

**COBHAM**

# EXPLORER 8100

User & installation manual

 **Remote Satellite Systems**  
INTERNATIONAL





# **EXPLORER 8100**

## **User & installation manual**

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## Safety summary

The following general safety precautions must be observed during all phases of operation, service and repair of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture and intended use of the equipment, and will void the warranty. Thrane & Thrane A/S assumes no liability for the customer's failure to comply with these requirements.



**WARNING!** Hazardous moving parts - keep fingers and other body parts away from the antenna while the system is powered!



**WARNING!** Be aware of pinch points while the antenna is being positioned, deployed or stowed.

### Install and use the antenna with care

Thrane & Thrane A/S assumes no liability for any damage caused by the antenna falling off the vehicle or stressing the mounting base. It is the responsibility of the customer to ensure a safe and correct installation of the antenna. The instructions in this manual are only guidelines.

### Service

User access to the interior of the system units is not allowed. Only a technician authorized by Cobham SATCOM may perform service - failure to comply with this rule will void the warranty.

### Power supply

The voltage range for the EXPLORER 8100 is 100 – 240 VAC (nominal), 4 A, 50/60 Hz. The socket-outlet shall be installed near the equipment and shall be accessible.



**WARNING!** Before disassembling or performing any maintenance or upgrades, unplug the unit from power source.

### Do not operate in an explosive atmosphere

Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical equipment in such an environment constitutes a definite safety hazard.

### Keep away from live circuits

Operating personnel must not remove equipment covers. Component replacement and internal adjustment must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

## Microwave radiation hazards

During transmission the antenna radiates Microwave Power. This radiation may be hazardous to humans close to the antenna. During transmission, make sure that nobody gets closer than the recommended minimum safety distance.



**WARNING!** This device emits radio frequency energy. Do not place your head or other body parts between transmitting feed horn and reflector when the system is operational.

Also do not place any objects between feed horn and reflector, as the object may reflect the signal in a different direction than the focal line.

The minimum safe distance applies in a 1200 mm diameter cylinder between the reflector and satellite, parallel with the feed arm (see Figure 1 below). No hazard exists at the back of the reflector.

### Minimum safe distance, Ku-Band:

- General public (uncontrolled environment, based on a radiation level of  $10 \text{ W/m}^2$ ): 30 m
- Trained professional operators, short term (controlled, radiation level:  $100 \text{ W/m}^2$ ): 1 m

### Minimum safe distance, Ka-Band:

- General public (uncontrolled environment, based on a radiation level of  $10 \text{ W/m}^2$ ): 36 m
- Trained professional operators, short term (controlled, radiation level:  $100 \text{ W/m}^2$ ): 1 m

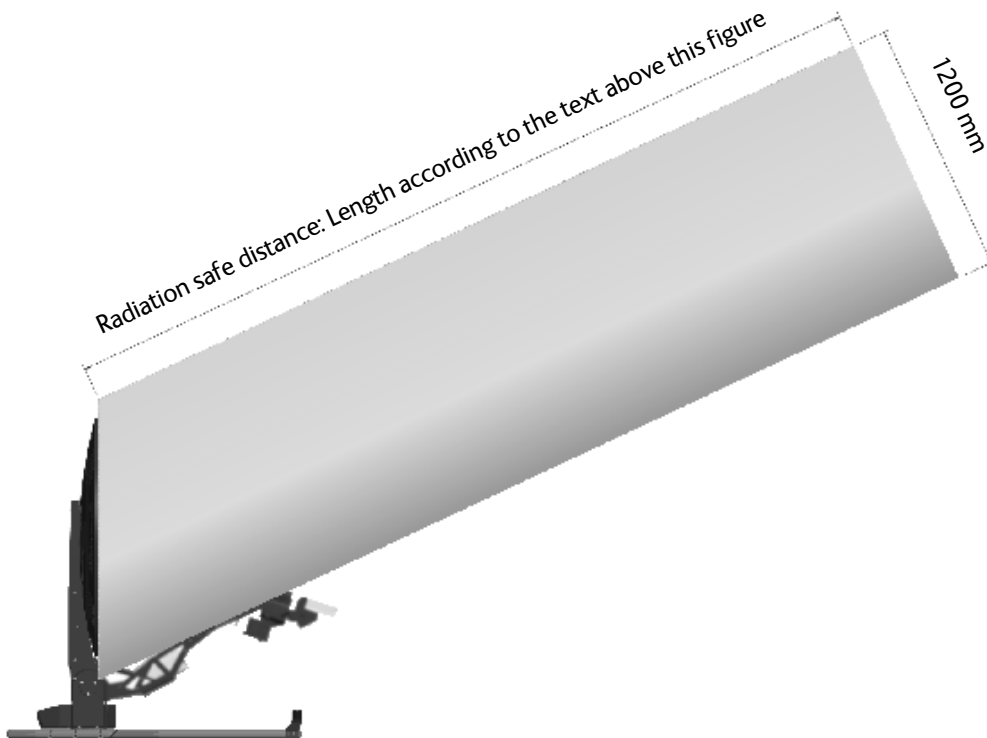
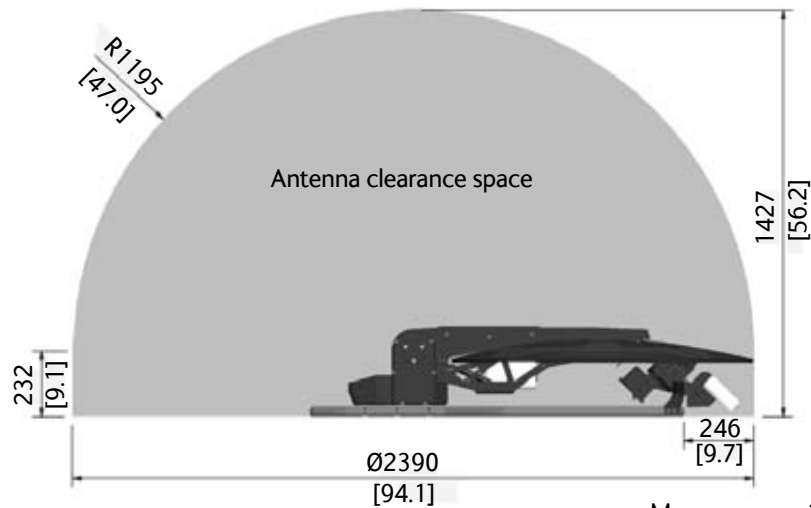


Figure 1: Radiation area

## Mechanical “stay-clear” area



**WARNING!** Stay clear of the antenna when it is powered! The antenna dish can move quickly across a large area, and can cause injury to persons close to the antenna. When the antenna is powered, make sure nobody gets closer than the limits of the “Stay-clear area” shown below.



