



iDirect Technologies

NetModem Installation Quick Reference Guide

iDS Version 5.0.0 and above

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Contents

1	GETTING STARTED	1
1.1	REQUIRED EQUIPMENT	1
1.2	ASSUMPTIONS.....	1
1.3	WHEN TO USE THIS GUIDE	1
1.4	RELATED DOCUMENTATION	1
2	POINTING THE ANTENNA USING PULSE WIDTH MODULATION.....	2
2.1	PREPARING IDU (INDOOR UNIT) AND ODU (OUTDOOR UNIT) FOR POINTING	2
2.2	LOGGING IN TO YOUR NETMODEM	2
2.3	CALCULATE POLARIZATION, AZIMUTH, AND ELEVATION.....	4
2.4	SELECT A SITE FOR THE ANTENNA	5
2.5	ASSEMBLE THE ANTENNA	5
2.6	ALIGN THE ANTENNA TOWARD THE SPACECRAFT.....	6
2.7	PERFORM PULSE WIDTH MODULATION (PWM) ANTENNA POINTING.....	7
3	POINTING THE ANTENNA USING THE CONSOLE PORT	11
3.1	SELECT A SITE FOR THE ANTENNA	11
3.2	ASSEMBLE THE ANTENNA	11
3.3	ALIGN THE ANTENNA TOWARD THE SPACECRAFT.....	11
3.4	PERFORM CONSOLE ANTENNA POINTING	13
3.4.1	<i>Modifying the Options File</i>	<i>13</i>
3.4.2	<i>Starting the Console Pointing</i>	<i>13</i>
3.4.3	<i>Using the DVM for Console Pointing</i>	<i>14</i>
3.4.4	<i>Console Pointing.....</i>	<i>14</i>
4	FINE-TUNING ANTENNA POINTING AND CROSS-POLARIZATION	15
4.1	SET UP THE NETMODEM FOR CROSS POLARIZATION	15
4.2	SET UP ISITE FOR CROSS POLARIZATION	15
4.3	PREPARING TO RUN THE CROSS-POLARIZATION TEST.....	16
4.4	RUNNING THE CROSS-POLARIZATION TEST	16
4.4.1	<i>Peaking the Polarization</i>	<i>16</i>
4.4.2	<i>Adjusting Azimuth</i>	<i>17</i>
4.4.3	<i>Adjusting Elevation</i>	<i>17</i>
4.4.4	<i>After the Cross Polarization Test.....</i>	<i>17</i>
5	ESTABLISHING THE 1 DB COMPRESSION POINT	18
6	RECORDING THE NETMODEM'S GEO LOCATION.....	19
6.1	SETTING THE NETMODEM'S GEO LOCATION.....	19
6.2	VERIFYING THE NETMODEM'S GEO LOCATION.....	19
7	BRINGING THE NETMODEM INTO THE NETWORK.....	20
7.1	NETMODEM FRONT PANEL LIGHTS	20
7.2	POST ACQUISITION ACTIVITIES	21
7.2.1	<i>Network Help Desk Duties.....</i>	<i>21</i>
7.2.2	<i>Remote Duties</i>	<i>21</i>

APPENDIX A – INSTALLING REMOTE SOFTWARE ON YOUR LAPTOP	23
COMPONENTS OF THE REMOTE-MODEM IMAGES SOFTWARE	23
INSTALLING THE REMOTE-MODEM IMAGES AND SOFTWARE	23
APPENDIX B – ESTABLISHING A NETMODEM CONSOLE CONNECTION	25
CONSOLE CABLE DETAILS	25
HYPERTERMINAL SETTINGS	25
APPENDIX C – GAINING IP CONNECTIVITY TO THE NETMODEM	28
DETERMINING THE NETMODEM’S IP ADDRESS AND SUBNET MASK	28
MODIFYING YOUR LAPTOP’S IP ADDRESS AND SUBNET MASK	29
APPENDIX D - TERMINATION OF COAXIAL CABLE	32
RECOMMENDED TOOLS	32
INSTRUCTIONS	32

Figures

<i>Figure 1 Creating a new remote</i>	<i>2</i>
<i>Figure 2 Logging in to the Remote</i>	<i>3</i>
<i>Figure 3 iSite Login</i>	<i>3</i>
<i>Figure 4 Antenna Pointing - Look Angle Calculator</i>	<i>4</i>
<i>Figure 5 Antenna Elevation Offset</i>	<i>6</i>
<i>Figure 6 Comparing Signal Strengths</i>	<i>8</i>
<i>Figure 7 Antenna Elevation Offset</i>	<i>12</i>
<i>Figure 8 iSite Cross Polarization</i>	<i>15</i>
<i>Figure 9 NetModem Front Panel</i>	<i>20</i>
<i>Figure 10 Hyper Terminal Connection Description</i>	<i>26</i>
<i>Figure 11 HyperTerminal Connection Details</i>	<i>26</i>
<i>Figure 12 Hyper Terminal COM 1 Properties</i>	<i>27</i>
<i>Figure 13 Local Area Connection Status</i>	<i>29</i>

1 Getting Started

1.1 Required Equipment

You will need the following equipment to successfully commission your iDirect NetModem in the field:

- ☐ Console cable with DB9 adapter;
- ☐ Cross-over LAN cable;
- ☐ Laptop with Windows 2000 or XP;
- ☐ iDirect iSite software and remote application and images installed on laptop;
- ☐ Digital Voltmeter;
- ☐ A hand-held GPS unit or a map that shows your current geographic location coordinates.

1.2 Assumptions

The procedures in this document assume the following conditions already exist, or can be made to exist, prior to beginning the commissioning procedure:

- ☐ An appropriate antenna location has been selected;
- ☐ The iDirect NetModem is configured with the correct application and firmware images;
- ☐ IP connectivity is established between the NetModem and the laptop running iSite.

1.3 When to Use this Guide

Once the NetModem has been successfully commissioned at a specific location, you can reset the NetModem at any time without repeating the procedures in this manual again. The NetModem will perform its self-test startup sequence and acquire into the network. However, these procedures must be repeated every time you move the NetModem from one established location to another.

1.4 Related Documentation

For further information regarding the iSite GUI, establishing IP connectivity from iSite to the NetModem, and downloading software and firmware images, please refer to the technical note, *Introducing iSite*, available on the iDirect TAC Support website.

2 Pointing the Antenna using Pulse Width Modulation

2.1 Preparing IDU (Indoor Unit) and ODU (Outdoor Unit) for Pointing

- ☐ If your NetModem is powered on, power it off at this time.
- ☐ Ensure that the Receive IFL cable is connected from the LNB to the NetModem.
- ☐ Ensure that the Transmit IFL cable is connected to the NetModem.
- ☐ Disconnect the Transmit IFL cable from the BUC and connect it to the Digital Volt Meter.

2.2 Logging in to Your NetModem

- ☐ Power on your NetModem and make sure that you have IP connectivity to it from your laptop computer.
- ☐ Launch the iSite application on your laptop.

If the remote is on the same LAN, it will be auto-detected.

If it is on a different LAN, you must right-click on the globe in the iSite Tree View, and then select **New** to create a new remote.

