Evolution User Guide

Terminal Web User Interface iDirect 9-Series, iQ-Series, and 3315 Series

Evolution

iDX 4.3.x

Revision 1

January 31, 2023

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Revision History

The following table shows all revisions for this document. To determine if this is the latest revision, check the Technical Assistance Center (TAC) Web site. Refer to *Getting Help* on page x for TAC access information.

Revision	Date	Updates
1	January 31, 2023	Initial release of the document for iDX Release 4.3.x.

Contents

Figures

Tables

About

This chapter contains the following sections:

Intended Audience

The *Terminal WUI User Guide* is for iDirect network operators or installers to connect directly to a 9-Series, iQ Series (iQ Desktop, iQ 200 Board, iQ 200 Rackmount and iQ LTE), and 3315 Series (MDM3315, SMB3315) satellite routers. This may include installers responsible for Terminal commissioning, network operators connecting remotely, or on-site personnel working with iDirect to troubleshoot network problems.

Manual Contents

In addition to the information in this chapter, this manual also includes the following:

- Chapter 1, *Introduction* on page 1, provides information about what the terminal WUI is, the supported routers, the login details, and the LED information.
- Chapter 2, *Terminal Web User Interface* provides information on how to connect to the terminal WUI and provides information on the terminal WUI and explains each one of the tabs in-detail.
- Chapter 3, *Commissioning a Terminal* provides information on how to commission a new remote using the terminal WUI.
- Appendix A, *Acronyms and Abbreviations* provides a basic list of acronyms and abbreviations.
- Appendix B, *Remote Locking* provides information about soft, temporary, and hard locking for iQ Series and 3315 Series remotes.

Related Documents

The following iDirect documents are available at http://tac.idirect.net and contain related information. Consult these documents for additional information about iDirect systems and equipment:

- *Quick Start Guide (QSG), included in package with router*
- *Installation, Support, and Maintenance* (ISM) Guide
- *iDirect Evolution™ Software Release Notes*
- *iBuilder User Guide*
- *iMonitor User Guide*
- *iDX Technical Reference Guide*

Related Training Services

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1 Introduction

This chapter provides a general overview of the Terminal Web User Interface (WUI).

1.1 Supported Routers

The Terminal WUI is supported on the iDirect 9-Series, 3315 Series, and iQ Series Satellite Routers.

NOTE: Pulse Width Modulation (PWM) is not supported for the iQ Series satellite routers.

1.2 Terminal Web User Interface

The Terminal Web User Interface (WUI) provides users with secure means to monitor satellite routers from the local area network (LAN) side.

The Terminal WUI also provides configuration and real-time status and statistical information about the satellite routers. Terminal WUI provides interaction with the satellite router, enabling configuration, commissioning, and monitoring without a direct connection with the iVantage NMS. The level of functionality available to the user is determined by the login access (admin or user).

1.2.1 Terminal WUI Features

Terminal WUI provides the following features:

- LED indicators that display real-time status of the satellite router
- A dashboard view of high-level satellite router information (for example, displays if a satellite router is in network or locked to the satellite)

- A status and monitoring view that provides status and monitoring information about the satellite router in real-time for modem information, events, Ethernet receive and transmit connections, and Internet Protocol (IP) configuration and information
- Administration tools for loading software packages and options files
- A wizard for commissioning new remotes

1.3 Terminal Web User Interface Login

The Terminal WUI supports two levels of log-in; a generic user level, and an administrator level. The log-in screen is shown in Figure 1-1.

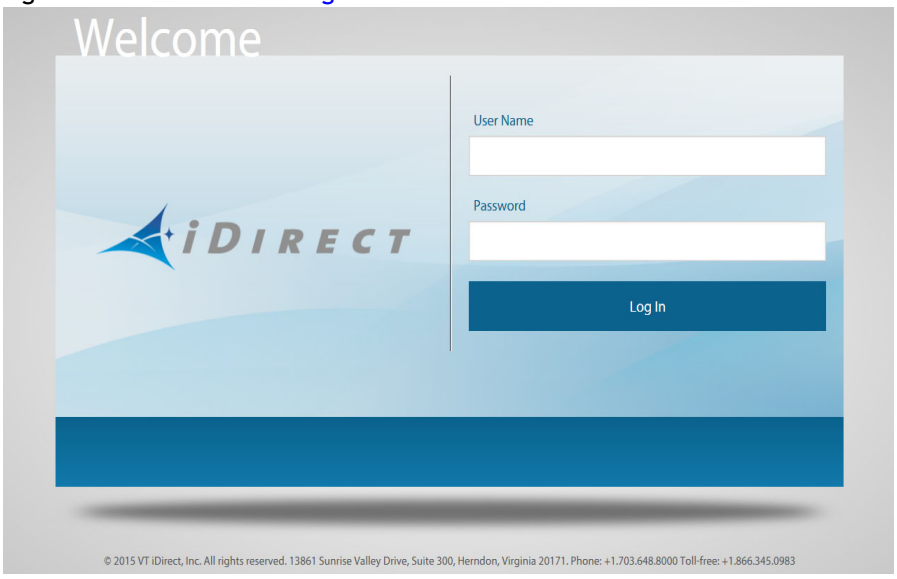


Figure 1-1. WUI Log-In Screen

The default login credentials for the two configured user accounts admin and user are:

Username: admin

Password: iDirect

NOTE: The password specified above is just an example and the actual password is the one that is configured in iBuilder. Username and password are both case sensitive.

1.4 Connecting to the Terminal WUI

Terminal WUI may be used at any time to access the Satellite Routers. All that is necessary is the IP address assigned to the satellite router and a physical Ethernet connection to the LAN port.

Default factory settings for the Satellite Routers are shown below:

- LAN IP Address: 192.168.0.1
- Subnet mask: 255.255.255.0

1.4.1 Manually Configuring the Windows Host to Connect to the Satellite Router

1. Click **Start** > **Control Panel** > **Network and Sharing Center**.

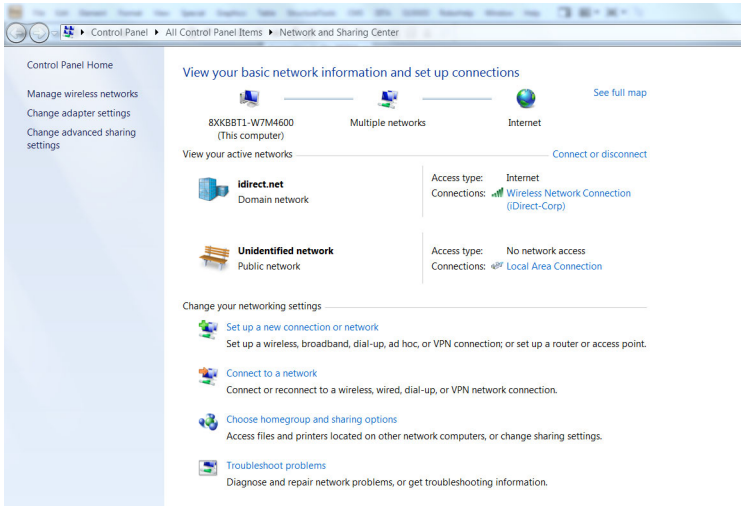


Figure 1-2. Network and Sharing Center

2. Under **View your active networks**, click **Local Area Connection**.

   The **Local Area Connection Status** window is displayed.

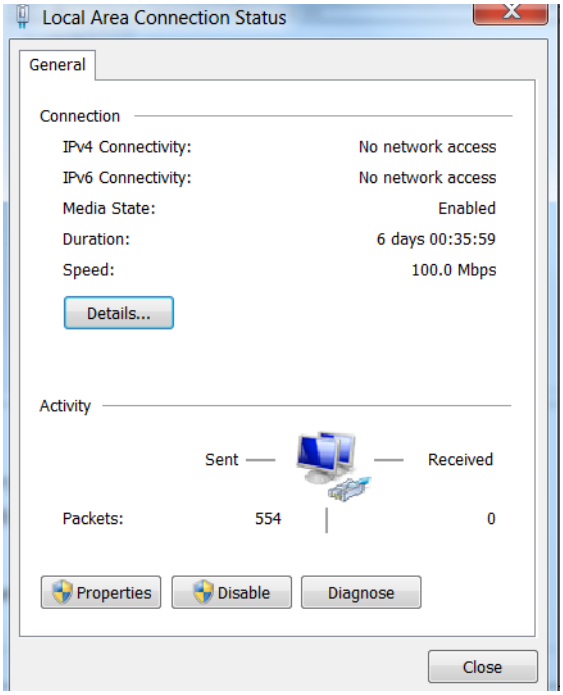


Figure 1-3. Local Area Connection Status

3. Click **Properties**.

   The **Local Area Connection Properties** window is displayed.

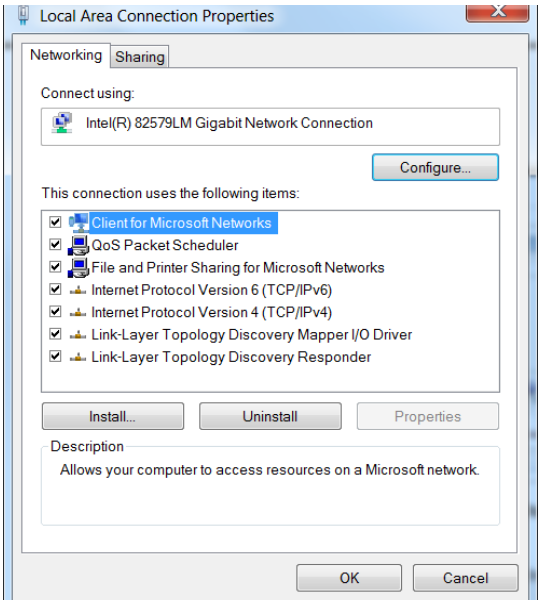


Figure 1-4. Local Area Connection Properties Window

4. Select the **Internet Protocol Version 4 (TCP/IPv4)** check box, and click **Properties**.

   The **Internet Protocol Version 4 (TCP/IPv4) Properties** window is displayed.

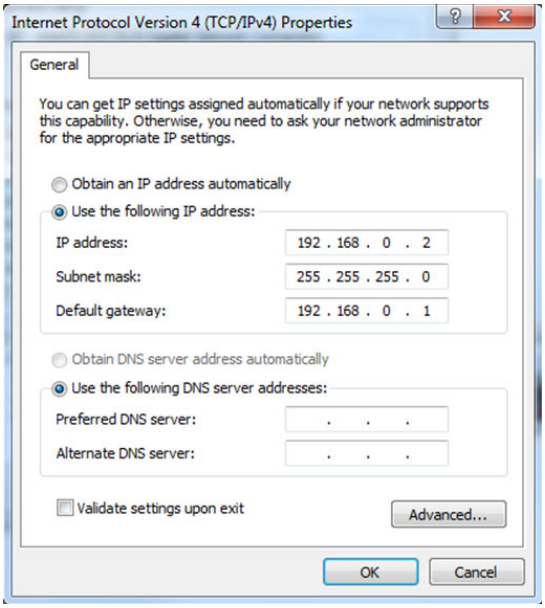


Figure 1-5. Internet Protocol Version 4 Properties

5. Select **Use the following IP address**, and enter the following:
   - **IP address**–Enter an unused IP address on the same subnet as the router.
   - **Subnet mask**–Enter the IP address, and the subnet mask is automatically retrieved.
   - **Default gateway**–This field is optional.
6. Click **OK**.

1.5 Starting a Terminal WUI Session

The Web view is compatible with Internet Explorer 10 and above, or latest Mozilla Firefox and Chrome browsers.

The Terminal WUI has two default user accounts:

- **admin**: Provides full access to WUI functionality
- **user**: Provides restricted access to WUI functionality

To launch the Terminal WUI, perform the following:

1. Connect the personal computer (PC) LAN port to the satellite router local area network (LAN) Port 1 using an Ethernet cable.
2. Launch the Web browser of choice.

   On the address bar, enter the IP address of the satellite router into the address field.

   The login terminal as seen in Figure 1-1 is displayed.
3. Enter the Username and Password as follows:

   Username - admin

   Password - iDirect
4. Click **Login**.

   The Web User Interface dashboard as seen in Figure 1-6 is displayed.

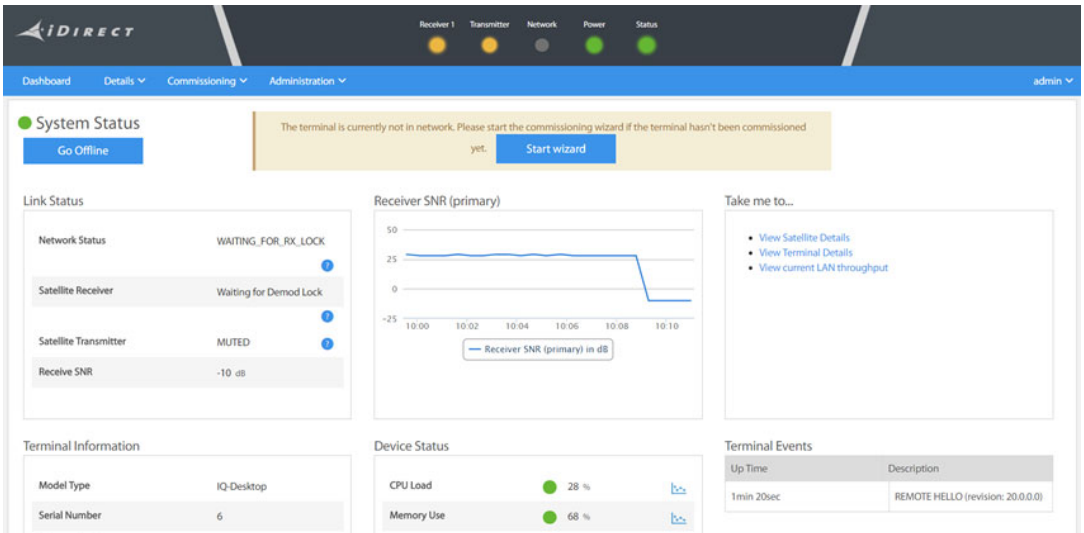


Figure 1-6. Terminal WUI Dashboard

1.5.1 Simulated LEDs

The menus in the Terminal WUI display simulated LEDS (see Figure 1-7). For detailed information on the LED color and function, see the routers *Installation, Support, and Maintenance Guide*.

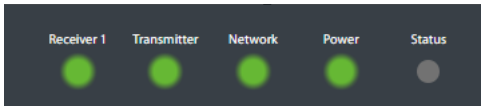


Figure 1-7. LED Indicators

2 Terminal Web User Interface

This chapter introduces the Terminal Web User Interface (WUI) provided on iDirect Satellite Routers. It contains the following sections:

2.1 Dashboard

The Dashboard page provides key information about the Satellite Routers that have an established connection.

The Dashboard page is the default landing page of the Terminal Web UI. See Figure 2-1.

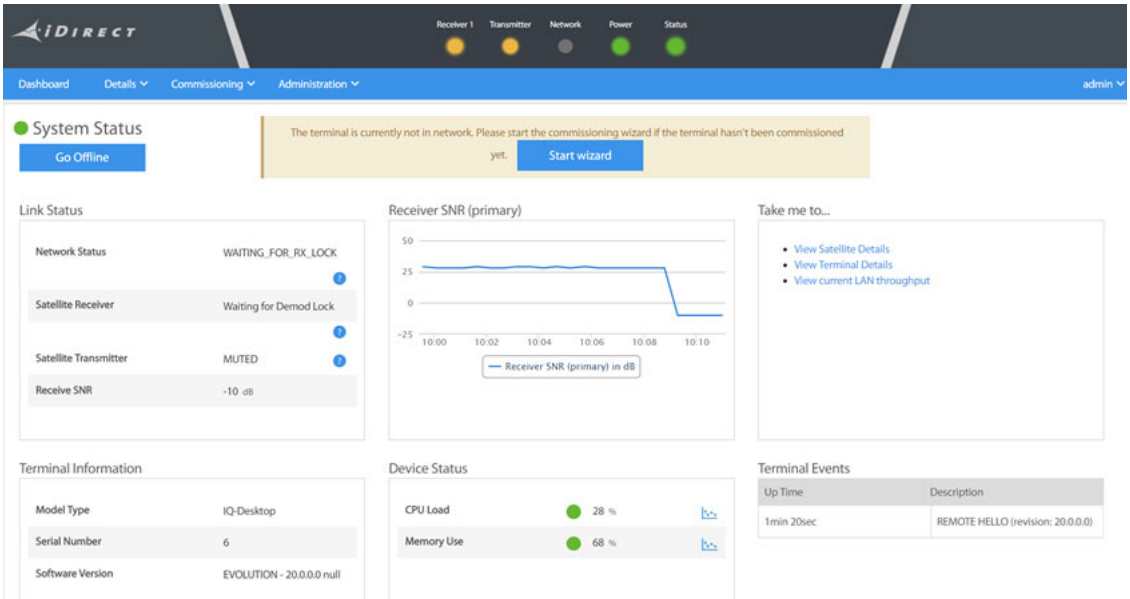


Figure 2-1. Dashboard Menu

NOTE: The Dashboard for 9-Series remotes is different from the Dashboards for the iQ Series and the 3315 Series remotes. The figure above shows the Dashboard for iQ Series/3315 Series remotes.

Table 2-1 displays the field descriptions for the dashboard.

Table 2-1. Dashboard Menu Items

Menu Item	Sub-menu Item	Description
System Status		Displays the overall status of the Terminal system.
Link Status		Displays the status of all the network links.
	Network Status	Displays if the router is in the network.
	Satellite Receiver	Displays if the router is enabled to receive information.
	Satellite Transmitter	Displays if the router is enabled to transmit information.
	Receive SNR	Displays the SNR of the received downstream.
Terminal Configuration		Displays the configuration of the terminal.
	Model Type	Displays the model type of the terminal.
	Serial Number	Displays the serial number of the terminal.
	Software Version	Displays the current software version that is running.
Receive SNR		Displays the receive carriers signal to noise ratio.
Device Status		Displays the status of the terminal.
	CPU Load	Displays the current CPU load.
	Memory Use	Displays the current memory in use.
Take me to...	View Satellite Details	Displays the details of the satellite.
	View Terminal Details	Displays the details of the terminal.
	View current LAN throughput	Displays the details of the LAN ports.
Terminal Events		Displays the events sent to the NMS.
	Up Time	Displays the amount of time falcon was running when an event occurred.
	Description	Displays the content of the event.

2.2 Details Menu

Use the Details Menu page to report and view satellite, terminal, LAN, and external equipment information.

NOTE: iDX Release 4.1.6.0 adds **BGP Peer Status** to the **Lan Interface** page.

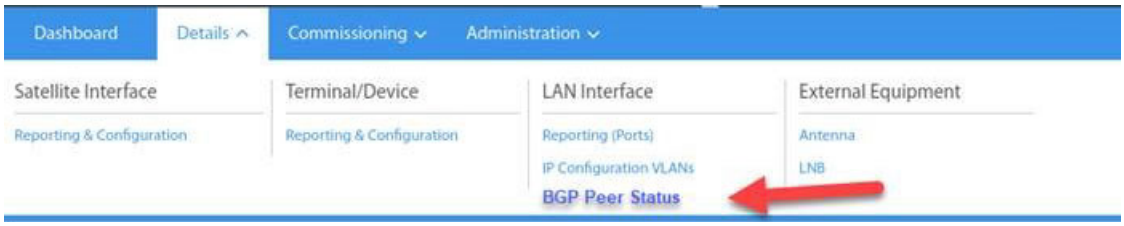


Figure 2-2. Details Menu

2.2.1 Satellite Interface

The Satellite Interface displays information on the satellite.

2.2.1.1 Satellite Interface - Reporting and Configuration

Click **Details > Satellite Interface > Reporting & Configuration** to view the satellite information.

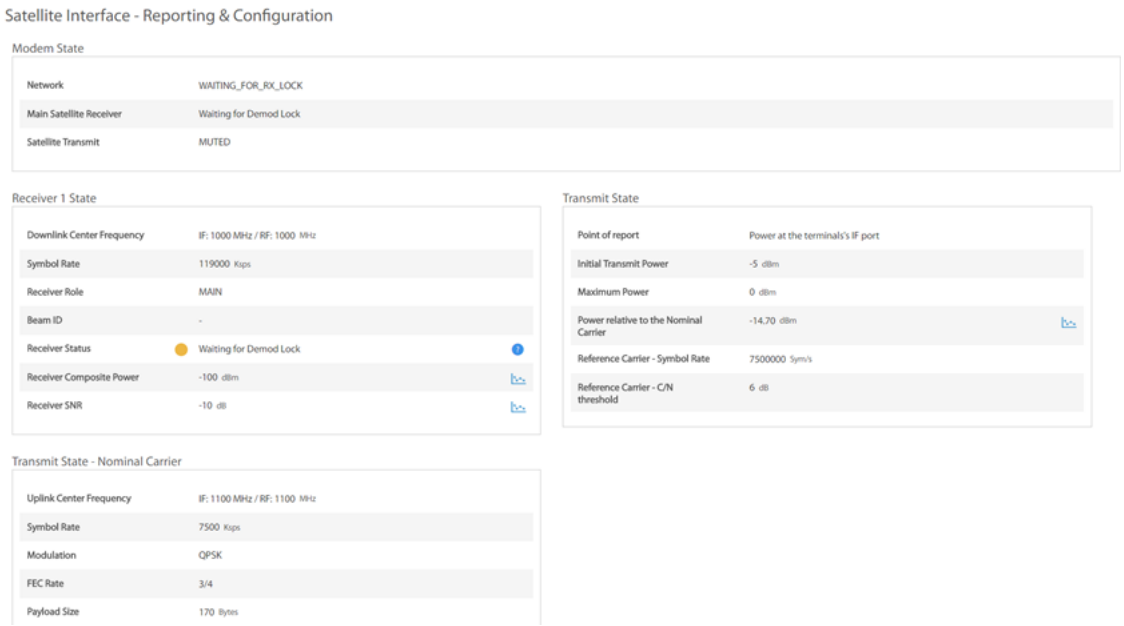


Figure 2-3. Satellite Interface - Reporting and Configuration

Table 2-2 displays the field descriptions for the satellite interface.

Table 2-2. Satellite Interface - Reporting and Configuration Field Descriptions

Menu Item	Sub-menu Item	Sub-menu Item	Description
Satellite Interface- Reporting and Configuration			
	Modem State		Displays the status of the modem.
		Network	Displays if the modem is connected to the network.
		Main Satellite Receive	Displays one of the following: • Locked • Waiting for NCR Lock—Third and final stage of the receiver lock. • Waiting for Demod Lock—Second stage of the receiver lock. • Waiting for Tuner Locktuner_locked—First stage of the receiver lock. • Off
		Satellite Transmit	Displays the state as either MUTED or UNMUTED. The transmitter can be muted by any of the following conditions: • not in network • external mute signal • OpenAMIP mute command **NOTE:** The above conditions are not exhaustive.
	Transmit State		Displays the status of the transmitter.
		Point of Report	Indicates the point for which the terminal's transmit power is reported. This point could be either at the output of the satellite router's transmit output, or at the BUC flange.
		Initial Transmit Power	Displays the initial transmit power of the satellite router.
		Maximum Power	Displays the configured max power of the satellite router’s transmitter.
		Power Relative to the Nominal Carrier	Displays the current transmit power relative to the nominal carrier.
		Reference Carrier - Symbol Rate	Displays the symbol rate of the reference carrier.
		Reference Carrier - C/N threshold	Displays the threshold of the reference carrier.
	Transmit State - Nominal Carrier		
		Uplink Center Frequency	Displays the uplink center frequency of the carrier.
		Symbol Rate	Displays the symbol rate of the carrier.

Menu Item	Sub-menu Item	Sub-menu Item	Description
		Modulation	Displays the modulation.
		FEC Rate	Displays the FEC rate.
		Payload Size	Displays the payload size.
	Receive 1 State		Displays the status of the first receiver.
		Downlink Center Frequency	Displays the router listening frequency.
		Symbol Rate	Displays the symbol rate.
		Receiver Role	Displays the receiver role as MAIN or AUXILIARY.
		Beam ID	Displays the Beam ID.
		Receiver Status	Displays the status of the receiver.
		Receive Composite Power	Displays the total power at the front end.
		Receiver SNR	Displays the signal noise ratio measured in the terminal.

2.2.2 Terminal/Device

The Terminal Device page displays details of the terminal.

2.2.2.1 Terminal Device - Reporting and Configuration

Click **Details > Terminal/Device > Reporting & Configuration** to view the terminal information.

Figure 2-4. Terminal Device - Reporting and Configuration

Table 2-3 displays the field descriptions for the terminal device.

Table 2-3. Terminal Device - Reporting and Configuration Field Descriptions

Menu Item	Sub-menu Item	Sub-menu Item	Description
Terminal/Device-	Reporting and Configuration		Displays information about the terminal or device.
	Terminal Information		Displays information about the terminal.
		Model Type	Displays the model type of the terminal.
		Serial Number	Displays the serial number.
		Software Version	Displays the software version that is active on the terminal.
	Device Status		Displays the status of the terminal.
		CPU Load	Displays the CPU load.
		Memory Use	Displays the amount of memory used by the device.
	Geographical Location		Displays the geographic location of the terminal.
		Longitude	Displays the longitude in decimal notation E or W.
		Latitude	Displays the latitude in decimal notation N or S.