Measures are in millimeter [inches in brackets]. Add a little extra security margin.

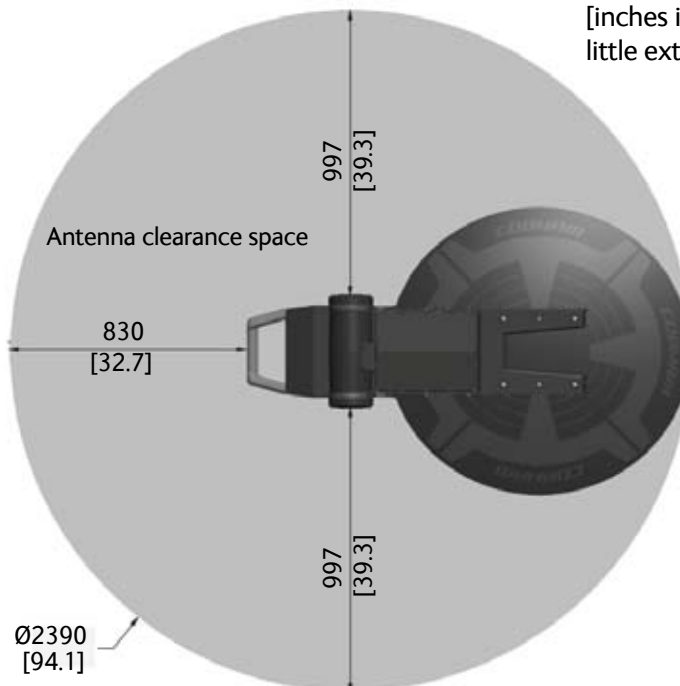


Figure 2: Stay-clear area for the antenna

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# About this manual

## 1.1 Manual overview

This manual has the following chapters:

- *Introduction*
- *Installation*
- *Interfaces*
- *Setup and operation*
- *Service and maintenance*

This manual has the following appendices:

- *Technical specifications*
- *VSAT modem cables*
- *VSAT modem settings*
- *System messages*
- *Approvals*

### 1.1.1 Intended readers

This is an installation and user manual for the EXPLORER 8100 system, intended for installers and users of the system. It is important that you observe all safety requirements listed in the beginning of this manual, and install and use the system according to the guidelines in this manual.

Service that requires access to the interior of the system units may only be performed by a technician authorized by Cobham SATCOM.

### 1.1.2 Software version

This manual is intended for EXPLORER 8100 with software version 1.51 (Antenna and ACU). The modem software version is shown in its own web interface.

### 1.1.3 Typography

In this manual, typography is used as indicated below:

**Bold** is used for the following purposes:

- To emphasize words.  
Example: "Do **not** touch the antenna".
- To indicate what the user should select in the user interface.  
Example: "Select **SETTINGS > LAN**".

*Italic* is used to emphasize the paragraph title in cross-references.

## 1.2 Precautions

Text marked with “Warning”, “Caution”, “Note” or “Important” show the following type of data:

- **Warning:** A Warning is an operation or maintenance procedure that, if not obeyed, can cause injury or death.
- **Caution:** A Caution is an operation or maintenance procedure that, if not obeyed, can cause damage to the equipment.
- **Note:** A Note gives information to help the reader.
- **Important:** A text marked Important gives information that is important to the user, e.g. to make the system work properly. This text does not concern damage on equipment or personal safety.

All personnel who operate equipment or do maintenance as specified in this manual must know and follow the safety precautions. The warnings and cautions that follow apply to all parts of this manual.

See also the *Safety summary* on page iii.



**WARNING!** Before using any material, refer to the manufacturers' material safety data sheets for safety information. Some materials can be dangerous.



**CAUTION!** Do not use materials that are not equivalent to materials specified by Cobham SATCOM. Materials that are not equivalent can cause damage to the equipment.

# Introduction

This chapter has the following sections:

- *EXPLORER 8100 system*
- *System components*

## 2.1 EXPLORER 8100 system

### 2.1.1 Overview

The EXPLORER 8100 is a 1.0 m drive-away antenna system for vehicle roof mounting. It comes in two versions: one designed for operation in the Ku-band and one for operation in the Ka-band.

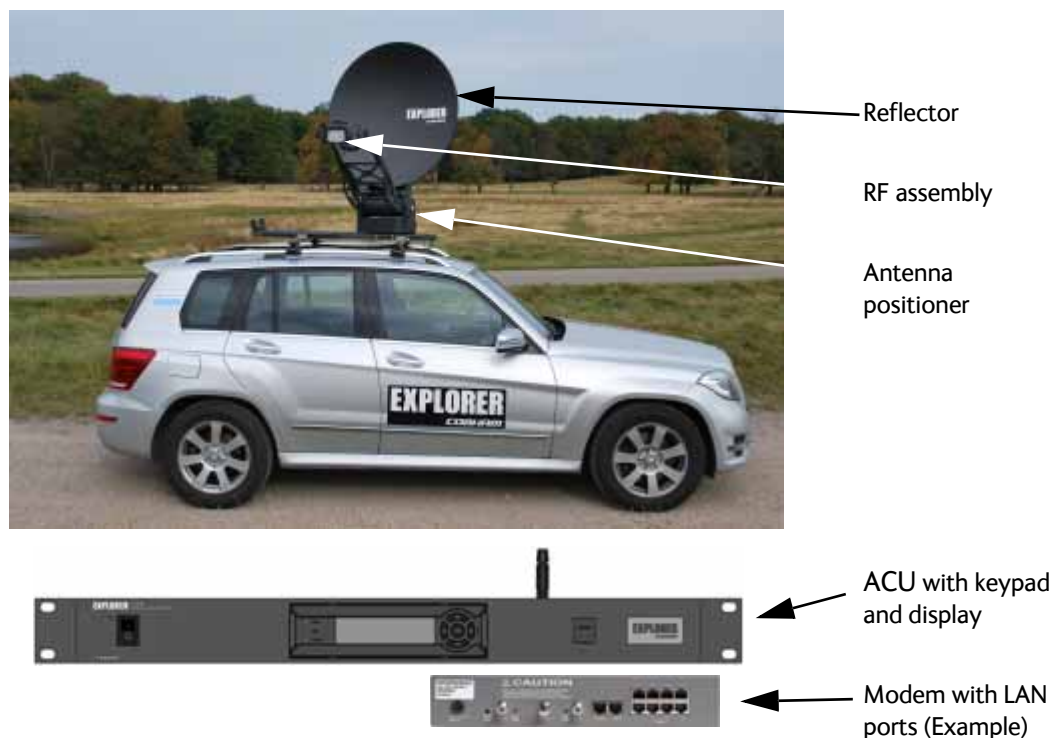


Figure 2-1: Major system components

The auto-deploy system allows personnel with minimal satellite experience to easily configure and operate this terminal enabling the user to access any broadband application over satellite.