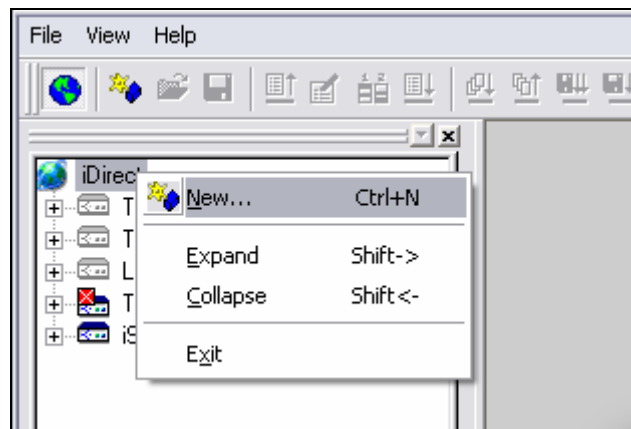


Figure 1 Creating a new remote

- Select your remote, right-click on the remote, and then click **Login**.

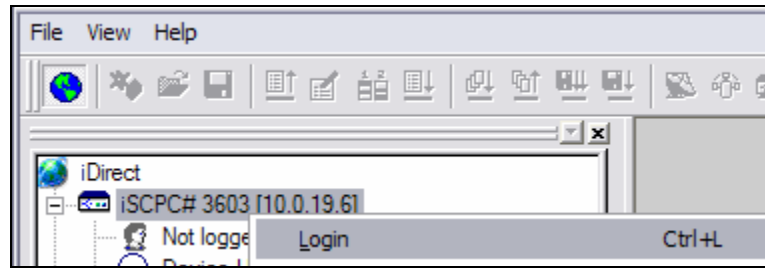


Figure 2 Logging in to the Remote

- In Login, enter the default password, *iDirect*.



Figure 3 iSite Login

- Click Admin, and then click **OK**.

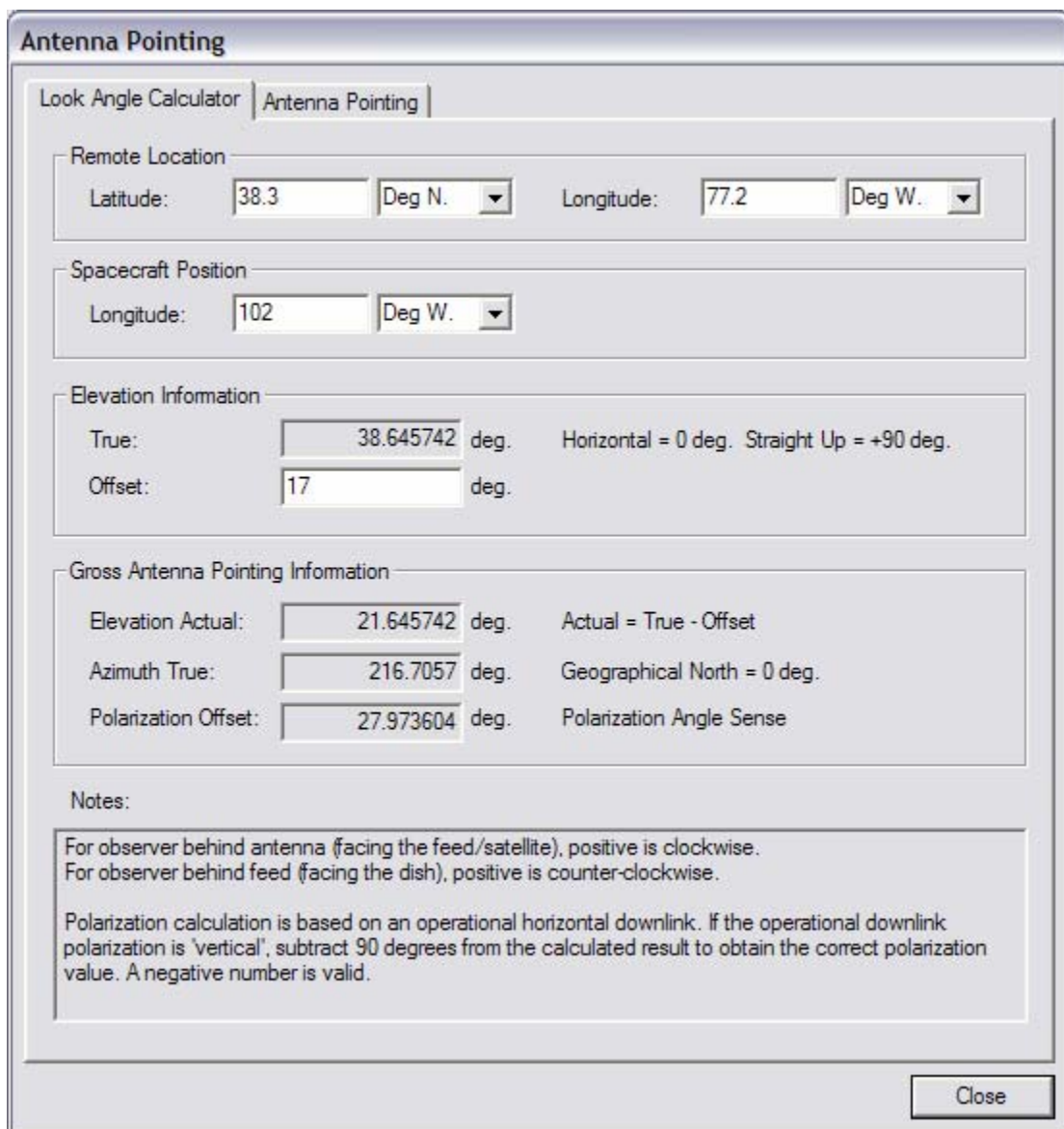
Note: iDirect is case sensitive.

2.3 Calculate Polarization, Azimuth, and Elevation

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

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

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.



The **Antenna Pointing** dialog box is shown with the **Look Angle Calculator** tab selected. It contains the following sections:

- Remote Location:** Latitude: 38.3 Deg N., Longitude: 77.2 Deg W.
- Spacecraft Position:** Longitude: 102 Deg W.
- Elevation Information:**
 - True: 38.645742 deg. Horizontal = 0 deg. Straight Up = +90 deg.
 - Offset: 17 deg.
- Gross Antenna Pointing Information:**
 - Elevation Actual: 21.645742 deg. Actual = True - Offset
 - Azimuth True: 216.7057 deg. Geographical North = 0 deg.
 - Polarization Offset: 27.973604 deg. Polarization Angle Sense
- Notes:**

For observer behind antenna (facing the feed/satellite), positive is clockwise.
 For observer behind feed (facing the dish), positive is counter-clockwise.

Polarization calculation is based on an operational horizontal downlink. If the operational downlink polarization is 'vertical', subtract 90 degrees from the calculated result to obtain the correct polarization value. A negative number is valid.

A **Close** button is located at the bottom right.

Figure 4 Antenna Pointing - Look Angle Calculator



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

- ☐ 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.
- ☐ In **Spacecraft Position**, enter the appropriate longitude values for the satellite that you are using.
- ☐ 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 fields are filled in, iSite automatically calculates your polarization offset, azimuth, and elevation values.

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

2.4 Select a Site for the Antenna

It is important to select an appropriate site for your antenna, prior to assembling the antenna.

- ☐ Select a level surface that is approximately 10 feet by 10 feet;
- ☐ Verify that nothing is blocking the line of site to the satellite in azimuth and elevation;
- ☐ Verify the IFL cable can reach the NetModem 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.);
- ☐ Verify that the IFL cable does not cross roads or heavy foot-traffic areas.

2.5 Assemble the Antenna

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

- ☐ The antenna base is on a stable surface that will not shift during windstorms.
- ☐ Ballast is installed on the antenna base.
- ☐ The mast pipe is plumb.

2.6 Align the Antenna toward the Spacecraft

You are now ready to perform the initial alignment of your antenna. Consult the details sections where appropriate for additional information.

