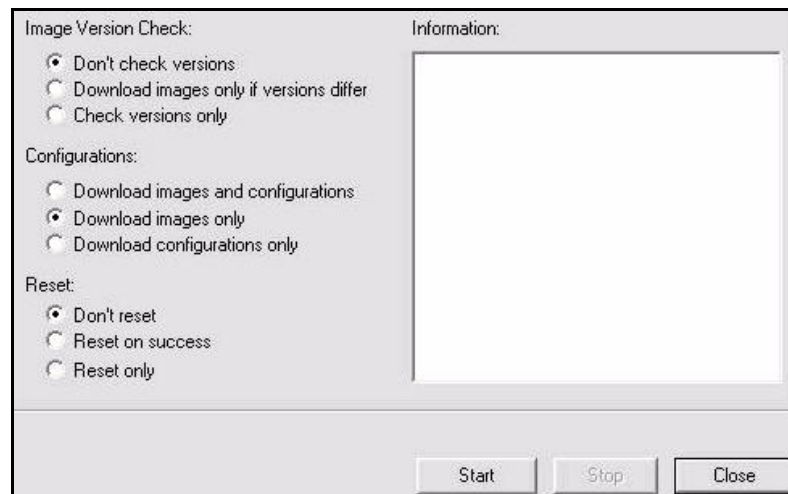
10. Wait while the download progresses. Observe the information in the **Information** section of the Download Package dialog until you see "Done".

☐

Information:

Start to download package ......
Package is sent 301441 bytes.
Package is downloaded successfully.
Please wait about one minute for remote to
flash images contained in package ......
...................Done.

You have successfully downloaded the package to your Satellite Router. Next, download the options file.

![iDirect Technologies logo]

5   Download the Options File to the Satellite Router

Follow the steps in this section to download the remote options file to the satellite router.

1.   In iSite, right-click on the remote and select **Download Option from Disk**.   ☐
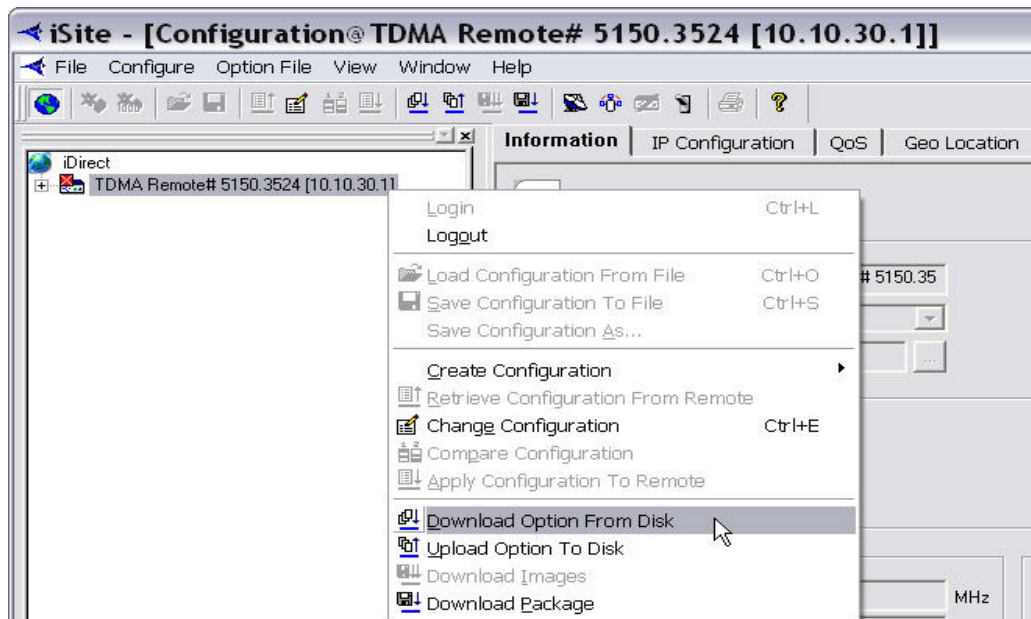
2.   Locate the Options file on your laptop (or PC), highlight it and click **Open**.   ☐

![iDirect Technologies logo]
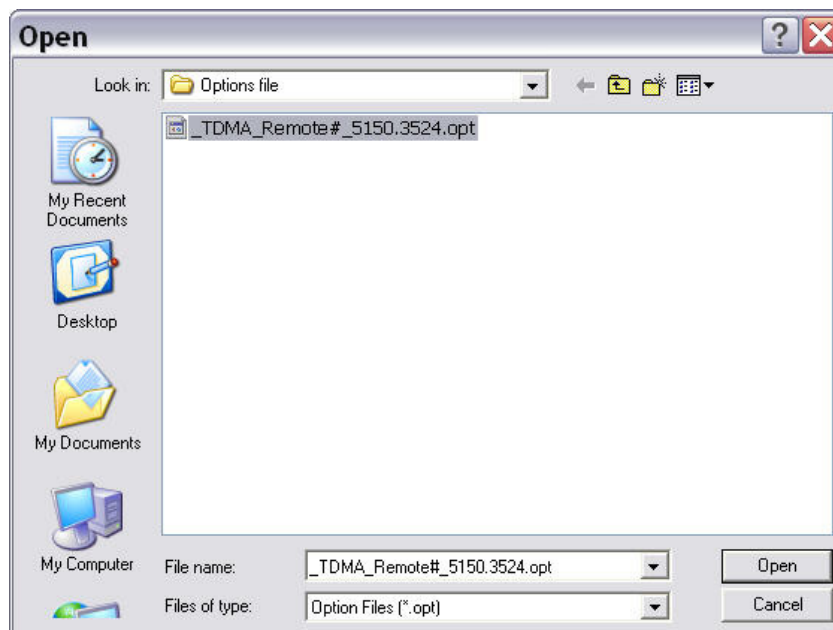
3. When iSite requests confirmation of the download request, click the **Yes** button. ☐

iSite

? Are you sure you want to download option file
   "_TDMA_Remote#_5150.3524.opt" to "TDMA Remote# 5150.3524"?

   [Yes]   [No]
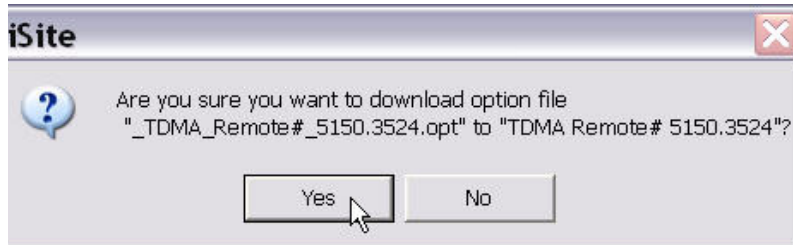
4. When iSite reports a successful download, click the **Reset Now** button to reset the ☐
    Satellite Router.

| NOTE | **It is OK to reset now because your Application and Images package and options file are from the same version of iDS software.** |

iSite

Download successful. Reset required.

   [Reset Now]   [Reset Later]
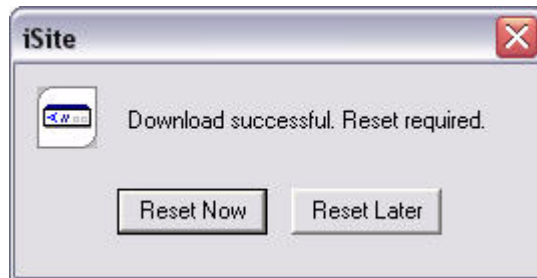
| NOTE | **Reset will log you out of the Satellite Router.** |

| NOTE | **Reset changes the IP address of the Satellite Router to the value provided by your Service Provider in the downloaded options file.** |

NOTE

Your Service Provider may change your Satellite Router password from the default iDirect password. Log in with the new password they provide you.

