DataSat II
SkyEdge IP and Pro Installation
and Monitoring

Version 052006
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About This Manual

This section describes the objectives, audience, document layout and conventions of the SkyEdge VSAT Installation and Monitoring manual.

Objectives

This manual provides detailed instructions how to configure, install and monitor the operation of the SkyEdge Pro, IP, Call or Gateway VSAT.

How to Use This Manual

This manual is to be used by a trained installer in order to configure and install a VSAT. The step-by-step procedures are to be closely followed in order to ensure that configuration and installation will be successful.

Audience

This manual is designed for trained personnel who will be responsible for the configuration, installation and monitoring of VSATs in a SkyEdge network.

Organization

The table below contains a list of the chapters in the manual, the chapter titles and a short description of the material contained in each chapter.

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Chapter Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1</td>
<td>Introduction and Overview</td>
<td>Contains a brief description of the VSAAT and its LCD keypad that is used for configuration</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>Configuring the VSAT</td>
<td>Contains details instructions on how to configure the VSAT using the LCD keypad or the SkyManage web page</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>VSAT Installation</td>
<td>Instructs how to connect and boot-up a VSAT to a previously pointed antenna and how to ground the VSAT. Shows how to use the VSAT as a pointing device. Contains instructions on how to broadcast a CW from the VSAT</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>VSAT Monitoring and Troubleshooting</td>
<td>Describes the menus and their parameters that are shown when the VSAT is in operation. These can be helpful in troubleshooting the VSAT operations.</td>
</tr>
</tbody>
</table>
Conventions

This manual uses the following conventions to convey instructions and information:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boldface font</strong></td>
<td>Commands and keywords</td>
</tr>
<tr>
<td><strong>Italic font</strong></td>
<td>The result of an instruction or command</td>
</tr>
<tr>
<td>Screen font</td>
<td>Information to be typed into a form or dialog</td>
</tr>
</tbody>
</table>

**WARNING**

This warning symbol means danger. It is used to describe a situation that can cause bodily injury. Before working on any equipment, be aware of the hazards involved with electrical circuitry and how to prevent accidents.

**Caution**

This symbol means reader be careful. In this situation, damage may be caused to equipment or data may be lost.

**Note**

This symbol means reader take note. Notes contain helpful suggestions and explanations.
1. Introduction and Overview

1.1 Background and Purpose

In order to enable a VSAT to come on line it has to be configured with a minimum number of parameters that are used to enable the VSAT to boot up. Currently, this operation is performed using the LCD panel and keypad located on the front of the SkyEdge Pro or IP VSATs. There is no requirement for a PC (laptop or desktop) to configure the VSAT. The SkyEdge Pro VSAT is shown in Figure 1 (front) and Figure 5 (rear). The IP VSAT is shown in Figure 2 (front) and Figure 6 (rear). The SkyEdge IP VSAT Version 3 (Figure 3) and SkyEdge Call VSAT (Figure 4) are configured using the internal web page. This procedure is found in Section 2.3.
Figure 4: SkyEdge Call VSAT (front view)

Figure 5: SkyEdge Pro VSAT (rear view)

Figure 6: SkyEdge IP VSAT (rear view)
Figure 7: SkyEdge IP VSAT with External Power Supply (rear view)

Figure 8: SkyEdge IP VSAT Version 3 (rear view)

Figure 9: SkyEdge Call VSAT (AC type rear view)

Figure 10: SkyEdge Call VSAT (DC type rear view)
The VSAT can be in either one of two modes, Boot or Operational. The configuration parameters can only be modified while the VSAT is in Boot mode. This ensures that no changes can be made in the basis VSAT configuration parameters to a VSAT that is live in a network. All changes to such a VSAT will be made from the NMS.

1.2 SkyEdge VSAT Expansion Cards

The SkyEdge Pro and Gateway VSATS can contain expansion cards that give additional capabilities to the VSAT. The possible locations of the expansion cards are shown in Table 1.