The EXPLORER 8100 terminals are easy to install, set up, and commission by a non-specialist technician. The system has the following system units:

1. One 2-axis semi-stabilized antenna for either Ku or Ka VSAT satellites.
2. One 1-Rack-Unit Antenna Control Unit (ACU) containing keypad and display and LAN/WLAN ports for system access and internal communication.

**VSAT modem:** Apart from the two units that make up the EXPLORER 8100, you need a VSAT modem to provide the IP services on the RF link.

The following VSAT modems are supported:

For Ku-Band:

- iDirect OpenAMIP (iINFINITY/Evolution)
- iDirect Serial (iINFINITY/Evolution)
- Comtech CDM-570/625
- Gilat SkyEdge II
- STM SatLink 2900

Additional VSAT modems may also be supported using the “Generic modem” or “Generic OpenAMIP” setup in the EXPLORER 8100.

- **Generic OpenAMIP:** used for OpenAMIP modems that are not in the dropdown list. This profile uses the information from the modem.
- **Generic modem:** Used for other modems that are not in the list. You must enter the information manually in this profile.

A **Service modem** profile is also available, e.g. for situations where a reference satellite is needed, see *To use a reference satellite (Ku only)* on page 6-10.

For Ka-Band:

- Surfbeam II Pro

The antenna provides a stable RF link and the modem provides services on the RF link.

## 2.1.2 Satellite service

The EXPLORER 8100 operates in the Ku-band (10.7 to 14.5 GHz) or the Ka-band (19.2 to 30 GHz), depending on the EXPLORER 8100 model. Service capabilities are determined by the connected VSAT modem.

## 2.1.3 Service activation

The service is activated by your service provider. For details, contact your service provider.

## 2.2 Description of the system components

### 2.2.1 Antenna pedestal/positioner

Antenna pointing is achieved with a 2-axis semi-stabilized pedestal. The Azimuth drive comprises a dual gear and belt drives, the Elevation drive a dual gear. Both drives have a manual stow function. An emergency stop button is placed on the side of the antenna.



Figure 2-2: Antenna system components, part 1

Deployment of the antenna unfolds the Reflector- and Feed support structure. The Feed position is controlled by 2 gas-springs, which are compressed when the antenna is in stowed position. Internal cable-wraps are included in both drives, whereas the Feed and GNSS antenna connecting cables are exposed on the Feed Support Structure.