6 Set Up your Antenna

You must select an appropriate site for your antenna prior to assembling the antenna.

6.1 Select a Site for the Antenna

1. Select a level surface that is approximately 10 feet by 10 feet. ☐

2. Verify that nothing is blocking the line of site to the satellite in azimuth and elevation ☐

3. Verify the IFL cable can reach the Satellite Router from the antenna location (RG-6 IFL cable may be used up to a distance of 250 feet. If your run is longer, RG-11 must be used, up to a distance of 500 feet.) ☐

4. Verify that the IFL cable does not cross roads or heavy foot-traffic areas. ☐

6.2 Assemble the Antenna

Assemble the antenna using the supplied antenna assembly instructions. After installation, ensure that the following are true:

1. The antenna base is on a stable surface that will not shift during windstorms. ☐

2. Ballast is installed on the antenna base. ☐

3. The mast pipe is plumb. ☐

6.3 Align the Antenna toward the Spacecraft

You are now ready to perform the initial alignment of your antenna.

1. Set the antenna's polarization to the approximate value provided by iSite's Look Angle Calculator. ☐

2. Set elevation to the value provided by iSite's Look Angle Calculator. ☐

To take into consideration the magnetic angle of declination in your location and to ensure that the compass reading is correct, you must

1. Take a reading at the back of the antenna

2. So that you have something to point to, mark a reference point some distance ahead of the antenna.

Keep in mind that large metal objects can throw off compass readings.

The 1.8 meter antenna has 22.6° offset and a 1.2 meter antenna has 17° offset. For example, an elevation angle of 50° would be set as follows:

50° - 22.6° = 27.4°

The back plane is perpendicular to the line of sight of the antenna plus 22.6°.

If the back plane is at 90°, the antenna elevation angle is at 22.6°.

In the example above the antenna would be elevated from 90° to 117.4° or depending on the type of inclinometer being used a reading of 62.6° to reach an elevation angle to 50°.
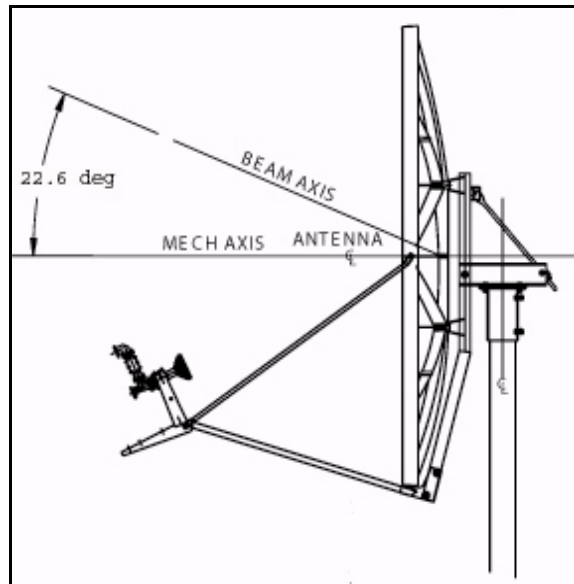
Figure 6-1: Antenna Elevation Offset

3. To prepare the antenna for pointing, move the antenna off the desired azimuth, by swinging the antenna 20° away in azimuth. This will enable you to get a clear sky reading and compare signal strengths during the antenna pointing procedure.

7 Point the Antenna Using a Voltmeter on the Transmit IFL Cable

This section describes pointing the antenna using Pulse Width Modulation and iSite. An alternative pointing method is described in the Appendix B of this document.

7.1 Prepare the IDU (Indoor Unit) and ODU (Outdoor Unit) for Pointing

1.   If your Satellite Router is powered on, power it off at this time.   ☐

2.   Ensure that the Receive IFL cable is connected from the LNB to the Satellite   ☐
        Router.

3.   Ensure that the Transmit IFL cable is connected to the Satellite Router.   ☐

4.   Disconnect the Transmit IFL cable from the BUC and connect it to the Digital   ☐
        Volt Meter

5.   Power on your Satellite Router.   ☐

7.2 Log in to Your Satellite Router

1.   After powering on your Satellite Router, you should still have IP connectivity.   ☐
        In iSite, select your remote in the iSite Tree View, right-click on it, and then
        select **Login**.
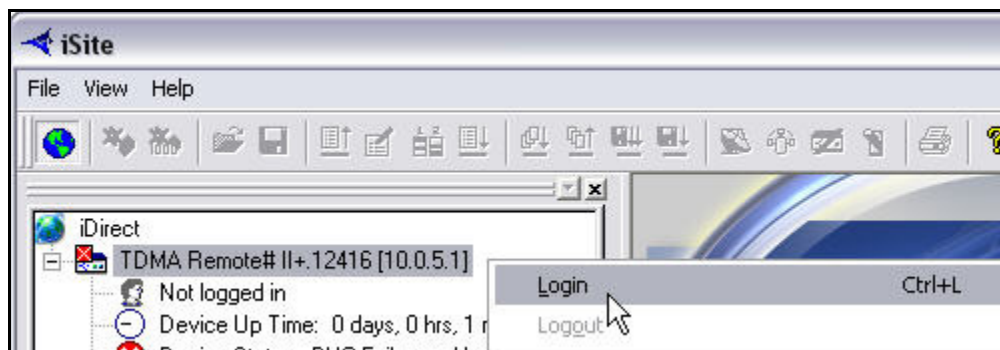
2.   In Login, enter the case-sensitive, default password, *iDirect* and the IP address ☐
      of the Satellite Router. In this example 10.0.5.1.

3.   Select Admin, and then click **OK**.   ☐

A new password may have been assigned at your Network Operator's Help Desk. If "iDirect" doesn't work, obtain the correct password by contacting the Network Help Desk.

 NOTE   If you do not have "Admin" privileges, log in as "User".
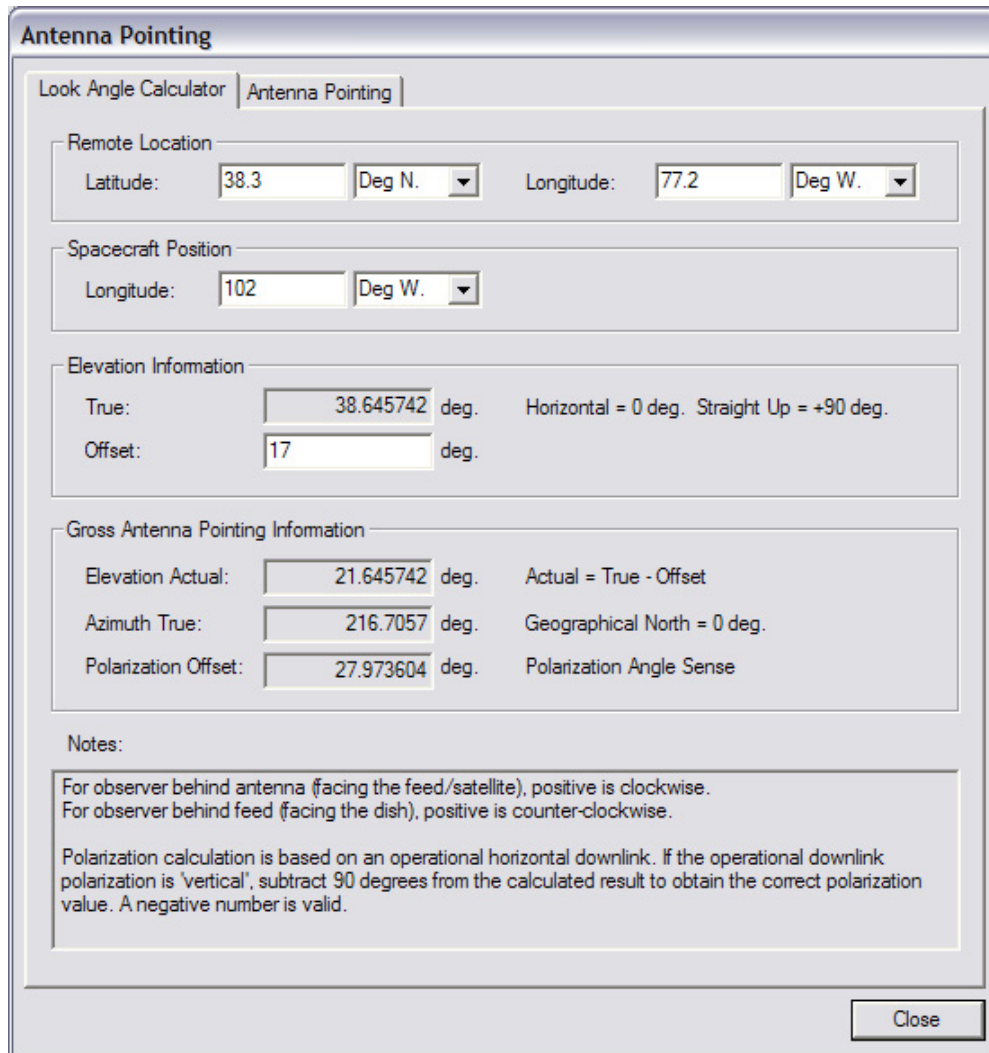
 NOTE   You can only change the password at the remote unit, if the original password is known.