2.2.3 LAN Interface

The LAN Interface page displays information on ports and VLANs.

2.2.3.1 LAN Interface - Reporting (LAN Ports)

Click **Details > LAN Interface > Reporting (Ports)** to view information on ports.

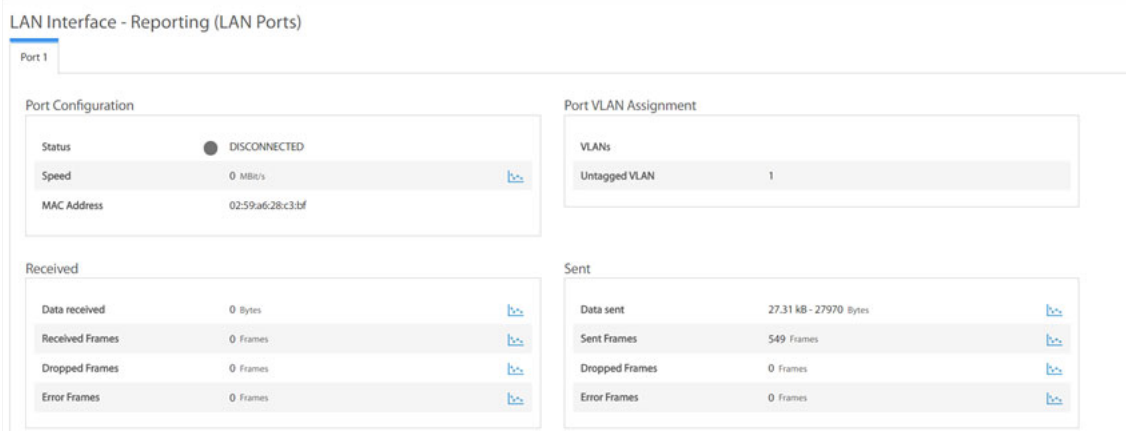


Figure 2-5. LAN Interface - Reporting (LAN Ports)

Table 2-4 displays the field descriptions for the LAN interface.

Table 2-4. LAN Interface - Reporting (LAN Ports) Field Descriptions

Menu Item	Sub-menu Item	Sub-menu Item	Description
LAN Interface - Reporting (LAN Ports)			Displays information about the terminal Ethernet port(s).
	Port Configuration		Displays the status of the port.
		Status	Displays the status of the port as connected, disconnected or disabled.
		Speed	Displays the speed of the port in 10, 100, or 1000 Mbps.
		MAC Address	Displays the MAC address of the LAN interface.
	Port VLAN Assignment		Displays information about the various Ports and VLANs assigned to those ports.
		VLANs	Displays the VLANs configured on the port.
		Untagged VLAN	Displays the VLAN that is not tagged with any VLAN ID.
	Received		
		Data Received	Displays the number of packets received.
		Received Frames	Displays the frames of ethernet data received through the port.
		Dropped Frames	Displays the number of dropped frames.
		Error Frames	Displays the number of error frames.
	Sent		
		Data Sent	Displays the number of packets sent.
		Sent Frames	Displays the frames of ethernet data sent through the port.
		Dropped Frames	Displays the number of dropped frames.
		Error Frames	Displays the number of error frames.

2.2.3.2 LAN Interface - IP Configuration VLANs

Click **Details > LAN Interface > IP Configuration VLANs** to view the VLAN information.

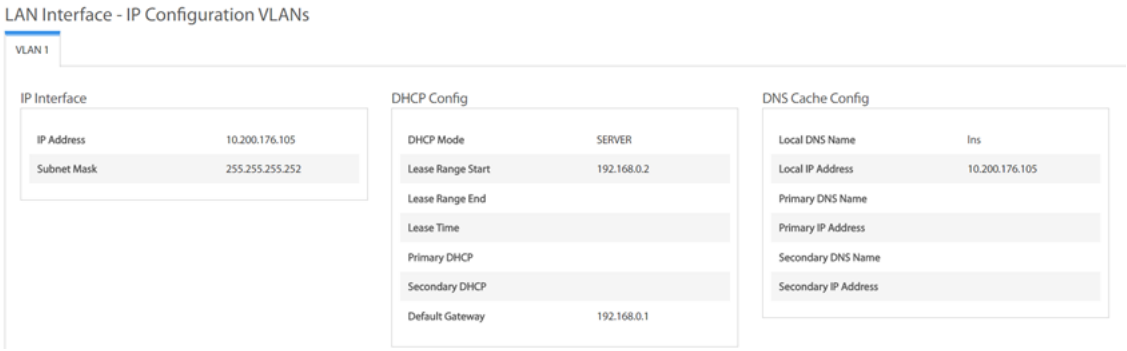


Figure 2-6. LAN Interface - IP Configuration VLANs

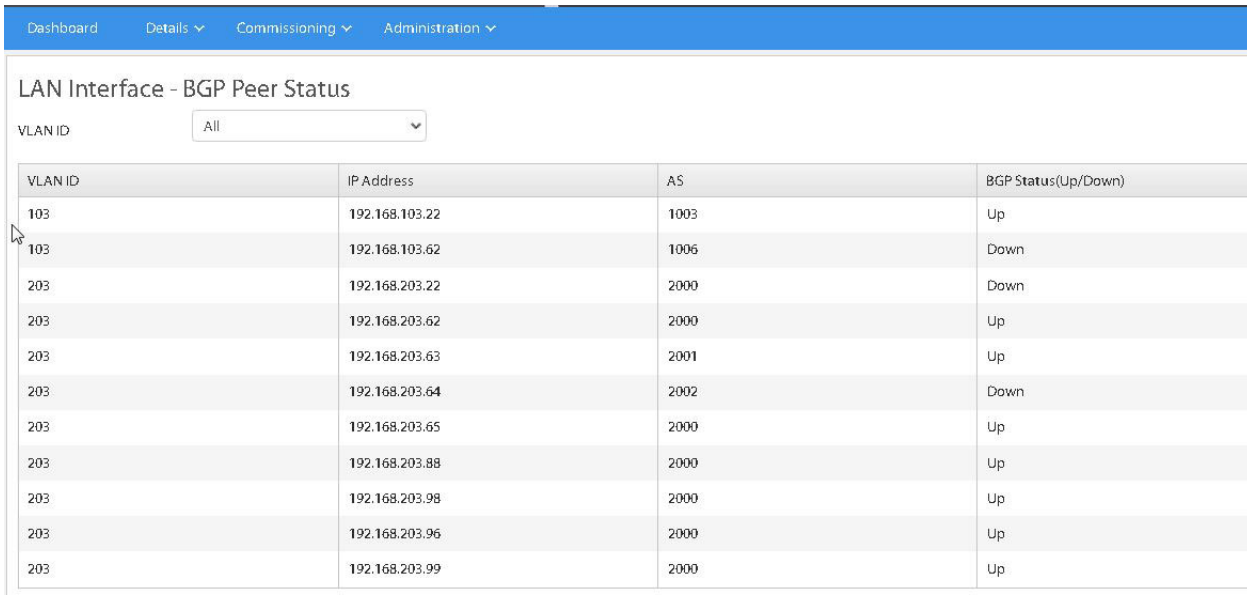
Table 2-5 displays the field descriptions for the VLANs.

Table 2-5. IP Configuration VLANs Field Descriptions

Menu Item	Sub-menu Item	Description
IP Interface		Displays the IP address/mask of the Ethernet interface of the management VLAN.
	IP Address	Displays the IP address.
	Subnet Mask	Displays the subnet mask address.
DHCP Config		Displays the DHCP configuration information.
	DHCP Mode	Displays the DHCP mode as either Server, Client, or Relay.
	Lease Range Start	Displays the DHCP servers lease range start.
	Lease Range End	Displays the DHCP servers lease range end.
	Lease Time	Displays the DHCP servers lease time.
	Primary DHCP	Displays the primary DHCP server.
	Secondary DHCP	Displays the secondary DHCP server.
	Default Gateway	Displays the default gateway.
DNS Config		
	Local DNS Name	Displays the local DNS name.
	Local IP Address	Displays the local IP address.
	Primary DNS Name	Displays the DNS server name.
	Primary IP Address	Displays the primary DNS server IP address.
	Secondary DNS Name	Displays the DNS secondary name.
	Secondary IP Address	Displays the secondary DNS server IP address.

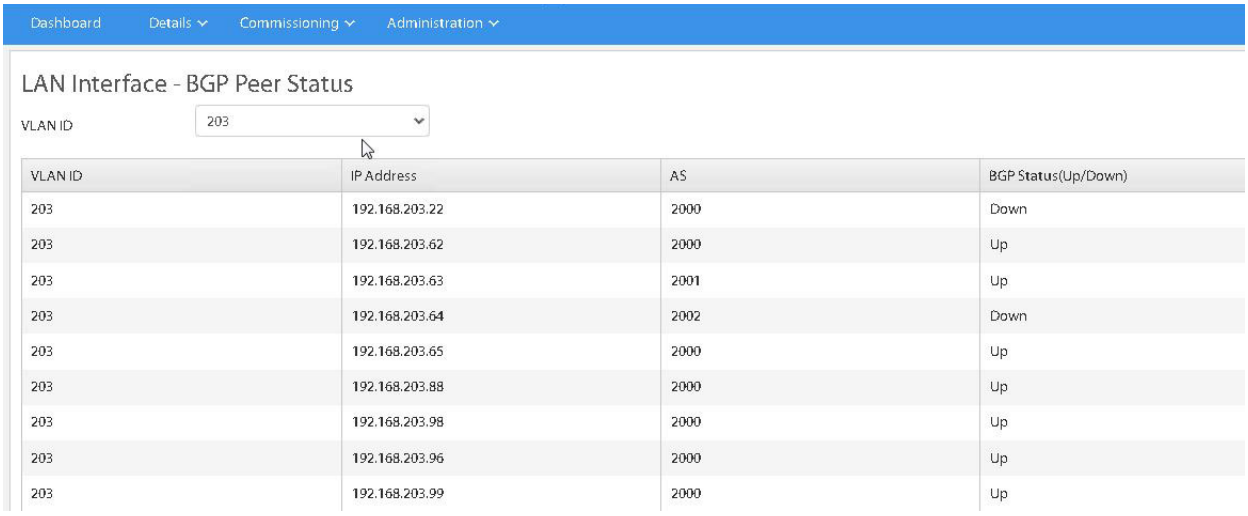
2.2.3.3 LAN Interface - BGP Peer Status

Click **Details > LAN Interface > BGP Peer Status** to view status information for all configured VLANs. Alternatively, click on the **VLAN ID** pull-down menu to view status information for a specific VLAN.



VLAN ID	IP Address	AS	BGP Status(Up/Down)
103	192.168.103.22	1003	Up
103	192.168.103.62	1006	Down
203	192.168.203.22	2000	Down
203	192.168.203.62	2000	Up
203	192.168.203.63	2001	Up
203	192.168.203.64	2002	Down
203	192.168.203.65	2000	Up
203	192.168.203.88	2000	Up
203	192.168.203.98	2000	Up
203	192.168.203.96	2000	Up
203	192.168.203.99	2000	Up

Figure 2-7. BGP Peer Status - All VLANs



VLAN ID	IP Address	AS	BGP Status(Up/Down)
203	192.168.203.22	2000	Down
203	192.168.203.62	2000	Up
203	192.168.203.63	2001	Up
203	192.168.203.64	2002	Down
203	192.168.203.65	2000	Up
203	192.168.203.88	2000	Up
203	192.168.203.98	2000	Up
203	192.168.203.96	2000	Up
203	192.168.203.99	2000	Up

Figure 2-8. BGP Peer Status - Specific VLAN

2.2.4 External Equipment

The External Equipment page displays information on the BUC, LNB, and Antenna.

2.2.4.1 External Equipment - Antenna

Figure 2-9. External Equipment - Antenna

2.2.4.2 External Equipment - LNB

Click **Details > External Equipment > LNB** to view the LNB information.

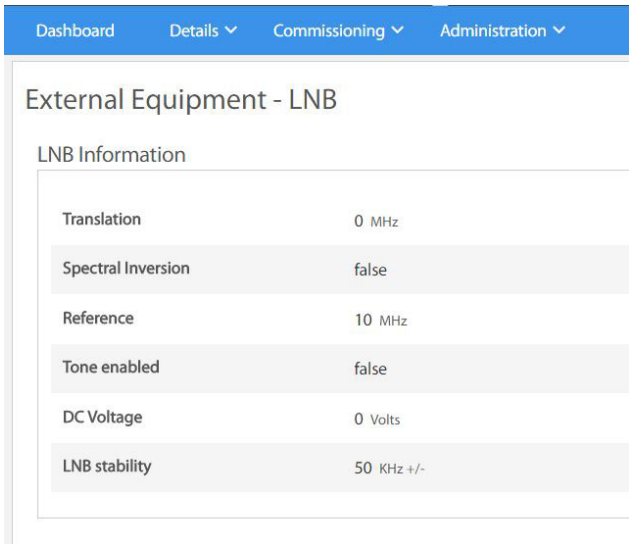


Figure 2-10. External Equipment - LNB

Table 2-6 displays the field descriptions for the LNB.

Table 2-6. LNB Field Descriptions

Menu Item	Sub-menu Item	Sub-menu Item	Description
External Equipment -LNB			
	LNB Information		Displays LNB information.
		Translation	Displays the LNBs LO frequency.
		Spectral Inversion	Displays the value as True or False if enabled in the options file. This is the function of the BUC or LNB where it mirror images the signal that helps in decoding the signal.
		Reference	Displays the LNB's reference clock in MHz.
		Tone enabled	Displays the value as True or False if enabled in the options file. This is the control tone to the LNB.
		DC Voltage	Displays the power output to the LNB in volts.

2.3 Commissioning

This section describes the procedure to bring a terminal into network using the Terminal WUI. Commissioning is the process of preparing a terminal to be able to properly transmit in a network. See Figure 2-11.

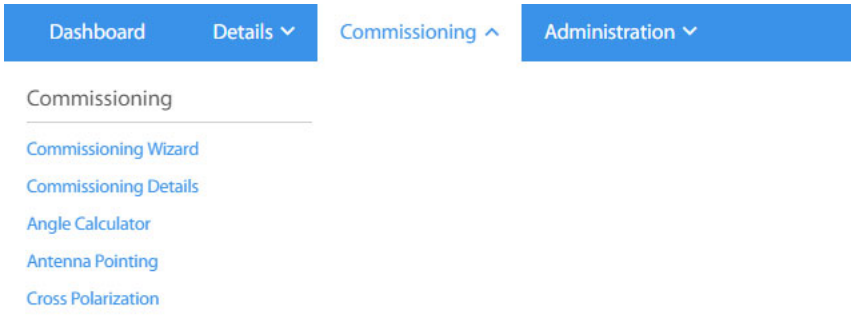


Figure 2-11. Commissioning Menu

2.3.1 Commissioning Wizard

For information on commissioning the terminal using the commissioning wizard, see *Commissioning a Terminal* on page 29.

2.3.2 Commissioning Details

The tab displays the commissioning details of the terminal.

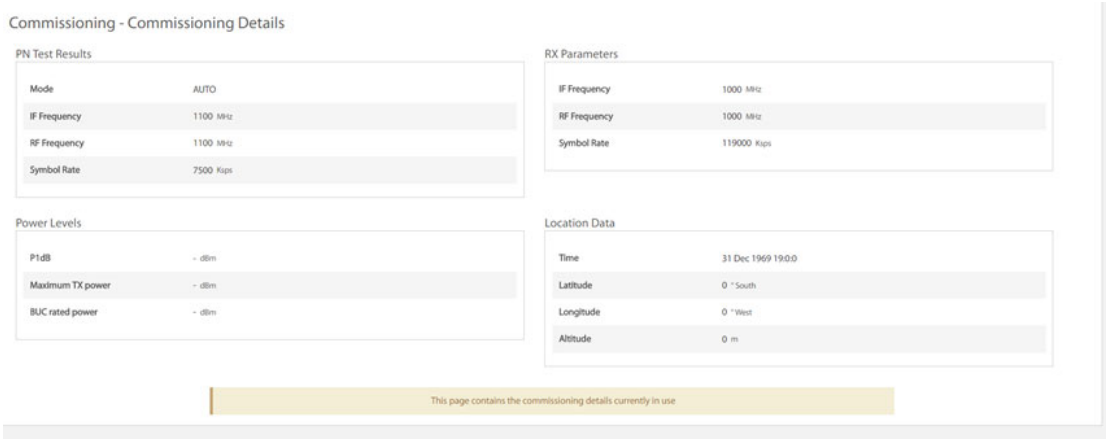


Figure 2-12. Commissioning Details

Table provides the descriptions for the fields in the commissioning details page.

Table 2-7. Commissioning Details

Menu Item	Sub-menu Item	Description
PN Test Results		
	Mode	Displays the mode as Pseudo-random Noise (PN).
	IF Frequency	Displays the IF frequency.
	RF Frequency	Displays the RF frequency.
	Symbol Rate	Displays the symbol rate of the carrier.
Power Levels		
	P1dB	Displays the P1dB level at which the BUC output begins to saturate.
	Maximum TX Power	Displays the maximum allowed transmit power.
	BUC rated power	Displays the BUC rated power.
RX Parameters		
	IF Frequency	Displays the IF frequency.
	RF Frequency	Displays the RF frequency.
	Symbol Rate	Displays the symbol rate of the carrier.
Location Data		
	Time	Displays the time taken to retrieve the longitude and latitude time during commissioning.
	Latitude	Displays the latitude in decimal notation N or S.

Menu Item	Sub-menu Item	Description
	Longitude	Displays the longitude in decimal notation E or W.
	Altitude	Displays the altitude of the terminal.

2.3.3 Angle Calculator

Use this tab to calculate the antenna settings to be used for initial, and manual pointing of the antenna.

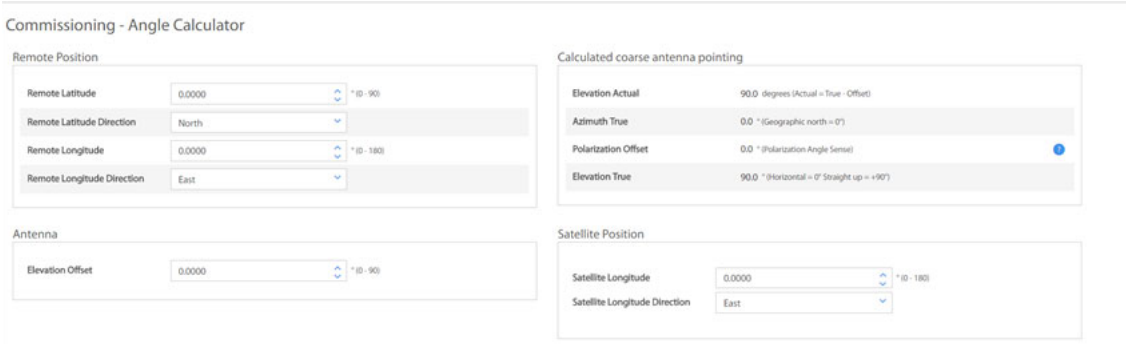


Figure 2-13. Angle Calculator

Table provides the descriptions for the fields in the angle calculator page.

Table 2-8. Angle Calculator

Menu Item	Sub-menu Item	Description
Remote Position		
	Remote Latitude	Displays the latitude of the terminal.
	Remote Latitude Direction	Indicates whether the latitude is in the North or South direction.
	Remote Longitude	Displays the longitude of the terminal.
	Remote Longitude Direction	Indicates whether the longitude is in the North or South direction.
Antenna		
	Elevation Offset	The offset angle of the antenna (that is, the degree to which the mechanical axis of the antenna feed is different from the optical axis).
Calculated coarse antenna pointing		
	Elevation Actual	The calculated elevation of the mechanical axis of the antenna reflector.
	Azimuth True	The calculated true azimuth to the spacecraft, referenced to geographic North (does not include magnetic variation).

Table 2-8. Angle Calculator (continued)

Menu Item	Sub-menu Item	Description
	Polarization Offset	The calculated polarization skew angle.
	Elevation True	The angle to the spacecraft if the antenna had no offset at all. This value is derived from the site geo-coordinates and the spacecraft longitude. It does not include antenna offset.
Satellite Position		
	Satellite Longitude	Displays the longitude of the satellite.
	Satellite Longitude Direction	Displays the satellite longitude direction.

2.3.4 Antenna Pointing

Use this tab to set the parameters needed to receive a downstream that will be used to fine-point the antenna.

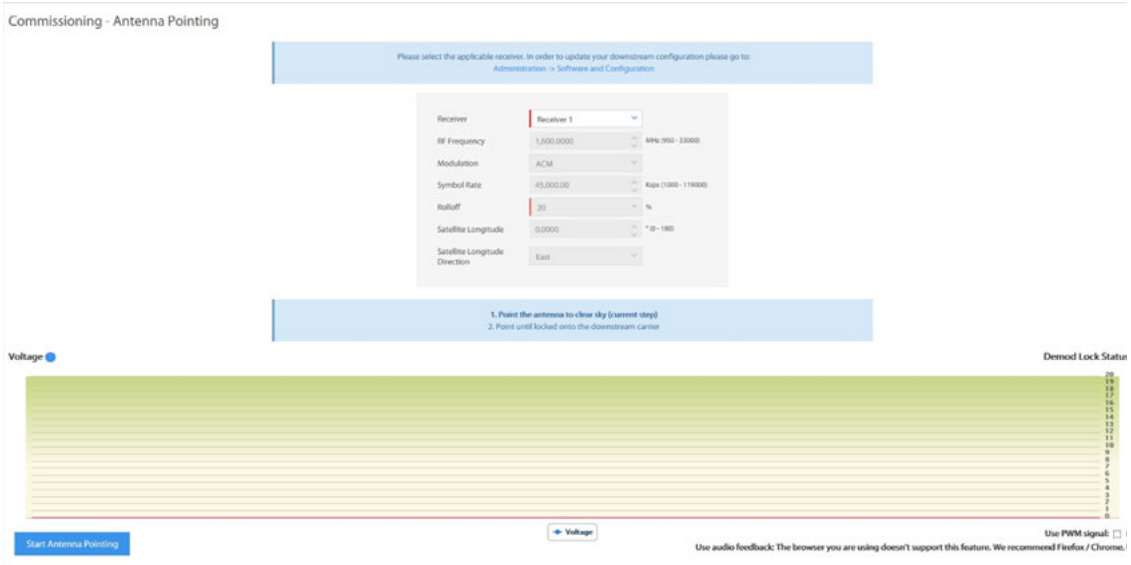


Figure 2-14. Antenna Pointing

Table 2-9 provides the descriptions for the fields in the antenna pointing page.

Table 2-9. Antenna Pointing

Menu Item	Description
Receiver	Displays the receiver type.
RF Frequency	Describes the RF frequency used.
Modulation	Displays the modulation options.
Symbol Rate	Displays the symbol rate selected by the installer.
Roll-Off	Displays the roll-off value.
Satellite Longitude	Displays the longitude of the satellite.
Satellite Longitude Direction	Displays the satellite longitude direction.

2.3.5 Cross Polarization/P1dB

Use this option to control the transmission of a test signal (either a CW or a PN modulated carrier) that can be used to find the P1dB compression point of the BUC or to adjust the polarization alignment and check the separation between the cross polarizations.

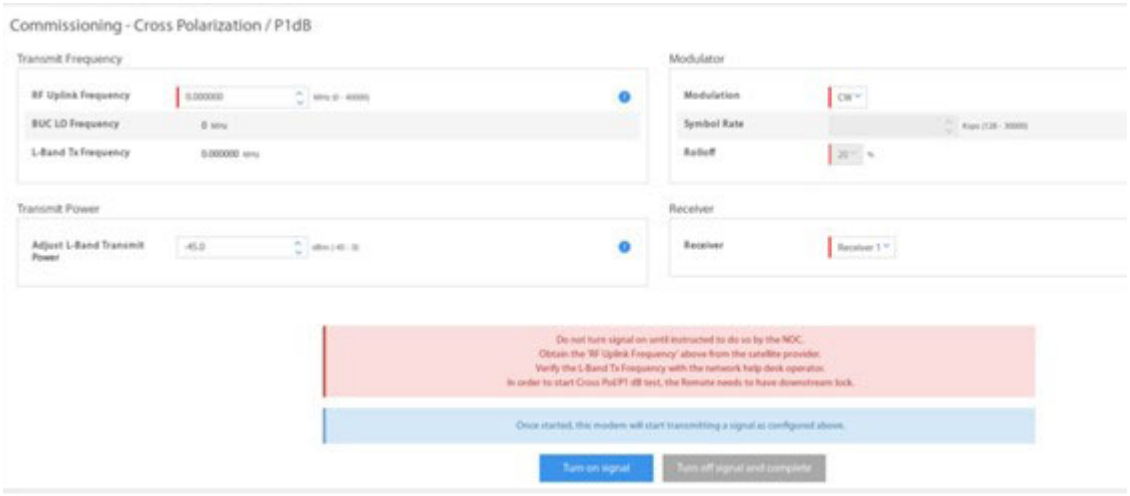


Figure 2-15. Cross Polarization

Table 2-10 describes the fields in the cross polarization page.