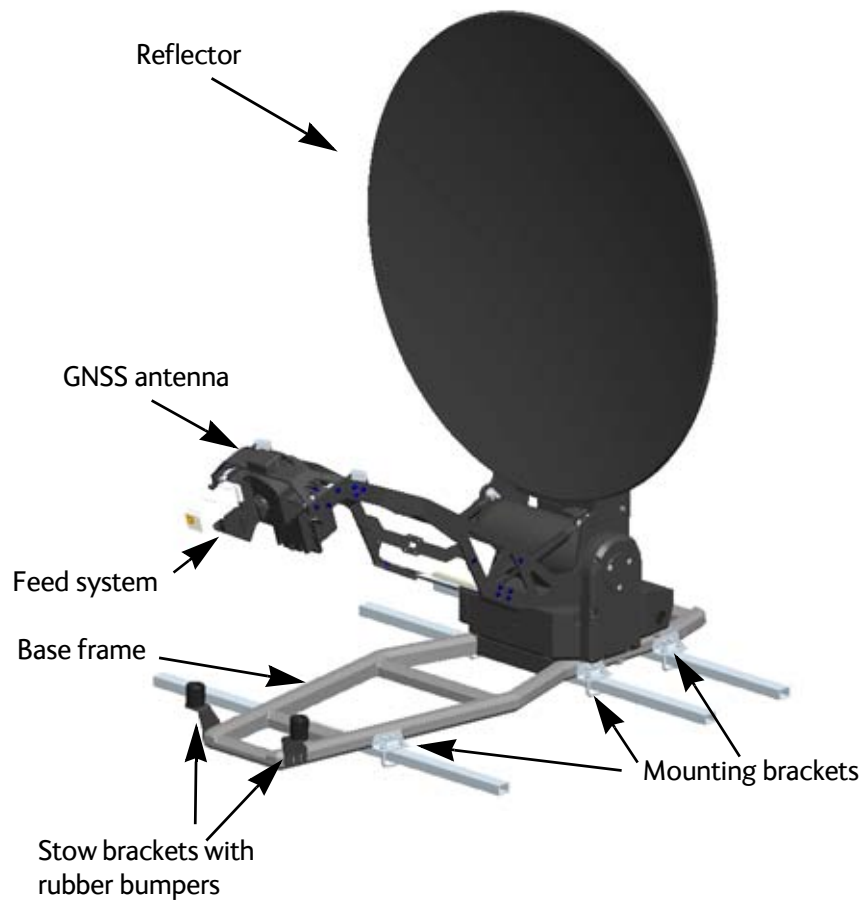


Figure 2-3: Antenna system components, part 2

## 2.2.2 Reflector and RF assembly

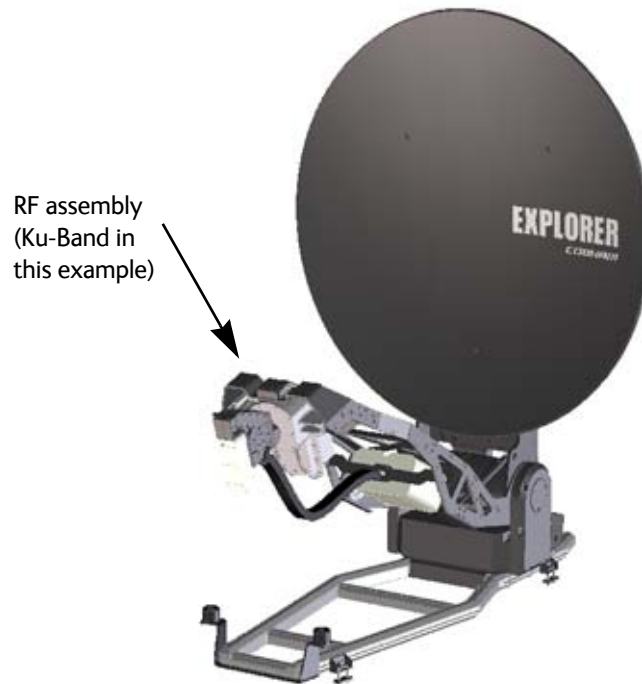


Figure 2-4: RF assembly

### Ku-Band RF assembly

The Ku version features a distributed RF system with a Block Up Converter (BUC) placed in the middle of the Feed support structure, connected to the Feed (Ortho Mode Transducer (OMT)/Low Noise Blockdown converter (LNB)) via a Flexible Wave Guide (FWG). A motor driven Polarizer is present.

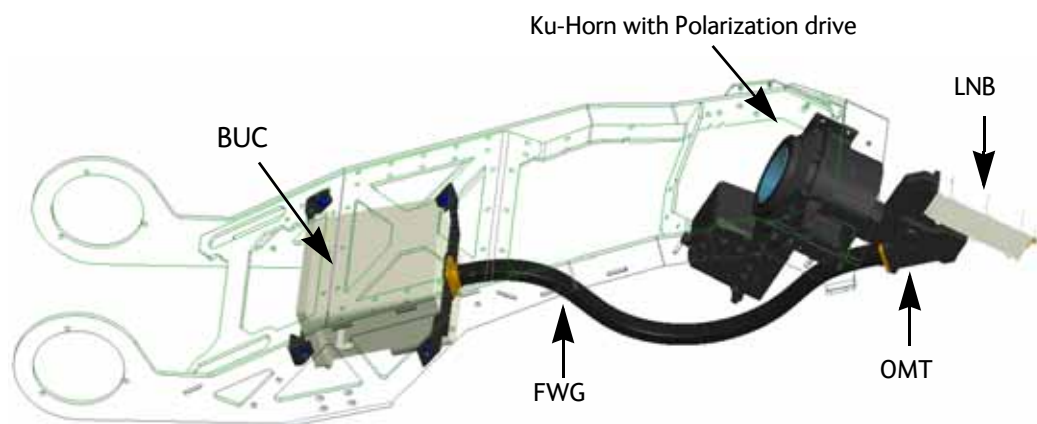


Figure 2-5: Components of the Ku-Band RF assembly



## Ka-Band RF assembly

In the Ka Eutelsat/Viasat version, the components in the RF assembly are integrated in a monolithic Transmit and Receive Integrated Assembly (eTRIA) unit, placed at the end of the Feed arm.

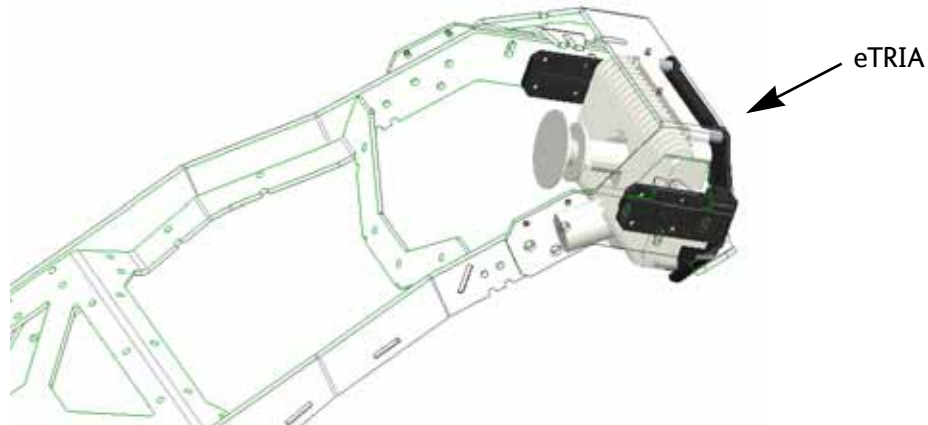


Figure 2-6: Components of the Ka-Band RF assembly

## 2.2.3 Antenna Control Unit (ACU)

### ACU

The ACU manages all communication between the antenna and the connected modem. The ACU has status LEDs, a display and a keypad. It also provides a flexible configurable LAN interface (DHCP client/server, static IP address etc.) and a built-in web interface for configuration of the system.



Figure 2-7: ACU front panel

For details of the interfaces of the ACU, see *Interfaces of the EXPLORER 8100 ACU* on page 4-1.



Figure 2-8: ACU connector panel

## 2.2.4 Keypad and display

Using the keypad and display on the ACU you can deploy, stow and stop the antenna, including monitoring the system (warnings, errors and information). See *Keypad and display menus* on page 6-17 for a full list of menus and details on how to use the display and keypad.

The menus show how the system has been configured. You can also see events (warnings, errors and information). Signal strength indication is rendered on the display as 7 blocks on the main display.



Figure 2-9: Keypad and display (detailed, example)

The display has a two line menu system. The display also supports two status lines (Upper and Lower) for compact satellite and antenna information. For a description of the LED light indicators see *LEDs on the keypad of the EXPLORER 8100* on page 7-9.

## 2.2.5 Web interface

The EXPLORER 8100 has a built-in web interface, which has two levels:

- **Mobile web interface**, used for basic operations and status. Accessed from a smartphone or tablet.
- **Computer web interface**, used for configuration, line-up, troubleshooting, extended status information etc. Accessed from a computer.

### Mobile web interface

When you access the web interface from a smartphone or tablet you get access to the mobile web interface, which offers the following basic operations and status:

- Deploy, Stow and Stop the antenna
- Activate satellite profile
- See status and events
- Access the full web interface

To access the mobile web interface:

1. Connect your smartphone or tablet to the WLAN access point of the ACU. For information on WLAN setup see *WLAN settings* on page 6-14.
2. In the browser of your smartphone or tablet, type in the IP address for the web interface. By default the IP address is `http://192.168.0.1`.