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

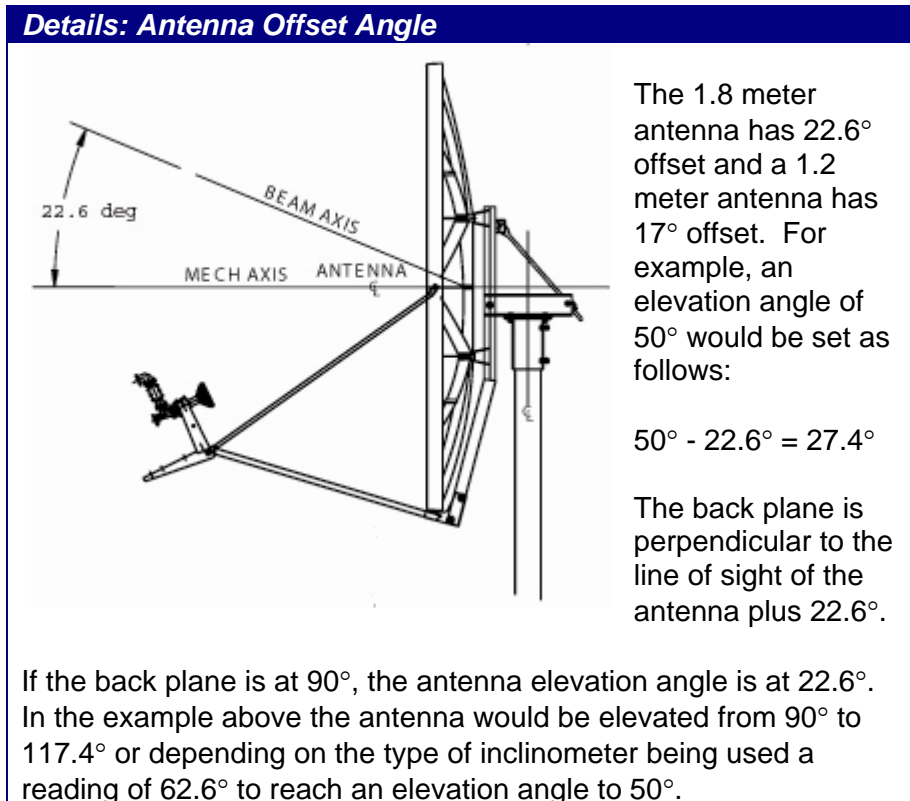


Figure 5 Antenna Elevation Offset

To prepare the antenna for pointing, move the antenna off the desired azimuth, so that the antenna pointing procedure can get a clear sky reading to compare signal strengths.

- ☐ Before starting the pointing procedure, swing the antenna 20° away in azimuth.

Details: Magnetic Angle of Declination

To take into consideration the magnetic angle of declination in your location and to ensure that the compass reading is correct, you must take a reading at the back of the antenna, and then mark a reference point some distance ahead on the antenna to point to. Keep in mind that large metal objects can throw off compass readings.

2.7 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.

<i>Signal Strength Ranges</i>	
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 cannot get a reading of \Rightarrow 12 volts from the wrong spacecraft or network.

- ☐ If you are not already connected to the NetModem, power on the NetModem, launch the iSite application, and connect to the NetModem following the instructions in section 2.2.
- ☐ In the iSite Tree View, right-click the remote, select **Align Antenna**, and then click **Antenna Pointing**.

- ☐ On the **Antenna Pointing** tab, click the **Start** button to start the pointing procedure and follow instructions.
- ☐ Slowly sweep the reflector in azimuth until a signal of the appropriate strength is found.

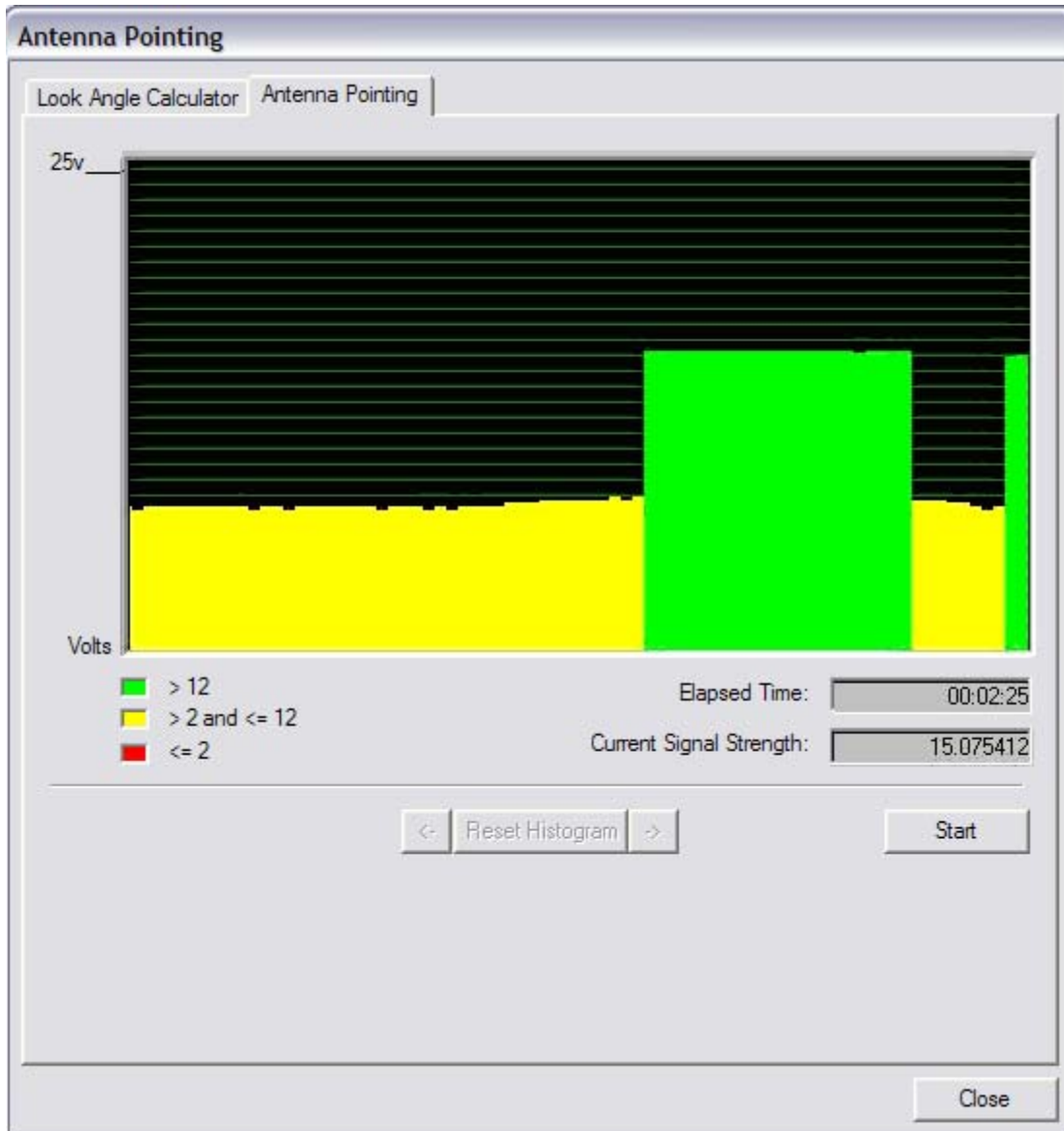





Figure 6 Comparing Signal Strengths

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. When you have achieved strong signal strength on the correct satellite, you will 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 cannot get a correct reading from the wrong spacecraft or network.