Table 2-10. Cross Polarization

Menu Item	Sub-menu Item	Description
Transmit Frequency		

Table 2-10. Cross Polarization (continued)

Menu Item	Sub-menu Item	Description
	RF Uplink Frequency	Displays the Transmit RF Uplink Frequency at which the router would transmit.
	BUC LO Frequency	Displays the BUC LO Frequency that is automatically populated from the terminal option file.
	L-Band Tx Frequency	Displays the L-Band Tx Frequency that is calculated based on the RF uplink frequency and BUC LO frequency.
Transmit Power		
	Adjust L-Band Transmit Power	Displays the power value set by the installer.
Modulator		
	Modulation	Displays the modulation options.
	Symbol Rate	Displays the symbol rate selected by the installer.
	Rolloff	Displays the rolloff factor. The rolloff factor can be 5% or 20% in PN test only.
	Receiver	Displays the receiver type.

2.4 Administration

The Administration page displays the software and configuration information. See Figure 2-16.

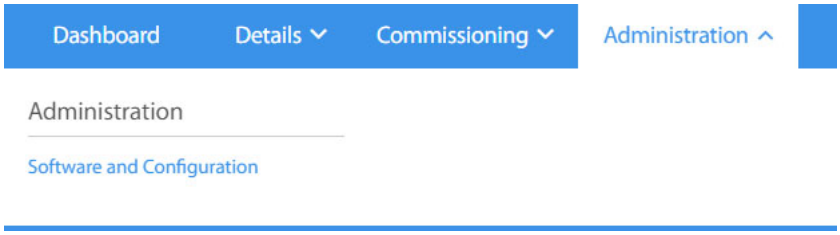


Figure 2-16. Administration Menu

Under the **Administration** tab, only one option, **Software and Configuration**, is available. Use this tab to load the latest software packages or option files.

The **Administration - Software & Configuration** page will display when selecting the **Software and Configuration** option (see Figure 2-17.).

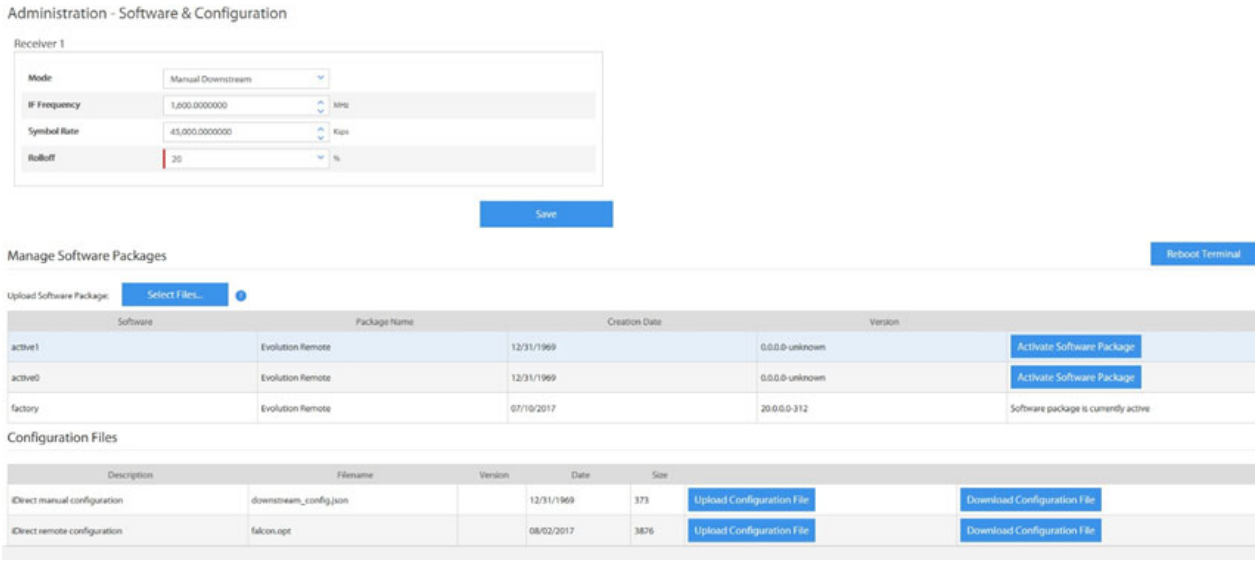


Figure 2-17. Administration - Software & Configuration

2.4.1 Downlink Configuration

The downlink configuration is available on the **Administration - Software & Configuration** page under **Receiver 1** section (see Figure 2-18.)

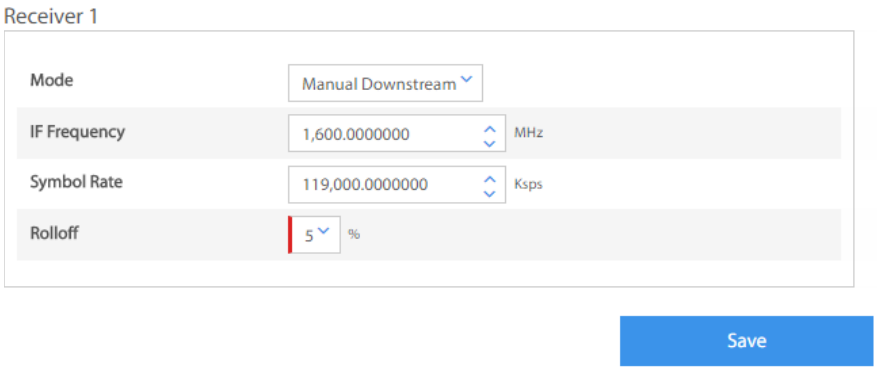


Figure 2-18. Downlink Configuration

Use this section to manually configure the downlink parameters as follows:

- **IF Frequency** — The IF downlink center frequency for the downstream carrier.
- **Symbol Rate** — The rate of downstream carrier in kilo symbols per second (Ksps)
- **Rolloff** — roll-off factor value predefined as: 5%, 10%, and 20%

Once the changes have been made, click **Save** to push the changes to the terminal. Note that, the changes will take effect immediately and only temporary while the terminal remains active. Once the terminal is reset, it will load from the stored options file.

2.4.2 Loading Packages using the Terminal WUI

Use the Terminal WUI to upload the latest software packages. To upload the latest software package, perform the following:

1. On the terminal WUI, click **Administration > Software and Configuration**. The **Administration - Software & Configuration** page is displayed.
2. Under **Manage Software Packages** (see Figure 2-19.), click **Select Files** and browse to the location where the packages are stored on the local system and click **Open**. The upload progress is seen on the right-hand corner. The software package will be uploaded and listed under **Upload Software Package**.

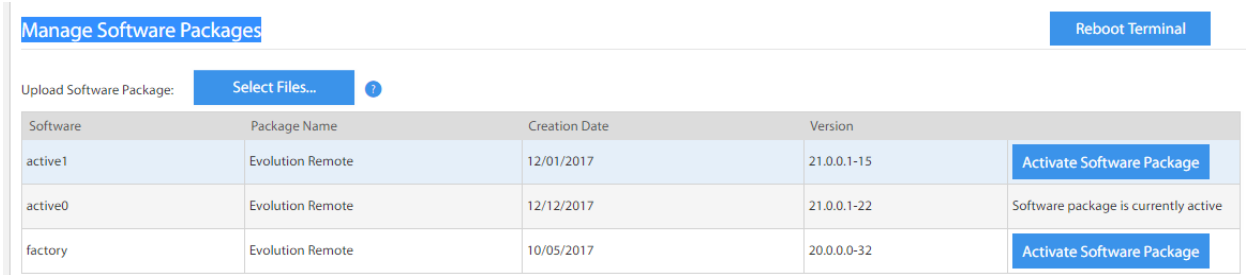


Figure 2-19. Manage Software Packages

   The current Partition number, Type, Description, and Version are displayed.

3. To activate the latest software, click **Activate Software Package** against the required partition.
4. After updating the latest software on the partition, a message to reboot the terminal is displayed. Click **Reboot Terminal** to restart the terminal.

2.4.3 Loading Configuration Files using the Terminal WUI

The configuration files can be uploaded to or downloaded from the terminal under the **Configuration Files** section.

There are two types of configuration files that are being used by the terminal, each with different usage:

- **downstream_config.json** — This file consists of a set of configuration parameters for the downlink (frequency, symbol rate, and roll-off factor). Changes in the **downstream_config.json** are only temporary and take effect immediately after uploading it to the terminal.
- **falcon.opt** — This file consists of a complete set of options for the terminal. The changes made to this option file are applied only after a reboot.

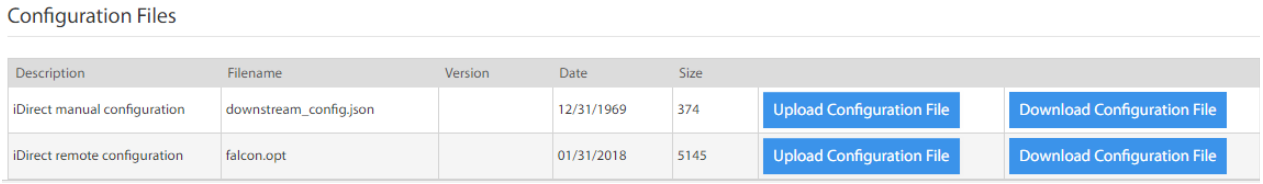


Figure 2-20. Loading Configuration Files

All the configuration files that are currently uploaded are displayed with the Description, Filename, Version, Date, and Size.

2.4.3.1 Loading the downstream_config.json File

To load the downstream_config.json file, perform the following:

1. On the terminal WUI, click **Administration → Software and Configuration**. The **Administration - Software & Configuration** page is displayed. See Figure 2-20.
2. Under **Configuration Files - iDirect manual configuration**, click **Download Configuration File** to download the existing configuration file or **Upload Configuration File** to upload a new configuration file from the local server.

   After uploading the downstream_config.json file, the changes (based on the values set in the file) will take effect immediately without having to reboot the terminal.

   CAUTION: **DO NOT** restart the terminal after uploading the latest **downstream_config.json** file. Rebooting the terminal will cause the terminal to lose the downstream configuration updates in the **downstream_config.json** file because it will boot up using the current **falcon.opt** file.

2.4.3.2 Loading the Options File

To load the falcon.opt options file, perform the following:

1. On the terminal WUI, click **Administration > Software and Configuration**. The **Administration - Software & Configuration** page is displayed. See Figure 2-20.
2. Under **Configuration Files**, click **Download Configuration File** to download the existing configuration file and click **Upload Configuration File** to upload a new configuration file from your system.

After uploading the latest **falcon.opt** on the partition, the terminal must be restarted for the changes to take place. Click **Reboot Terminal** to restart the terminal.

NOTE: The terminal must be restarted so that it will boot up with the latest falcon.opt file.

2.5 COTP (Comm-On-The-Pause)

NOTE: COTP tab is only available for the iQ Series satellite routers.

The COTP is a new feature introduced in iDX Release 4.1.1 and available only for the iQ Series satellite routers. This feature allows a VSAT user to move a terminal to a new location by simply entering the new location information and re-pointing the antenna.

The COTP page provides the Set Remote Location function. See Figure 2-21.

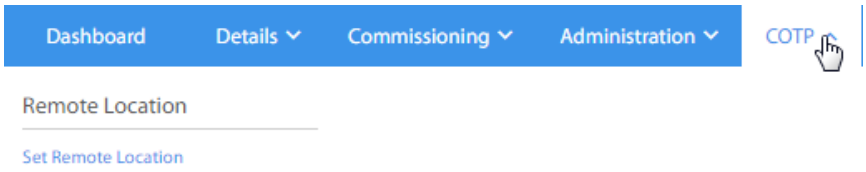


Figure 2-21. COTP Menu

Under the **COTP** tab, only one option, **Set Remote Location**, is available. Use this tab to set the remote location in COTP mode.

The **Set Remote Location** page will display when selecting the **Set Remote Location** option (see Figure 2-17.).

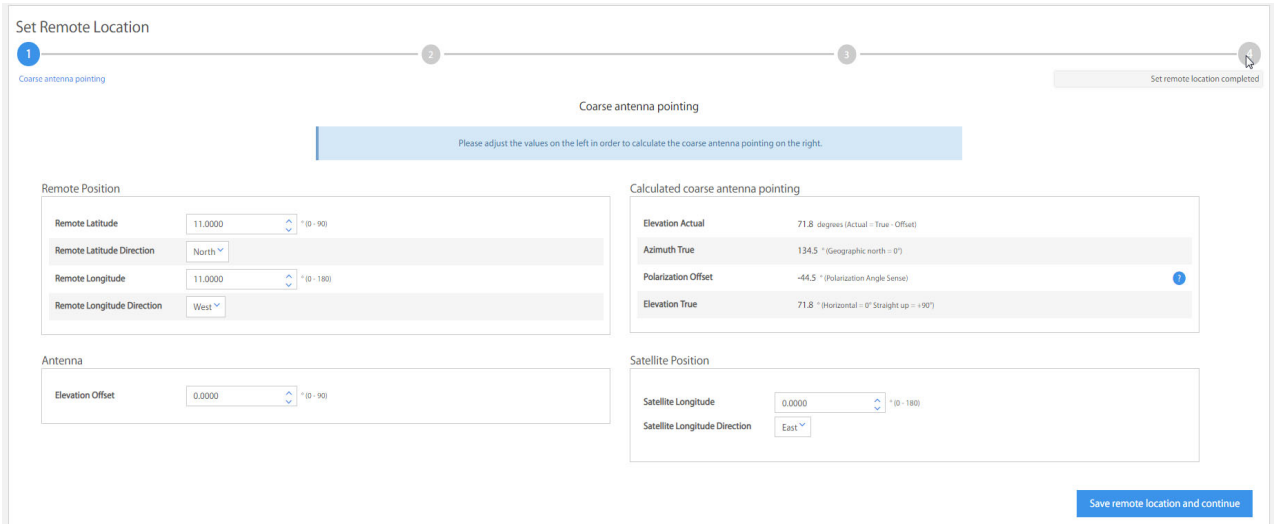


Figure 2-22. COTP - Set Remote Location

2.5.1 Using the Terminal WUI

On the terminal WUI, click **COTP > Set Remote Location**. On the **Coarse Antenna Pointing** page (Figure 2-22). Update the **Remote Position** section based on the current location of the satellite terminal. Click **Save Remote Location and Continue.**

On the **Configure Downstream** page (Figure 2-23), ensure the frequency and other parameters are correct. Click **Continue**. To change the frequency or any other parameter, click **Administration > Software and Configuration**.

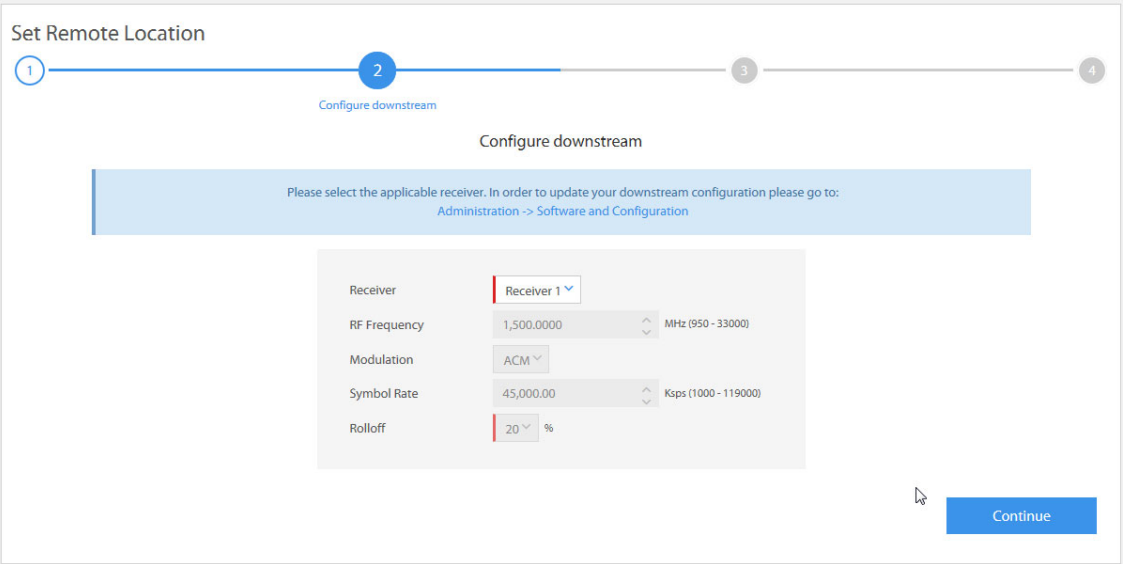


Figure 2-23. Set Remote Location - Configure Downstream

NOTE: Before pointing the antenna to the satellite, ensure the highlighted step in the **Fine Antenna Pointing** page is followed. Always point the antenna to clear sky first and mark the measurement.

On the **Fine Antenna Pointing** page (Figure 2-24), physically position the antenna to point to the satellite.

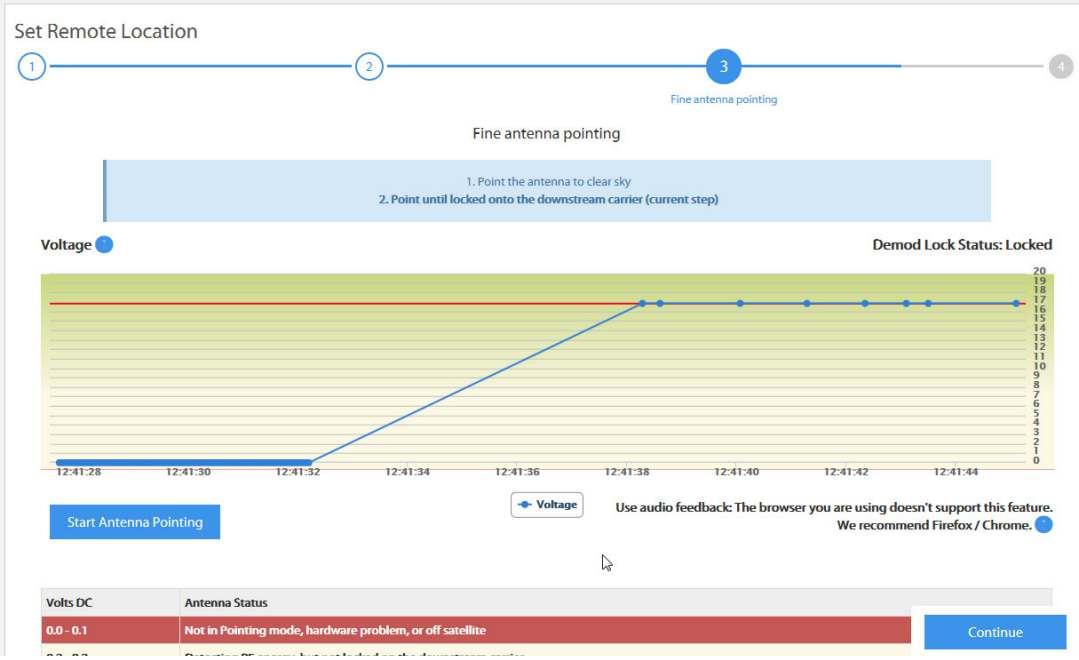


Figure 2-24. Antenna Pointing

Point the antenna (satellite dish) towards the clear sky. Click **Start Antenna Pointing** to initialize the graphing of the received signal. Physically start rotating/moving the antenna towards the direction of the satellite (as calculated in the coarse pointing page). The graph starts to display an increase in received signal. Direct the antenna to the direction where the graph displays the highest voltage.

When the **Demod Lock Status** displays **Locked,** click **Continue**.

Set Remote Location for COTP is now completed (Figure 2-25), click **Return to dashboard** to go back to the main dashboard.

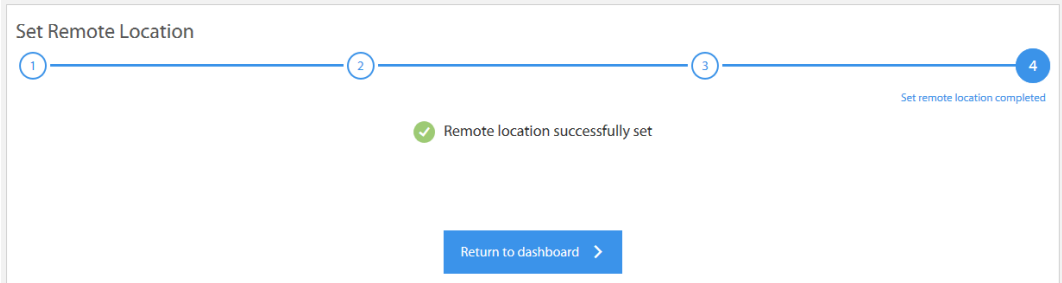


Figure 2-25. COTP - Set Remote Location Completion

3 Commissioning a Terminal

This chapter describes how to commission a satellite router. Commissioning is the process of preparing a satellite router to be able to properly transmit in a network.

This chapter includes the following sections:

3.1 Introduction

Commissioning is the process of preparing a terminal to be able to properly transmit in a network.

NOTE: For commissioning a remote with manual antenna, see *Manual Antenna Pointing (without OpenAMIP)* on page 31. For commissioning a remote with automatic antennas, see *Cross-Polarization* on page 36.

NOTE: PWM is not supported for the iQ Series satellite routers.

To commission a remote using the Terminal WUI, click **Commissioning > Commissioning Wizard**. See Figure 3-1.

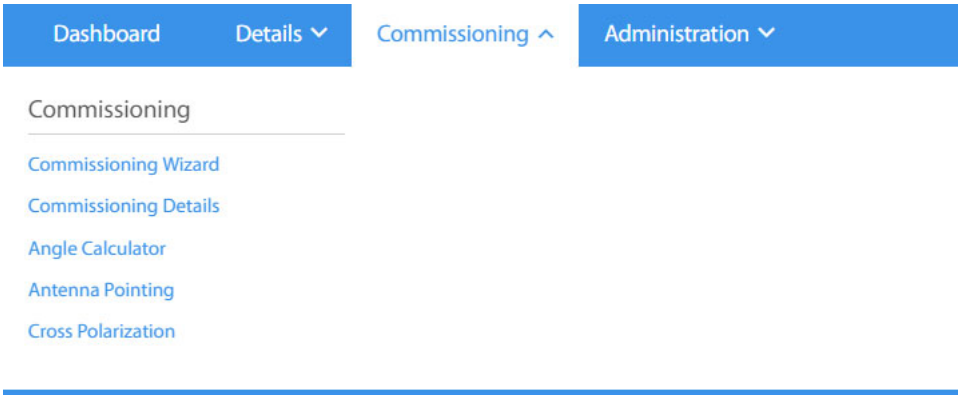


Figure 3-1. Commissioning Menu

Once the user clicks the Commissioning Wizard, the commissioning procedure starts with the following page:

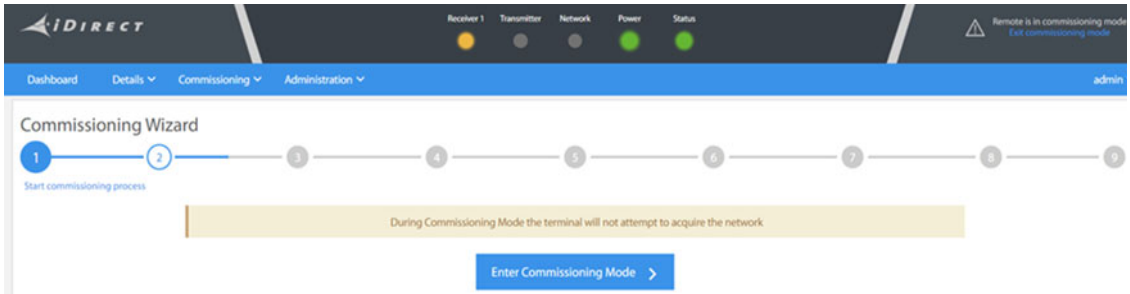


Figure 3-2. Commissioning Wizard

3.2 Software Upgrade

See *Administration - Software & Configuration* on page 23 and *Loading Configuration Files using the Terminal WUI* on page 24.

3.3 Manual Antenna Pointing (without OpenAMIP)

Follow the procedures in this section only if a remote is being commissioned with a manual antenna.

3.3.1 Selecting a Site

A comprehensive site survey is beyond the scope of this guide. However, keep the following general guidelines in mind when selecting the site:

- Select a level surface that is approximately 10 feet by 10 feet.
- Avoid proximity to other transmitters.
- Avoid exposing others to incident radiation.
- Verify a clear line-of-sight to the satellite.
- Consider availability of electrical power and routing of cables (power, IFL, LAN).
- Verify that the coaxial IF cables (Tx, Rx) can reach the Satellite Router from the selected antenna location. RG-6 cable may be used up to a distance of 250 feet. If the run is longer, RG-11 cable must be used up to a maximum distance of 500 feet.
- Ensure that cables do not cross roads or foot-traffic areas.

3.3.2 Assembly

Assemble the antenna and mount by following the manufacturer's assembly instructions. After installation, ensure that:

- The antenna base is fixed on a stable surface that will not shift.
- Ballast is installed on the antenna base (to combat wind).
- The mast pipe is plumb.

3.3.3 Orientation

The following section describes antenna orientation principles generally applicable to all site installations, illustrated with a typical VSAT antenna configuration. Magnetic variation and elevation offset principles are discussed in detail.

NOTE: The antenna may not be identical to the antenna used in this example. See the antenna manufacturer's instructions for specific information.

3.3.4 Magnetic Variation

Magnetic variation (also referred to as “declination”) is the difference between the true heading referenced to the geographic North Pole, and the magnetic heading as registered on a magnetic compass. The magnitude and direction of magnetic variation differs depending upon the geographic location. Magnetic variation changes slowly with time.