Figure 2-10: Mobile web interface, for basic operation

## Web interface for setup and troubleshooting

To fully configure the EXPLORER 8100, use a computer with a standard Internet browser to access the built-in web interface.

The web interface is mainly used for calibration of the system, first-time setup of satellite and modem profiles, setup of the LAN ports, WLAN use and administrating admin and guest access rights. You can also deploy, stow and stop the antenna, and monitor the system (warnings, errors and information) with the web interface.

The web interface can be accessed using LAN or WLAN, if configured. see *WLAN settings* on page 6-14. Note that you must use the LAN connection when you first configure the WLAN interface.

To access the web interface:

1. Connect your computer to the LAN 1 or WLAN interface. For details on LAN/WLAN interface setup see *To configure the LAN network* on page 6-11.
2. Enter the IP address for the web interface. The default IP address is `http://192.168.0.1`.

For details about further configuration and use, see *Setup and operation* on page 6-1.

The screenshot displays the COBHAM web interface for the EXPLORER 8100. At the top, there is a blue header with the COBHAM logo. Below the header, there are status indicators for RX and TX signal levels, and buttons for 'Deploy', 'Stow', and 'Deployed Tracking'. A red 'STOP' button is also visible. The main content area is divided into a sidebar with navigation options (DASHBOARD, SETTINGS, SERVICE, ADMINISTRATION, HELPDESK, SITE MAP) and a main panel displaying system parameters. The parameters are organized into sections: DASHBOARD, POINTING, and MODEM. A 'Refresh' button is located at the bottom of the main panel.

Section	Parameter	Value
DASHBOARD	GNSS position	55°47' N, 12°31' E
	Base orientation	184.28°
	Satellite profile	1W Generic
	Satellite position	1°W
	RX polarisation	Vertical
	TX polarisation	X-pol
	RX RF frequency	12.607000 GHz
	LNB LO frequency	10.750000 GHz
	TX RF frequency	14.000000 GHz
	BUC LO frequency	12.800000 GHz
POINTING	Azimuth, elevation geo	195.4° 24.3°
	Azimuth, elevation rel	11.0° 25.2°
	Polarisation skew	9.0°
MODEM	Model	Generic modem
	RX locked status	Locked
	Signal level	0(pwr)
	RX IF frequency	1857.000000 MHz
	TX IF frequency	1200.000000 MHz
	TX allowed	Yes
	TX mute	Not Muted
	BUC TX	On

Figure 2-11: Web interface, DASHBOARD (example, Ku-Band)

## 2.2.6 LAN ports and WLAN

The ACU has five configurable LAN connectors (type RJ45). LAN 2, LAN 3 and LAN 5 are switched, i.e. the configuration for LAN 5 also applies to LAN 2 and LAN 3.

The default configuration is as follows:

- LAN 1 is used for system control via the web interface.  
If you want to use the front connector instead of LAN 1, connect the short LAN cable (37-206570-025) between LAN 1 and LAN X (Front) in the connector panel. LAN X is internally connected to the front LAN connector.
- LAN 5 is used to connect to the VSAT modem.
- LAN 4 is configured as a DHCP client.

The EXPLORER 8100 has a WLAN module. Access to one of the LAN ports using WLAN must be set up in the web interface, see *To configure the LAN network* on page 6-8.

## 2.2.7 Power supply

The power input for the ACU and modem is specified as follows: Nominal:100-240 VAC, 4A, 50/60 Hz, using IEC320 connector. The antenna is powered by the ACU.

## 2.2.8 VSAT modem unit

EXPLORER 8100 is designed to be operated with third-party VSAT modems. For a list of supported VSAT modems see *VSAT modem unit* on page 2-10.

## 2.3 Part numbers

The following part numbers are available for the EXPLORER 8100 system:

Part number	Description
407140A-50001	EXPLORER Antenna Control Unit
408147A-50210	EXPLORER 8100 Ku VSAT Antenna (8 W BUC)
408147B-50550	EXPLORER 8100 Ka VSAT Antenna (Viasat eTRIA)

Table 2-1: Part numbers for the EXPLORER 8100 system

# Installation

This chapter has the following sections:

- *To unpack the system*
- *To install the EXPLORER 8100*

## 3.1 To unpack the system

The antenna is attached to the bottom of the transport box. To unpack the antenna you must remove the screws attaching the antenna to the packing material.



**CAUTION!** Do not manually unfold the antenna without first releasing the stow lock! If it is necessary to unfold the antenna in order to access the screws attaching the antenna to the packing material, you must first release the stow lock as described in *Manual deploy* on page 7-13.

### 3.1.1 What's in the box

Unpack the antenna and ACU and check that the following items are present:

- EXPLORER 8100 Ku VSAT antenna (part number 408147A-50210), or EXPLORER 8100 Ka VSAT antenna (part number 408147B-50550)
- EXPLORER Antenna Control Unit (ACU) (part number 407140A-50001)
- With ACU:
  - AC Power cord 1.8 m, US wall plug (37-207152-000)
  - AC Mains cable 1.8 m, Schuko (Euro) wall plug (37-207148-000)
  - Ethernet cable 2 m (37-203213-A)
  - Short Ethernet cable 0.25 m (37-206570-025)
  - WLAN antenna (88-139591-A)
  - WLAN TNC key for mounting the WLAN antenna (41-140645-C)
  - Quick guide (98-146768)
- With antenna:
  - Cable harness, antenna to ACU and modem, 10 m (37-145530)
  - Hand crank for manual operation (62-147900)
  - Hex L key 4 X 142 mm for manual operation (covers and stow lock) (51-207294-000)
  - For antenna installation: 6 mounting brackets (41-145536-A) and Thule rail adapter (41-145220-A), nylon lock nuts and washers
  - **Ka only:** F-to-SMA adapter for connection to modem (31-207170-000)

### 3.1.2 Initial inspection

Inspect the shipping cartons and wooden box immediately upon receipt for evidence of damage during transport. If the shipping material is severely damaged or water stained, request that the carrier's agent be present when opening the cartons and wooden box. Save all packing material for future use.



**WARNING!** To avoid electric shock, do not apply power to the system if there is any sign of shipping damage to any part of the front or rear panel or the outer cover. Read the safety summary at the front of this manual before installing or operating the system.