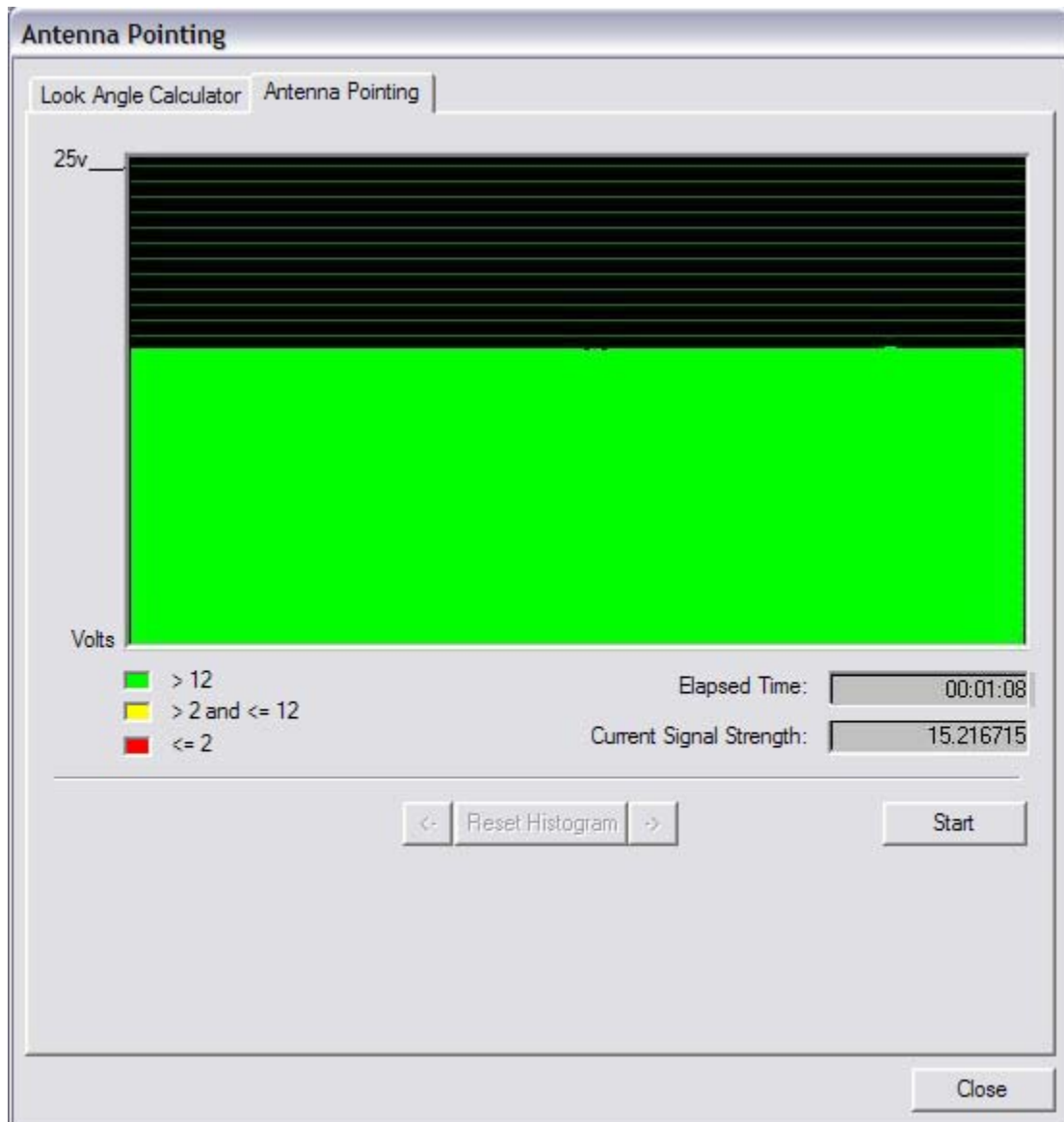


Figure 7 Locking into a Carrier Stream

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

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.

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

- ☐ Ensure that the Top Plate locking bolts are snug to allow azimuth movement.
- ☐ Adjust the elevation until maximum dc voltage is obtained.
- ☐ Fine tune azimuth until maximum dc voltage is obtained.



- ☐ Make sure azimuth and elevation are locked down.
- ☐ Adjust polarization until maximum dc voltage is obtained.
- ☐ Write down the final antenna pointing voltage reading and give the reading to the operator at the Network Help Desk.
- ☐ In iSite, click **Stop** to exit the modem's antenna pointing mode.
- ☐ Power down the NetModem.

Note: Before continuing to the next section, you must power down the NetModem.

3 Pointing the Antenna using the Console Port

3.1 Select a Site for the Antenna

It is important to select an appropriate site for your antenna, prior to assembling the antenna.

- ☐ Select a level surface that is approximately 10 feet by 10 feet;
- ☐ Verify that nothing is blocking the line of site to the satellite in azimuth and elevation;
- ☐ Verify the IFL cable can reach the NetModem 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.);
- ☐ Verify that the IFL cable does not cross roads or heavy foot-traffic areas.

3.2 Assemble the Antenna

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

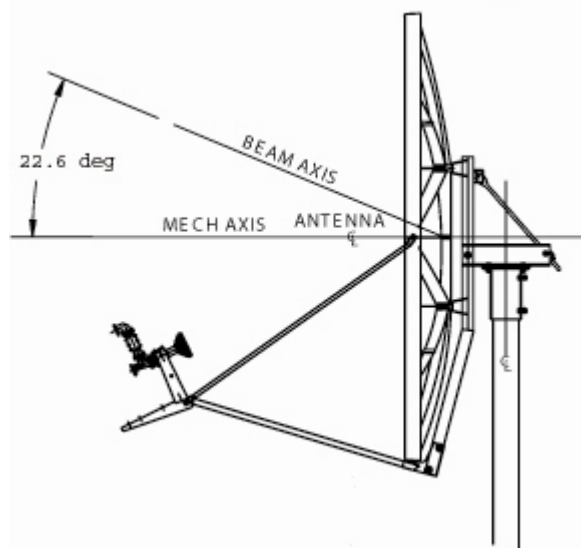
- ☐ The antenna base is on a stable surface that will not shift during windstorms.
- ☐ Ballast is installed on the antenna base.
- ☐ The mast pipe is plumb.

3.3 Align the Antenna toward the Spacecraft

You are now ready to perform the initial alignment of your antenna. Consult the details sections where appropriate for additional information.

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

Details: Antenna Offset Angle



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:

$$50^{\circ} - 22.6^{\circ} = 27.4^{\circ}$$

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 7 Antenna Elevation Offset

To prepare the antenna for pointing, move the antenna off the desired azimuth, so that the antenna pointing procedure can get a clear sky reading to compare signal strengths.

- ☐ Before starting the pointing procedure, swing the antenna 20° away in azimuth.

Details: Magnetic Angle of Declination

To take into consideration the magnetic angle of declination in your location and to ensure that the compass reading is correct, you must take a reading at the back of the antenna, and then mark a reference point some distance ahead on the antenna to point to. Keep in mind that large metal objects can throw off compass readings.

3.4 Perform Console Antenna Pointing

This pointing is only available for NMII+ remotes serial number 6000 and above, loaded with ISite version 5.0 or later software.

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

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.

NOTE: Section 3.4.1 MUST be completed to ensure that no damage is done to the BUC and that console pointing works correctly.

3.4.1 Modifying the Options File

To modify the options file, complete the following

- ☐ Power up the NetModem and let it boot up completely.
- ☐ From console or telnet session enter the command
"options set ODU odu_disable_tx_pwm 1"
- ☐ Press **Enter**.
- ☐ Type *"options flash"*
- ☐ Press **Enter**.
- ☐ Reset the NetModem.