7.3 Calculate Polarization, Azimuth, and Elevation

Using iSite, calculate the polarization, azimuth, and elevation appropriate for your current location.

1.   In the iSite Tree View, select the remote, right-click the remote, select **Align Antenna**, and then click **Antenna Pointing**.

2.   On the **Look Angle Calculator** tab, Longitude parameters should already be entered for you in **Spacecraft Position**. If they are not, enter the appropriate longitude values for the satellite that you are using.

If you are implementing a mobile remote, the white fields will all be blank. You must enter the following information.

1. In **Remote Location**, enter the appropriate latitude and longitude values for your current geographic location. In mobile remotes, this can be determined by your GPS unit.

2. In **Spacecraft Position**, enter the appropriate longitude values for the satellite that you are using

3. In **Elevation Information**, enter the appropriate Offset value for your antenna.

    The offset for a 1.8 meter antenna is 22.6°.

    The offset for a 1.2 meter antenna is 17°.

    When all of the information is entered, iSite automatically calculates your polarization offset, azimuth, and elevation values.

NOTE	Write these values down, or leave this screen open on your laptop. You will need these values later to perform the initial pointing of your antenna.

7.4 Perform Pulse Width Modulation (PWM) Antenna Pointing

Next, you must fine-tune the antenna pointing. You will attempt to lock onto the downstream carrier for your network, by sweeping the antenna in azimuth, looking for a value in the range of 12 to 24 volts DC. Readings in this range indicate that you have successfully locked into the correct satellite.

Table 7-1: Signal Strength Ranges (PWM)

Signal Strength Ranges	
volts DC	**Antenna Status**
0 – 2:	Not in pointing mode, hardware problem, or off satellite
2 – 10	Detecting RF energy, but not locked on the downstream carrier
12 – 24	Locked on the downstream carrier

NOTE	You can *only* get a reading of >= 12 volts when you are locked onto the correct spacecraft or network.

If you are not already connected to the Satellite Router, power it on, launch iSite, and connect to the Satellite Router following the instructions provided earlier in this manual.

1. In the iSite Tree View, right—click the remote, select **Align Antenna**, and then click **Antenna Pointing.** ☐

2. Slowly sweep the reflector in azimuth until a signal of the appropriate strength is found. ☐

The signal reading on the pointing graph will turn red, then yellow, and finally, completely green, as you sweep the reflector to lock onto the downstream carrier.
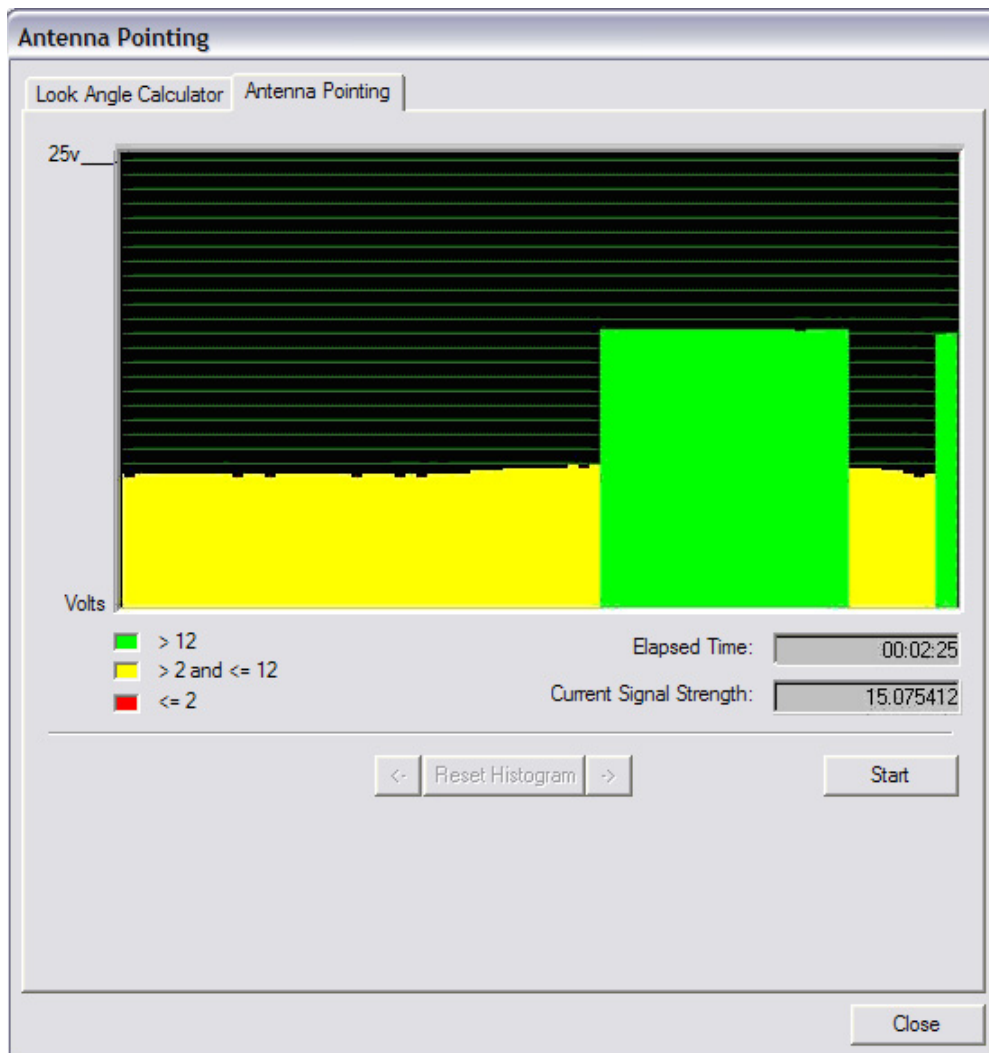
Figure 7-1: Comparing Signal Strength

3. When you have achieved strong signal strength on the correct satellite, you should see:

    - A green reading on the Antenna Pointing graph ☐

    - A reading within the desired range in the **Current Signal Strength** box ☐

    - A signal within the correct range on the digital voltmeter (DVM) => 12 volts ☐

NOTE You will not get a correct reading ((DVM) >= 12 volts) from the wrong spacecraft or network.