Figure 3-3 illustrates magnetic variation in the United States. More detailed, up-to-date maps are available on the Internet, and must be consulted for the latest data.

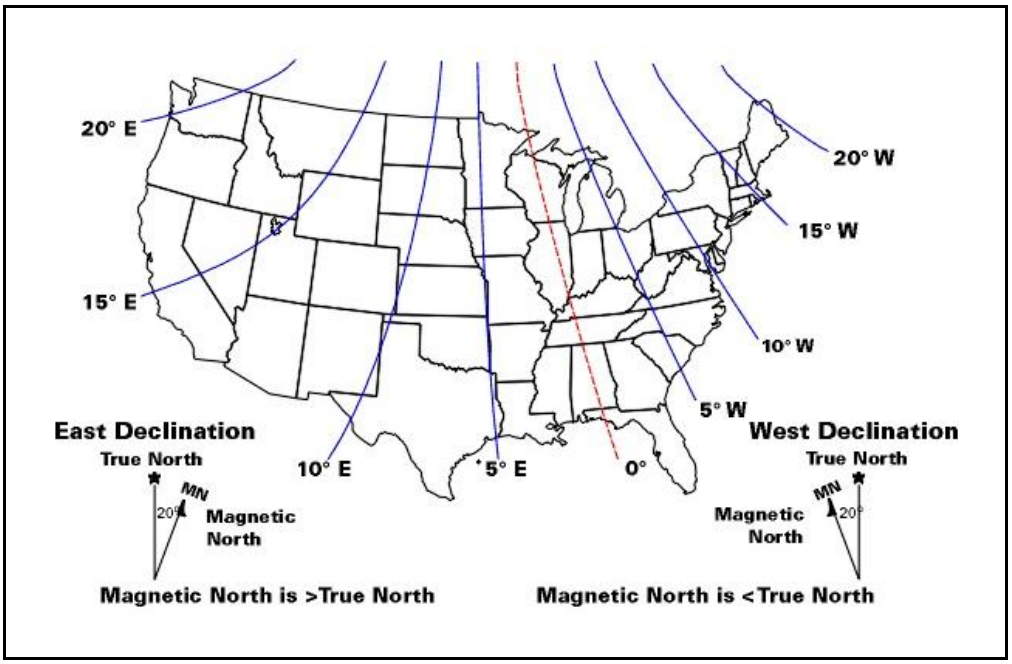


Figure 3-3. Example: Magnetic Declination

Magnetic variation alters the reading of a magnetic compass with respect to true North. Maps and map display systems, including the output of the iDirect **Look Angle Calculator**, are referenced to true geographic North. Therefore a correction factor must be applied to readings taken by a magnetic compass to obtain the correct value, referred to as the true heading.

Magnetic variation is specified in degrees East or West of the *agonic line* (line of zero variation), shown as a red dotted line in Figure 3-3. As depicted in the figure, East declination causes the compass to be deflected to the right of the true heading, while West declination causes the compass needle to deflect to the left of the true heading. Consequently, add West declination, and subtract East declination, from the compass reading to obtain the true heading.

For example, the illustration depicts the 10° West isogonic line passing through Baltimore, MD. In that location, 10 degrees must be added to the compass indication to obtain the true heading.

3.3.5 Sighting Antenna Azimuth

When sighting the antenna to determine azimuth, it is important to consider the effect of large metal objects nearby, which could influence the compass measurement.

Measure from behind the antenna, looking in the direction of the feed horn. Walk around behind the antenna and watch the compass to determine if the field is uniform or if anomalies exist.

Use an object in the far background as a target to align the compass. Sight along a line perpendicular to the plane of the reflector. The back plate of the reflector assembly can serve as a reference.

Add or subtract the declination in your location to the compass reading. This is the true heading of the antenna. When aligning the antenna to the value determined by the **Look Angle Calculator**, mark the position with a line drawn across the lower section of the azimuth mount and the pole using an indelible marker.

3.3.6 Elevation Offset

An offset antenna has the virtue of unobstructed antenna aperture, especially beneficial for VSAT terminals. Reflector optics are modified from a parabola, allowing the feed to be placed off the mechanical axis. The resulting beam (optical) axis is offset by an angle equal to the angle between the feed and the mechanical axis. See Figure 3-4.

A typical 1.8 meter antenna has a 22.6° offset, while a typical 1.2 meter antenna has a 17° offset. For example, the antenna reflector elevation required to achieve a beam angle of 50° relative to the horizon is calculated as follows for a 1.8 meter antenna:

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

The reflector back plate is perpendicular to the mechanical axis of the antenna. When the back plate is vertical (90°), the beam elevation is 22.6°. To move the beam axis to the desired 50° elevation angle as in the example above, the antenna back plate is elevated from 90° to 117.4° (90 + 27.4) or, depending on the type of inclinometer used, a reading of 62.6° (90 - 27.4).

Always refer the original equipment manufacturer's (OEM) installation instructions when installing the antenna and mount. Consult the OEM specifications to determine the offset angle for the particular antenna being installed.

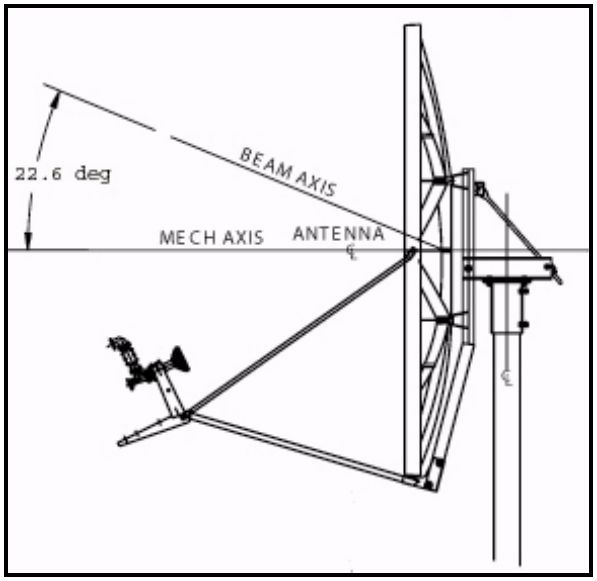


Figure 3-4. Antenna Elevation Offset

3.3.7 Using the Terminal WUI

On the terminal WUI, click **Commissioning > Commissioning Wizard.** On the **Coarse Antenna Pointing** page (Figure 3-5), read the values on the right-hand side of the page and use those values to physically point the antenna. Click **Save Remote Location and Continue.**

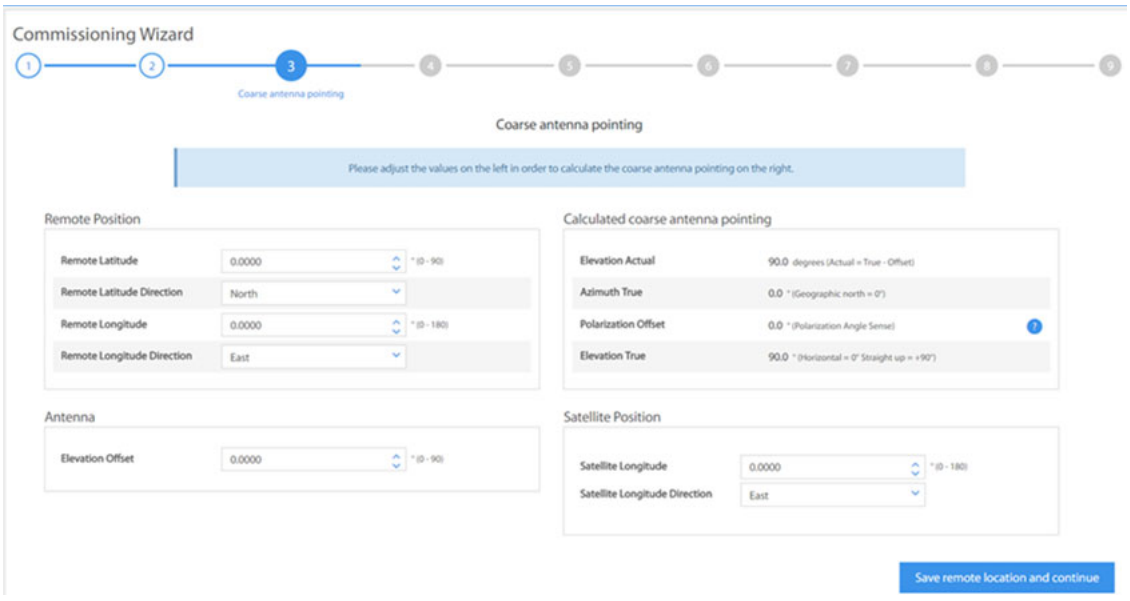


Figure 3-5. Antenna Pointing

On the **Configure Downstream** page (Figure 3-6), ensure the frequency and other parameters are correct. Click **Continue**. To change the frequency or any other parameter, click **Administration > Software and Configuration**.

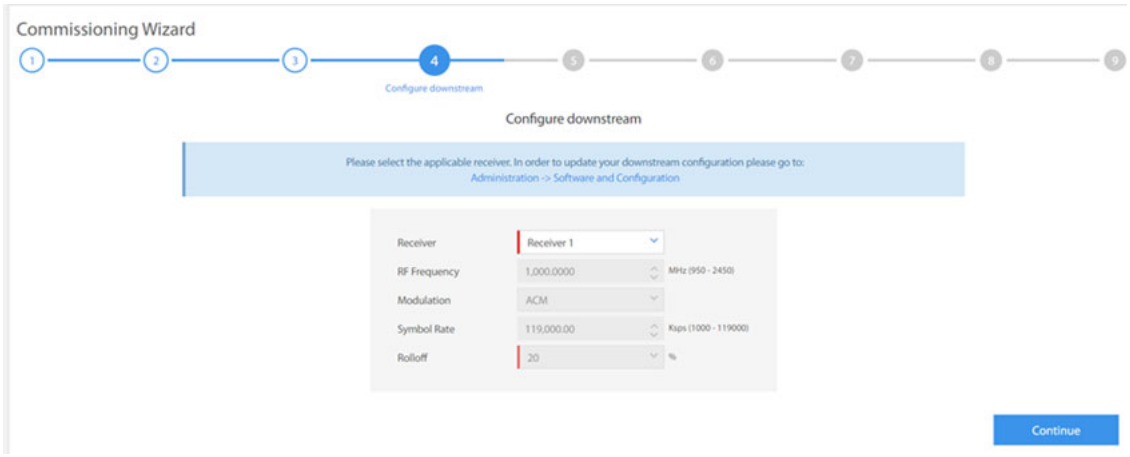


Figure 3-6. Configure Downstream

NOTE: Before pointing the antenna to the satellite, ensure the highlighted step in the **Fine Antenna Pointing** page is followed. Always point the antenna to clear sky first and mark the measurement.

On the **Fine Antenna Pointing** page (Figure 3-7), physically position the antenna to point to the satellite.

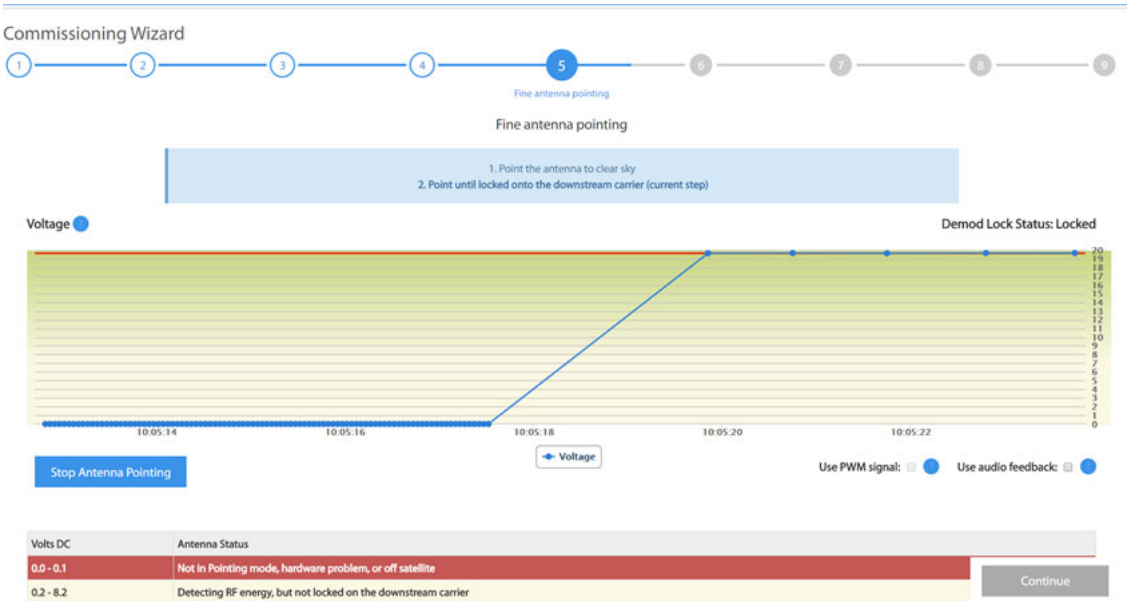


Figure 3-7. Antenna Pointing

Point the antenna (satellite dish) towards the clear sky. Click **Start Antenna Pointing** to initialize the graphing of the received signal. Physically start rotating/moving the antenna towards the direction of the satellite (as calculated in the coarse pointing page). The graph starts to display an increase in received signal. Direct the antenna to the direction where the graph displays the highest voltage.

When the **Demod Lock Status** displays **Locked,** click **Continue**.

3.4 Cross-Polarization

This section describes how to minimize return link cross-pol energy under the guidance of the satellite access control center.

3.4.1 Overview

Cross-pol isolation is measured over-the-air by the satellite access control center. Be prepared to contact the Network Operator by telephone.

Transmit cross-pol isolation is maximized in order to limit interference to users on the opposite polarity of linearly-polarized satellite transponders. Typically, the spacecraft operator requires a minimum of 30 dB of isolation. To measure this, the terminal must transmit at a power level at least 30 dB above the noise floor of the transponder. The satellite access control center measures and compares the received co-pol and cross-pol energy to determine if the site meets polarity isolation standards.

VSAT terminals using circularly-polarized feed systems need not perform cross-pol tests.

To Prepare for Cross-Pol Adjustment:

1. Disconnect power from the Satellite Router.
2. Disconnect the receive IF cable from the Satellite Router.
3. Connect the transmit IF cable to the BUC Tx input.
4. Connect power to the Satellite Router.
5. Connect to the satellite router's web user interface using a Web browser.
6. Log in as **Admin** and click **Commissioning** > **Cross Polarization/P1dB**. See Figure 3-8.

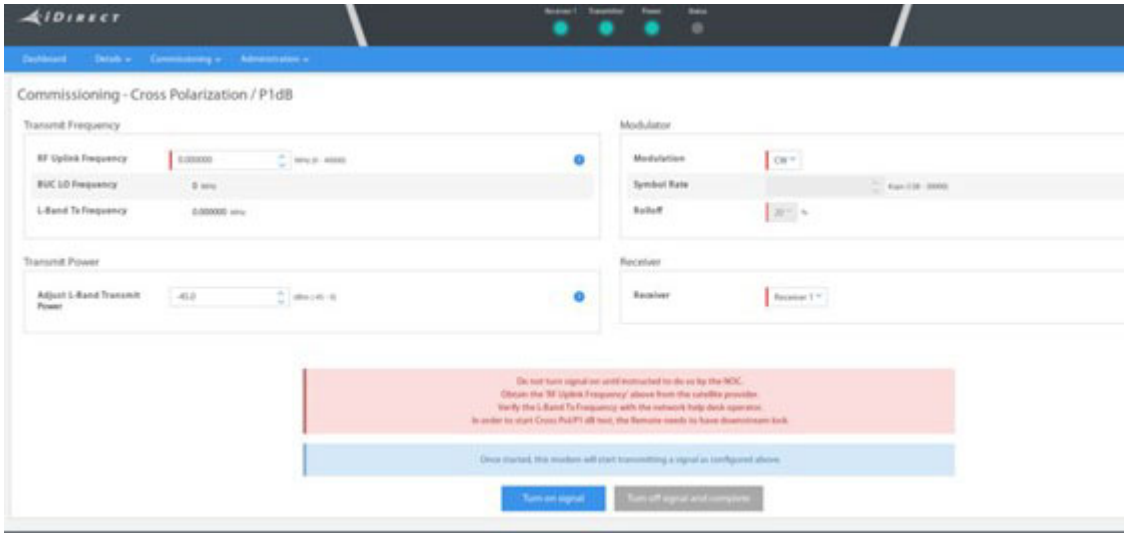


Figure 3-8. Terminal WUI Cross Polarization Page

3.4.2 Satellite Access

WARNING: Do not click the **Turn on Signal** until instructed to do so by the satellite access control center. Clicking the **Turn on Signal** causes the Satellite Router to transmit a continuous-wave (CW) signal to the satellite.

While still connected to the Satellite Router, call the Network Operator. The Network Operator will establish a conference call with the satellite access control center. The access controller will assign an uplink frequency for performing the cross-pol isolation adjustment. For a Satellite Router that transmits an SCPC return channel, the assigned test frequency may be the same as the final operating frequency. For TDMA terminals, cross-pol must be measured at a test frequency different from the traffic-carrying channel.

Preparation

Follow the steps below to prepare for satellite access and cross-pol adjustment:

To Prepare for Satellite Access:

1. Loosen the fasteners securing the feed, as well as the hose clamp on the BUC, so that the entire assembly (feed, BUC, and LNB) rotates freely.
2. Provide the final antenna pointing voltage reading to the Network Operator. The Network Operator records the value.
3. Obtain the test frequency from the satellite access controller.

4. Under **Commissioning** > **Cross Polarization/P1dB**, under **RF Uplink Frequency** (Figure 3-8) enter the test frequency.

NOTE: The BUC LO Frequency is read from the options file loaded on the Satellite Router. Using the RF Uplink Frequency and BUC LO Frequency, the L-band TX Frequency is calculated automatically.

5. Verify with the Network Operator that the displayed **L-band TX Frequency** is correct.
6. In **Adjust Transmit Power**, set power to **-35 dBm**.

3.4.3 Performing Cross-Pol Adjustment

During adjustment of the antenna feed, the satellite access controller observes the transmitted signal on a spectrum analyzer, switching from co-pol to cross-pol to compare levels. The controller will ask for power to be increased until sufficient energy is available to detect the cross-pol signal. At that time a polarity adjustment is made. The controller may ask for more changes in transmit power and additional polarity adjustments as needed until the required level of isolation is achieved.

The access controller will not specify a transmit power in absolute terms, such as -35 dBm or -20 dBm. Instead, the controller will ask for power increases or decreases in relative terms, such as a 1 dB increase, or a 2 dB decrease. Perform the following procedure when instructed by the access controller.

To Start the CW Carrier and Adjust TX Polarity Isolation:

1. On the Terminal WUI, click **Turn On Signal** (Figure 3-8).
2. In the terminal WUI, adjust the transmit power as instructed by the access controller by selecting the appropriate power value in the **Transmit Power** section of the Cross Polarization screen. (See Figure 3-8)
3. At the instruction of the access controller, rotate the feed slowly in one direction. Move the assembly in small (1/2°) increments.
4. Wait for the access controller to make a measurement. The access controller may say to continue moving the feed in the same direction, or to reverse direction. Continue as directed until the required isolation is achieved.
5. Secure all fasteners and the hose clamp.

It may be necessary to re-peak azimuth and elevation in order to achieve sufficient cross-pol isolation. The access controller may ask for fine adjustments in azimuth or elevation before repeating the cross-pol adjustment. Follow the directions of the access controller. Securely fasten all antenna axes after peaking and isolation have been optimized.

3.4.4 After Securing the Antenna

Wait for the access controller to verify that cross-pol isolation and peaking did not change due to tightening of the antenna axis fixing hardware. Confirm that the Network Operator has recorded the final cross-pol isolation value.

When directed to modulate the test carrier, perform the following:

1. Using the Terminal WUI, on the **Cross Polarization/P1dB** page (see Figure 3-8):
   a. In the **Modulation** field of the **Modulator** section, select **BPSK**.
   b. Enter the **Symbol Rate** as directed.
   c. Click **Turn On Signal**.

3.4.5 Establish 1dB Compression Point and Maximum Power

This section describes how to determine the IF drive level that causes 1dB gain compression of the Block Up-Converter (BUC). This IF level is the “never exceed” level for driving the particular BUC used.

Preparation

Determination of the 1dB compression point (P1dB) is made immediately following successful cross-pol adjustment. The Satellite Router is transmitting a high-level continuous-wave (CW) signal to the satellite, and the respective **Cross Polarization** windows are open on the local PC user interface. Under direction of the satellite access control center, the Satellite Router transmit IF level is increased until BUC gain compression is detected.

To determine the 1dB compression point, the access controller must carefully measure incremental power changes at a high resolution. It may be necessary to perform the procedure more than once to be certain that the 1dB compression point is properly identified. Follow the direction of the access controller.

The 1dB compression point is defined as the output power level at which BUC amplifier gain has decreased by 1dB from the small-signal value. If, for example, a particular amplifier exhibits a low-power gain of 40dB, the P1dB point is the output power level at which gain has been reduced to 39dB. See Figure 3-9 for an illustration of the concept using sample data representing a typical solid-state amplifier.

Although the P1dB point is located beyond the start of gain compression and is therefore in the non-linear region of the transfer characteristic, most BUCs can operate safely at that power level without exceeding the limits imposed by the transmit spectral mask. Many current BUCs are able to maintain acceptable Adjacent Channel Power Ratios (ACPR) while operating within a dB or less of maximum rated power.

Network designers consult manufacturer data sheets to determine the operating point and headroom requirements of individual amplifiers. The considerations are incorporated into link budget and site provisioning calculations. The purpose of P1dB determination in the iDirect system is to set a maximum IF transmit power limit for each site.

Pin	Pout	Pout Increase	Delta	Gain	
-14	26	1	0	40	Linear Region
-13	27	1	0	40	
-12	28	1	0	40	
-11	29	1	0	40	
-10	30	1	0	40	
-9	31	1	0	40	
-8	32	1	0	40	
-7	32.9	0.9	0.1	39.9	
-6	33.7	0.8	0.2	39.7	
-5	34.4	0.7	0.3	39.4	
-4	35	0.6	0.4	39	Sum of deltas = 1
-3	35.5	0.5	0.5	38.5	
-2	35.9	0.4	0.6	37.9	
-1	36.2	0.3	0.7	37.2	
0	36.4	0.2	0.8	36.4	
1	36.5	0.1	0.9	35.5	
2	36.5	0	1	34.5	
3	36.5	0	1	33.5	

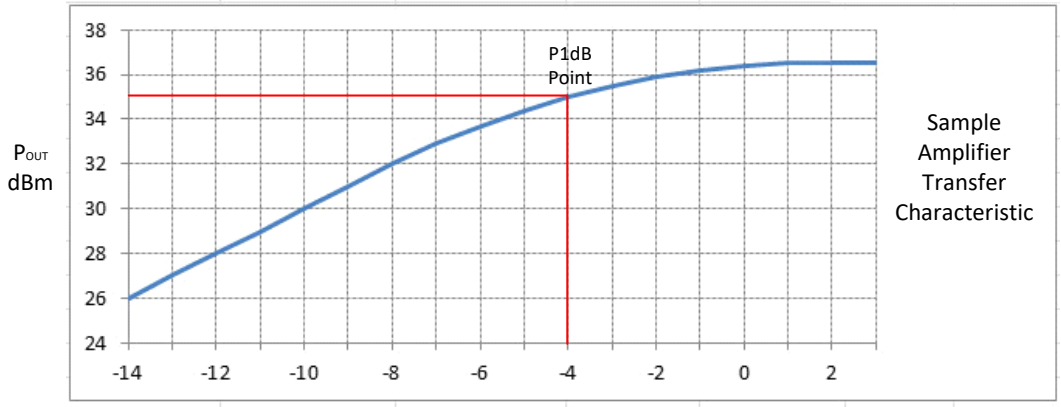


Figure 3-9. Sample Transfer Characteristic

Determine 1dB Compression Point

Perform the 1dB Compression Point test using the same CW carrier used during the cross polarization test. This test determines the point at which Satellite Router transmit power, saturates the BUC.

Using Terminal WUI to perform this procedure in the **Transmit Power** section of the Cross Polarization page, see Figure 3-10.

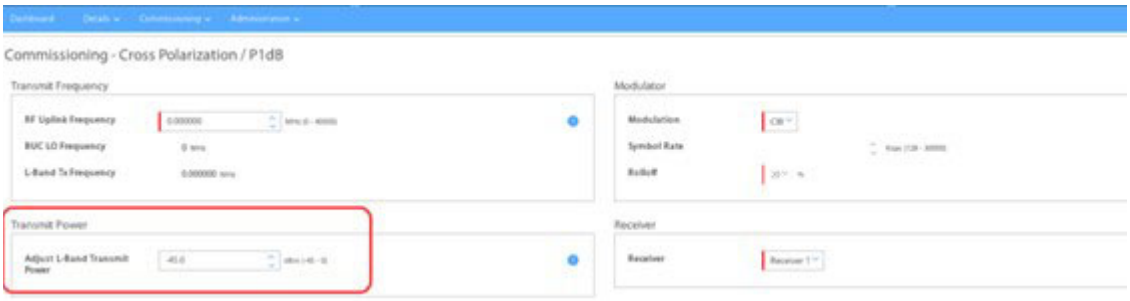


Figure 3-10. Adjust Transmit Power

WARNING: To avoid over driving the satellite, the BUC and antenna must be sized correctly for the network.