After unpacking the system, i.e. removing the top and sides of the wooden box and opening the cartons, inspect it thoroughly for hidden damage and loose components or fittings. If the contents are incomplete, if there is mechanical damage or defect, or if the system does not work properly, notify your dealer.

## 3.2 To install the EXPLORER 8100

### 3.2.1 Prerequisites

#### Vehicle

The antenna is intended for installation on a vehicle, taking advantage of the vehicle's suspension system during transport. Inadequate or no suspension, e.g. trailer mount, will require special measures - contact your dealer or factory before such installation.

Make sure the vehicle and roof rails are approved to carry the weight of the antenna. See *Weights and measures* on page A-3.

#### Magnetizable material

When you install the antenna, make sure the amount of magnetizable material close to the antenna is as small as possible, as magnetizable material could interfere with the magnetometer and affect the precision of the system. If in doubt, make a test setup prior to final manufacture of the supporting structure.

#### Line of sight

The antenna should be installed in such a way that no objects on the vehicle can block the line of sight from the antenna in any direction.

#### Mechanical obstructions

Make sure there are no objects on the vehicle that can obstruct the mechanical movement of the antenna. Preferably do not place any objects within the stay-clear area shown in page v. If you cannot avoid objects inside the stay clear area, you must define a blocking zone. For details, see *Blocking zone* on page 6-11.

### 3.2.2 Installation of the antenna on the vehicle

To install the antenna to the transport vehicle do as follows:



**CAUTION!** Make sure that the rear of the antenna positioner faces towards the front of the vehicle as shown in Figure 3-1 below. Otherwise the wind pressure may cause damage to the antenna when the vehicle is moving!



This end towards the front of the vehicle

Figure 3-1: Position of the antenna (stowed) on the vehicle

3. Safely and securely install the antenna's mounting frame to the roof of the vehicle.



**CAUTION!** The major part of the weight is on the front end (Azimuth base) of the structure. Pay special attention to support for this area when you plan the installation.

You can mount the antenna on a roof-rack (Thule-bars) or mounted on a custom made structure/enhancement of the vehicle roof or truck bed, see *Custom made structure* on the next page. For optimum servo performance, resilience to wind loads and vehicle movements, the azimuth base should be stiffly supported.

The mounting frame of the antenna has lengthwise adjustable brackets to accommodate different placements of the supports. If you are not using a roof rack, omit the U-bars.

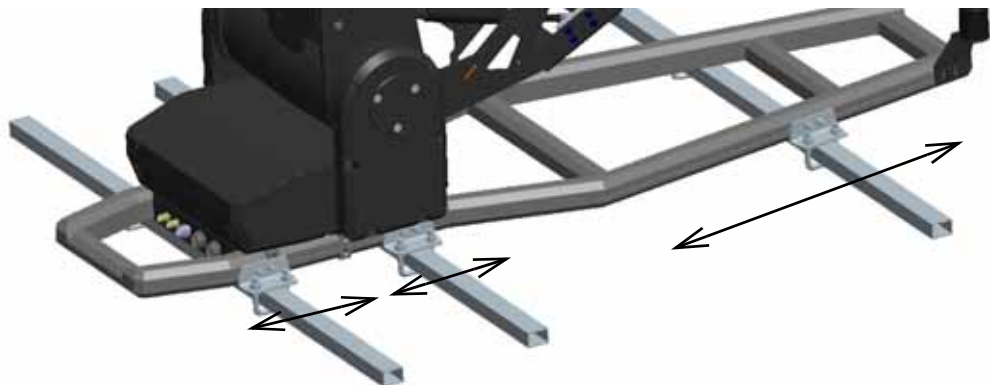


Figure 3-2: Antenna mounting brackets



## Roof-rack mount

We recommend a 3-bar solution over a 2-bar solution whenever possible. Adhere to the load limits of the roof-rack manufacturer and use sturdy, professional grade racks.

## Custom made structure

Custom structures should likewise focus on supporting the azimuth base.

Avoid large amounts of magnetizable material close to the antenna - it could adversely affect the magnetometer. If in doubt, make a test setup prior to final manufacture of the supporting structure.

For measures for antenna installation, see *Measures for antenna installation* on page A-6.

See also *Weights and measures* on page A-3 and *Antenna dimensions* on page A-4.

### 3.2.3 Installation of the ACU

To install the ACU, do as follows:

1. If you are going to use WLAN, connect the WLAN antenna to the connector marked WLAN in the ACU connector panel. The WLAN antenna is part of the accessories supplied with the EXPLORER 8100 system.



**CAUTION!** Turn the WLAN antenna into horizontal position before sliding the unit into the rack. The WLAN antenna may be damaged if it is placed in a vertical position.



Figure 3-3: ACU connector panel with WLAN antenna

2. If you are going to use the LAN connector on the front, connect the enclosed patch cable (37-206570-025) between LAN1 and LANX (Front) on the rear of the ACU.

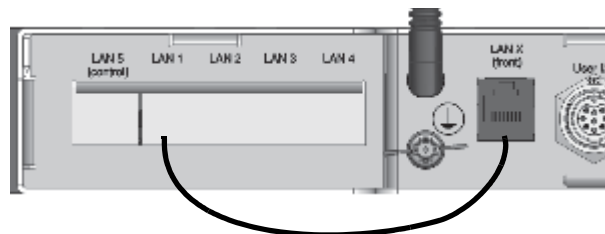


Figure 3-4: ACU connector panel with front LAN connection

3. Slide the ACU into a 1U space in a 19" rack.

**Note**

We recommend supporting the ACU either with rails on the side of the rack system or by attaching it with screws on the side using the 2 M4 inserts on each side of the ACU (see *ACU left and right side* on page A-9).

4. Mount the screws on each side through the holes in the front and fasten the screws to the rack. Make sure that the unit is mounted securely according to the requirements for your 19" rack.



Figure 3-5: ACU installation

### 3.2.4 Installation of the VSAT modem

For a list of supported VSAT modems see *VSAT modem unit* on page 2-10.

1. Mount the VSAT modem close to the ACU, preferably at a distance less than 1 m.
2. Connect all cables. See *VSAT modem settings* on page C-1 for a description of the connectors for supported VSAT modems. For cable specifications see *VSAT modem cables* on page B-1.

### 3.2.5 To connect the ACU, VSAT modem and antenna pedestal

The connections to be made depend on the EXPLORER 8100 system (Ku or Ka) and the VSAT modem used. The drawings on the next pages show an overview of connections in an EXPLORER 8100 Ku system and an EXPLORER 8100 Ka system.