Table 1: VSAT Types and Plug-in Cards

<table>
<thead>
<tr>
<th>VSAT Type</th>
<th>Optional Plug-in Cards</th>
<th>Plug-in Cards Combinations and Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SkyEdge IP</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>SkyEdge PRO</td>
<td>Single Line – one FXS port</td>
<td>Any combination of 1-12 FXS lines, limited by the number of available slots</td>
</tr>
<tr>
<td></td>
<td>Dual Line – two FXS ports</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quad Line – four FXS ports</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quad LAN</td>
<td>Quad LAN can be installed only in slot 3. Only one Quad LAN card can be installed in the VSAT. When the Quad LAN card is installed, the on-board LAN is disabled.</td>
</tr>
<tr>
<td></td>
<td>Serial Async/Sync</td>
<td>Up to 3 cards per VSAT (3 x DB-25 interfaces per SkyEdge Pro), limited by the number of available slots.</td>
</tr>
<tr>
<td></td>
<td>Dual Serial Async (DB-9)</td>
<td>Up to 3 cards per VSAT (6 x DB-9 interfaces per SkyEdge Pro), limited by the number of available slots.</td>
</tr>
<tr>
<td></td>
<td>Mesh Receiver</td>
<td>Mesh Receiver can be installed only in slot 1. One card per SkyEdge Pro IDU.</td>
</tr>
<tr>
<td>SkyEdge Gateway</td>
<td>Single Line – one FXS port</td>
<td>Any combination of 1-8 FXS lines, limited by the number of available slots.</td>
</tr>
<tr>
<td></td>
<td>Dual Line – two FXS ports</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quad Line – four FXS ports</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E1 Interface</td>
<td>E1 interface card must be installed in a basic SkyEdge Gateway IDU. E1 card will always be installed in slot 2 to avoid any configuration limitations.</td>
</tr>
<tr>
<td></td>
<td>Serial Async/Async (DB-25)</td>
<td>Up to 2 cards per VSAT (2 x DB-25 interfaces per SkyEdge Gateway) limited by the number of available slots.</td>
</tr>
<tr>
<td></td>
<td>Dual Serial Async (DB-9)</td>
<td>Up to 2 cards per VSAT (4 x DB-9 interfaces per SkyEdge Gateway) limited by the number of available slots.</td>
</tr>
<tr>
<td></td>
<td>Mesh Receiver</td>
<td>Mesh Receiver can be installed only in slot 1. One card per SkyEdge Pro IDU.</td>
</tr>
<tr>
<td></td>
<td>Quad LAN</td>
<td>Quad LAN can be installed only in slot 3.</td>
</tr>
</tbody>
</table>
When a Mesh card is installed, the RF IN port on the Mesh card and the RF IN port on the VSAT are connected with an RF splitter, supplied by Gilat, as shown in Figure 11.

![Mesh Card with RF Splitter](image1)

**Figure 11: Mesh Card with RF Splitter**

### 1.3 LCD Display and Keypad

The VSAT LCD display and keypad are shown in Figure 12.

![LCD Display and Keypad](image2)

**Figure 12: LCD Display and Keypad**

The keypad is used to configure the VSAT in Boot mode and to navigate through the display in both Boot and Operational modes. An explanation of the functions is found in Table 2.
Table 2: Keypad Functions

<table>
<thead>
<tr>
<th>Key Description</th>
<th>Boot Mode</th>
<th>Operation Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up Arrow ▲</td>
<td>Scroll through menu</td>
<td>Scroll through menu</td>
</tr>
<tr>
<td></td>
<td>Increase number of digits displayed</td>
<td></td>
</tr>
<tr>
<td>Down Arrow ▼</td>
<td>Scroll through menu</td>
<td>Scroll through menu</td>
</tr>
<tr>
<td></td>
<td>Decrease number of digit displayed</td>
<td></td>
</tr>
<tr>
<td>Left Arrow ◄</td>
<td>Move left to next character</td>
<td>Inactive</td>
</tr>
<tr>
<td>Right Arrow ►</td>
<td>Move right to next character</td>
<td>Inactive</td>
</tr>
<tr>
<td>Enter</td>
<td>Enter the sub-menu</td>
<td>Enter the sub-menu</td>
</tr>
<tr>
<td></td>
<td>Enter the displayed or selected data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Exit and save the displayed or selected data</td>
<td></td>
</tr>
<tr>
<td>Esc</td>
<td>Exit to the previous menu</td>
<td>Exit to the previous menu</td>
</tr>
<tr>
<td></td>
<td>Exit and ignore the displayed or selected data</td>
<td></td>
</tr>
</tbody>
</table>

1.4 Inter-Facility Link (IFL) Cables

1.4.1 Coaxial Cables

The Inter-Facility Link between the ODU and IDU provides a full duplex communication path between the two units. It consists of two coaxial cables: IFL Tx and IFL Rx. In general, no line amplification is required for cables less than 50 meters in length. For lengths over 50 meters consult your Gilat representative for additional information and specifications.

1.4.2 LAN Cable

All of the LAN cables used are type CAT-5. Ethernet hubs or switches are used to connect multiple PCs to the SkyEdge VSAT. The maximum length of a LAN cable is 100 meters (325 feet).
2. Configuring the VSAT

2.1 Data Required

Prior to configuring a VSAT verify that the following parameters have been supplied by the hub operations staff using the spreadsheet supplied by Gilat. The parameters are found in Table 3. For two of the parameters (OB Modulation and OB Code Rating) a number is entered that represents a predetermined modulation or FEC rate.