4. If the desired signal is not found, increase or decrease elevation setting by 2° increments and repeat the azimuth sweep, until the correct signal is found. ☐
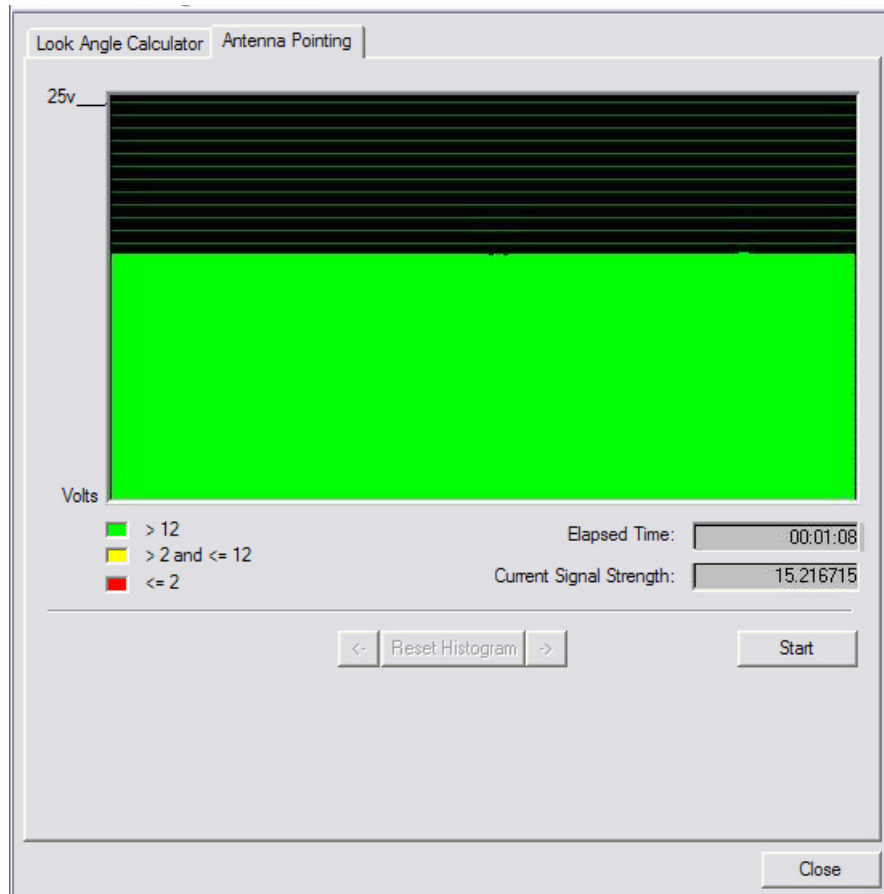
Figure 7-2: Locking into a Carrier Stream

5.   When you have found the desired signal: ☐

 • Tighten down the 4 bolts on the Yoke Cap that secure the Yoke Cap to ☐
    the Mast Pipe.

 • Ensure that the Top Plate locking bolts are snug to allow azimuth ☐
    movement.

 • Adjust the elevation until maximum dc voltage is obtained. ☐

The rest of the azimuth adjustments will be made with the azimuth adjustment screws.

6.   Fine tune azimuth until maximum dc voltage is obtained ☐

7.   Make sure azimuth and elevation are locked down ☐

8.   Adjust polarization until maximum dc voltage is obtained ☐

9.   Write down the final antenna pointing voltage reading and give the reading to the ☐
     operator at the Network Help Desk

10. In iSite, click **Stop** to exit the modem's antenna pointing mode ☐

11. Power down the Satellite Router. ☐

⚠ **!** **WARNING** You *must* power down the Satellite Router before continuing to
the next section, "Fine-tune the Antenna Pointing and Cross
Polarization" on page 35.

8 Fine-tune the Antenna Pointing and Cross Polarization

Complete fine-tuning the antenna pointing and cross polarization from within the iSite GUI.

8.1 Set up the Satellite Router for Cross Polarization

1. Disable the power to the Satellite Router to set it up for cross polarization. □

2. Disconnect the receive IFL cable from the Satellite Router. □

3. Disconnect the transmit IFL cable from the DVM and connect it to the BUC. □

8.2 Set up iSite for Cross Polarization

The remote portion of the cross polarization test is conducted from the iSite GUI.

1. Power on the Satellite Router and ensure that you have IP connectivity to it from your laptop. □

2. Launch iSite and connect to the Satellite Router using its IP address □

3. Log in as Admin with a valid password. □

4. In the iSite main menu, select **Configure**, select **Align Antenna**, and then click **Cross Polarization**. □
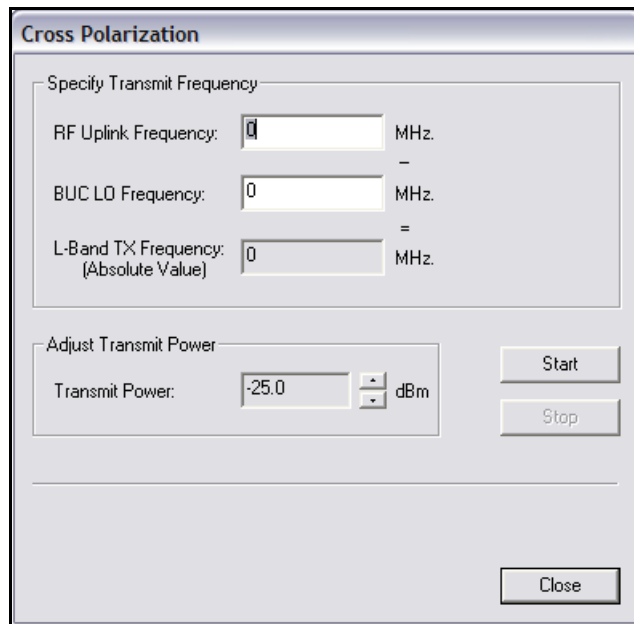
Figure 8-1: iSite Cross Polarization

8.3 Preparing for the Cross Polarization Test

1. While still in the iSite GUI, call the Network Help Desk. The Network Operator will establish a conference call between you, the Help Desk, and the satellite provider**.**

2. Provide the final antenna pointing voltage reading to the operator at the Network Help Desk; he will record the value for their records

3. Obtain the test frequency from the satellite provider and enter the test frequency into the **RF Uplink Frequency** box.

The BUC LO frequency is read from the options file on your satellite Router. Using these values, iSite automatically calculates the L-band TX frequency.

4. Verify the L-band TX frequency with the Network Help Desk operator**.**

The BUC LO frequency will typically show a value of 13050 MHz for Ku band and 4900 for C band. These values are read from the options file on your Satellite Router. Using the RF Uplink and BUC LO frequencies, iSite automatically generates an L-band frequency for the Satellite Router.

8.4 Running the Cross Polarization Test

1. When instructed by the satellite provider, click the **Start** button. This will program the Satellite Router with the calculated L-band frequency**.**

⚠️ **WARNING** Do not click the **Start** button until instructed to do so by the satellite provider. When you do click **Start**, your Satellite Router will start transmitting a Continuous Wave Carrier, or "CW."

⚠️ **WARNING** You may receive an error message after clicking the **Start** button. If this happens, click the **Stop** button and try again.

2. If the Satellite Provider asks you to adjust the Satellite Router's transmit power, select a power value in the **Transmit Power** box as appropriate**.**

The satellite provider will then ask to have the azimuth, polarization, and/or elevation adjusted. The polarization is usually adjusted first. If the correct isolation cannot be achieved, then the operator may ask to adjust the azimuth and/or elevation.