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

- ☐ Type *"options show ODU"*
- ☐ Press **Enter**.
- ☐ In the ODU group, the line *odu_disable_tx_pwm = 1* should be 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.

3.4.2 Starting the Console Pointing

To start the console pointing, enter the following commands.

- ☐ Type *"rx pointing enable."*
- ☐ Type *"rx pointing on."*

At this point, the NetModem is in console pointing mode.

3.4.3 Using the DVM for Console Pointing

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

- ☐ Disconnect the console port from the laptop, or PC, leaving the RJ-45 connector in the NetModem.
- ☐ From the DB-9 connector, connect pin 4 or 5 (GND) to the negative probe on the DVM.
- ☐ Connect pin 8 (+) to the positive probe on the DVM.
- ☐ Point the antenna using the normal procedure, until the signal falls into the desired range:

Signal Strength Ranges	
volts DC	Antenna Status
0-2.5 vdc	RF energy detected but wrong satellite
2.6 – 5.0 vdc	Carrier lock, correct satellite

You can use the front or the rear panel LED to verify Carrier Lock. If the front Network LED is solid orange it indicates Carrier Lock. If the rear RX LED is green it indicates Carrier Lock.

3.4.4 Console Pointing

- ☐ Slowly sweep the reflector in azimuth until a signal of the appropriate strength is found.
- ☐ If the desired signal is not found, increase or decrease elevation setting by 2° and repeat the azimuth sweep.

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.

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

- ☐ Ensure Top Plate locking bolts are snug to allow azimuth movement.
- ☐ Adjust the elevation until maximum dc voltage is obtained.
- ☐ Fine tune azimuth until maximum dc voltage is obtained.
- ☐ Make sure azimuth and elevation are locked down.
- ☐ Adjust polarization until maximum dc voltage is obtained.
- ☐ Write down the final antenna pointing voltage reading and give the reading to the operator at the Network Help Desk.
- ☐ When finished pointing, disconnect power from the NetModem to stop the pointing process.

4 Fine-Tuning Antenna Pointing and Cross-Polarization

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

4.1 Set up the NetModem for Cross Polarization

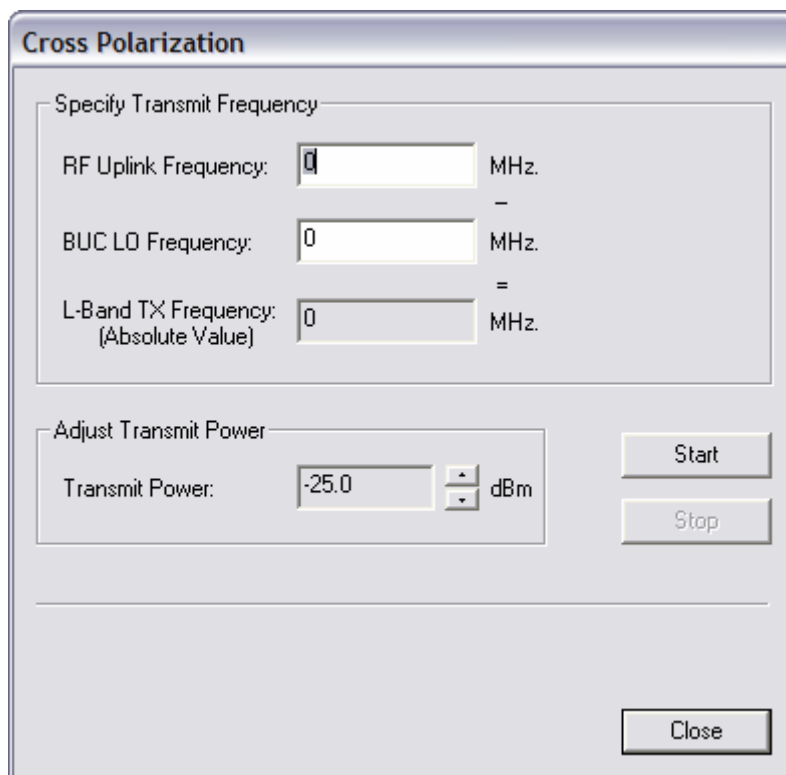
With the power off to the NetModem, set up the NetModem for cross-polarization.

- ☐ Disconnect the receive IFL cable from the NetModem.
- ☐ Disconnect the transmit IFL cable from the DVM and connect it to the BUC.

4.2 Set up iSite for Cross Polarization

The remote portion of the cross polarization test is conducted from the iSite GUI. Perform the following steps to set up iSite:

- ☐ Power on the NetModem, and Ensure that you have IP connectivity to it from your laptop computer.
- ☐ Launch the iSite application and connect to the NetModem using its IP address.
- ☐ Log into the NetModem in Admin status by supplying the valid password.
- ☐ In the iSite main menu, select **Configure**, select **Align Antenna**, and then click **Cross Polarization**.



The image shows a software window titled "Cross Polarization". It contains two main sections. The first section, "Specify Transmit Frequency", has three rows of input fields: "RF Uplink Frequency:" with a value of 0, "BUC LO Frequency:" with a value of 0, and "L-Band TX Frequency: (Absolute Value)" with a value of 0. Each field is followed by "MHz." and a minus sign. The second section, "Adjust Transmit Power", has a "Transmit Power:" field with a value of -25.0 and a "dBm" label. To the right of this section are "Start" and "Stop" buttons. At the bottom right of the window is a "Close" button.

Figure 8 iSite Cross Polarization

4.3 Preparing to Run the Cross-Polarization Test

While still in the iSite GUI:

- ☐ Call the Network Help Desk; the operator will establish a conference call between you, the help desk, and the satellite provider.
- ☐ Provide the final antenna pointing voltage reading to the operator at the Network Help Desk; he will record the value for their records.
- ☐ 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 NetModem. Using these values, iSite automatically calculates the L-Band TX frequency.

- ☐ 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. This value is read from the options file on your NetModem. Using the RF Uplink and BUC LO frequencies, iSite automatically generates an L-Band frequency for the NetModem.

4.4 Running the Cross-Polarization Test

- ☐ When instructed by the satellite provider, click the **Start** button. This will program the NetModem with the calculated L-Band frequency.

Caution: Do not press this button until instructed by the satellite provider.

Your NetModem will start transmitting a Continuous Wave Carrier, or "CW."

- ☐ If the Satellite Provider asks you to adjust the NetModem's transmit power, in the **Transmit Power** box, select a power value 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.

4.4.1 Peaking the Polarization

The polarization of the feed will now be peaked.

- ☐ Loosen the two screws at the feed.
- ☐ Loosen the hose clamp on the back end of the BUC just enough that entire assembly (feed, BUC, and LNB) will rotate freely.
- ☐ At the direction of the satellite provider, move the feed in one direction in approximately $1/2^\circ$ increments, or as little as possible.
- ☐ 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.
- ☐ Lock down the two screws and the hose clamp to secure the outdoor unit.

4.4.2 Adjusting Azimuth

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

When making adjustments to the azimuth and the elevation, make $\frac{1}{4}$ turns of the adjustment nut, and then wait 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.

Adjust the azimuth by loosening the four bolts on top of the canister as little and as evenly between the four as possible. Loosening these four bolts too much, or adjusting some more than others, throws the elevation off more than necessary.

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.

4.4.3 Adjusting Elevation

Elevation adjustment is performed in the same manner as the azimuth; use the elevation rod/nut for the adjustments.