![Caution]

Not all of the Outbound Coding Rates can be used with each Modulation type. Use only the values that are supplied by the Hub Operations Center.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Code Entered and Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Password</td>
<td>44528</td>
</tr>
<tr>
<td>OB Modulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 – QPSK</td>
</tr>
<tr>
<td></td>
<td>1 – QPSK Turbo</td>
</tr>
<tr>
<td></td>
<td>2 – 8PSK Turbo</td>
</tr>
<tr>
<td></td>
<td>0 – ½</td>
</tr>
<tr>
<td></td>
<td>1 – ¾</td>
</tr>
<tr>
<td></td>
<td>2 – 2/3</td>
</tr>
<tr>
<td></td>
<td>3 – ¾</td>
</tr>
<tr>
<td></td>
<td>4 – ¾:205</td>
</tr>
<tr>
<td>OB Coding Rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 – ¾:21</td>
</tr>
<tr>
<td></td>
<td>6 – ¾:26</td>
</tr>
<tr>
<td></td>
<td>7 – 5/6</td>
</tr>
<tr>
<td></td>
<td>8 – 6/7</td>
</tr>
<tr>
<td></td>
<td>9 – 7/8</td>
</tr>
<tr>
<td></td>
<td>10 – 8/9</td>
</tr>
<tr>
<td>OB Frequency (KHz)</td>
<td></td>
</tr>
<tr>
<td>OB Data Rate (bps)</td>
<td></td>
</tr>
<tr>
<td>OB ID</td>
<td></td>
</tr>
<tr>
<td>DVB Reduced Latency</td>
<td>Disabled</td>
</tr>
<tr>
<td>(For telephony only)</td>
<td>Enabled</td>
</tr>
<tr>
<td>Management PID</td>
<td></td>
</tr>
<tr>
<td>Workgroup ID</td>
<td></td>
</tr>
<tr>
<td>Software Group ID</td>
<td></td>
</tr>
<tr>
<td>VSAT ID</td>
<td></td>
</tr>
<tr>
<td>DHCP</td>
<td>1 – ON</td>
</tr>
<tr>
<td></td>
<td>0 - OFF</td>
</tr>
<tr>
<td>ODU Initial Offset</td>
<td></td>
</tr>
</tbody>
</table>

The value is obtained from the ODU. The value entered is with the opposite sign. For example; if the Initial Offset value on the ODU is 300, the value entered is – 300.
2.2 Configuring the VSAT via the LCD Keypad

To configure the VSAT parameters using the LCD display:

1. Verify that nothing is connected to the VSAT except for the power cable.

2. Turn the VSAT power switch to **On**.
   
   *Result: The VSAT PWR LED turns on and VSAT Information appears on the LCD display.*

3. When the Tx LED starts blinking press **Esc**.

4. Press **Down (▼)** twice.
   
   *Result: VSAT Configuration appears on the LCD display.*

5. Press **Enter**.
   
   *Result: PASSWORD appears on the LCD display*

6. Press **Enter**.
   
   *Result: The first digit flashes.*

7. Enter the first digit of password given by pressing the up (▲) or down (▼) arrow and press the right arrow (►).
   
   *Result: The next digit flashes.*

8. Repeat step 7 until all of the digits of the password have been entered.

9. Press **Enter**.
   
   *Result: If the password has been entered correctly, **Access Granted** flashes in the LCD display followed by **CW Test**.*
   
   *If the password has not been entered correctly, **Access Denied** appears.*

10. Press the down arrow (▼) and press **Enter**.
    
    *Result: OB Modulation appears on the LCD display*
11. Enter the code for the Outbound Modulation from Table 3. Press Enter.  
   Result: Saved flashes on the LCD display.

12. Repeat Steps 10 and 11 for the following parameters:
   - Outbound Coding Rate
   - Outbound Frequency
   - Outbound Data Rate
   - Outbound ID
   - DVB Reduced Latency
   - Management PID
   - Workgroup ID
   - Software Group ID
   - VSAT ID
   - DHCP

13. Press the down arrow (▼) and press Enter. Enter the ODU Initial Offset Value found on the ODU with the opposite sign.

   ![Note]
   - For example, if the ODU Initial Offset Value found on the ODU is 300 enter a value of -300.
   - If the ODU Initial Offset Value found on the ODU is -300 enter a value of 300

14. Press Enter.

   At this point the VSAT configuration is complete.