To determine the 1dB Compression Point, perform the following:

1. With the access controller observing the transmitted CW signal, increase the **Transmit Power** in Terminal WUI by 1dBm.

   WARNING: If no power increase is observed, the BUC be saturated; this is unusual, ***but*** it can occur. Reduce power and re-attempt.

2. If a 1dB increase in power is observed, increase the **Transmit Power** by another 1dBm.
3. Repeat Step 2 until the observed power increase is less than 1dB.
4. Subtract the observed power increase from 1. For example, if power increased by 0.8dB, the difference is 0.2dB. Record the difference as “delta.”
5. Increase the **Transmit Power** by 1dBm. Confirm that the observed power increase is again less than 1dB from the previous value. Add the difference from 1 to the delta recorded in Step 4.
6. Repeat Step 5 until the sum of all differences (delta) is equal to 1.
7. Record the **Transmit Power** setting of the Satellite Router at the point at which delta equals 1. This is the 1dB compression point. The Network Operator will enter this value later as the Maximum Power for the remote site in iBuilder.

8. Click the **Stop** button in iSite or Web iSite to turn off the CW carrier.

NOTE: Do not restart or remove power from the Satellite Router.

The 1dB compression point has now been established, please proceed to *Acquire the Network* on page 43.

3.4.6 Using the Terminal WUI

On the Terminal WUI, click **Commissioning** > **Commissioning Wizard**. On the **Cross Polarization test** page (see Figure 3-11), under **CW Transmit Frequency**, enter the **RF Uplink Frequency**. The **BUC LO** and **L-Band Tx Frequency** are automatically displayed.

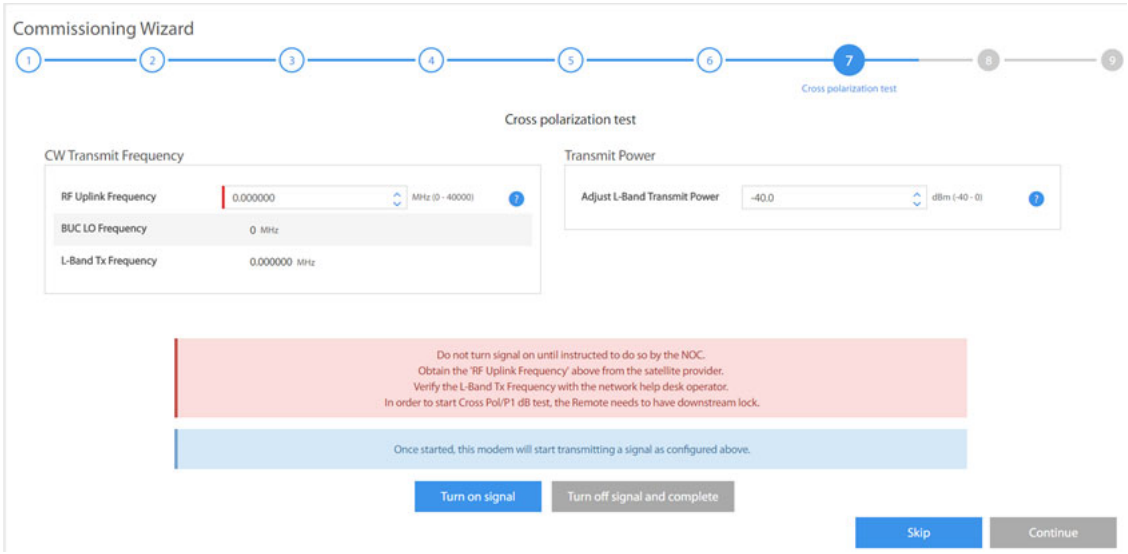


Figure 3-11. Cross Polarization test

NOTE: The satellite provider should provide the RF Uplink Frequency and the NOC operator should provide the Adjust L-Band Transmit Power.

Under **Transmit Power**, select the **Adjust L-Band Transmit Power** from the drop-down box.

Click **Turn on Signal** once the RF Uplink Frequency and Adjust L-Band Transmit Power are entered. The router starts transmitting CW (continuous waves) at the specified frequency and transmit power.

The user can increase or decrease the frequency and transmit power. Once the CW is transmitted accurately at the desired level, click **Turn off signal and Complete** to stop transmitting CW.

Click **Continue**. The **Exit Commissioning Mode** page is displayed.

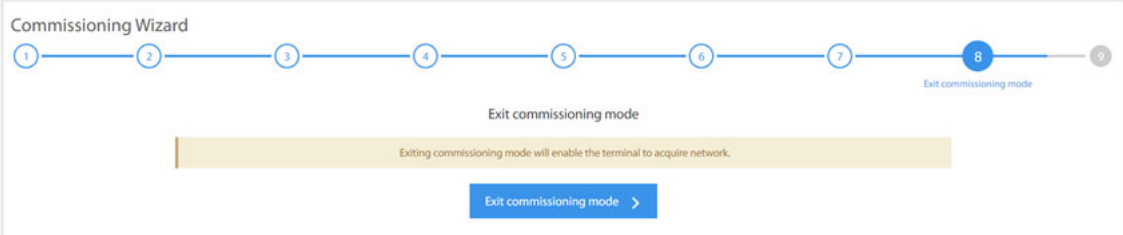


Figure 3-12. Exit Commissioning Mode

Click **Exit Commissioning Mode** to complete commissioning the terminal.

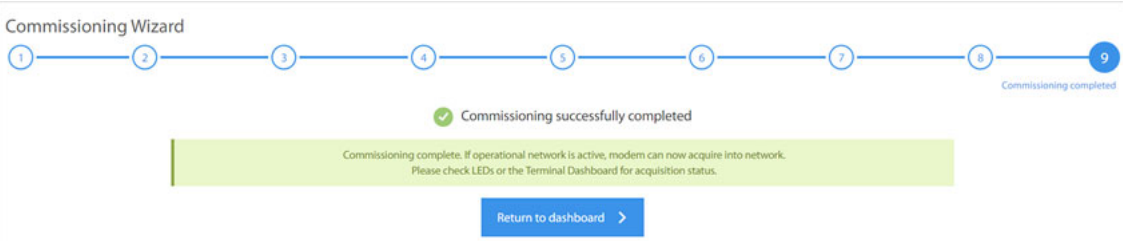


Figure 3-13. Commissioning Complete

3.5 Acquire the Network

This section describes initial acquisition of the Satellite Router into the network.

3.5.1 Overview

After executing a restart, the Satellite Router performs a power-on self-test (POST) and acquires the network. Restarting causes the Satellite Router to conform to the operational state defined in the options file, including transmit frequency and initial power settings.

Upon completion of POST, the Satellite Router tunes to and locks on the downstream carrier, which contains an invitation to join the network in the form of acquisition slot assignments on the upstream carriers. The Satellite Router transmits one or more acquisition bursts to facilitate synchronization and allow the Satellite Router to join the network and begin transmitting traffic bursts.

The first acquisition bursts from a newly-commissioned site are transmitted at the power level specified in the options file. This “first burst” power level is determined by the Network Operator when configuring the site in iBuilder.

The initial acquisition or “first burst” power may or may not be sufficient for reliable acquisition. iDirect recommends that the initial power in the commissioning options file be set at a low value (for example, -35dBm) to ensure that the satellite router does not cause interference on the transponder when transmitting its first acquisition bursts.

After the Satellite Router has been acquired into the network for the first time, the Network Operator must set two power parameters in iBuilder: the maximum site power, and the power to be used for future acquisition bursts, referred to as the initial transmit power. The procedures for setting these parameters are contained in *Set Power* on page 47.

NOTE: The initial transmit power must be determined under clear sky conditions.

3.5.2 Initial Acquisition

Following establishment of the P1dB Compression point, the Satellite Router is powered on and the receive IF cable is disconnected. Perform the following procedures under clear sky conditions to acquire the network for the first time.

NOTE: In a TRANSEC network, the network operator must disable authentication for the Satellite Router on the iBuilder Remote Information tab and apply a hub-side configuration. See “Using the iDirect CA Foundry” in the iBuilder User Guide.

To Prepare to Acquire the Network:

1. Remove power from the Satellite Router.
2. Reconnect the receive IF cable from the LNB to the **RX In** port.
3. Reconnect power to the Satellite Router.
4. Monitor the Satellite Router LEDs to observe progress and confirm the Satellite Router receiver has locked to the outbound carrier.

Depending on the initial power setting in the options file, the Satellite Router may or may not join the network. In either case, the Network Operator should complete the following steps to bring the Satellite Router into the network (if necessary) and to determine the clear sky operating power of Satellite Router. During this procedure, the local installer should monitor the Satellite Router acquisition status as the Network Operator adjusts power.

To Acquire the Network and Determine the Clear Sky Transmit Power:

1. Log in to iMonitor.
2. In the iMonitor Tree, expand the Inroute Group containing this Satellite Router.
3. Right-click the Satellite Router in the iMonitor Tree and select **Probe** from the menu.

4. In the **Remote Power** section of the **Probe** dialog box, click **Change** to open the **Change Remote Tx Power** dialog box (Figure 3-14).

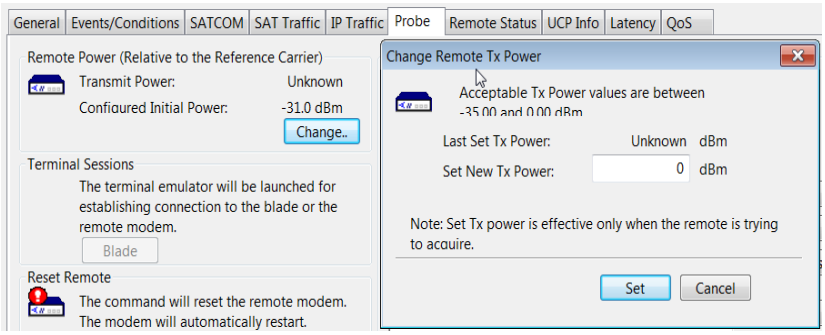


Figure 3-14. iMonitor Probe: Changing the Satellite Router Transmit Power

NOTE: For TDMA remotes, the Transmit Power displayed in the Remote Power section of the Probe represents the Satellite Router transmit power relative to the reference carrier when the remote is in the network.
This value is unknown until the Satellite Router joins the network and sends status to the NMS.

5. Ask the local installer to monitor the Satellite Router front-panel LED or Terminal WUI status indicators to determine when the remote has joined the network.
6. In the **Change Remote Tx Power** dialog box (Figure 3-14 on page 45):
   a. In **Set New Tx Power**, enter the minimum transmit power for the Satellite Router, or enter a value several dBm below the value specified in the network link budget for this Satellite Router.

NOTE: The minimum transmit power of most Satellite Routers is -35dBm. The minimum transmit power of an X1 Satellite Router is -30dBm.

   b. Click **Set**.
   c. Slowly increase the transmit power by increments of 1dB and click **Set** until the remote joins the network.

NOTE: When the Satellite Router joins the network, the Transmit Power in the Remote Power section of the Probe will begin to update. However, there may be a delay of several seconds before the value is reported to the NMS. The Satellite Router LEDs provide a more timely indication of when the remote has acquired.

7. Wait for the **Transmit Power** displayed on the Probe to settle on a constant value and note the value. This value is required to set the correct Initial Power in iBuilder in *Set Power* on page 47.

3.6 Set Power

This section describes how to set initial acquisition power and maximum transmit power for the remote site in iBuilder. The instructions provided in this section are performed by the Network Operator.

3.6.1 Overview

Remote site transmit power is controlled by the hub Protocol Processor Uplink Control Process (UCP). A UCP operates in a manner similar to other uplink power control systems, where received signal strength is compared to a nominal value, and adjustments are made based on the comparison. The UCP constantly measures performance and adjusts power as needed. See the *iDirect Technical Reference Guide* for details.

The power of acquisition bursts transmitted by the Satellite Router must be set as a constant since during acquisition the Satellite Router is not yet participating in the UCP loop. An acquisition or "initial" power must be configured that guarantees acquisition without overpowering the transponder or the receiver. iDirect defines initial power as the acquisition burst power. Initial power varies from site to site.

A separate quantity, referred to as maximum power, is the "never exceed" IF output power for the site. Maximum transmit power also varies from site to site. UCP enforces this limit, and uses the configured value to determine the available power headroom at each site.

After the 1dB compression point is determined, the Network Operator enters the initial and maximum power settings for the remote site in iBuilder. Immediately afterward, the Network Operator generates a new options file containing the updated information and sends it to the Satellite Router over the air.

The Reference Carrier

In an Adaptive TDMA network, the upstream transmission can change frequency, MODCOD, symbol rate and/or spreading factor at any time depending upon network demand, rain fade, or other rules. To provide a constant baseline for comparison, a reference carrier is defined for each remote site by the Network Operator. Reference carrier properties are set by the Network Operator on the Remote Information tab in iBuilder. For TDMA remotes, the initial transmit power is configured in relation to the Reference Carrier.

After the Satellite Router is acquired for the first time and the UCP process is operating, the Network Operator records the reference carrier power level as a clear-sky benchmark for the remote site. The **Transmit Power Relative to the Reference Carrier** is the Satellite Router IF output power that would be used if the remote site were to close the link at the required C/N_0 using a carrier with properties identical to those defined for the reference carrier.

The **Transmit Power Relative to the Reference Carrier** is displayed on the iMonitor **Probe** screen. The Network Operator notes the transmit power level after acquisition and uses it as the starting point for determining the initial power setting in iBuilder.
The procedure to bring the remote into the network for the first time and determine the transmit power level is *Initial Acquisition* on page 44.

Figure 3-15 shows the related sections of the iMonitor Probe (left) and the iBuilder Remote Information tab (right) after commissioning. In the figure, the Satellite Router is in the network and is currently transmitting (under UCP control) at -21.78dBm relative to the

configured reference carrier. The Satellite Router sends acquisition bursts at -20dBm when trying to acquire on a carrier that matches the reference carrier. When acquiring on a carrier with a different configuration, the Satellite Router automatically adjusts the transmit power of the acquisition burst such that it is received by the hub at the correct C/N_0.

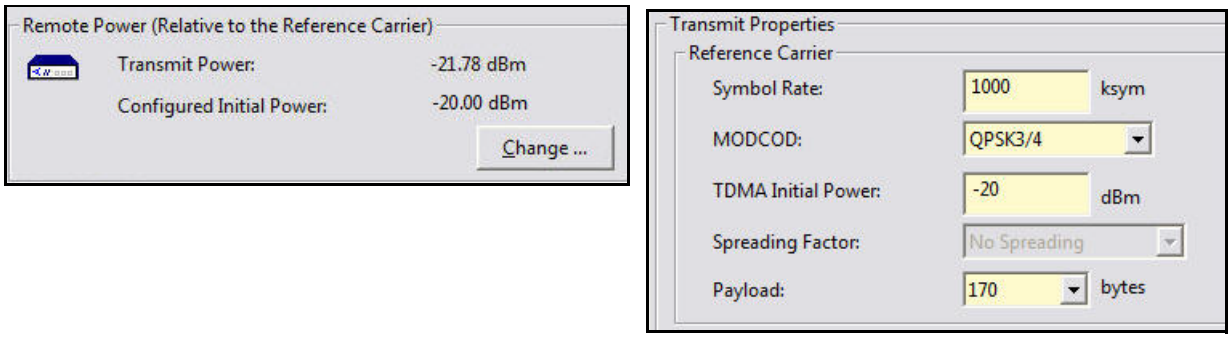


Figure 3-15. Initial Power in Probe and iBuilder

NOTE: For more information on configuring the reference carrier, refer to the i*Builder User Guide* and the *Technical Reference Guide*.

Maximum Power

For each remote site, there is an absolute upper power limit imposed by the limitations of the RF amplifier or BUC. For each BUC, there is also an upper limit of *usable* power imposed by the linearity characteristics of the amplifier itself, in conjunction with the minimum spectral purity requirements for the output signal.

Setting the maximum power in iBuilder has two purposes:

1. To ensure the remote site BUC is not driven so far into the non-linear region that unacceptable levels of spectral regrowth occur; and
2. To establish a reference point for the Uplink Control Process to determine the usable power headroom available at the remote site at any given time.

The data needed to set maximum power on the iBuilder Remote Information tab was obtained during the procedure executed in *Determine 1dB Compression Point* on page 41.

3.6.2 Set Power

After completing the steps in *Acquire the Network* on page 43, the Satellite Router is acquired into the network and the Protocol Processor UCP loop is controlling power.

Setting TDMA Initial Power and Maximum Power

Use the following procedure to set initial and maximum power for TDMA remote sites.

WARNING: Setting initial power too high above normal operating levels can cause problems with remote acquisition into the network or interfere with network operation.

To Set Initial and Maximum Power (TDMA):

1. Log in to iBuilder.
2. Right-click the remote in the iBuilder Tree and select **Modify > Item** to open the Remote Information tab.
3. Scroll down to the **Reference Carrier** section (Figure 3-16).

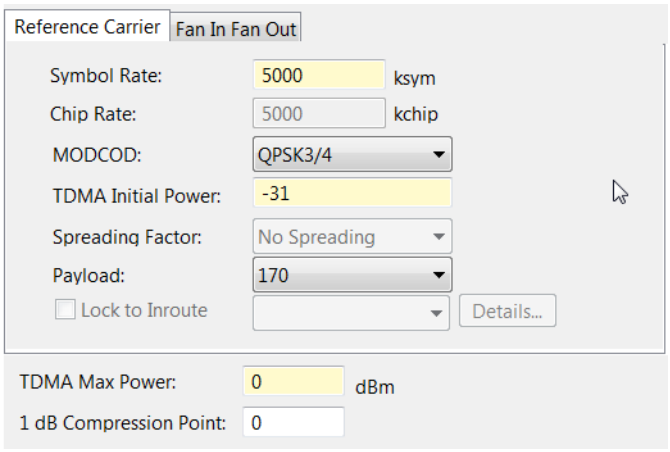


Figure 3-16. iBuilder Transmit Properties: TDMA

4. Set **TDMA Initial Power** to the **Transmit Power** recorded in Step 7 of *Initial Acquisition on page 44* plus any link budget margin required to acquire the network under all conditions.
5. Set **TDMA Max Power** to the (CW) P1dB point determined in *Determine 1dB Compression Point on page 41*.
6. Enter the same value in the **1dB Compression Point** field. (This is an optional field for information only).
7. Click **OK** to save the changes.
8. Right-click the remote in the iBuilder Tree and select **Apply Configuration > Reliable Both (TCP)**.

If commissioning a remote in a TRANSEC network AND authentication is disabled, perform the following steps:

1. If the remote is ***not*** yet issued an X.509 certificate, issue the certificate now. (See the *iBuilder User Guide* appendix “Using the iDirect CA Foundry” for details.)
2. Re-enable authentication on the remote Information tab by clearing the **Disable Authentication** check box.
3. Click **OK** to save the changes.
4. Right-click the remote in the iBuilder Tree and select **Apply Configuration > Reliable Both (TCP)**.

3.7 16QAM Output Back-Off

Starting with iDX Release 4.1.3, 16QAM modulation is supported for the iQ Series satellite routers.

As a result of the higher linearity requirement for 16QAM, power amplifiers need to be backed off from their normal max output power which is set through the 1dB compression procedure during terminal commissioning, *Determine 1dB Compression Point* on page 41. The optimal amount of output back off (OBO) is to be determined immediately after terminal commissioning.

To set OBO on a remote for 16QAM transmission, perform the following:

1. On iBuilder client, set the OBO value for the remote to 1dB before generating the options file for commissioning.

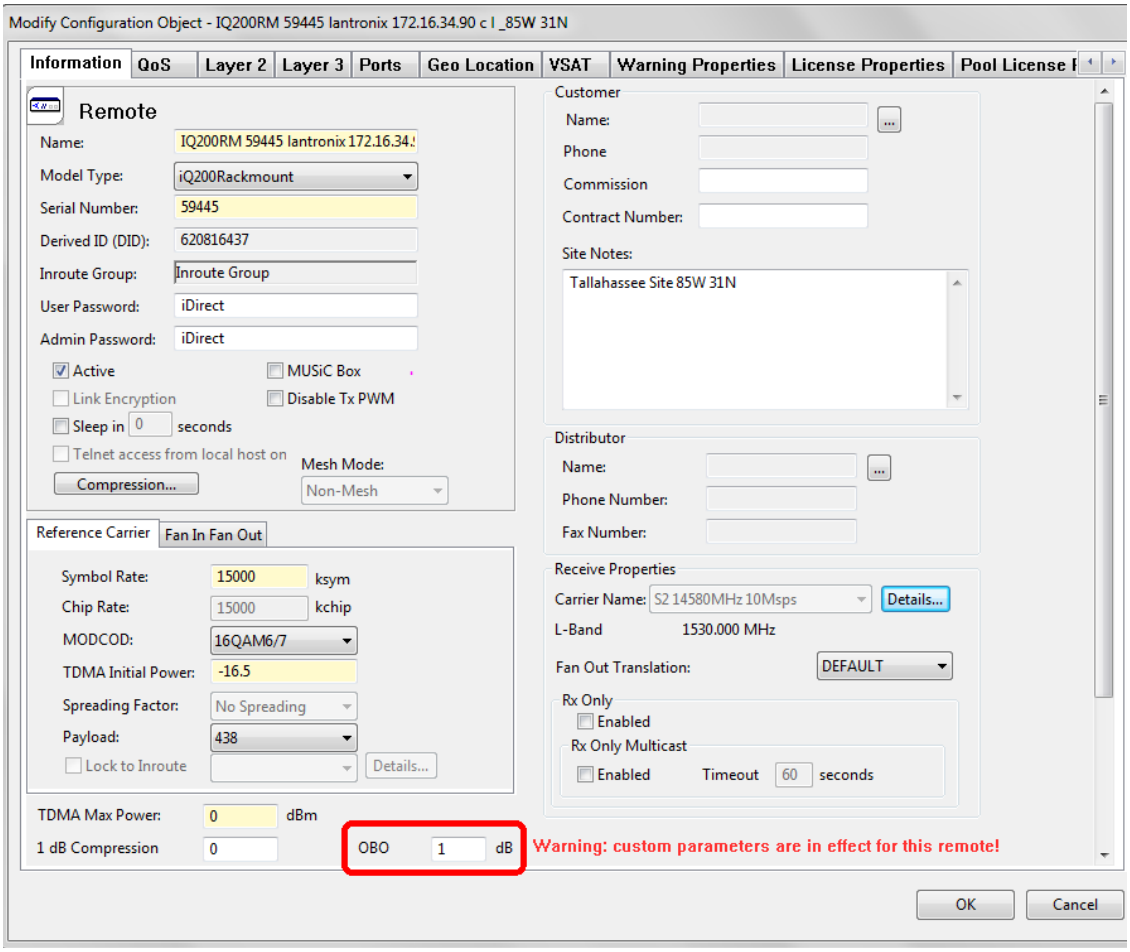


Figure 3-17. Setting Up OBO Value Before Commissioning

2. Commission the terminal using the procedures described in this chapter including the setting of Pmax using 1dB compression procedure and the initial Tx power.

3. Determining the optimal OBO requires that the terminal is in an inroute group that has 16QAM carriers and has the link budget to support these carriers. If not, the subsequent steps should be postponed till these conditions are met.

4. Under clear sky condition for the terminal, after the remote is acquired into the network, observe the following:

   a. Is this terminal CRC-free?

      Using iMonitor client, monitor the CRCs on the terminal and on the line card configured with 16QAM carrier.