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

4.4.4 After the Cross Polarization Test

- ☐ Wait for the satellite provider to verify that the cross polarization is still good after everything is tightened.
- ☐ Confirm that the network operator at the help desk has recorded the cross polarization results.
- ☐ This completes the satellite provider's portion of the call. Disconnect the satellite provider from the call.

Do not close out iSite or stop the cross polarization test yet.

5 Establishing 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 Net Modem's transmit power saturates the BUC.

While still in iSite Cross Polarization dialog box,

- ☐ While 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.

Note: 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. This scenario is unusual, but it can happen.

If power does not increase,

- ☐ decrease the power by 1 dBm until the operator sees the CW decrease by 1 dB.

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

- ☐ Record the TX power value. This will be used as the maximum power for this remote on the NMS
- ☐ Click the **Stop** button to turn off the CW carrier.
- ☐ Exit the iSite application.

The 1 dB compression point has now been established.

Note: Do not power off the NetModem yet.

6 Recording the NetModem's Geo Location

Important: This section describes a specific operational scenario in which remote modems are configured as both Mobile and Secure. If your remotes do not fall into this category, you may skip this section.

For security reasons, the NetModem's geographic location coordinates have not been recorded by the Network Help Desk. You must enter these coordinates into the NetModem manually before the modem will acquire into the network.

Note: It is critical that the geographic coordinates accurately reflect your current location. If the values are incorrect your NetModem will not acquire into the network.

6.1 Setting the NetModem's Geo Location

You will enter the lat/long coordinates from the NetModem console via a special command.

- ☐ Open a HyperTerminal session on the NetModem's console. Alternatively, you may telnet to the NetModem. For further information on connecting via the console or telnet, please refer the technical note, *Introducing iSite*, available on the iDirect TAC Support website.
- ☐ At the Peacock prompt, type the following command:
`latlong <your lat> [N|S] <your long> [E|W]`

See the details section below for more information about this command's format.

Details: Format of the latlong Command

The format of the latlong command is as follows:

`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.

6.2 Verifying the NetModem's Geo Location

Verify the correct geographic location coordinates:

- ☐ Verify that you entered the correct values by typing "extras show" at the console prompt to display the current settings for latitude and longitude.
- ☐ Reset the NetModem.

7 Bringing the NetModem into the Network

After you have entered the correct geographic coordinates for your current location and reset the NetModem, the NetModem should perform its power-up self-test and acquire into the network. The first time that this happens, complete the post-acquisition steps below.

If your NetModem does not acquire into the network, contact the Network Help Desk for assistance.

7.1 NetModem Front Panel Lights

As 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 NetModem.



Figure 9 NetModem Front Panel

Various combinations of the power and network LEDs on the front panel will indicate the different states of the iDirect NetModem.

<i>NetModem Front Panel Power and Network LEDs</i>		
Power LED	Network LED	Indicated Unit Status
dark	dark	Unit is powered off.
green	dark	Unit is booting up.
green	flashing yellow	Unit is attempting to lock on the downstream carrier.
green	solid yellow	Unit is locked on the downstream carrier.
green	flashing green	Unit is transmitting and attempting to acquire.
green	solid green	Unit is acquired into the network.

7.2 Post Acquisition Activities

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

7.2.1 Network Help Desk Duties

The first time after commissioning the NetModem, after the NetModem has acquired into the network, the Network Help Desk will take control of the NetModem to perform the following tasks.

Important: Do not power down the NetModem during this time.

- The Network Help Desk will make adjustments to the NetModem's configuration to set the initial and maximum transmit power settings. Initial transmit power is typically set to 1 to 2 dB above nominal transmit power in clear sky conditions. The maximum transmit power is set for the 1 dB compression point.
- The Network Help Desk will download the updated configuration to the NetModem and issue a reset.
- The Network Help Desk will also record levels of the remote NetModem as a baseline for troubleshooting.
- The Network Help Desk will ensure software and firmware on the NetModem are at the correct revision level. If necessary they will upgrade the software on the NetModem and issue a reset.

The Network Help Desk will let you know when they are done

7.2.2 Remote Duties

After the Network Help Desk has made any necessary adjustments to the NetModem'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.

- ☐ Open a HyperTerminal session to the NetModem's console. Alternatively, you may telnet to the NetModem. For further information on connecting via the console or telnet, please refer the technical note, *Introducing iSite*, available on the iDirect TAC Support website.
- ☐ At the Peacock prompt, enter *rmtstat*. The output of this command contains all of the information that you need to record.
- ☐ Record the following information:
 1. The receive SNR of the NetModem. (> 10.0 dB Clear Sky Conditions)
 2. The transmit power of the NetModem.
 3. The receive composite power into the NetModem. (-65 to -5 dBm)
 4. The temperature reading in Celsius.

Example: Remote Status Message

```
Peacock <R 3421> rmtstat
Printing Remote Status messages is ON

RemoteStatus: t:000017435715 SNR=15.60 RxPower=-33.79
dBm TxPower=-15.00 dBm DigitalRxPower=21.07 Temp=49.1
TDM_Lost=0 FllDac = 1812 LAN Port: 10 Mbps Half Duplex
(AutoNegotiation: None)
```

These readings should be checked periodically to ensure 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.

Appendix A – Installing Remote Software on Your Laptop

The following instructions guide you through the process of installing the iSite software and remote images onto your laptop computer.

Components of the Remote-Modem Images Software

- The NMS iSite program and support files
- The NetModem2 Remote-Modem application and image files
- The NetModem2Plus Remote-Modem application and image files

Installing the Remote-Modem Images and Software

The steps for installing the software depend upon whether you have received the software via the Internet, or have a copy on CD.

A. Installing software transferred via the Internet:

This software is usually distributed in a ZIP file. Once you have the ZIP file you can extract the contents using one of the several Windows tools that recognize the .zip format such as Info-Zip (at <http://www.info-zip.org/>), WinZip (at <http://www.winzip.com/>), or PKZIP (at <http://www.pkware.com/>).

After receiving the compressed archive file **remote-*<version>*.zip** from iDirect, copy it to a directory where you may uncompress the files. (Note: *<version>* is the NetModem version number in the form '5_0_0').

1. Uncompress the files by using unzip, WinZip, PKZIP, or another utility that understands the .zip format.

The following directory structure will be created when the files are

uncompressed:

```
NetModem-<version>/
    iSite/
    Images/Remote_2plus/
    Images/Remote_NM2/
```

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

B. Installing software from the iDirect NetModem CD:

1. Put the iDirect NetModem CD into the CD drive, and locate the file **remote-*<version>*.zip** in the directory *NetModem-*<version>** on the CD. (*<version>* is the NetModem version number in the form '5_0_0')
2. Uncompress the files in the .zip file to a folder on your hard drive by using unzip, WinZip, PKZIP, or another utility that understands the .zip format.

The following directory structure will be created when the files are uncompressed:

```
NetModem-<version>/
    iSite/
    Images/Remote_2Plus/
    Images/Remote_NM2/
```

3. Create a shortcut to iSite.exe (in the iSite folder) on the desktop or Windows taskbar, if desired.

Appendix B – Establishing a NetModem Console Connection

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

Console Cable Details

In addition to the NetModem Console Table cable, you will need an RJ-45 to DB-9 adapter. The pin outs for a NetModem console cable are as follows:

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

You should connect this adapter to the COM1 port of your laptop. Plug the other end of the cable into the COM port of the NetModem.

HyperTerminal Settings

Complete the following steps to set up and save a Hyper Terminal session:

- ☐ In the Windows Start menu, select Programs, select Accessories, select Communications, and then select HyperTerminal.
- ☐ You may have to answer some questions about area code and dialing details. The information you enter here isn't important, but you must enter something.