   ![Caution]
   It is highly recommended that the entire Configuration be carefully checked to ensure that it is correct.
2.3 Configuring SkyEdge VSATs via SkyManage Web Page

All SkyEdge VSATs can be configured via the SkyManage web page contained in the factory installed Boot Code version 2.0.3.3 or higher. SkyEdge Call VSATs and SkyEdge IP VSATs Version 3 must be configured using this procedure because they do not have a keypad or LCD display.

2.3.1 Accessing the SkyManage Web Page

The SkyManage web page can be accessed in a number of different ways:

- Via a PC using a cross LAN cable
- Via a PC with a wireless link. A wireless adapter is inserted in the VSAT LANport.
- Via a PDA (Palm type device) running Microsoft Mobile 2003 or Palm OS with PalmOne Blazer (V4.0 or higher) web browser. Either a cross LAN cable or a wireless connection can be used.

- All of the captures in this section were taken using Microsoft Internet Explorer. The screens viewed when using other web browsers may be slightly different in appearance.
- All of the captures were carried out on a VSAT that had not yet downloaded its operational code.
- Verify that the device being accessed has its IP address configured on the same subnet as the built-in web page (192.168.1.1).
- Verify that the use of a proxy has been disabled in the browser application.
1. To open the SkyManage web page type **192.168.1.1** in the address bar and click to open. 
   *Result: The SkyManage home page opens (Figure 13).*

![SkyManage Home Page](image)

**Figure 13: SkyManage Home Page**

The home page, viewable by all users, contains the following information (for an operational VSAT additional parameters are shown):

- **The VSAT type** is indicated by the picture in the upper right corner (Pro VSAT in this case)
- **The VSAT status** (in this case Boot) is shown by the logo in the upper left corner
- **Active code type** - Boot or Operational
- **Outbound Lock state** – Unlocked or Locked
- **LAN Port** – speed and duplex mode mode
- **Powering mode** – Normal/Low Power/Power Save
- **Operation time** – time since VSAT was powered on or reset
2. Click Info to open the page (Figure 14) showing the hardware and software components of the VSAT

![Image of SkyManage interface]

**Figure 14: Info Page Before Configuration**

The Info page, viewable by all users, contains the following:

- **Identity** – VSAT ID (if configured), part number and serial number (factory assigned)
- **Hardware** – identifies the hardware version of the main board and any expansion cards present
- **Software** – lists the factory boot version, active boot version and operation version of the VSAT. A VSAT that has never received operational code will have a message instead of the code version.
- **Networking** – lists the MAC address, Admin IP address and Admin subnet mask (factory assigned)
3. Click Telemetry to view the available telemetries (Figure 15).

![Telemetry Page](image)

*Figure 15: Telemetry Page*

This page shows the CPU Utilization and Rx Signal EbN0 (for offline VSATs the value is 0).

4. To view a graphical presentation of the telemetry, click on the Graph button next to the telemetry bar graph.

*Result: The CPU Utilization Graph appears (Figure 16).*
2.3.2 Configuring the VSAT

To configure the VSAT from the SkyManage web site:

1. Click **Installer**.

   *Result: The Password screen opens (Figure 17).*

   ![Figure 17: Password](image)

2. Type the User name inst and Password $Sat2598$ and click OK.

   *Result: The Setup page opens (Figure 18).*

   ![Figure 18: Setup](image)
3. Enter all of the configuration parameters as shown in Figure 19 and explained in Table 4.

**Note**

- Parameters marked with an asterisk (*) must be typed in the field. All other parameters are selected from the drop-down list.
- Each of the parameters has a pop-up with the valid range.
- If an out of range value is used a warning will appear next to the parameter as shown below.

![Configuration Parameters](image-url)
Table 4: Configuration Parameters

<table>
<thead>
<tr>
<th>Parameter Type</th>
<th>Parameter</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>VSAT ID</td>
<td>Assigned in NMS</td>
</tr>
<tr>
<td></td>
<td>Workgroup Address</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Software Group Address</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manage PID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outbound ID</td>
<td></td>
</tr>
<tr>
<td>Bott-time Options</td>
<td>Software Download</td>
<td>Enable or Disable</td>
</tr>
<tr>
<td></td>
<td>Software Download Timeout</td>
<td>Needs to be entered when configuration parameters are modified to prevent VSAT from not rebooting</td>
</tr>
<tr>
<td></td>
<td>DHCP</td>
<td>Enable or Disable</td>
</tr>
<tr>
<td></td>
<td>ODU Constant Drift</td>
<td>Value is found on ODU</td>
</tr>
<tr>
<td></td>
<td>LNB Installation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ODU Type</td>
<td></td>
</tr>
<tr>
<td>Modulation and Coding</td>
<td>Frequency</td>
<td>Outbound Frequency</td>
</tr>
<tr>
<td></td>
<td>Data Rate</td>
<td>Outbound Data Rate</td>
</tr>
<tr>
<td></td>
<td>Modulation</td>
<td>DVB, Advanced QPSK or 8PSK</td>
</tr>
<tr>
<td></td>
<td>Coding Rate</td>
<td>½, 2/3, 3/4 2.05, ¾ 2.1, 5/6, 7/8, 8/9</td>
</tr>
<tr>
<td></td>
<td>DVB Reduced Latency (for telephony only)</td>
<td>Disable or Enable</td>
</tr>
</tbody>
</table>
2.4 Configuring a VSAT using a File