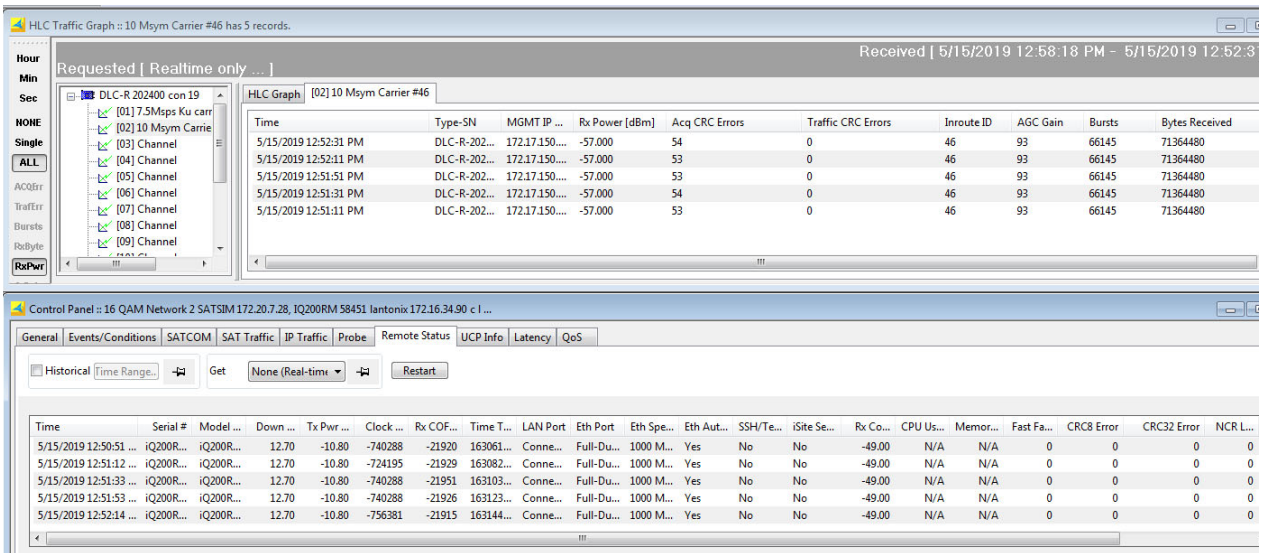
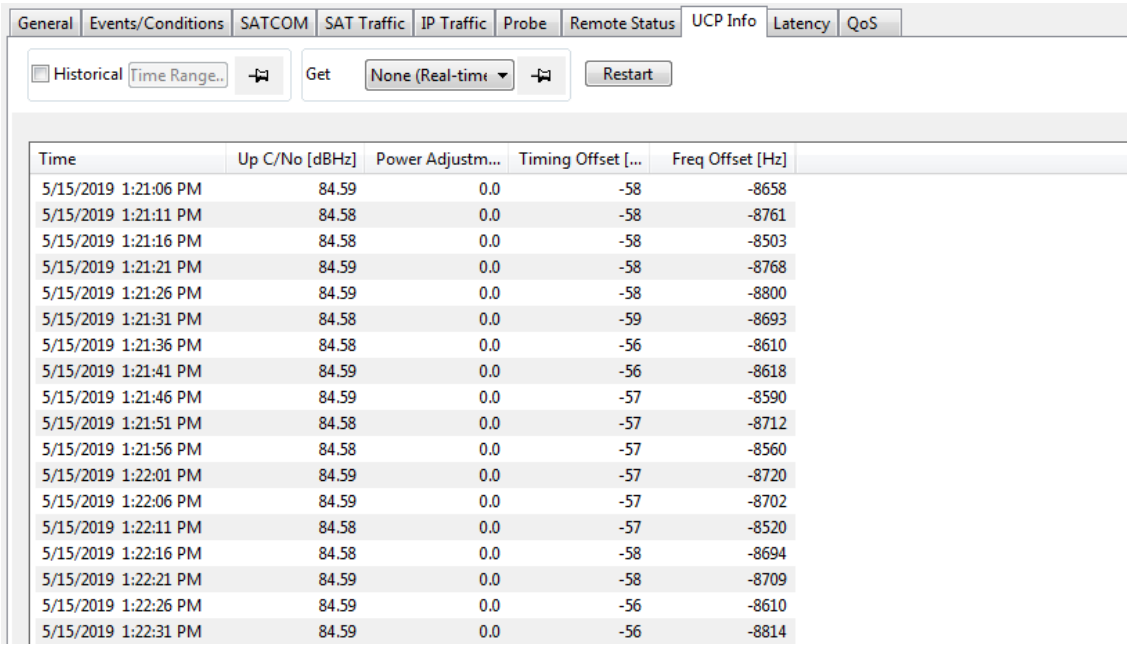


Figure 3-18. CRC Monitoring on iMonitor

   b. Is the terminal able to reach the inroute carriers for which the link budget was designed?

Verify if C/N0 reported by the terminal meets requirement for 16QAM.



Time	Up C/No [dBHz]	Power Adjustm...	Timing Offset [...	Freq Offset [Hz]
5/15/2019 1:21:06 PM	84.59	0.0	-58	-8658
5/15/2019 1:21:11 PM	84.58	0.0	-58	-8761
5/15/2019 1:21:16 PM	84.58	0.0	-58	-8503
5/15/2019 1:21:21 PM	84.59	0.0	-58	-8768
5/15/2019 1:21:26 PM	84.59	0.0	-58	-8800
5/15/2019 1:21:31 PM	84.58	0.0	-59	-8693
5/15/2019 1:21:36 PM	84.58	0.0	-56	-8610
5/15/2019 1:21:41 PM	84.59	0.0	-56	-8618
5/15/2019 1:21:46 PM	84.59	0.0	-57	-8590
5/15/2019 1:21:51 PM	84.58	0.0	-57	-8712
5/15/2019 1:21:56 PM	84.58	0.0	-57	-8560
5/15/2019 1:22:01 PM	84.59	0.0	-57	-8720
5/15/2019 1:22:06 PM	84.59	0.0	-57	-8702
5/15/2019 1:22:11 PM	84.58	0.0	-57	-8520
5/15/2019 1:22:16 PM	84.58	0.0	-58	-8694
5/15/2019 1:22:21 PM	84.59	0.0	-58	-8709
5/15/2019 1:22:26 PM	84.59	0.0	-56	-8610
5/15/2019 1:22:31 PM	84.59	0.0	-56	-8814

Figure 3-19. C/N0 verification for 16QAM requirement

5. If the answer is “No” to any question above, then try increasing OBO in 0.5dB step and redo step 4.

Appendix A Acronyms and Abbreviations

The list in this appendix is meant to be generic and may contain acronyms and abbreviations not found in this manual and some terms may not be defined based on industry standards of knowledge.

0…9

16APSK	Sixteen Amplitude and Phase Shift Keying
16QAM	A quadrature amplitude modulation
8PSK	Eight Phase Shift Keying

A

A-TDMA	Adaptive Time Division Multiple Access
ABS	Automatic Beam Switching
AC	Alternating Current
ACM	Adaptive Coding and Modulation
ACS	Antenna Control System
AES	Advanced Encryption Standard
APSK	Amplitude and Phase-shift keying
AWG	American Wire Gauge
AZ	Azimuth

B

BB	BaseBand
BIM	Below-Decks Interface Module
BIST	Built-In Self-Test
BITE	Built-In Test Equipment
BPN	BUC Part Number
BPSK	Binary Phase Shift Keying

BSN	BUC Serial Number
BTP	Burst Time Plan
BUC	Block Up Converter

C

C/N	Carrier to Noise ratio
C/N0	Carrier C/N threshold
CBIT	Continuous Built In Test
CDR	Critical Design Review
CIR	Committed Information Rate
CPE	Customer Premise Equipment
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
CSA	Canadian Space Agency

D

DAC	Digital to Analog Converter
dB	deciBel
dBi	deciBel isotropic
dBm	deciBel milli-Watt
dBW	deciBel Watt
DC	Direct Current
DDR	Double Data Rate
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Service
	DVB-S2
	Digital Video Broadcasting over Satellite, Second Generation

E

EIRP	Effective Isotropic Radiated Power
Eb/N0	Bit Energy to Noise Power Spectral Density ratio
EEPROM	Electrically Erasable Programmable Read-Only Memory
EL	Elevation
EMC	ElectroMagnetic Compatibility
EMI	ElectroMagnetic Interference
ETSI	European Telecommunications Standards Institute

F

FCC	Federal Communication Commission
FEC	Forward Error Correction
FID	Functional ID
FMECA	Failure Mode Effects Criticality Analysis
FPGA	Field Programmable Gate Array
FS	Functional Specification

G

G/T	Gain over Temperature
GHz	GigaHertz
GPIO	General-Purpose Input/Output
GPS	Global Positioning System

H

HCP	High-Capacity Payload

I

IBIT	Initiated Built In Test
ICD	Interface Control Document
ICMP	Internet Control Message Protocol
iDX	Evolution Software System
IEC	International Electrotechnical Commission
IFL	Inter-Facility Link
IF	Intermediate-frequency
IP	Ingress Protection
IP	Internet Protocol

IR	Information Rate

J

K

kbps	kilobit per second
kHz	kilohertz
KRFU	Ku/Ka-band Radio Frequency Unit
ksps	kilosymbol per second

L

LAN	Local Area Network
LDPC	Low-Density Parity Coding
LED	Light Emitting Diode
LNB	Low Noise Block Converter
LOS	Loss of Signal
LRU	Line-Replaceable Unit

M

Mbps	Megabits per second
Mcps	Megachips per second
MES	Mobile Earth Station
MF-TDMA	Multi-Frequency TDMA
MHz	Megahertz
MID	Manufacturer ID
MIL-STD	US Military Standard
MODCOD	Modulation and Coding
Msps	Mega Symbols per Second
MTBF	Mean Time Between Failures
MTBUR	Mean Time Between Unscheduled Removals

N

NAND	Not AND
NF	Noise Figure
NOR	Not OR
NMS	Network Management System

O

OAE	Outside Antenna Equipment
ODU	Outdoor Unit
OEM	Original Equipment Manufacturer
OMT	Orthogonal-Mode Transducer
OpenAMIP	Open Antenna-Modem Interface Protocol
OTA	Over The Air
OTP	One Time Programmable

P

PA	Power Amplifier
PAST	Person-Activated Self-Test
PCB	Printed Circuit Board
PC	Personal Computer
PDR	Preliminary Design Review
PLL	Phased Locked Loop
PSK	Phase Shift Keying
PSU	Power Supply Unit
PWM	Pulse width modulation

Q

QEF	Quasi Error Free
QoS	Quality of Service
QPSK	Quadrature Phase Shift Keying

R

RF	Radio Frequency
RGMII	Reduced Gigabit Media Independent Interface
RMS	Root Mean Square
RoHS	Restriction of Hazardous Substances

ROM	Read-Only Memory
RSSI	Receive Signal Strength Indication
RTP	Real-Time Protocol
Rx or RX	Receive

S

SAS	Satellite Access Station
SCPC	Single Channel Per Carrier
SGMII	Serial Gigabit Media Independent Interface
SIM	Subscriber Identity Module
SNR	Signal to Noise Ratio
SRS	Systems Requirement Specification
SRU	Shop Replaceable Unit
SSB	Single Side Band

T

TBD	To Be Defined
TCP	Transmission Control Protocol
TDMA	Time Division Multiple Access
TFI	Terminal Functional ID
TMI	Terminal Manufacturer ID
TPCFEC	Turbo Product Code FEC
TPN	Terminal Part Number
TSN	Terminal Serial Number
TTC	Terminal Transmit Control
Tx or TX	Transmit

U

UDP	Universal Data Protocol
UL	Underwriters Laboratories

V

VAC	Volts Alternating Current
VDC	Volts Direct Current
VSAT	Very Small Aperture Terminal

W

WFQ	Weighted Fair Queuing
WGS	Wideband Global SATCOM

X

X

Z

Appendix B Remote Locking

Soft, temporary, and hard locking for an iQ Series or 3315 Series remote requires a unique Locking Key for each satellite router which is formed using a combination of the Network Key and a randomly generated Confirmation Word to securely lock satellite routers to a network.

An iQ Series or 3315 Series remote can be configured with a hard (permanent) lock. However, during the configuration of a hard lock, the network operator may choose to create a temporary lock. This is to allow a network operator to test the lock for the first iQ Series or 3315 Series remote in order to verify operation, and to record the Netkey Fingerprint that is returned.

A hard locked satellite router cannot be unlocked; it must be returned to iDirect for a Non-Warranty RMA hardware replacement. A Netkey Fingerprint can help to avoid errors when locking the satellite router. The fingerprint identifies the network for the satellite router without revealing the Network Key on the satellite router.

A remote locked with a Soft Lock can be unlocked by entering the Confirmation Word provided when the lock was performed. If the Confirmation Word is lost, the soft lock cannot be disengaged. In order to unlock the remote, it must be returned to iDirect for a Non-Warranty RMA hardware replacement.

Remote locking is performed at the operator's own risk. Non-Warranty RMA charges (plus all shipping) apply to all satellite routers returned to iDirect for the purpose of removing a network lock.

WARNING: It is possible to remove a soft lock or temporary lock using the Terminal WUI. However, it is not possible to remove a hard lock using the Terminal WUI. Removing a hard lock requires returning the satellite router to iDirect for a Non-Warranty RMA hardware replacement.

NOTE: Non-Warranty RMA and shipping charges apply to all satellite routers returned to iDirect for the purpose of removing a network lock.

This appendix contains the following sections:

- *Unlocking a Soft Lock* on page 65

B.1 Locking the Remote

Temporary, Soft, and/or Hard locking an iQ Series or 3315 Series remote requires the following:

1. Creating the Network Key at the network level in iBuilder, and applying the changes. See *Configuring the Network Key* on page 58.
2. Connecting to the satellite router to be locked and entering the Network Key.
3. Generating the **Netkey Fingerprint** and **Confirmation Word**, and recording their values.
4. Locking the remote.

B.2 Configuring the Network Key

Remote Locking of any sort requires the creation of a Network Key before locking the satellite routers to a network. Create the Network Key by configuring the following custom key on the Custom tab for the network in iBuilder:

```
[NETWORK_DEFINITION]
  net_key = <Network Key>
```

where `<Network Key>` is a string of between 5 and 64 alphanumeric characters.

After configuring the custom key in iBuilder, propagate the key to all satellite routers in the network by applying the changes to the network.

During operation, if a locked satellite router receives a Network Key message containing a Network Key that is different from the key set on the satellite router, the satellite router immediately stops sending upstream messages.

B.3 The Remote Lock Process

This section contains figures that show the Remote Lock process. These figures are referenced in the following sections:

- *Performing a Temporary Lock* on page 62
- *Performing a Soft Lock* on page 63
- *Performing a Hard Lock* on page 64
- *Unlocking a Soft Lock* on page 65

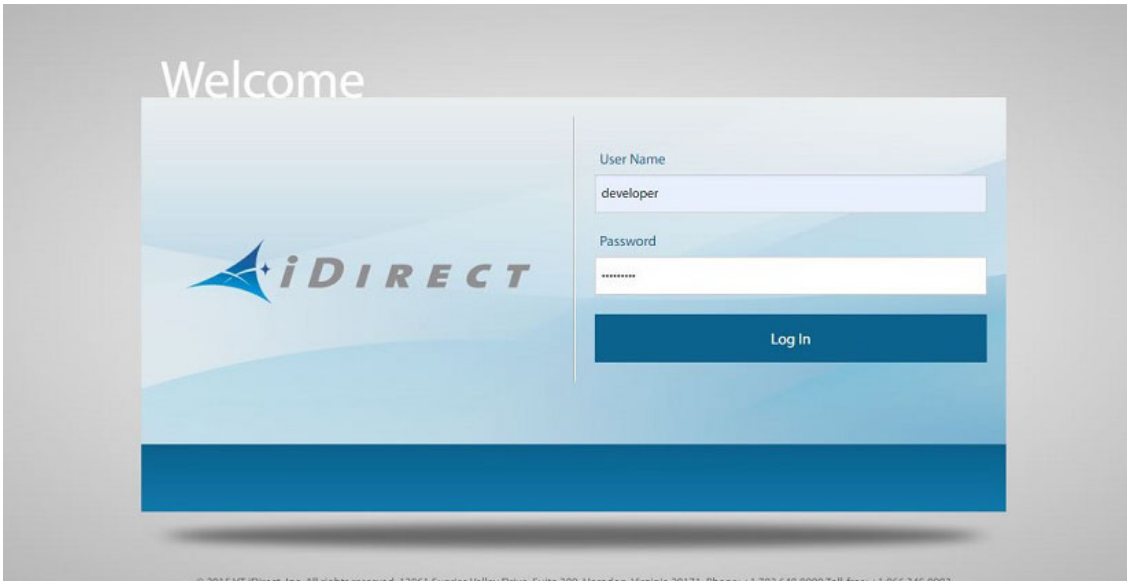


Figure B-1. Login Page Showing Username as "developer"

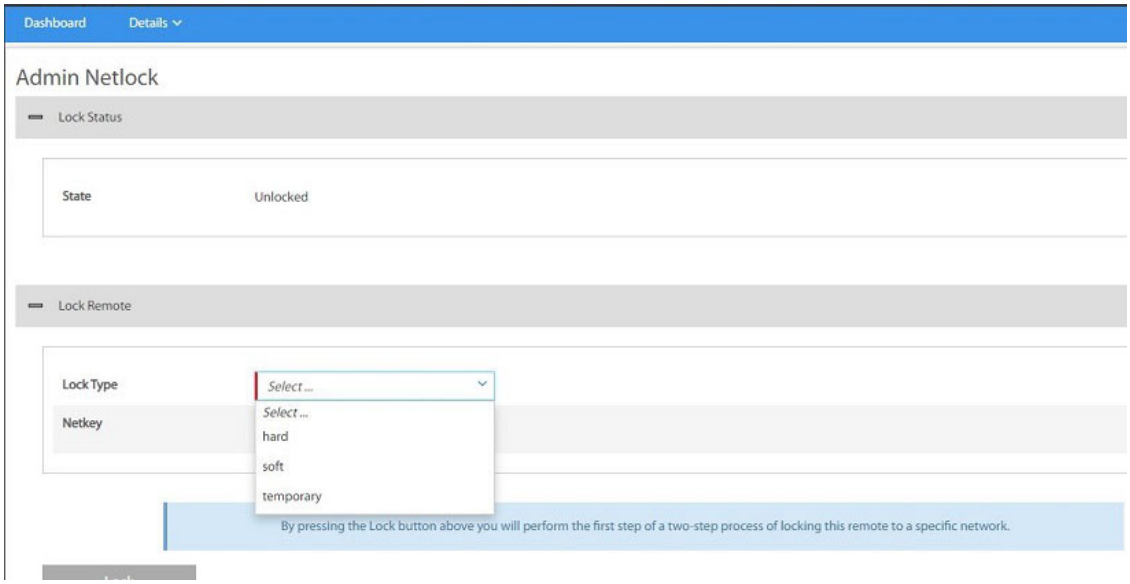


Figure B-2. Lock Type Drop-Down List Options

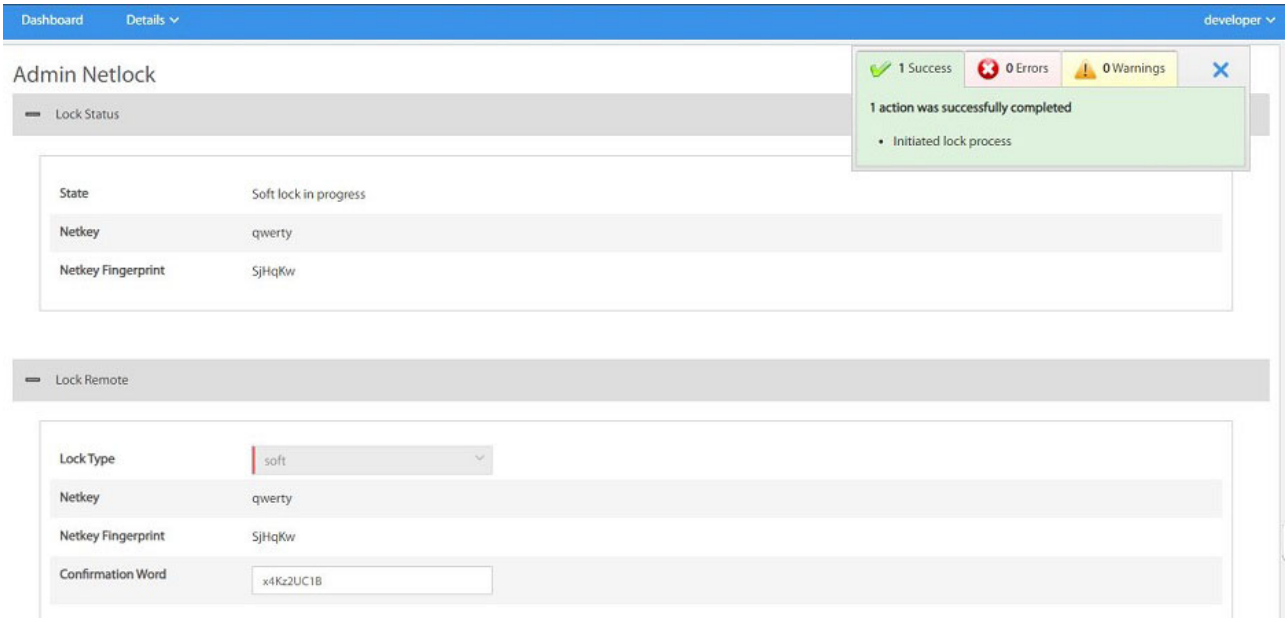


Figure B-3. Netkey, Fingerprint, and Confirmation Word

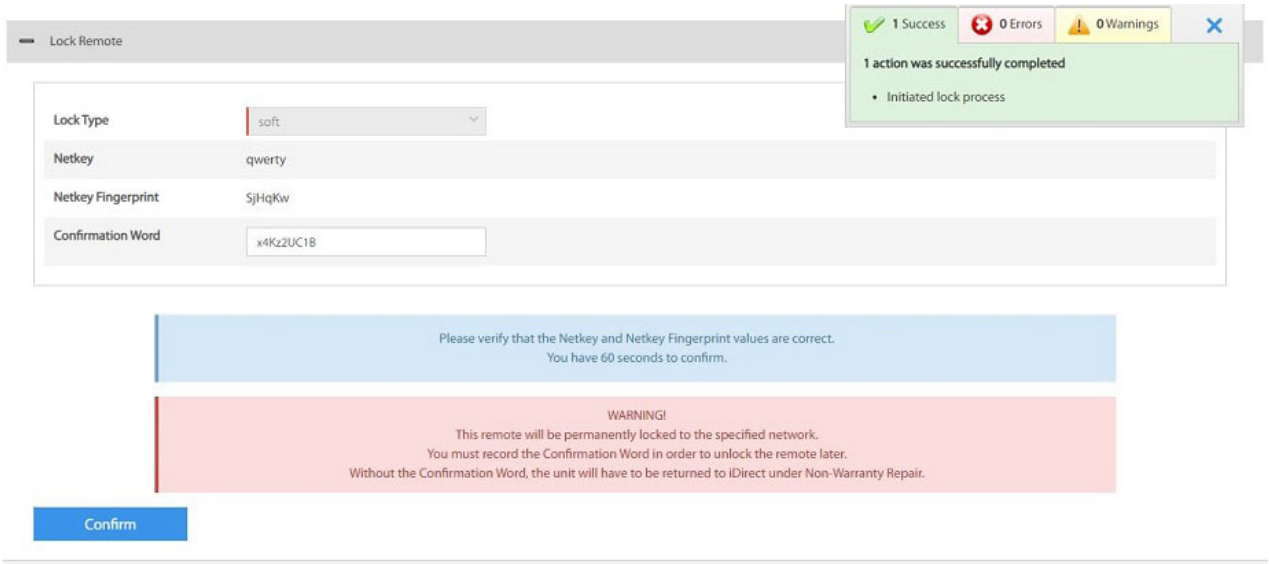


Figure B-4. Warning at Page Bottom

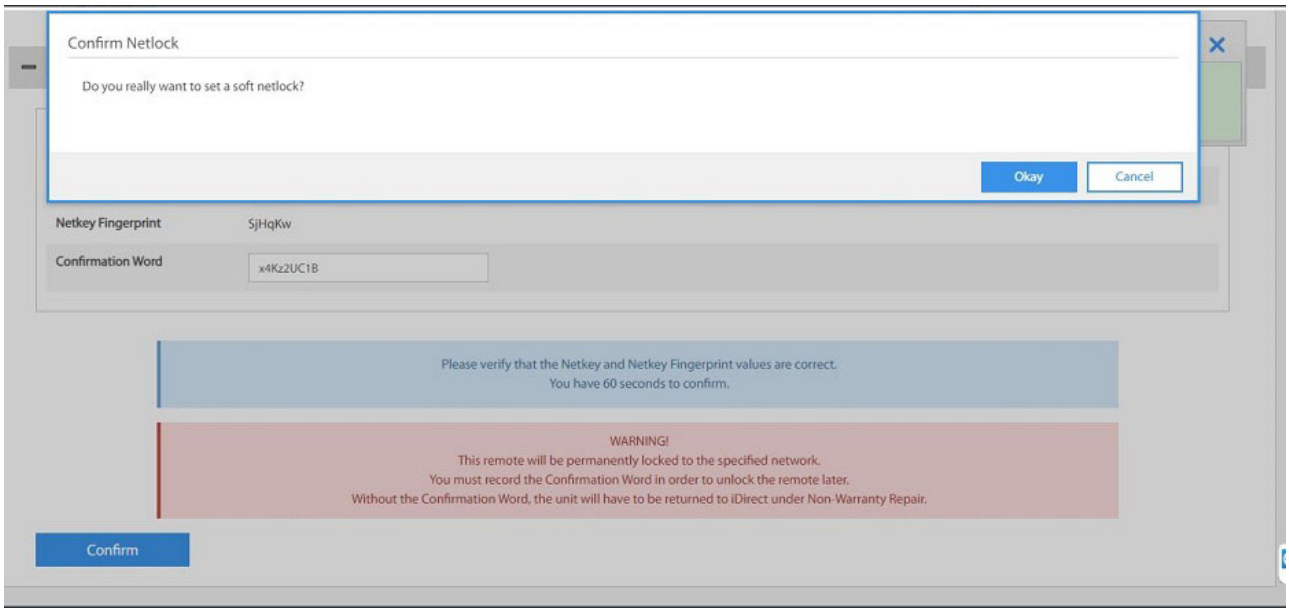


Figure B-5. Confirm Netlock Pop-Up Window

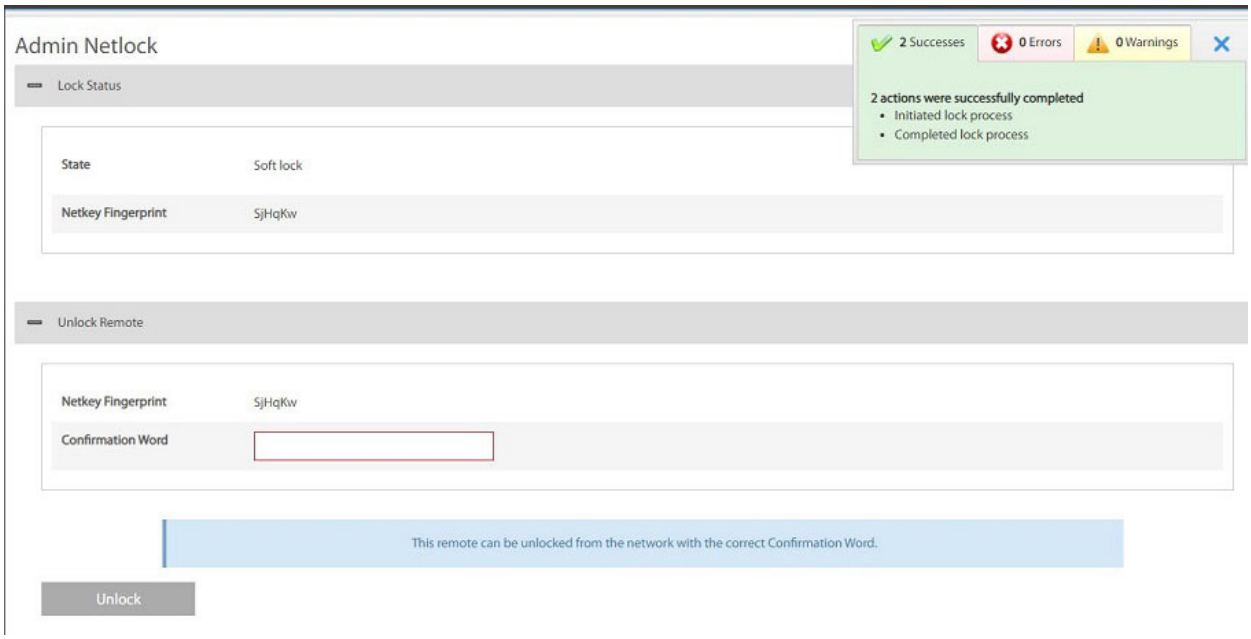


Figure B-6. Final Lock Status

B.4 Performing a Temporary Lock

Performing an optional Temporary Lock allows a network operator to test the locking of the first iQ Series or 3315 Series remote, to verify operation, and to record the Netkey Fingerprint that is returned. Perform the following steps to temporarily lock the first iQ Series or 3315 Series remote in a network.