8.4.1 Adjusting Azimuth

1. Adjust the azimuth and the elevation, by making ¼ turns of the adjustment nut, and then waiting for the satellite provider to measure the cross polarization reading. The provider will then instruct you to continue adjusting in the same direction or to reverse the direction. ☐

2. Adjust the azimuth by loosening the four bolts on top of the canister as little and as evenly between the four as possible. ☐

⚠️ **WARNING** Loosening the four bolts too much, or adjusting some of them more than others, will throw the elevation off more than necessary.

3. After the azimuth has been peaked, make certain that the four bolts and the fine adjustment rod are completely tightened, so that the elevation is not affected later, after being peaked. ☐

8.4.2 Adjusting Elevation

The elevation adjustment is performed in the same manner as the azimuth adjustment.

1. Using the elevation rod/nut, adjust the elevation. ☐

2. Once the elevation is peaked, make certain that the elevation rod and nuts are completely tightened. ☐

8.4.3 Peaking the Polarization

The polarization of the feed will now be peaked.

1. Loosen the two screws at the feed. ☐

2. Loosen the hose clamp on the back end of the BUC just enough that entire assembly (feed, BUC, and LNB) will rotate freely. ☐

3. At the direction of the satellite provider, move the feed in one direction in approximately 1/2° increments, or as little as possible. ☐

4. Wait for the satellite provider to take a measurement. The satellite provider may tell you to continue moving the feed in the same direction, or to reverse the direction. Continue until the satellite provider tells you that the polarization is peaked. ☐

5.　　　Lock down the two screws and the hose clamp to secure the outdoor unit.

☐

At this point, the canister bolts on the pole should be completely tightened.

8.4.4　After the Cross Polarization Test

1.　　　Wait for the Satellite Provider to verify that the cross polarization is still good after everything is tightened.

☐

2.　　　Confirm that the Network Operator at the help desk has recorded the cross polarization results

☐

3.　　　Proceed to the 1 dB Compression Point test.

☐

9   Establish the 1 dB Compression Point

The 1 dB Compression Point test is performed with the same CW setup used during the previous cross polarization test. This test establishes the point at which the Satellite Router's transmit power saturates the BUC.

WARNING To avoid overdriving the satellite, do not conduct this test if the power of the BUC exceeds five watts.

1.   While still in iSite Cross Polarization dialog box and the Network Operator is watching the CW, increase the transmit power of the carrier in the Adjust Transmit Power drop-down box by 1 dBm increments   ☐

WARNING The operator should see the CW increase in power by approximately 1 dB. If the power does not increase, then the BUC may already be saturated. Although this scenario is unusual, it can occur.

2.   If power does not increase, decrease the power by 1 dBm until the operator sees the CW decrease by 1 dB.   ☐

NOTE The last point at which the CW changes by 1 dB is the 1 dB compression point.

3.   Record the TX power value. This will be used as the maximum power for this remote in the NMS.   ☐

4.   Click the **Stop** button to turn off the CW carrier and exit the iSite application.   ☐

The 1 dB compression point has now been established.

This completes the Satellite Provider's portion of the call. Disconnect the Satellite Provider from the call.

Do not power off the Satellite Router yet.

10 Record the Geo Location - Mobile Secure Remotes Only

NOTE This section describes a specific operational scenario for configuring remote Satellite Routers as both Mobile and Secure. If your remotes do not fall into this category, skip this section.

If for security reasons the Satellite Router's geographic location coordinates have not been recorded by the Network Help Desk, you must enter these coordinates into the Satellite Router manually, before the modem will acquire into the network.

WARNING It is critical that the geographic coordinates accurately reflect your current geographic location. If the values are incorrect, your Satellite Router will not be acquired into the network.

10.1 Set the Satellite Router's Geo Location

You will enter the latitude and longitude coordinates from the Satellite Router console via a special command.

1. Open a HyperTerminal session on the Satellite Router's console. Alternatively, you may telnet to the Satellite Router.

2. At the prompt, type the following command
   latlong <your lat> [N|S] <your long> [E|W]

Format of the latlong Command
The format of the latlong command is: `latlong <lat> [N/S] <long> [E/W]` When entering this command, replace the <lat> string with your current latitude in decimal notation, followed by N for north or S for south. Replace the `<long>` string with your current longitude in decimal notation, followed by E for east or W for west.

10.2 Verify the Satellite Router's Geo Location

You should verify that you have entered the correct geographic location coordinates.

1. Type `"extras show"` at the console prompt to display the current settings for latitude and longitude.

2. Reset the Satellite Router.

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11 Bring the Satellite Router into the Network

After you have entered the correct geographic coordinates for your current location and reset the Satellite Router, the Satellite Router should perform its power-up self-test and acquire into the network. Observe the LEDs on the front of the Satellite Router while the network powers on and goes through the acquisition process. You will see various combinations of front-panel lights indicating the current status of the Satellite Router.

The first time that the Satellite Router is acquired into the network, complete the post-acquisition activities described below. If your Satellite Router does not acquire into the network, contact the Network Help Desk for assistance.

11.1 Series 3000, 5000 and 7000 Front Panel LEDs

Various combinations of the LEDs on the front panel of the 3000/5000/7000 series remote will indicate the different states of your iDirect Satellite Router.

Figure 11-1: iDirect 3000 series Satellite Router Front Panel

Table 11-1: iDirect 3000/5000/70000 LED Status

LED Label	LED Color	Indicated Unit Status
PWR	OFF	The Satellite Router is powered Off or there is a power supply problem.
	GREEN	The Satellite Router is powered On.
NET	GREEN	Indicates that the Satellite Router has been acquired into the network.
	FLASHING GREEN	Indicates that the Satellite Router is attempting acquisition into the network.
	SOLID YELLOW	Indicates that the downstream SCPC is locked.
	FLASHING YELLOW	Indicates that the downstream SCPC is not locked.
STATUS	GREEN	IDU is functioning properly. The DRAM test is successful.
	FLASHING GREEN	Indicates that the unit is booting. The DRAM test is in progress.
	RED	Indicates a serious fault or failure in the software, hardware or configuration. May indicate that the DRAM test failed.

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Table 11-1: iDirect 3000/5000/70000 LED Status

TX	GREEN	Indicates that the IDU's transmitter is enabled.
	YELLOW	Indicates that the IDU's transmitter is disabled.
RX	GREEN	Indicates that the IDU transmitter is successfully locked to the downstream.
	YELLOW	Indicates that the IDU is not locked to the downstream carrier.

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12   Post Acquisition Activities

To guarantee trouble-free operation of your Satellite Router, certain activities should be completed after the Satellite Router comes into the network for the first time. Some activities will be performed at the Network Help Desk. Other activities will be performed by you.

12.1   Network Help Desk Duties

After commissioning the Satellite Router for the first time and after it has acquired into the network, the Network Help Desk will take control of the Satellite Router to perform the following tasks.

⚠ **WARNING** Do not power down the Satellite Router during this time.

1. The Network Help Desk will follow the procedure in "Adjusting Power Settings and Configuring UCP Parameters" on page 49 to set the initial transmit power, maximum transmit power, and UCP settings for the remote. For star remotes, initial transmit power is typically set to 2 to 3 dB above nominal transmit power in clear sky conditions. For mesh remotes, initial power is determined by UCP adjustments made by the hub. Maximum transmit power is set for the 1 dB compression point. ☐

⚠ **WARNING** Setting the initial power too high above the normal operating levels can cause problems with the remote acquiring into the network or cause problems on the network.