When multiple VSATs are configured, the changes between them are minimal. In order to simplify the configuration process, the configuration of one VSAT can be used for others using the procedure in this section. The parts of the procedure are as follows:

- Save the configuration to a PC as a file
- Upload the file to the VSAT to be configured
- Modify the parameters as necessary (in all cases the VSAT ID must be changed)

### 2.4.1 Saving the Configuration as a File

To save a VSAT configuration as a file:

1. After submitting the configuration, click **Setup from File**.

   *Result: The Setup from file page opens (Figure 22).*
2. Click **Save current setup parameters to file**.

   **Result:** The Save as file message appears (Figure 23).

   ![File Download](image)

   **Figure 23: Save as file**

3. Click **Save**.

   **Result:** A Save As dialog box opens.

4. Save the file to the desired location. It is recommended that the file be saved to the Desktop.

   A sample file is shown in Figure 24.
2.4.2 Uploading a File to a VSAT

To upload a file to a VSAT:

1. On the Setup from file page, click **Browse** (Figure 22).
2. Browse to the location of the file and click **Load**.

Result: The parameters are loaded to the VSAT.

2.4.3 Modifying VSAT Parameters

To modify the VSAT parameters that are different from the ones in the imported file, go to Section 2.3.2 and start at step 3.

2.5 Reset VSAT

To reset a VSAT:

1. On the Installer page, click **Reset**.
2. Click **Reset VSAT**.

*Result: The Confirm Reset VSAT message appears (Figure 25).*

3. Click **OK**.

*Result: The Reset VSAT Successful message appears (Figure 27).*
3. VSAT Installation

3.1 Grounding

**Warning**

Before installing the unit, be sure the antenna and cable system is grounded so as to provide protection against voltage surges and static charges. Section 810 of the US National Electrical Code, ANSI/NFPA 70, and Section 54 of the Canadian Electrical Code provide information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes and requirements for the grounding electrode.

To connect the VSAT to “ground”:

1. Connect one end of the grounding wire to the Grounding Pin of the VSAT (Figure 28 for IP VSAT or Figure 29 for Pro VSAT) and tighten the bolt in order to secure the connection.

![Figure 28: SkyEdge IP VSAT – Grounding Pin](image)

![Figure 29: SkyEdge Pro VSAT – Grounding Pin](image)
2. Connect the other end of the grounding wire to the common ground, if possible, or to the nearest local grounding point (for example – a water pipe).

3.2 VSAT Physical Connections

Caution

- Before starting this section verify that the VSAT power cord is not connected to the power source and that the VSAT power switch is OFF.
- For the physical connections of a Mesh VSAT go to Section 3.3.

To connect the VSAT to the ODU and Antenna perform the following:

1. Connect the IFL cables to the ODU as shown in Figure 30.

![Figure 30: ODU and Cable Connections](image)

2. Place the VSAT on a flat surface with the rear panel facing towards you as shown in Figure 5 for the SkyEdge Pro VSAT and Figure 6 for the SkyEdge IP VSAT.
3. Connect the coaxial cable labeled RF IN to the RF-IN connector on the VSAT.
4. Connect the cable marked RF OUT to the RF OUT connector on the VSAT.
5. Insert the power cord into the power socket (No. 1) on the VSAT and then into the local power supply.
6. Turn the power switch **ON**.

### 3.3 Mesh VSAT Physical Connections

![Caution Image]

- Before starting this section verify that the VSAT power cord is not connected to the power source and that the VSAT power switch is **OFF**.
- For the physical connections of a non-Mesh VSAT go to Section 3.2.

To connect the VSAT to the ODU and Antenna perform the following:
1. Connect the IFL cables to the ODU as shown in Figure 30.
2. Place the VSAT on a flat surface with the rear panel facing towards you as shown in Figure 31.