1. Using a Web browser, connect to the satellite router to be locked and log on as *developer*. See Figure B-1.

   NOTE: Locking a satellite router requires a developer login.

2. In the browser address bar, type **`/#admin-netlock`** to the right of the IP address. For example:

   `https://192.168.0.1/#admin-netlock`

   NOTE: If the satellite router is locked, only the **Lock Status** section of the page appears.

3. In the **Lock Status** section, verify **State** displays **Unlocked**.
4. In the **Lock Remote** section, select **temporary** from the **Lock Type** drop-down list. See Figure B-2.
5. In the **Netkey** field, enter the Network Key obtained in section *Configuring the Network Key* on page 58.
6. Click **Lock**. The **Lock Remote** section expands to show the following fields (see Figure B-3):
   - **Netkey**
   - **Netkey Fingerprint**
   - **Confirmation Word**

   NOTE: When locking the satellite router, use the Netkey Fingerprint to catch typographical errors and prevent accidentally locking the satellite router to the wrong network. Record the Netkey Fingerprint value returned when locking the first satellite router to a network. When locking subsequent satellite routers, verify that the Netkey Fingerprint has the same value before confirming the lock.

7. Perform the following actions:
   a. Review the warning at the page bottom (see Figure B-4).
   b. Verify the **Netkey**.
   c. Record the value of the **Netkey Fingerprint**.
   d. Record the **Confirmation Word** that appears.
8. Click **Confirm** (see Figure B-5). The **Lock Status** section displays the **State** of the Lock Status (see Figure B-6).

B.5 Performing a Soft Lock

Perform the following steps to soft lock the first iQ Series or 3315 Series remote to a network.

1. Using a Web browser, connect to the satellite router to lock and log on as *developer*. See Figure B-1.

   NOTE: Locking a satellite router requires *developer* privileges.

2. In the browser address bar, type **`/#admin-netlock`** to the right of the IP address. For example:

   `https://192.168.0.1/#admin-netlock`

   NOTE: If the satellite router is locked, only the **Lock Status** section of the page appears.

3. In the L**ock Status** section, verify **State** displays **Unlocked**.
4. In the **Lock Remote** section, select **soft** from the **Lock type** drop-down list (see Figure B-2).
5. In the **Netkey** field, enter the Network key obtained in section *Configuring the Network Key* on page 58.
6. Click **Lock**. The **Lock Remote** section expands to show the following fields (see Figure B-3):
   - **Netkey**
   - **Netkey Fingerprint**
   - **Confirmation Word**.

   NOTE: When locking the satellite router, use the Network Key Fingerprint to catch typographical errors and prevent accidentally locking the satellite router to the wrong network. Record the Network Key Fingerprint value returned when locking the first satellite router to a network. When locking subsequent satellite routers, verify that the Network Key Fingerprint has the same value before confirming the lock.

7. Perform the following actions:
   a. Review the warning at the page bottom (see Figure B-4).
   b. Verify the **Netkey**.
   c. Verify that the value of the **Netkey Fingerprint** matches the value recorded at Step 7 of *Performing a Temporary Lock* on page 62.
   d. Record the **Confirmation Word**.

      WARNING: Recording the Confirmation Word is critical. Without the Confirmation Word, the unit will have to be returned to iDirect under Non-Warranty RMA repair.

NOTE: Each remote has a unique Confirmation Word. It may be necessary to maintain a table/database of each remote model, serial number, and Confirmation Word.

8. Click **Confirm** (see Figure B-5). The **Lock Status** section displays the **State** of the Lock Status (see Figure B-6).

B.6 Performing a Hard Lock

A hard lock permanently burns the Network Key into the remote hardware using the generated Confirmation Word.

WARNING: It is possible to remove a soft lock or temporary lock using the Terminal WUI. However, it is not possible to remove a hard lock using the Terminal WUI. Removing a hard lock requires returning the satellite router to iDirect for a Non-Warranty RMA hardware replacement.

To hard lock a remote into the network, do the following:

1. In a Web browser, connect to the satellite router to be locked and log on as *developer* at the Terminal WUI. See Figure B-1.

NOTE: Locking a satellite router requires a developer login.

2. In the browser address bar, type **`/#admin-netlock`** to the right of the IP address. For example:

   `https://192.168.0.1/#admin-netlock`

NOTE: If the satellite router is locked, only the **Lock Status** section of the page appears.

3. In the **Lock Status** section, verify **State** displays **Unlocked**.
4. In the **Remote Lock** section, select **hard** from the **Lock Type** drop-down list (see Figure B-2).
5. At the **Netkey** field, enter the Network Key obtained in *Configuring the Network Key* on page 58.
6. Click **Lock**. The **Lock Remote** section expands to show the following fields (see Figure B-3):
   - **Netkey**
   - **Netkey Fingerprint**
   - **Confirmation Word**

NOTE: When locking the satellite router, use the Network Key Fingerprint to catch typographical errors and prevent accidentally locking the satellite router to the wrong network. Record the Network Key Fingerprint value returned when locking the first satellite router to a network. When locking subsequent satellite routers, verify that the Network Key Fingerprint has the same value before confirming the lock.

7. Perform the following actions:
   a. Review the warning at the page bottom (see Figure B-4).
   b. Verify the **Netkey**.
   c. Verify that the value of the **Netkey Fingerprint** matches the value recorded at Step 7 of *Performing a Temporary Lock* on page 62.

WARNING: The following step will permanently lock the satellite router to the network. Only a hardware replacement can reverse this lock.

8. Click **Confirm** (see Figure B-5). The **Lock Status** section displays the **State** of the Lock Status (see Figure B-6).

NOTE: Repeat these procedures to lock additional remotes.

B.7 Unlocking a Soft Lock

A remote locked with a Soft Lock can be unlocked by entering the **Confirmation Word** that was provided when the lock was performed. Perform the following steps to unlock a soft locked iQ Series or a 3315 Series remote:

1. Using a Web browser, connect to the satellite router to be locked and log on as *developer*. See Figure B-1.

   NOTE: Locking a satellite router requires a developer login.

2. In the browser address bar, type **`/#admin-netlock`** to the right of the IP address. For example:

   `https://192.168.0.1/#admin-netlock`

   NOTE: If the satellite router is locked, only the **Lock Status** section of the page appears.

   The soft locked remote screen shown similar to Figure B-6 appears.

3. Enter the **Confirmation Word** in the designated area (as noted during the locking of the remote) and press **Unlock**. See Figure B-7.

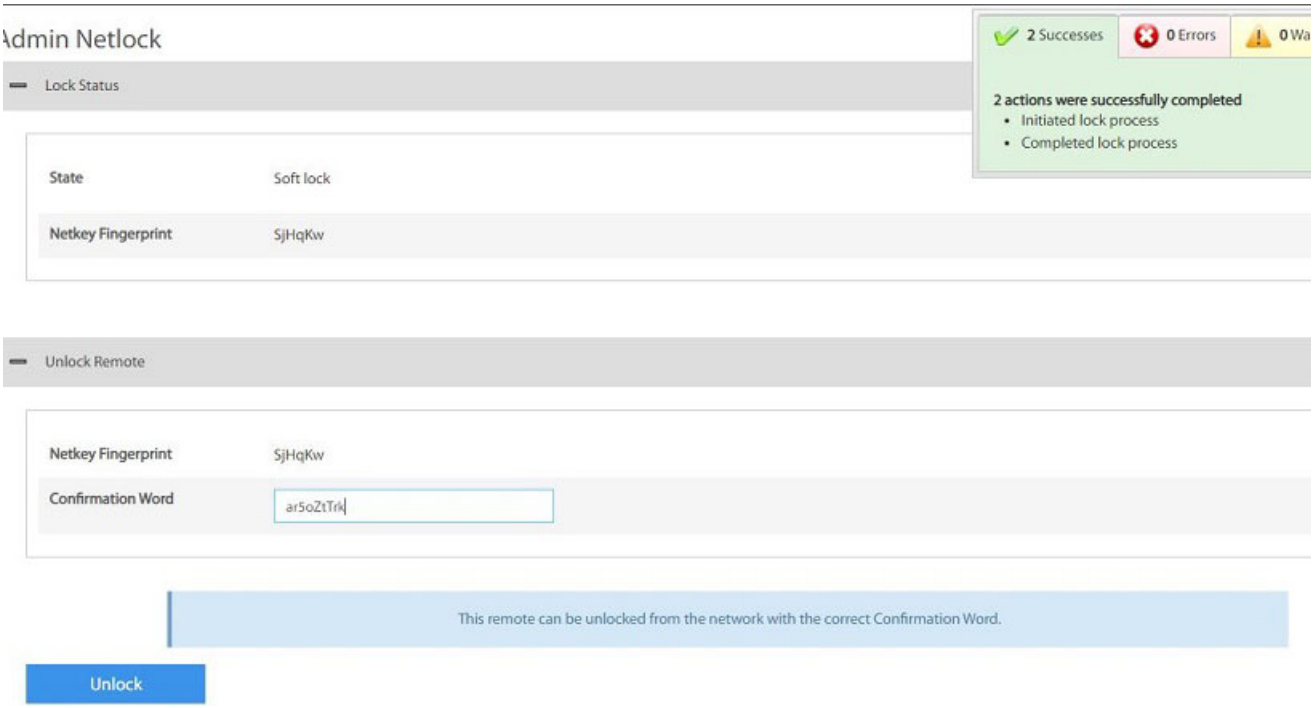


Figure B-7. Soft Locked Screen

In the **Lock Status** section, the state displayed is **Unlocked**. See Figure B-8.

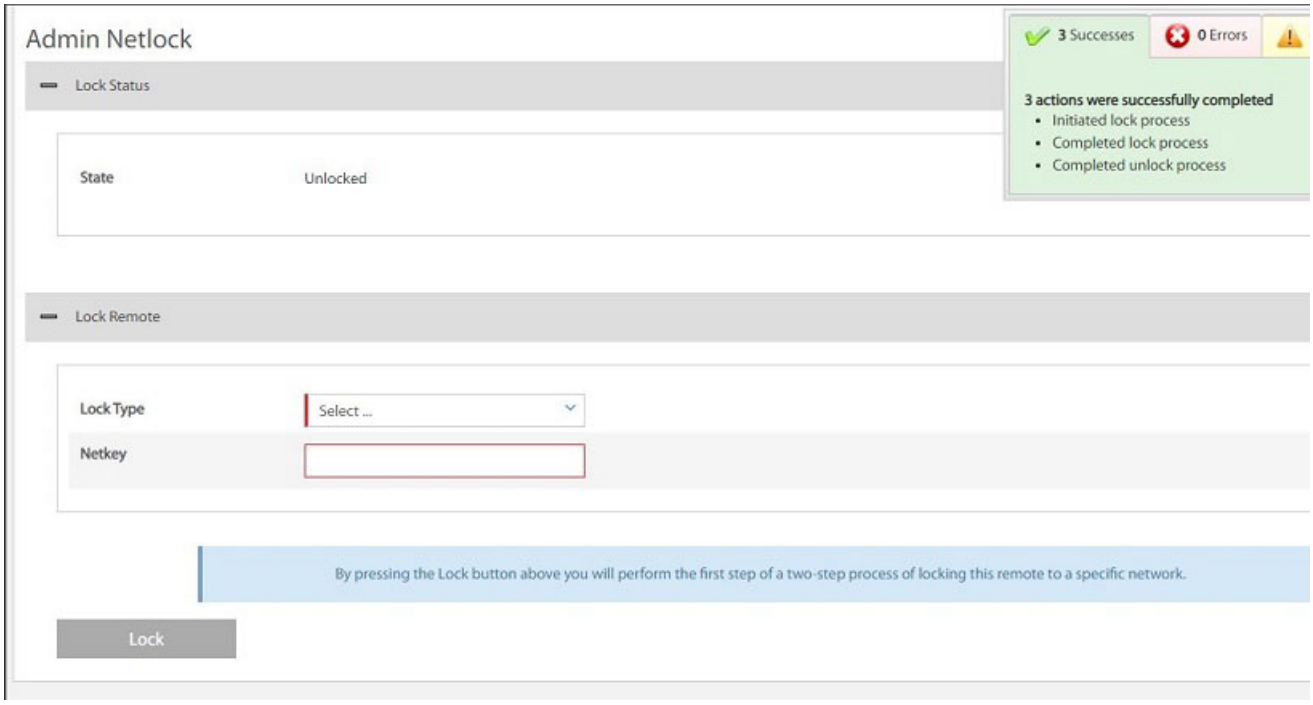


Figure B-8. Unlocked State

B.8 Non-Warranty RMA Required to Remove Remote Locks

It is not possible to change or remove a hard lock or to open a soft lock without a Confirmation Word on an iQ Series or 3315 Series remote. In order to unlock the satellite router, return it to iDirect for a Non-Warranty RMA hardware replacement.

NOTE: RMA and shipping charges apply to all satellite routers returned to iDirect for the purpose of removing a network lock.

Appendix C Using the Unified Recovery Program (URP)

This appendix contains information about how to use the Unified Recovery Program (URP) to load a new software package on a SMB3315/MDM3315 satellite modems. It contains the following sections:

NOTE: URP is only supported on SMB3315 and MDM3315 satellite modems.

C.1 URP Overview

URP enables you to load a new software package on a satellite modem. The modem reboots with the new software image using the default options file, software, and passwords. Access to the Terminal WUI is available at 192.168.1.1.

URP use cases include:

- Loading a new software package on a failed modem.
- Recommissioning a modem into a new network.
- Recovering a modem that has been mis-configured.
- Booting a modem from a release in anther partition.
- Configuring a modem for operation in at least two networks.

When a modem is booted to the partition specified by URP, contents of the directory */sysopt/factory* are not modified if they are valid and contain the correct complement of files. Any missing directories associated with configuration files are reconstructed, as are missing or corrupt file system(s) for directories associated with configuration files. The contents of software loaded to other partitions are not modified.

If there are any questions regarding the instructions provided in this section, or additional information is needed, contact TAC at (703) 648-8151 or by e-mail at tac@idirect.net.

Evolution Software Installation Details

When the URP is used to install a Evolution software package on a modem, all of the existing Evolution configuration is cleared, including the following:

- */sysopt/buc*
- */sysopt/cache*
- */sysopt/config/certs*
- */sysopt/config/network*
- */sysopt/config/sat_router*
- */common/OTA_SatelliteBeamMap.json*

C.2 Downloading a New Software Package

To download the latest Evolution software release, perform the following:

1. Using your iDirect login name and password, log on to the iDirect TAC Web site (Service Now Customer Portal) at https://support.idirect.net.
2. Click **Software Downloads**.
3. In the **Product Line** section, click **Evolution**.
4. Download all applicable software packages.

C.3 Accessing the URP

1. Connect your laptop LAN port to the modem's local area network (LAN) Port 2 using an Ethernet cable, as described in *Terminal Web User Interface Login* on page 2.
2. Hold down the reset button on the modem for ten seconds or longer, which will reboot the modem. Refer to the appropriate ST Engineering Installation Guide for the modem for information about the location of the reset button on your specific modem model and information about how to hold it down.
3. Wait for the modem to fully reboot.
4. Enter *192.168.1.1* in the address bar of a supported browser to connect to the URP user interface. The URP home page appears.

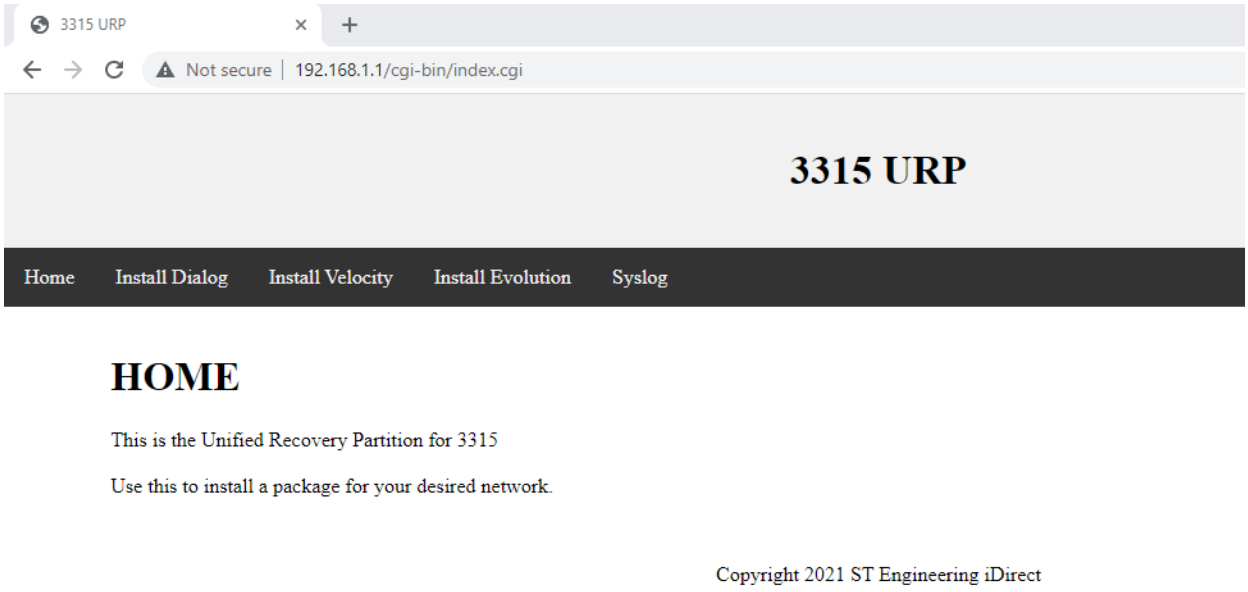


Figure C-1. URP Home Page

C.4 Installing Evolution Software on a Modem

1. From the URP home page, click **Install evolution**.

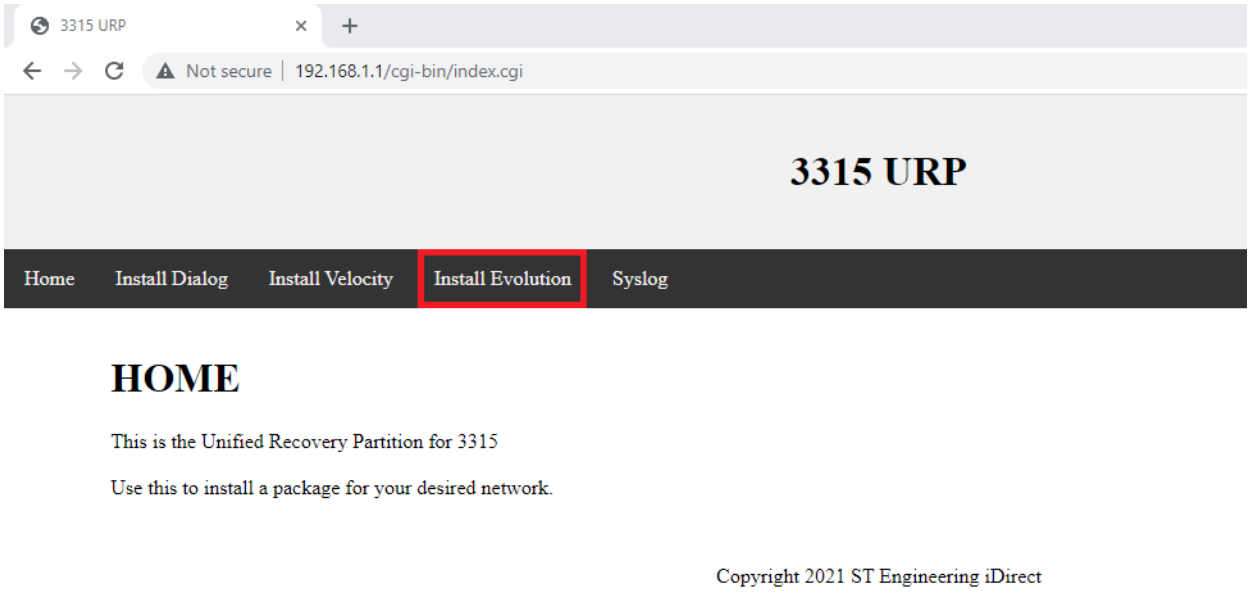


Figure C-2. URP Home Page - Install Evolution

2. Click **Choose File** and select the Evolution software package you wish to upload from your laptop.

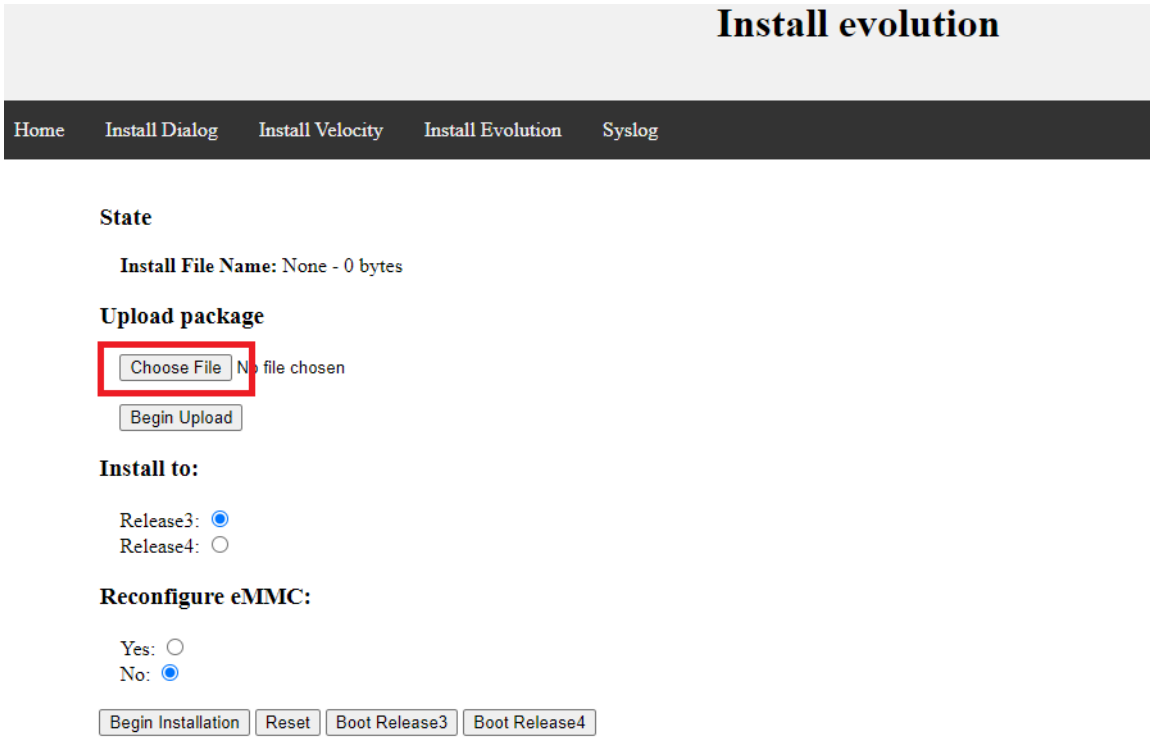


Figure C-3. Choose the Evolution Software Package

3. Click **Begin Upload** to upload the selected Evolution software package from your laptop.

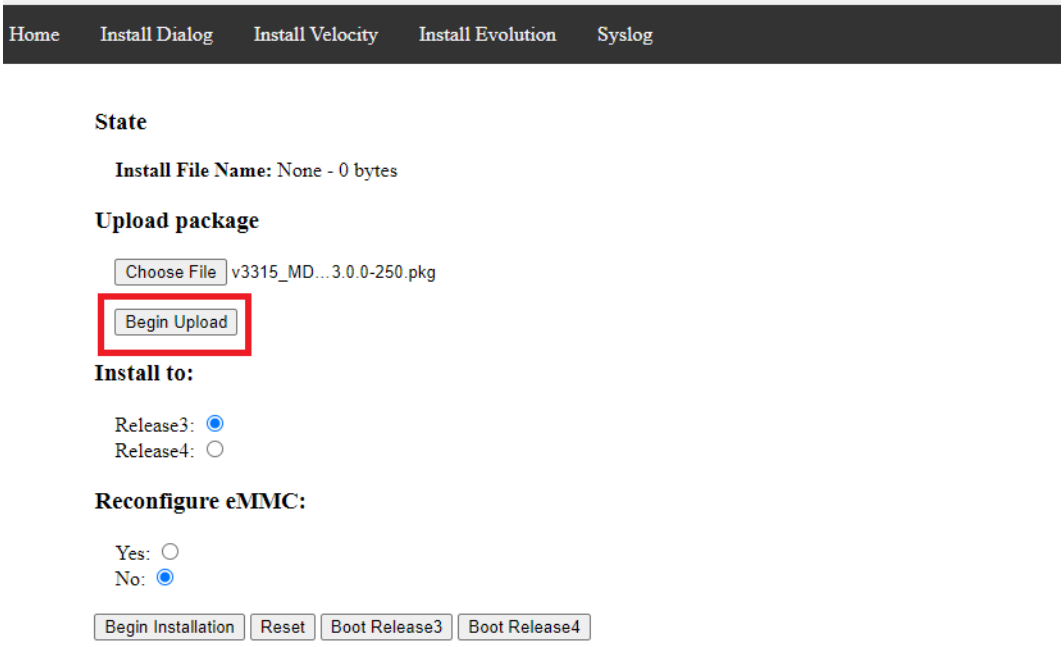


Figure C-4. Upload the Evolution Software Package

4. Wait for the system to display that the upload is complete.

Figure C-5. Evolution Software Package Upload Complete

5. Click **Install Evolution** to return to the Evolution software installation page and confirm that the correct software package was uploaded.