2. The Network Help Desk will download the updated configuration to the Satellite Router and issue a reset. ☐

3. The Network Help Desk will also record levels of the remote Satellite Router as a baseline for troubleshooting. ☐

4. The Network Help Desk will ensure that the software and firmware on the Satellite Router are at the correct revision level. If necessary they will upgrade the software on the Satellite Router and issue a reset. ☐

The Network Help Desk will let you know when they are finished.

12.2 Remote Duties

After the Network Help Desk has made any necessary adjustments to the Satellite Router's configuration, you should record some baseline readings for local reference, in case the antenna is moved, or some other service issue arises.

Use the following procedure to record the baseline readings.

1. Open a HyperTerminal session to the Satellite Router's console. Alternatively, you may telnet to it.

2. Record the:

   a. Receive SNR of the Satellite Router(> 10.0 dB Clear Sky Conditions).

   b. Transmit power of the Satellite Router.

   c. Receive composite power into the Satellite Router. (-60 to –5 dBm).

   d. Temperature reading in Celsius.

Example: Remote Status Message
RemoteStatus: t:000017435715 **SNR=15.60 RxPower=-33.79 dBmTxPower=-15.00** dBm DigitalRxPower=21.07 **Temp=49.1** TDM_Lost=0FllDac = 1812 LAN Port: 10 Mbps Half Duplex (AutoNegotiation: None)

These readings should be checked periodically to ensure that the service is not degrading. These readings will be monitored from the Network Help Desk. Heavy weather or sandstorms can cause

these levels to change. During heavy weather or sandstorms the levels should be monitored because it is important that they return to the original readings once the weather or sandstorm has cleared.

13 Adjusting Power Settings and Configuring UCP Parameters

Once you have completed the 1 dB compression test, the hub operator should set the following parameters for the remote in iBuilder:

- Maximum transmit power

- Initial transmit power

- Clear sky C/N for the SCPC downstream carrier. (Mesh remotes only.)

- Loopback Clear Sky C/N for the TDMA mesh carrier. (Mesh remotes only.)

- Clear Sky C/N for the mesh inroute group. (During commissioning of the *first* remote in a mesh inroute group.)

Contact the Network Help Desk and ask the hub operator to follow the instructions in this section to set these parameters. Provide the hub operator with the results of the 1 dB compression test. This value will be entered as the maximum transmit power for the remote.

13.1 Set the Maximum Tx Power for a Remote

Follow this procedure to set the maximum transmit power for the remote:

1. In iBuilder, right-click the remote in the network tree and select **Modify → Item** from the menu. ☐

2. Select the **Information** tab. ☐

3. In the **Transmit Properties** section of the dialog box, enter the 1 dB compression point as the value for **Max Power**. ☐

4. Right-click the remote in the network tree and apply the configuration. ☐

13.2 Set the Initial Tx Power for a Remote

📝	**NOTE**	You must determine the initial transmit power setting under clear sky conditions.

⚠️ (!)	**WARNING**	Following this procedure to determine the initial transmit power for a mesh remote while the remote is in a rain fade can result in a power setting that is too high. This can overdrive the power on the satellite.

Determine and set the initial transmit power as follows:

1. In iMonitor, right-click the remote in the network tree and select **Probe** from the menu.

2. In the **Remote Power** area of the screen, click the **Change** button.

```
Probe :: Overlay Network, 2045

┌─ Remote Power ───────────────────────┐   ┌─ Protocol Processor ─────────────────┐
│  [≡]  Transmit Power Value: Unknown   │   │  [🖥]  mvinjamuri                      │
│       Initial Power Value:    -25 dBm │   │                                      │
│                          [ Change ... ]│   │  Protocol Layer:  [Link Layer    ▼] │
│                                       │   │                                      │
├─ Telnet Remote ──────────────────────┤   │                                      │
│  The Telnet client will be launched  │   │                                      │
│  for establishing                    │   │                                      │
│  connection to the blade or the      │   │                                      │
│  remote modem.                       │   │                                      │
│   [ Blade ]            [ Remote ]    │   │                                      │
└──────────────────────────────────────┘   └──────────────────────────────────────┘
```
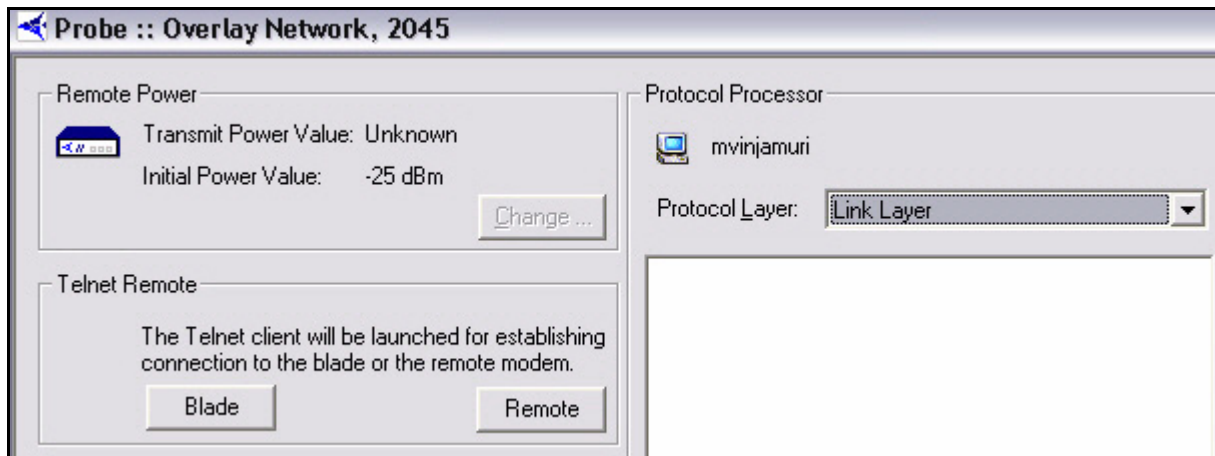
3. In the **Change Remote Tx Power** dialog box:

   a. Enter -25 in **New Tx Power** and click **Set**. (You can also base this initial setting on another remote in the network with similar antenna, BUC and geographic location.)

   b. Increase the transmit power by increments of 3 dB until the remote acquires into the network.

Change Remote Tx Power

Acceptable Tx Power values are between -35.00 and 0.00 dBm.

Current Tx Power: -9.5 dBm

New Tx Power: [0] dBm

[Set] [Cancel]
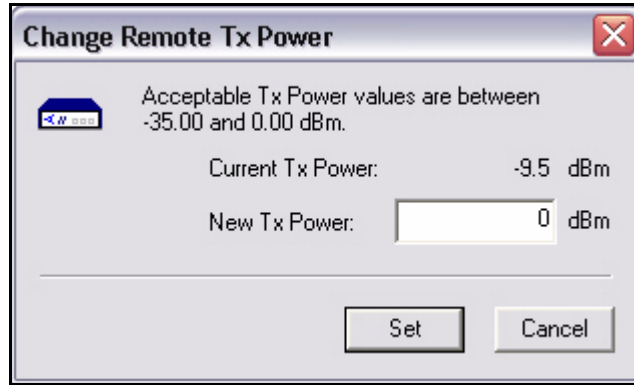
NOTE

If you are commissioning the *first* remote on a mesh inroute, you must determine and set **TDMA Clear Sky C/N** for the mesh inroute at this time. Do not continue with this procedure until you have set that parameter. For details, see Chapter 14, Commissioning a Line Card, Private Hub or Mini Hub in the *Network Management System iBuilder User Guide*.

4. In iMonitor, right-click the remote in the network tree and select **Remote Status/ UCP** from the menu. Then select the **Remote Status** tab.