![Diagram Image]

**Figure 31: Mesh VSAT Physical Connections**

3. Connect the cable marked **RF OUT** to the **RF OUT** connector on the VSAT.
4. Connect the cable marked **RF IN** to the **Input** connector on the splitter.
5. Connect one of the cables from the Mesh Kit to the **RF IN** connector on the VSAT and to the **DC+OUT** connector on the splitter (Figure 31) or the **OUT** connector with the diagonal line (Figure 11) depending upon the type of splitter supplied.

6. Connect the other cable from the Mesh Kit to the Mesh Receiver RF IN connector on the mesh card and to the other OUT connector on the splitter.

7. Insert the power cord into the power socket (No. 1) on the VSAT and then into the local power supply.

8. Turn the power switch **ON**.

### 3.4 Using the VSAT as a Pointing Device

The VSAT can be used as a pointing device to assist in the final pointing of the VSAT antenna.

**NOTE**

The VSAT can be used as a pointing device without configuring the parameters.

To use the VSAT as a pointing device:

1. Verify that the VSAT power is turned off.

2. Install the antenna and adjust the azimuth and elevation angles in accordance with the worksheet received from the hub.

3. Connect the coaxial cable labeled **RF IN** to the **RF-IN** connector on the VSAT.

4. Connect the other end of this coaxial cable to the LNB.

5. Connect the cable marked **RF OUT** to the **RF OUT** connector on the VSAT.

6. Connect the other end of this coaxial cable to the ODU.

7. Power on the VSAT.

8. Log on to the SkyManage web page according to the instructions in Section 2.3.1.

9. Log on to the Installation page according to the instructions in Section 2.3.2, steps 1 and 2.

10. Click **Antenna**.

**Result:** The Antenna page appears (Figure 32).
The device works by reading the outbound signal received by the VSAT. As the antenna position is adjusted, the strength of the signal is indicated simultaneously in two different forms:

- Bar graph with Eb/N0 reading
- Audio signal through speaker. The higher the pitch and strength of the sound, the higher the reading.

The optimal angle is achieved when the indicators are at their maximum values.

11. Activate the speaker by clicking on it.

12. Loosen the azimuth lock bolt and slowly rotate the antenna from side to side until you pass the maximum signal strength, as indicated on the screen and speaker.

13. Set the antenna to the position where the readings are at their highest, and tighten the azimuth lock bolt.

14. Loosen the elevation lock bolt and slowly rotate the antenna from side to side until you pass the maximum signal strength, as indicated by the readings.
15. Set the antenna to the position where the readings are at their highest, and tighten the elevation lock bolt.

### 3.5 Initial Boot-Up

#### 3.5.1 Monitoring via the LCDs

After successfully assembling the ODU and antenna and pointing the antenna, the IFL (coax) cables are connected to the VSAT as described in the previous section and the power switch is turned on or the external power supply is plugged in. At this point the LEDs on the VSAT (Figure 33) flash in accordance with Table 5.

![Figure 33: VSAT LEDs](image)

Table 5: LED Boot Sequence

<table>
<thead>
<tr>
<th>Mode</th>
<th>LED</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boot Mode</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PWR</td>
<td>On</td>
<td></td>
</tr>
<tr>
<td>Tx</td>
<td>Flash On and Off</td>
<td></td>
</tr>
<tr>
<td>On-Line</td>
<td>Flash On and Off</td>
<td></td>
</tr>
<tr>
<td>SYNC</td>
<td>Flash On and Off</td>
<td></td>
</tr>
<tr>
<td>Rx</td>
<td>Flash On and Off</td>
<td></td>
</tr>
<tr>
<td>Tx</td>
<td>Flashes On and Off for 5 seconds</td>
<td></td>
</tr>
<tr>
<td>Rx</td>
<td>On</td>
<td></td>
</tr>
<tr>
<td><strong>Operational Mode</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rx</td>
<td>Off</td>
<td></td>
</tr>
<tr>
<td>Rx</td>
<td>On</td>
<td></td>
</tr>
<tr>
<td>SYNC</td>
<td>On</td>
<td></td>
</tr>
<tr>
<td>Tx</td>
<td>Flash On and Off</td>
<td></td>
</tr>
<tr>
<td>On-Line</td>
<td>On</td>
<td></td>
</tr>
<tr>
<td>SYNC</td>
<td>Off and On</td>
<td></td>
</tr>
<tr>
<td>Tx</td>
<td>Flashes</td>
<td></td>
</tr>
</tbody>
</table>
At this point the VSAT should be operating normally and web browsing can successfully carried out.