- In the Connection Description dialog box, enter a name for the connection, such as NetModem Console. You may also select an icon other than the default icon.



Figure 10 Hyper Terminal Connection Description

- Select COM1 in the Connect using box.



Figure 11 HyperTerminal Connection Details

- ☐ Using the default variables in Figure 8, enter the session properties. Be certain that your settings exactly match the settings in Figure 8 below.

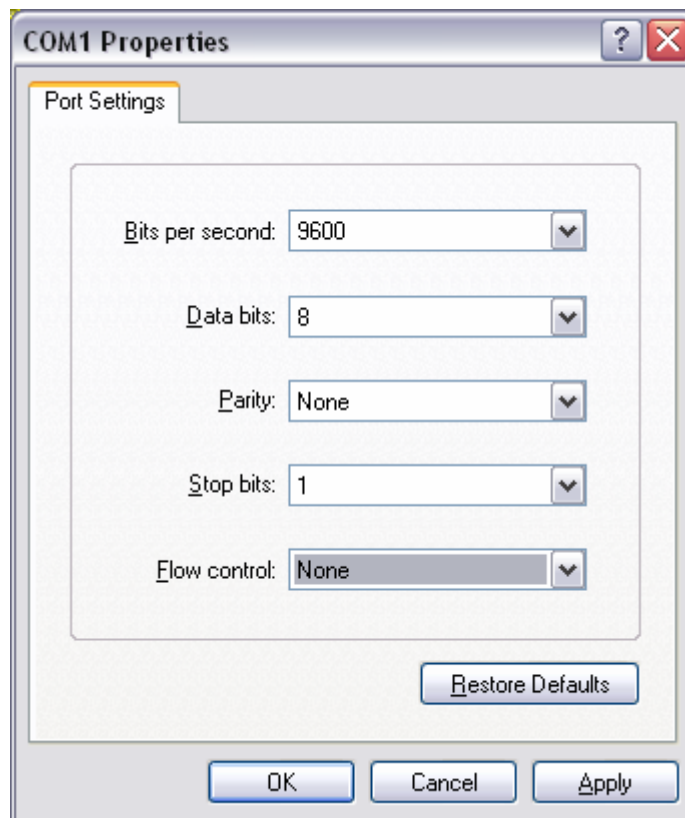


Figure 12 Hyper Terminal COM 1 Properties

- ☐ Click Return a few times to see if you can generate a response from the NetModem. If you are successful, you will see the NetModem console prompt. If you are unable to generate a response from the NetModem, reexamine your settings to be certain that they are correct.
- ☐ When you close the console session, you will be prompted to save the session. Click Yes to save this session for re-use later.

Appendix C – Gaining IP Connectivity to the NetModem

To establish IP connectivity to the NetModem from your laptop computer, the following conditions must exist:

- ☐ Your computer must be connected directly to the NetModem via a LAN crossover cable, or indirectly via an external switch or router.
- ☐ Your computer's IP address must be in the range of addresses specified by the NetModem's IP address and subnet mask.
- ☐ Your subnet mask must match the NetModem's subnet mask.

Determining the NetModem's IP Address and Subnet Mask

The easiest way to determine the NetModem's IP address is to establish a console session and type the appropriate console command:

- ☐ Open a console session to the NetModem (see Appendix B for details).
- ☐ At the NetModem prompt, enter the command *laninfo*. Sample output is shown below:

Details: Sample Output of the laninfo command

```
Peacock <R 3224> laninfo
IP Address:  192.168.4.65
Subnet mask: 255.255.255.0
Gateway:     0.0.0.0
```


Modifying Your Laptop's IP Address and Subnet Mask

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

- ☐ From your computer's Control Panel, double-click Network Connections. This screen's appearance is different in Windows 2000 and Windows XP.
- ☐ Launch the status dialog box for your Local Area Connection object by double-clicking on the icon. It should look similar to the following.

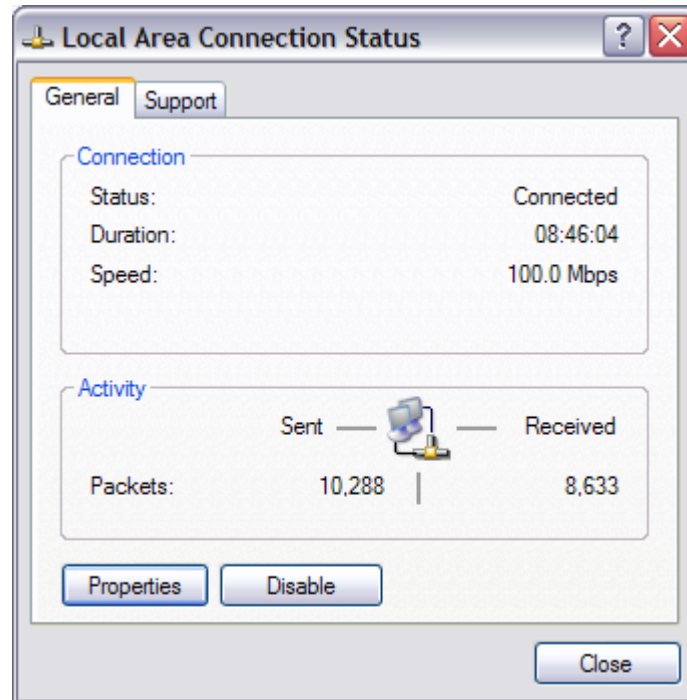


Figure 13 Local Area Connection Status

- ☐ Click **Properties** to launch the Local Area Connection Properties dialog box.

- ☐ Select the **Internet Protocol** box.
- ☐ Click the **Properties** button.

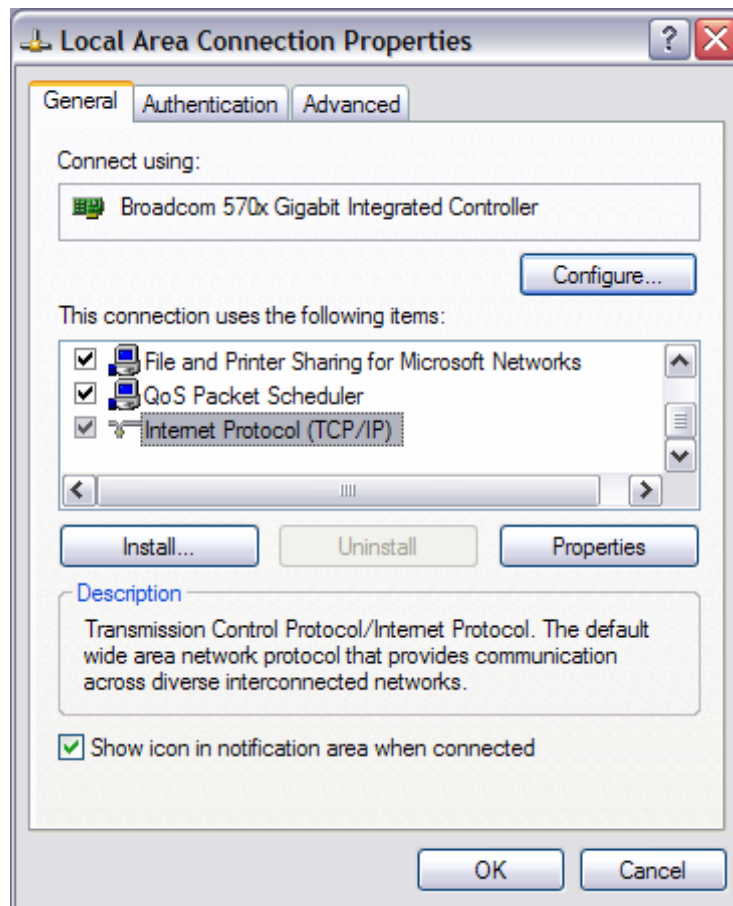


Figure 10 LA Connection Status Window

- ☐ Select **Use the following IP address**, and then enter an IP address that is inside the range specified by the NetModem's IP address and subnet mask.
- ☐ Enter the same subnet mask you retrieved from the NetModem using the "laninfo" command.