5. Select the **Remote Status** tab and observe the column **Tx Pwr [dBm]**.

RemStats :: Overlay Network, 2045

Remote Status | UCP Info | Mesh UCP

☐ Historical Time Range... ⇥   Get past None (Real-time) ▼

T..	D..	I..	D..	M..	M..	M..	Tx Pwr [dBm]	R..	D..	F..	R..	T..
1...	0...	Y...	2...	1...	-1	-4	-9.50	-...	2...	1...	-...	4..
1...	0...	Y...	2...	1...	-1	5...	-9.50	-...	2...	1...	2...	4..
1...	0...	Y...	2...	1...	-2	2...	-9.50	-...	2...	1...	8...	4..
1...	0...	Y...	2...	1...	-2	1...	-9.50	-...	2...	1...	-...	4..
1...	0...	Y...	2...	1...	-1	-...	-9.50	-...	2...	1...	8...	4..
1...	0...	Y...	2...	1...	-1	-...	-9.50	-...	2...	1...	2...	4..
1...	0...	Y...	2...	1...	-2	-4	-9.50	-...	2...	1...	6...	4..
1...	0...	Y...	2...	1...	-2	-...	-9.50	-...	2...	1...	-...	4..
1...	0...	Y...	2...	1...	-1	4...	-9.50	-...	2...	1...	-...	4..
1...	0...	Y...	2...	1...	-2	3...	-9.50	-...	2...	1...	-...	4..
1...	0...	Y...	2...	1...	-2	2...	-9.50	-...	2...	1...	3	4..
1	0	Y	2	1	-2	-	-9.50	-	2	1	-	4

6. Wait for the Tx Power to settle on a constant value and note the value.   □

	NOTE	For a mesh remote, in clear sky conditions, if UCP adjusts the power up to the maximum power set in the 1dB compression test, and the signal strength is lower than the TDMA Clear Sky C/N, there may be link budget problem. If the antenna is properly pointed and undamaged, then a larger dish or higher power BUC must be installed.

7. In iBuilder, right-click the remote in the network tree and select **Modify → Item** from the menu.   □

8. Select the **Information** tab.   □

9. In the **Transmit Properties** section of the dialog box, enter the following value for **Initial Power**:   □

    • For star remotes, set **Initial Power** to 2 dB to 3 dB above the transmit power determined using iMonitor.

    • For mesh remotes, set **Initial Power** to the same setting as the transmit power determined using iMonitor.

Transmit Properties
Carrier Name: 1450 Upstream Carrier
L-Band Frequency: 1450.000 MHz
Initial Power: -14 dBm
Max Power: 0 dBm
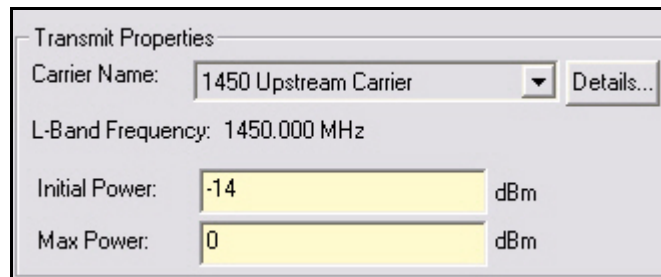
13.3 Set the Clear Sky C/N Parameters for a Mesh Remote

If you are commissioning a mesh remote, follow these steps to set the values for **SCPC Clear Sky C/N** and for **TDMA Loopback Clear Sky C/N**. These parameters will help to diagnose issues related to fade during network operation.

1. In iMonitor, right-click the remote in the network tree and select **Control Panel** from the menu. ☐

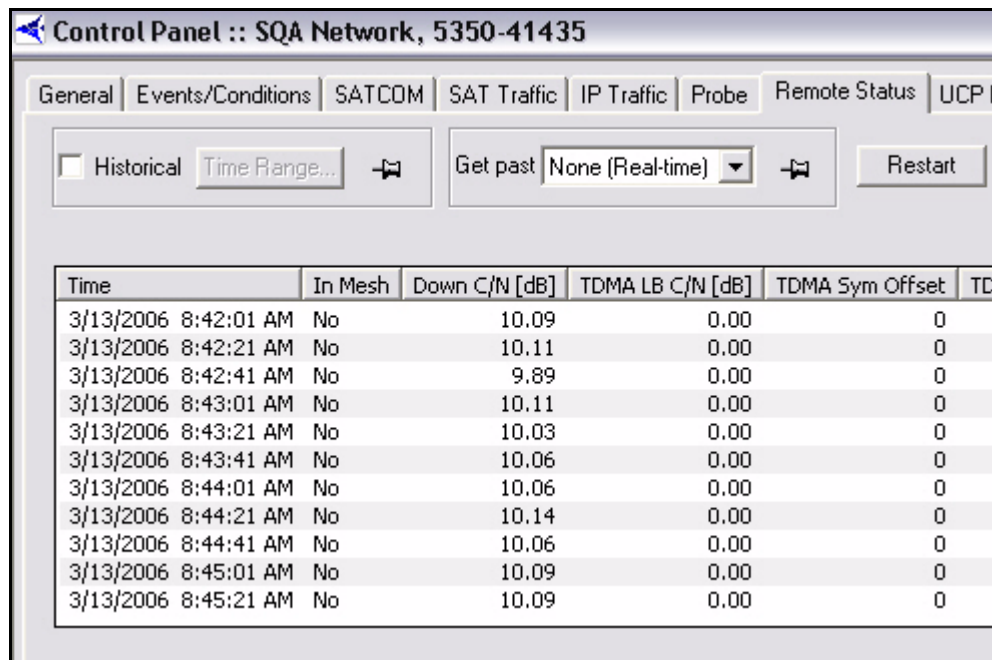2. Click the **Remote Status** tab and record the values for **Down C/N [dB]** and **TDMA LB C/N [D/B]**. ☐

3. In iBuilder, right-click the remote in the network tree and select **Modify → Item** from the menu. ☐

4. On the **Information** tab, ensure that **Mesh Enabled** is selected. ☐

5. In **SCPC Clear Sky C/N**, enter the value recorded for **Down C/N [dB]** from iMonitor. ☐

6. In **TDMA Loopback Clear Sky C/N**, enter the value recorded for **TDMA LB C/N [dB]** from iMonitor. ☐

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7. Right-click the remote in the network tree and apply the configuration. ☐

14 iDirect Technical Support and Sales Information

In accordance with your contract, contact your local service representative or reseller, if further information is needed beyond the coverage of this manual.

NOTE Do not attempt to repair or replace a malfunctioned or defective component or module. Doing so may void the warranty.

NOTE If any equipment is used in a manner not specified by the manufacturer, the protection provided in the equipment may be impaired.

Technical Assistance Center (TAC)

Technical support is available to customers with a current contract with iDirect. If you currently are a contracted iDirect customer, please check our customer-only, password-protected TAC web page at TAC.iDirect.net.

Customers will find useful information, such as the Technical Assistance Center's hours of operation, product documentation, release notes, procedures and a technical FAQ. Our web-based customer ticketing system for entering service issues and requesting RMAs is also located on our TAC web page.

If you are unable to find the answer to your question, iDirect Customer support is available by telephone, 703.648.8151, or you are welcome to enter a service issue through our web-based ticketing system.

If you are not a direct customer of iDirect, support can be provided at a billable rate using a major credit card for payment.

Sales

Please contact iDirect Corporate Sales by telephone or e-mail for more information.

Telephone: 703.648.8000

e-mail: SALES@iDirect.net

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Appendix A Loading Images using the TFTP Server

An alternate method of loading the images is to use the TFTP server that comes bundled with iSite.