### 3.5.2 Monitoring via the SkyManage Web Page

This section details what is shown on the SkyManage web page after successfully assembling the ODU and antenna and pointing the antenna, the IFL (coax) cables are connected to the VSAT, the power switch is turned on or the external power supply is plugged in and the VSAT is reset as shown in Section 2.5. The captures in this section are from different pages on the web site.

1. The Outbound locks on while the VSAT is still in Boot code mode.

![Figure 34: Boot Code and Outbound Locked](image)

2. The VSAT downloads the software tables.

![Figure 35: Download Software](image)
3. The Outbound locks on in Operational code mode.

![Figure 36: Outbound Locked in Operational Code](image)

4. The VSAT is Authorized (Sync up, Satellite link up).

![Figure 37: VSAT Authenticated with Sync and Satellite Link Up](image)
5. The Access scheme is listed and the first packets may be transferred.

6. The VSAT is shown to be fully active (HTTP acceleration is only active with embedded RPA, which is an optional feature).
7. The VSAT Info page is updated.

![VSAT Info page]

**Figure 40: VSAT Info page for Active VSAT**

### 3.6 Activating CW

#### 3.6.1 Activating CW from the LCD Keypad

**Caution**

*DO NOT TRANSMIT A CW UNLESS AUTHORIZATION TO TRANSMIT IS GIVEN BY THE HUB OPERATOR!*

If the commissioning of the VSAT cannot successfully be carried out from the hub it will be necessary to initiate a CW broadcast from the VSAT. In this case, the VSAT will stay in Boot mode and no Operational code will be downloaded. This procedure is carried out from the LCD and keypad as follows:

1. Turn the VSAT power switch to **Off** and then **On**.
   *Result: The VSAT PWR LED turns on and VSAT Information appears on the LCD display.*

2. When the Tx LED starts blinking press **Esc**.
3. Press **Down (▼)** twice.
Result: VSAT Configuration appears on the LCD display.

4. Press **Enter**.
   Result: PASSWORD appears on the LCD display.

5. Press **Enter**.
   Result: The first digit flashes.

6. Enter the first digit of password given by pressing the up (▲) or down (▼) arrow and press the right arrow (►).
   Result: The next digit flashes.

7. Repeat step 6 until all of the digits of the password have been entered.

8. Press **Enter**.
   Result: If the password has been entered correctly, Access Granted flashes in the LCD display followed by CW Test. If the password has not been entered correctly, Access Denied appears.

9. Press **Enter**.
   Result: CW Frequency appears on the LCD display.

10. Press **Enter** and enter the CW Frequency in kHz. When the frequency is entered, press **Enter**.

   Result: **Frequency Saved** flashes on the LCD display.

   ![NOTE]
   Verify that the Rx LED is lit before continuing.

11. Press the down arrow (▼) and press **Enter**. Press the up arrow (▲) and press **Enter**.

   Result: The CW status is changed to ON (1). **CW ON for 30 minutes** appears on the LCD display.

12. Carry out the commissioning and co-pole/cross-pole tests with the hub operations staff. When the commissioning process is completed, press **Enter**. Press the down arrow (▼) and press **Enter**.

   Result: The CW status is changed to OFF (0). **CW OFF** appears on the LCD display.

13. Turn the VSAT power switch to Off and then On. The VSAT should reboot as described in Section 3.3 and the VSAT operational code should be downloaded.
3.6.2 Activating CW from the SkyManage Web Page

**Caution**

DO NOT TRANSMIT A CW UNLESS AUTHORIZATION TO TRANSMIT IS GIVEN BY THE HUB OPERATOR!

If the commissioning of the VSAT cannot successfully be carried out from the hub it will be necessary to initiate a CW broadcast from the VSAT. In this case, the VSAT will stay in Boot mode and no Operational code will be downloaded.

To send a CW to the hub:

1. On the Install page, click **CW**.
   
   Result: The CW page opens. The CW Off dialog box (Figure 41) is located in the middle of the page

   ![Figure 41: CW Off](image)

   **Note**

   When this screen appears the frequency field is blank. The value in Figure 41 is for demonstration purposes only.

2. Type the **CW Frequency** and **Duration** (maximum 3600 seconds/default 1800 seconds) and click **On**.
   
   Result: The CW is sent to the hub and CW On appears (Figure 42)

   ![Figure 42: CW On](image)

3. Click **Off** to stop the CW signal as soon as approval is received from the Hub.
4. VSAT Monitoring and Troubleshooting

4.1 Using LCD Display

The LCD display contains a number of menus that can be used to monitor the performance of the VSAT during normal operations and aid in the troubleshooting when there are problems. When the VSAT boots, the first item that appears on the LCD display is the VSAT ID. This can be very important when there is a major problem as the client can at least inform the hub operations staff as to which VSAT is having difficulties. The second display contains the date and time, as received from the hub. The remaining parameters displayed are found in Table 6.