For the purposes of a local connection, you do not need to specify DNS server addresses.

- ☐ Click **OK** to save your changes.

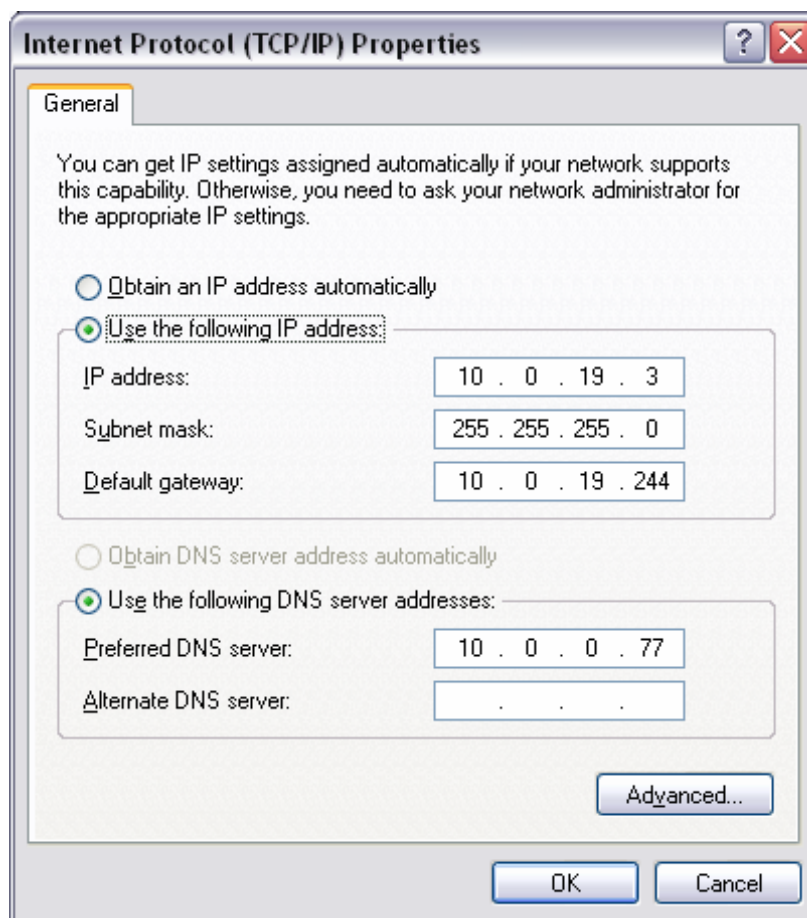


Figure 11 TCP/IP Properties

You should now be able to connect to the NetModem using either the "telnet" command, or the iSite GUI.

Once you have established IP connectivity to the NetModem, you can start a NetModem console session either by using telnet or using the HyperTerminal connection discussed in Appendix B.

Appendix D - Termination of Coaxial Cable

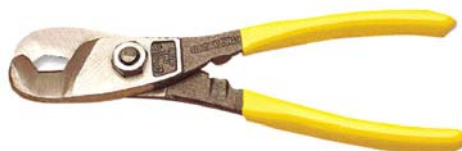
Recommended Tools



Paladin Tools: LC-CST-CATV-'F' 1257



CablePrep: RG-6 HCT-775 Crimp Hex Size 0.384 inch
RG-11 HCT-116 Crimp Hex Size 0.472 inch



Coax Cutter: Benner-Bawman TMT-BN-76

Instructions

To terminate a Type-F Connector onto a RG-6 or RG-11 cable.

Step 1: Cut off each end of the coax squarely with the proper cable cutter.



Caution: If a different cutter type is used, ensure the center conductor is straight and round without any burrs. Failure to do so will result in damage to the NetModem, BUC, and/or LNB connector.

Step2: Remove jacket material and foam insulation per dimension “ a ” in the trim table as shown. For RG-6, use a 2-step Coax Stripper, such as the LC-CST 1257 from Paladin Tools.



Coax Trim Dimensions			
	a inch (mm)	b inch (mm)	Braid Fold Back
RG-6	1/8 (9.5)	1/4 (6.4)	1/4 (6.4)
RG-11	7/16 (10.3)	5/16 (7.9)	7/16 (10.3)

Step 3: Remove any foil in the braid. Fold the braid back over the jacket and trim the braid length per the “Braid Fold Back” in the Coax Trim Dimension Table.

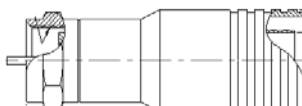
Step 4: Remove foil and cut dielectric to length “ b ” (if using a coax stripper, then skip this step). Be careful not to cut into the copper of the center conductor. Remove any dielectric residue.

Step 5: If the conductive foil is burred, then smooth out the burr so that the edge (area where the dielectric material was removed) is smooth and provides a lead-in for the connector mandrel.

Step 6: Install connector mandrel over foil and underneath the braid.

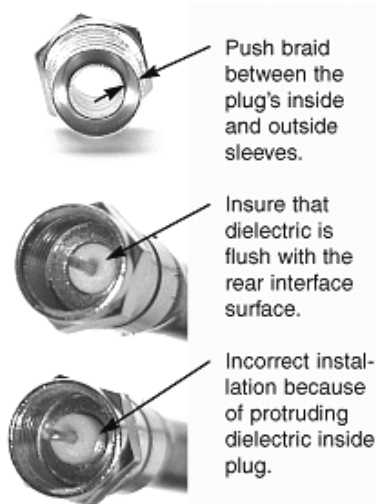


Note: Since RG-11 connector has built-in center pin, ensure the coax center pin makes contact to the internal seizing pin of the connector. Refer to picture below.

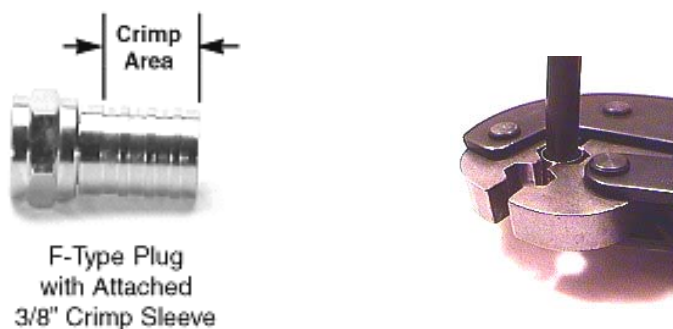


**RG-11 Connector
with Center Pin**

Note: For RG-6, the white color inner dielectric insulation should be flush even with the inner rear surface of the connector. Refer to picture below for RG-6 termination.



Step 7: Crimp the connector with the proper crimp tool such as CablePrep HCT-775 for RG-6 or HCT-116 for RG-11.



Step 8: Inspect and ensure that the copper center conductor only protrudes 1/8 inch (3.2mm) nominally beyond the rim of the F-connector. Trim if necessary.



Caution: The copper center conductor shall only extend 1/8 inch (3.2mm) beyond the rim of the F-connector. It must be straight and cylindrical without any burrs at the end. Failure to do so will result in damage to the NetModem, BUC, LNB connector and/or possible intermittent service.