1. Open iSite and from the File menu select TFTP. ☐

2. A pop up window will prompt you to the TFTP server local folder. Browse and select the folder in which the remote package resides. ☐

3. Open a console session to the iNFINITI unit and login to the Linux prompt as root. ☐

4. Type "service idirect_falcon stop". This will stop the application. ☐

5. Type "tftp_package.sh <IP address of TFTP server> <package name>". ☐

    For example, if your laptop's IP address is 10.10.1.2 and you are loading 6.0.3 remote package the command will be "tftp_package.sh 10.10.1.2 remote 6_0_3.pkg".

6. Once the transfer is complete, reset the unit using the "reboot" command. ☐

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Appendix B   Pointing the Antenna through the Console Port

This section describes the procedure for pointing the antenna using console commands and a digital voltmeter (DVM).

B.1   Performing Console Antenna Pointing

When using console pointing, the Rx and Tx cables from the Satellite Router can remain connected to the LNB and BUC, respectively.

Pin 8 on the RJ-45 connector MUST be pinned to pin 8 on the DB-9 connector to read DVM voltages from the serial port.

!   **WARNING**   The following section MUST be completed to ensure that damage is not done to the BUC and that console pointing mode works correctly.

B.2   Modifying the Options File to Disable the Transmit PWM Voltage

The options file *must* contain the line "`options set ODU odu_disable_tx_pwm 1`" with the value set to "1". Setting the value to "1" disables the transmit PWM voltage normally present on the transmit IFL cable.

The options file must be modified through the console port.

NOTE   When the value is set to zero, DC voltage will be felt on the transmit IFL cable at the BUC (Block Up-Converter) during the pointing process which could cause damage to the BUC and potentially generate an unwanted carrier.

To modify the options file through the console port complete the following procedure.

1.   Power up the Satellite Router and let it boot up completely.   ☐

2.   From console or telnet session enter the command   ☐
      "`options set ODU odu_disable_tx_pwm 1`"

3.   Press **Enter.**   ☐

4.   Type **"`options flash`"**   ☐

5.   Press **Enter.**   ☐

6.   Reset the Satellite Router.   ☐

After the modem reboots, you must verify that the correct entry is in the options file.

1. Type **"options show odu"** ☐

2. Press **Enter.** ☐

3. In the ODU group, check to see that the line **odu_disable_tx_pwm = 1** is present. If this line is not present in the Options file, you must not start console pointing until it is present, or you will damage your hardware. ☐

B.3 Starting the Console Pointing

To start the console pointing, enter the following commands.

1. Type **"rx pointing enable"** ☐

2. Type **"rx pointing on"** ☐

At this point, the Satellite Router is in console pointing mode.

B.4 Using the DVM for Console Pointing

To use the digital voltmeter for console pointing, complete the following.

1. Disconnect the console port from the laptop (or PC) leaving the RJ-45 connector in the Satellite Router. ☐

2. From the DB-9 connector, connect pin 4 or 5 (GND) to the negative probe on the DVM. ☐

3. Connect pin 8 (+) to the positive probe on the DVM. ☐

4. Point the antenna using the normal procedure, until the signal falls into the desired range. ☐

Table B-1: Signal Strength Ranges (DVM)

Signal Strength Ranges	
Volts DC	Antenna Status
0-2.5 VDC	RF energy is detected, but from the wrong satellite
2.6 – 5.0 VDC	Carrier lock, correct satellite

	NOTE	The LEDs the front panel of the Satellite Router will verify Carrier Lock. If the "Net" LED is solid yellow it indicates that the downstream SCPC is locked. If the "RX" LED is solid green, it indicates Carrier Lock.

B.5 Pointing

1. Slowly sweep the reflector in azimuth until a signal of the appropriate strength is found. ☐

2. If the desired signal is not found, increase or decrease elevation setting by 2° and repeat the azimuth sweep. ☐

3. When you have found the desired signal, tighten down the 4 bolts on the Yoke Cap that secure the Yoke Cap to the Mast Pipe. ☐

B.6 Final Adjustments

The remaining azimuth adjustments are made with the azimuth adjustment screws.

1. Ensure Top Plate locking bolts are snug to allow azimuth movement. ☐

2. Adjust the elevation until maximum DC voltage is obtained. ☐

3. Fine tune azimuth until maximum DC voltage is obtained. ☐

4. Make sure azimuth and elevation are locked down. ☐

5. Adjust polarization until maximum DC voltage is obtained. ☐

6. Write down the final antenna pointing voltage reading and give the reading to the operator at the Network Help Desk. ☐

7. When finished pointing, disconnect power from the Satellite Router to stop the pointing process. ☐

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# Appendix C   Disabling the PWM Voltage through iBuilder

In release 6.0 or above, if you have access to iBuilder, you can verify that the transmit PWM voltage normally present on the transmit IFL cable is disabled.

To verify the transmit PWM voltage normally present on the transmit IFL cable is disabled through iBuilder complete the following procedure.

1.   Power up the Satellite Router and let it boot up completely.   ☐

2.   In iBuilder, right-click on the remote and select modify.   ☐
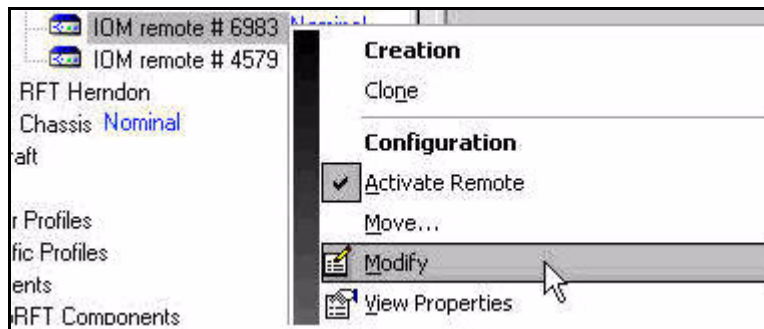
3.   In the **Modify Configuration** dialog box, make sure that the Disable Tx PWM   ☐
        check box is selected.

4.   Reset the Satellite Router.   ☐

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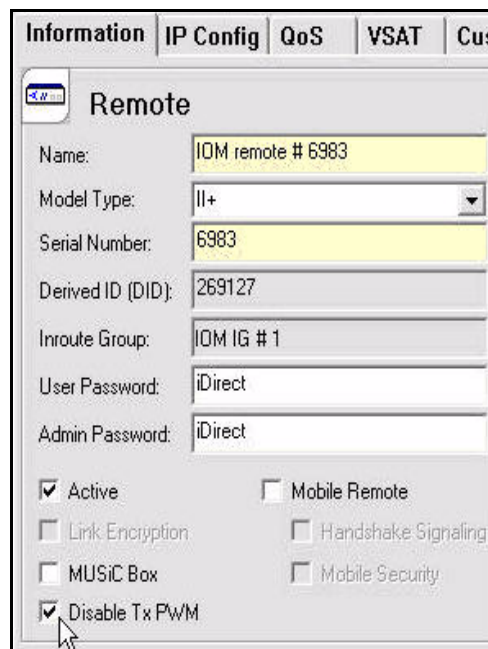
Appendix D   Pinout for RJ-45 to DB-9 Adapter

In addition to the Satellite Router console cable, you will need an RJ-45 to DB-9 adapter. The pinouts are as follows:

Table D-1: DB-9 to RJ-45 Adapter Pinout

DB-9 to RJ-45 Adapter Pin-Out		
RJ-45	Color Code	DB-9
1	Blue	8
2	Orange	6
3	Black	2
4	Red	5
5	Green	N.C.
6	Yellow	3
7	Brown	4
8	White/Gray	7

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