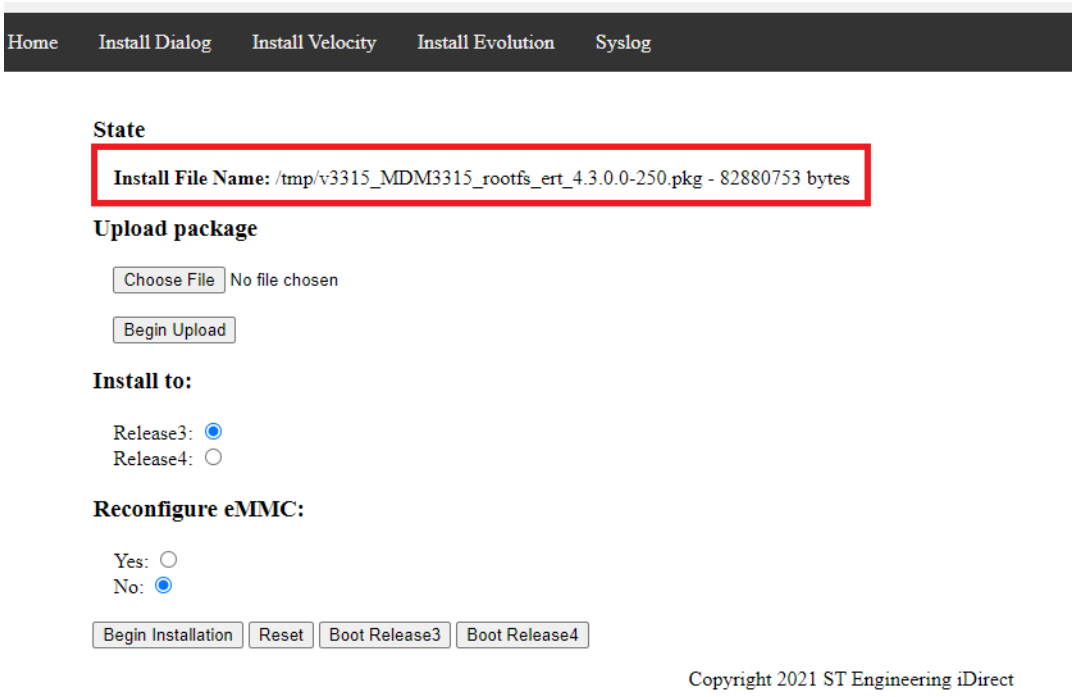


Figure C-6. Evolution Software Package Upload Confirmation

6. Select to which partition on the modem you want to install the software package.

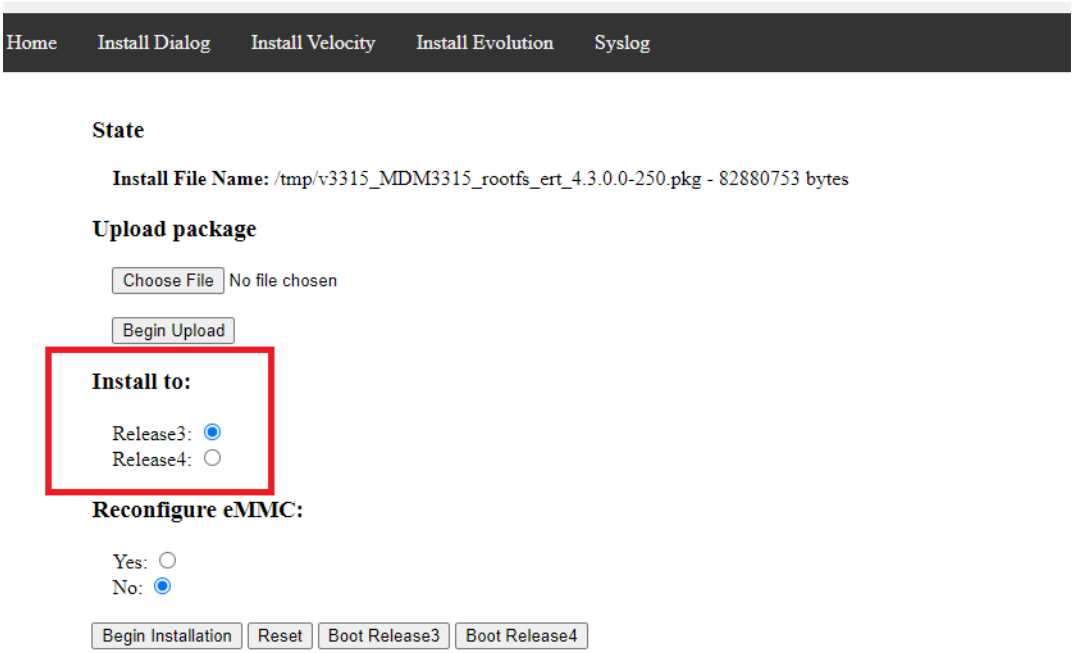


Figure C-7. Select Modem Partition

7. Specify if you want to also reconfigure the embedded MultiMediaCard (eMMC). This option reconfigures the flash memory on the modem and is typically selected if your modem is in a failed state, if you wish to completely wipe the current software configuration from the modem or if you are switching from one software version to another (for example, from Dialog to Evolution).

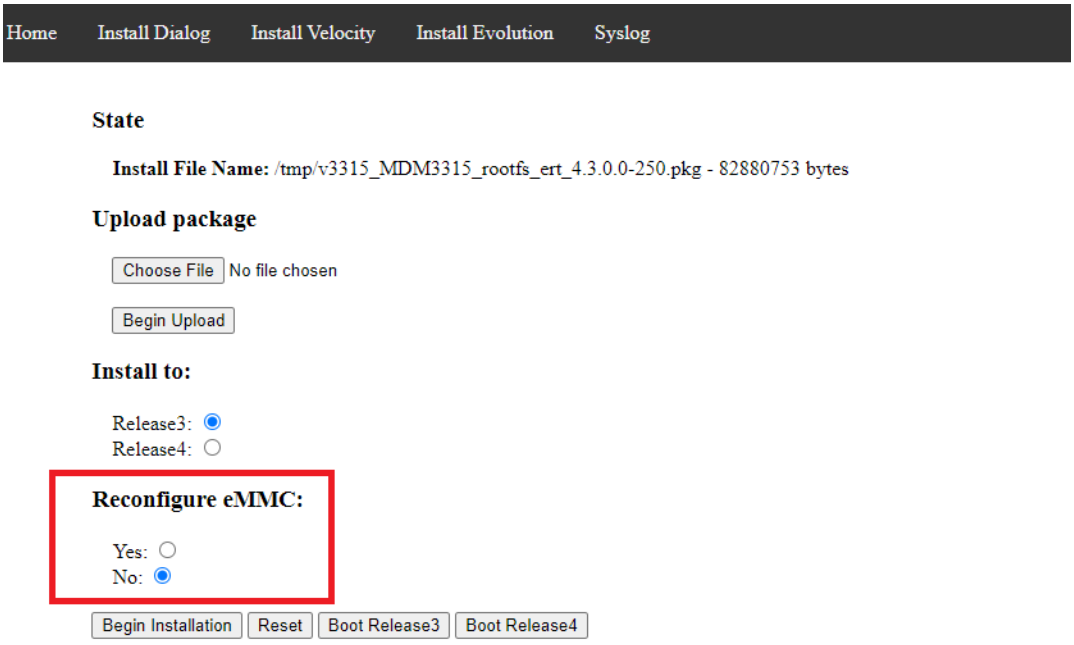


Figure C-8. Reconfigure the eMMC

8. Click **Begin Installation** to install the software package on the modem.

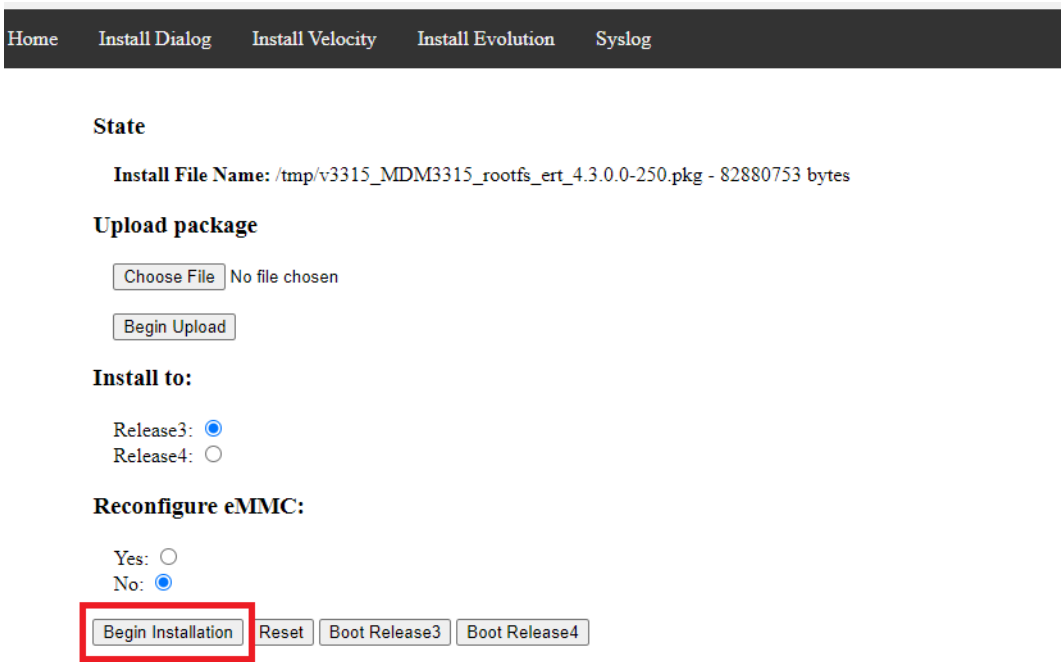


Figure C-9. Evolution Software Package Installation

9. The URP confirms that it has started to install the new software package on the modem.

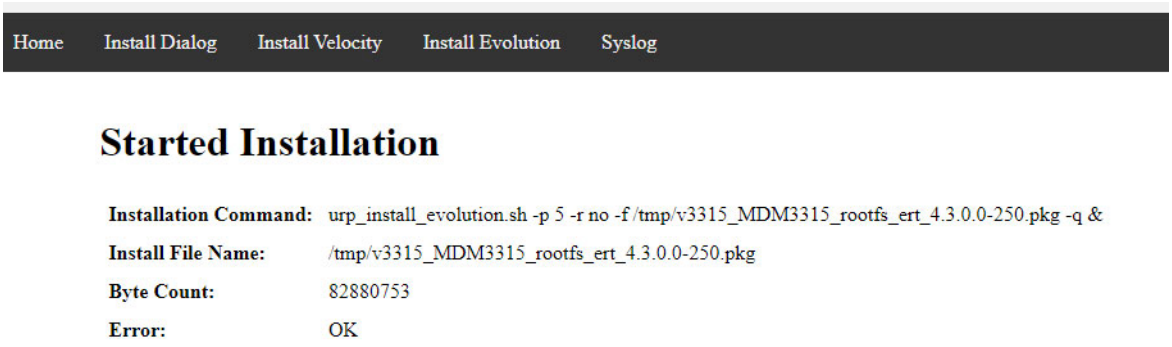


Figure C-10. URP Started Installation Message

10. Click **Syslog** to monitor the progress of the installation.

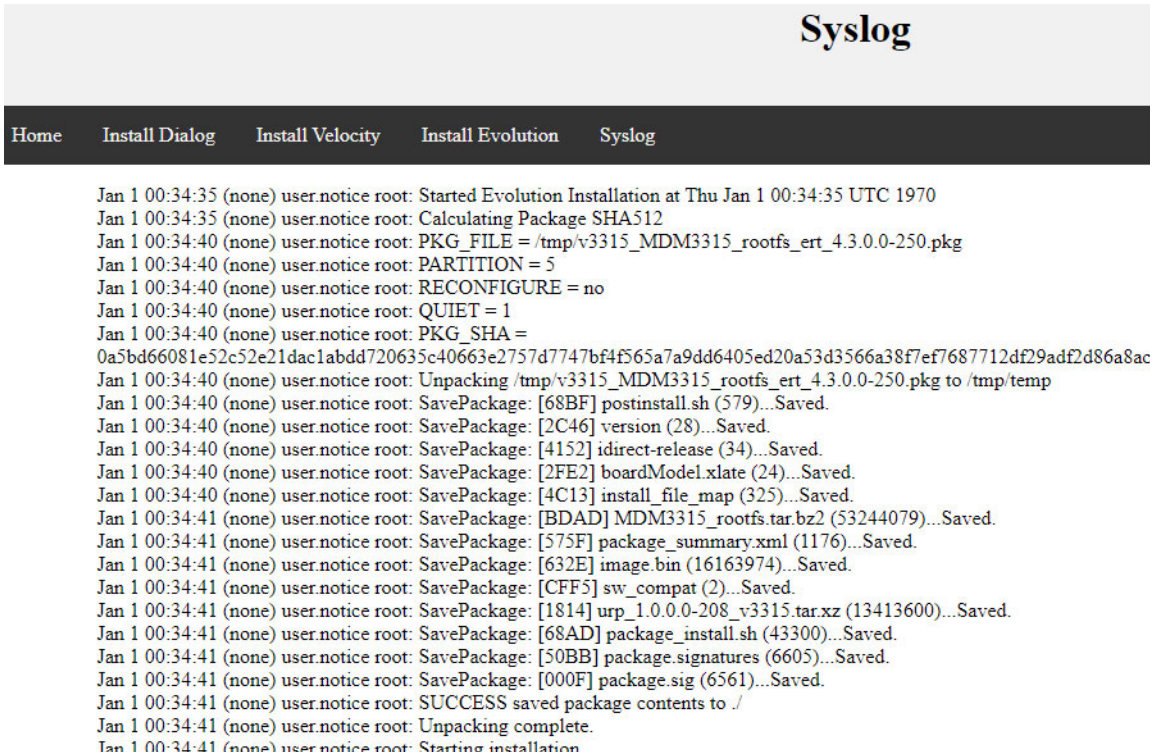


Figure C-11. Viewing Syslog Messages

11. Wait until you see messages that indicate the installation is complete, as shown in the following example, and click **Install Evolution** to return to the Evolution software installation page.

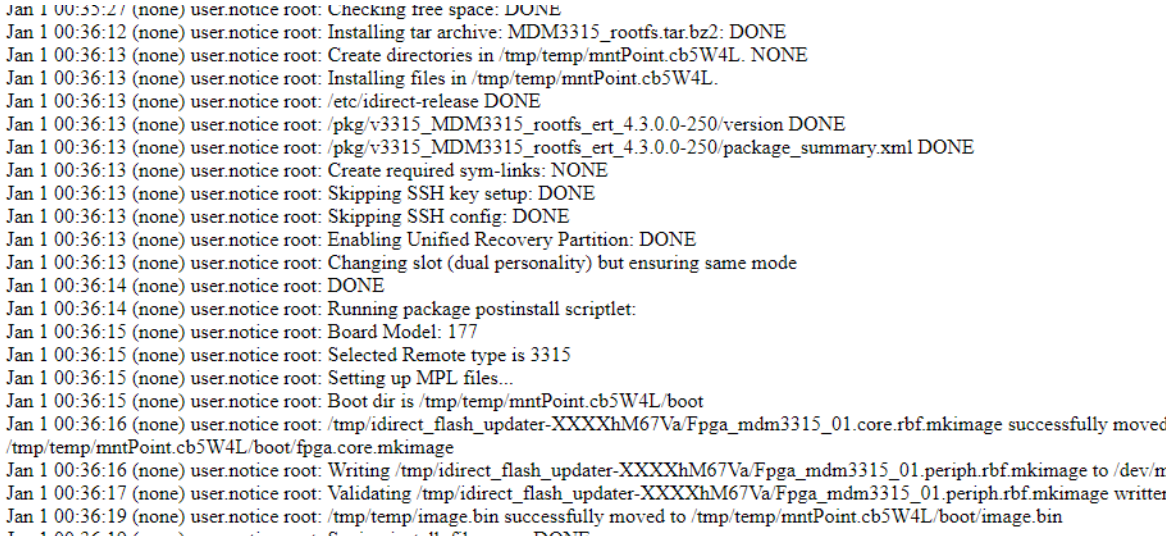


Figure C-12. Syslog Messages - Installation Complete

12. Click **Reset if you wish to** return all inputs on the modem to default settings.

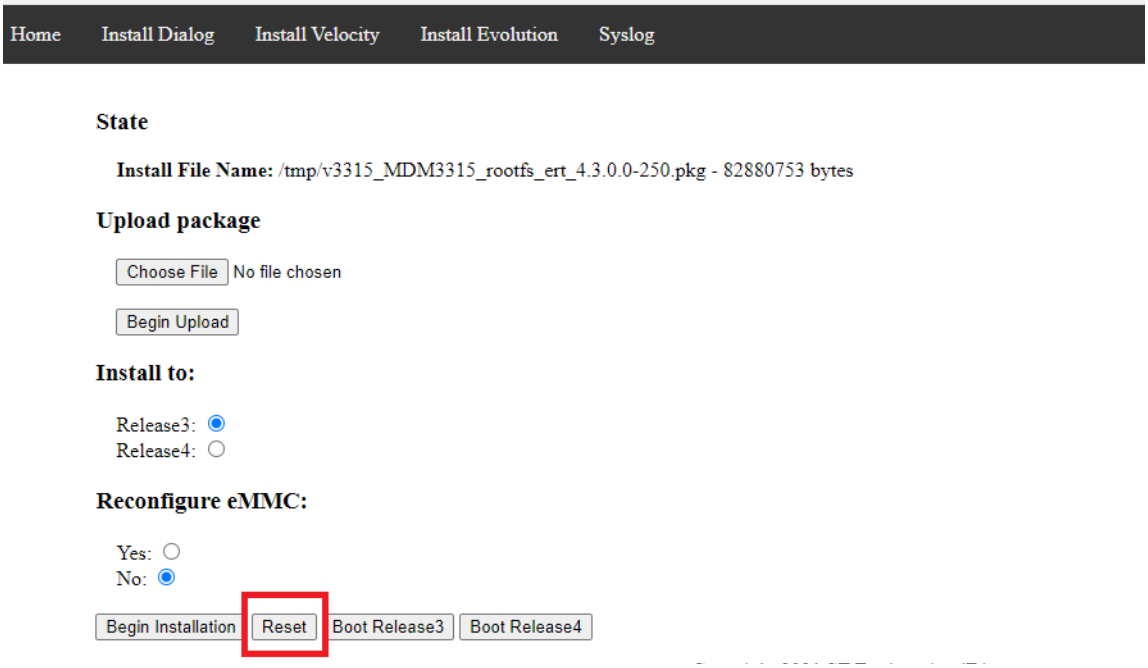


Figure C-13. Reset Button

13. Boot the software package to the partition where you placed the software package. In this example, the software package was placed in partition 3 (Release3), so it is booted to that partition.

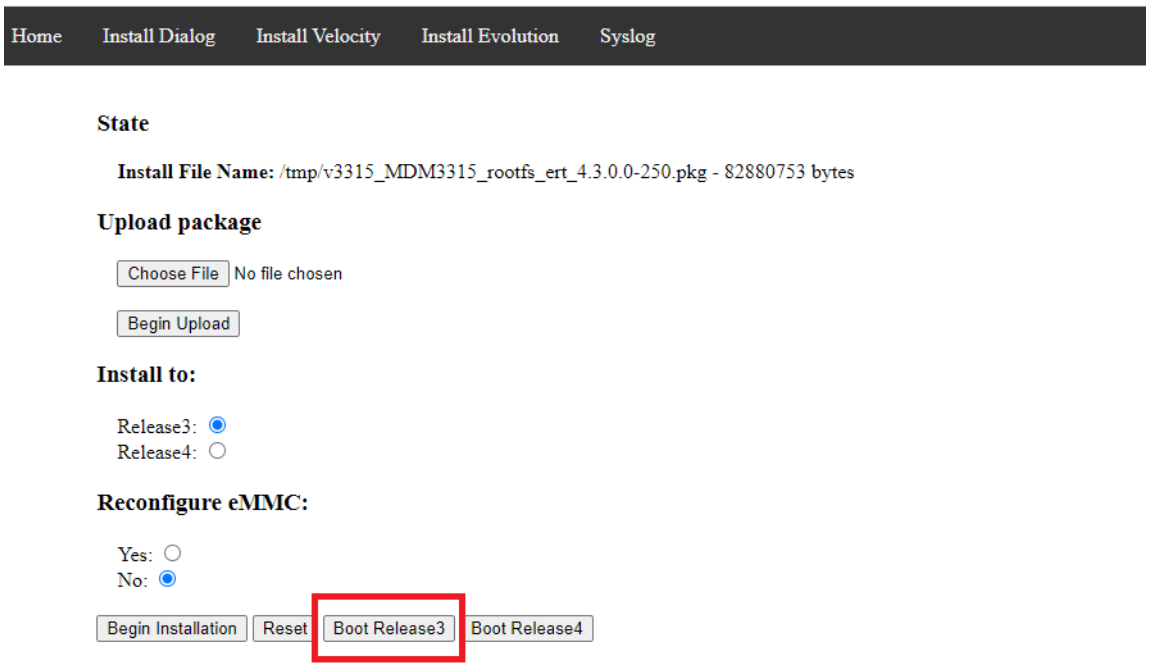


Figure C-14. Evolution Software Package Boot Release

14. The URP confirms that it is booting the software package to the specified partition.

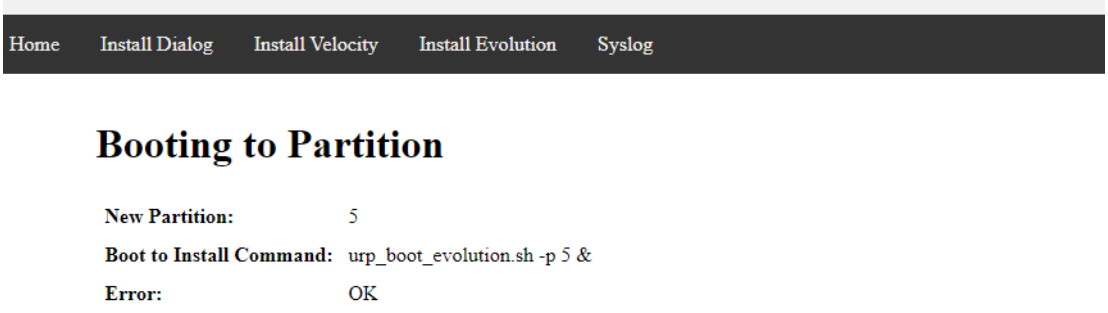


Figure C-15. URP Started Installation Message

15. Log into the Terminal WUI at 192.168.1.1, using the default password.

16. Click **Administration** > **Software and Configuration. T**he **Manage Software Packages** page is displayed (Figure 2-11). Confirm that the new software package was installed in the correct partition.

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