Table 6: VSAT Monitoring Menus

<table>
<thead>
<tr>
<th>Menu</th>
<th>Parameter</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSAT Status Menu</td>
<td>Sync Status</td>
<td>Synchronized when VSAT is operating properly</td>
</tr>
<tr>
<td></td>
<td>Satellite Link</td>
<td>Up or Down (with cause)</td>
</tr>
<tr>
<td></td>
<td>RPP Satellite Link</td>
<td>Up or Down</td>
</tr>
<tr>
<td></td>
<td>Active Power Mode</td>
<td>Normal or Power Save</td>
</tr>
<tr>
<td>VSAT Status Menu</td>
<td>IB Data Packets</td>
<td>Inbound numbered LAPU packets</td>
</tr>
<tr>
<td></td>
<td>IB UData Packets</td>
<td>Inbound un-numbered LAPU packets</td>
</tr>
<tr>
<td>VSAT Status Menu</td>
<td>OB Data Packets</td>
<td>Outbound numbered LAPU packets</td>
</tr>
<tr>
<td></td>
<td>OB UData Packets</td>
<td>Outbound un-numbered LAPU packets</td>
</tr>
<tr>
<td></td>
<td>Time Since Last Wake Up</td>
<td>Time since last reboot</td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Authentication</td>
<td>Authenticated or Not Authenticated</td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Authorization</td>
<td>Full Access or No Access</td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Main OB Modulation</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Main OB Code Rate</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Main OB Frequency</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Main OB DataRate</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Alt OB Modulation</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Alt OB Code Rate</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Alt OB Frequency</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>OB ID</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>DVB Deduced Latency</td>
<td>Disabled or Enabled</td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Sync PID</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Management PID</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Workgroup ID</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>Software Group ID</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>IB Reference Frequency</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>IB Start Frequency</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>IB Stop Frequency</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>IB Channel Step</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>RA Symbol Rate</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>RA MTV (MI)</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>DA Symbol Rate</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters</td>
<td>DA MTV (MI)</td>
<td></td>
</tr>
<tr>
<td>VSAT Access Parameters (continued)</td>
<td>Data MTU (MI)</td>
<td>Tables Parameter Version</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Telephony Menu</td>
<td>VRPP Version</td>
<td>VUI Version</td>
</tr>
<tr>
<td>Telephony Info</td>
<td>Remote Type</td>
<td>Star/Mesh/Multistar</td>
</tr>
<tr>
<td></td>
<td>Compression Type</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Remote IP Address</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Site ID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DCAS Status</td>
<td>Alive or Down</td>
</tr>
<tr>
<td></td>
<td>Registration Status</td>
<td>Registered OK or Not Registered</td>
</tr>
<tr>
<td></td>
<td>RBRT Beacon</td>
<td></td>
</tr>
<tr>
<td>Telephony Menu</td>
<td>Card No. Time and Pulses</td>
<td></td>
</tr>
<tr>
<td>Pulse Metering</td>
<td>Card No. Port No.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DRPP Version</td>
<td>Version of Current DRPP Code</td>
</tr>
<tr>
<td></td>
<td>BB Status</td>
<td>Up when link is established</td>
</tr>
<tr>
<td>Datacom Menu</td>
<td>RPA</td>
<td>Enabled when Up</td>
</tr>
<tr>
<td></td>
<td>OB Encryption</td>
<td>Enabled or Disabled</td>
</tr>
<tr>
<td></td>
<td>OB Compression</td>
<td>Enabled or Disabled</td>
</tr>
<tr>
<td></td>
<td>IB Encryption</td>
<td>Enabled or Disabled</td>
</tr>
<tr>
<td></td>
<td>IB Compression</td>
<td>Enabled or Disabled</td>
</tr>
<tr>
<td></td>
<td>VSAT IP Address</td>
<td>IP Address used by VSAT</td>
</tr>
<tr>
<td></td>
<td>Data Packets Rx</td>
<td>Data packets received</td>
</tr>
<tr>
<td></td>
<td>Data Packets Tx</td>
<td>Data packets sent</td>
</tr>
<tr>
<td></td>
<td>LAN Packets Rx</td>
<td>LAN packets received</td>
</tr>
<tr>
<td></td>
<td>LAN Packets Tx</td>
<td>LAN packets sent</td>
</tr>
</tbody>
</table>

### 4.2 Monitoring Using SkyManage Web Page

The SkyManage can be used for monitoring as shown in Figure 39 and Figure 40.

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