- For details on how to connect the modem, see *VSAT modem settings* on page C-1.
- For details on the interfaces, see *Interfaces* on page 4-1.

## Ku-band, connections

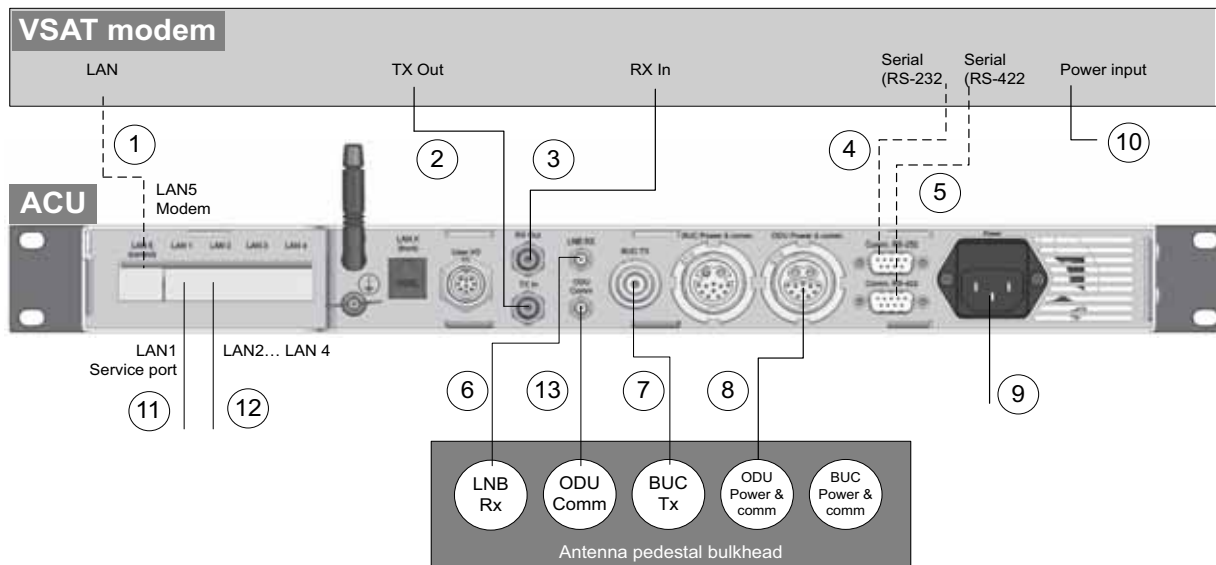


Figure 3-6: Ku-Band: Connection between antenna, ACU and VSAT modem

**Important** If you replace antenna cables you must make a cable calibration. See *Ku-Band version only: Cable calibration* on page 6-21.

Connect the cables as described below:

**Note** The cables 6, 7, 8 and 13 are delivered as a cable bundle.

1. If you are using LAN to connect the VSAT modem to the system, connect any LAN port on the VSAT modem to the LAN 5 control port on the ACU.
2. Connect the VSAT modem's Tx Out port to the ACU's Tx In port.
3. Connect the VSAT modem's Rx In port to the ACU's Rx Out port.
4. If applicable, connect the VSAT modem's RS-232 port to the ACU's RS-232 port.
5. If applicable, connect the VSAT modem's RS-422 port to the ACU's RS-422 port.
6. Connect the LNB Rx port on the pedestal bulkhead to the ACU's LNB Rx port.
7. Connect the BUC Tx port on the pedestal bulkhead to the ACU's BUC Tx port.
8. Connect the ODU Power & comm. port on the pedestal bulkhead to the ACU's ODU Power & comm. port.
9. Connect the ACU to an AC power source (Standard IEC320 on ACU).
10. Connect the VSAT modem to an AC power source.
11. Use LAN1 to access the web interface.
12. For LAN2, LAN3 and LAN4, see *To configure the LAN network* on page 6-11.
13. Connect ODU Comm. on the pedestal to ODU Comm. on the ACU

## Ka-band, connections

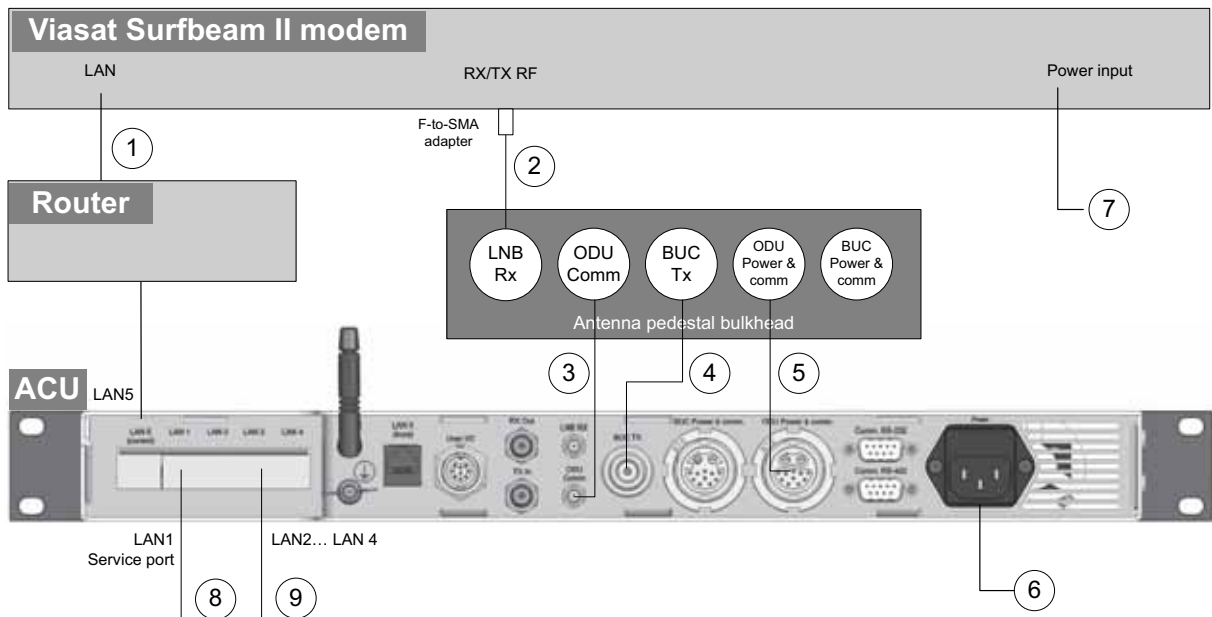


Figure 3-7: Ka-Band: Connection between antenna, ACU and VSAT modem

Connect the cables as described below:

**Note** | The cables 2, 3, 4 and 5 are delivered as a cable harness.

1. Connect the LAN port on the VSAT modem to a router connected to the LAN 5 control port on the ACU.
2. Connect the RX/TX RF connector on the VSAT modem to the LNB RX connector on the antenna, using the F-to-SMA adapter included in the delivery (31-207170-000).
3. Connect the ODU Comm. connector on the antenna to the ODU Comm. connector on the ACU.
4. Connect the BUC TX connector on the antenna to the BUC TX connector on the ACU (this connection is not used for the Ka-Band version, but is part of the cable bundle).
5. Connect the ODU Power & comm. connector on the antenna to the ODU Power & comm. connector on the ACU.
6. Connect the ACU to an AC power source (Standard IEC320 on ACU).
7. Connect the VSAT modem to a suitable power source.
8. Use LAN1 to access the web interface.
9. For LAN2, LAN3 and LAN4, see *To configure the LAN network* on page 6-11.

# Interfaces

This chapter is organized in the following sections:

- *Interfaces of the EXPLORER 8100 ACU*
- *Interfaces of the EXPLORER 8100 antenna*
- *Interfaces of the VSAT modem*

## 4.1 Interfaces of the EXPLORER 8100 ACU

### 4.1.1 WLAN interface

The EXPLORER 8100 ACU has a WLAN interface for wireless access to the system. To be able to use the WLAN interface, you must first set it up in the web interface, from a computer connected to the front LAN connector or LAN 1 in the connector panel of the ACU. For details, see *To configure the LAN network* on page 6-11 and *WLAN settings* on page 6-14.

### 4.1.2 LEDs, display and keypad



Figure 4-1: ACU front

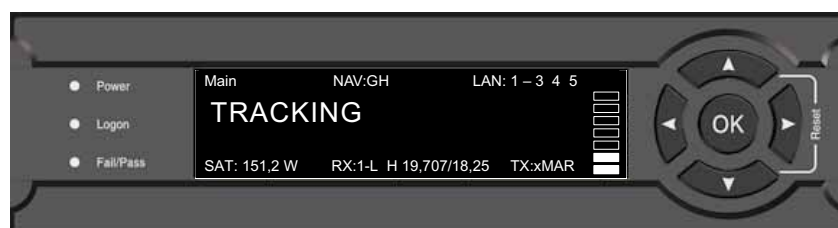


Figure 4-2: ACU display and keypad and LEDs

### 4.1.3 ACU Connector panel — overview



Figure 4-3: ACU rack version, connector panel overview

The connector **LAN** on the front panel is internally connected to the **LAN X** connector in the connector panel. Typically you connect **LAN X** to the service port at **LAN 1** with a straight Ethernet cable. Then you can access the service port from the front of the ACU.

### 4.1.4 AC Input connector

Provide AC power to the ACU from a standard 100-240 VAC supply using the cable included in the delivery. First find a suitable connector for your AC Mains supply and mount it on the cable according to the table below.

The AC connector on the ACU is an IEC320 connector for universal AC power input.

Outline (on the ACU)	Pin function	Wire color
	Live (L)	Brown
	Neutral (N)	Blue
	Earth (E)	Green/Yellow

Table 4-1: AC Input connector, pin assignment

### 4.1.5 Connectors for antenna connection

A cable bundle with all necessary cables between antenna and ACU is delivered with the system. There are 5 connectors on the ACU for connection to the antenna:

- **BUC TX:** N-connector for signal and power to the BUC
- **LNB RX:** SMA-connector for signal from the LNB to the ACU and power to the LNB
- **ODU Power & comm:** Circular connector for antenna power (ODU power), stow indicator signal and internal system communication.

Outline (on the ACU)	Pin	Pin function
<p>Front VIEW</p>	P1	ODU Power RTN
	P2	ODU Power +48V
	P3	Reserved
	P4	Reserved
	P5	GND
	P6	Com1 antenna ID
	P7	Com2 antenna ID
	P8	Reserved
	P9	Reserved
	P10	Reserved
	P11	GND
	P12	Stow indicator switch

Table 4-2: Circular connector, ODU Power & comm, outline and pin assignment

- **BUC Power & Comm.:** Circular connector. For future use.
- **ODU Comm:** SMA connector used for Housekeeping communication between the ACU and the antenna.

### 4.1.6 Rx/Tx connectors for VSAT modem

RX Out and TX In are F-connectors for connection to the Rx and Tx channels of the VSAT modem.


Outline (on the ACU)	Pin number	Pin function
	1	Inner conductor: 10 MHz clock, VSAT Rx/Tx
	2	Outer conductor: GND (Shield)

Table 4-3: F connector, Rx and Tx, outline and pin assignment

For step-by-step guidelines how to set up the VSAT modem see *VSAT modem settings* on page C-1.

### 4.1.7 RS-232 and RS-422 connectors for VSAT modem

Use these connectors to connect the ACU to the VSAT modems with serial interfaces. See Appendix C, *VSAT modem settings*.

#### RS-232

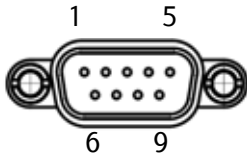
Outline (on the ACU)	Pin	Pin function
	1	Not connected
	2	RXD
	3	TXD
	4	DTR
	5	Ground
	6	DSR
	7	RTS
	8	CTS
	9	Receive Signal Strength Indicator

Table 4-4: RS-232 connector, male, outline and pin assignment



## RS-422

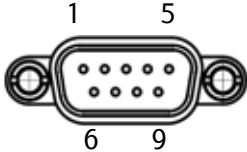
Outline (on the ACU)	Pin	Pin function
	1	Ground
	2	Line A RXD (+)
	3	Line B TXD (+)
	4	Ground
	5	Ground
	6	Not connected
	7	Line A RXD (-)
	8	Line B TXD (-)
	9	Not connected

Table 4-5: RS-422 connector, male, outline and pin assignment

### 4.1.8 LAN connectors

The LAN connectors on the ACU are used for system setup and for connection to the VSAT modem.

**Note** These connectors are normally only for communication with the EXPLORER 8100 system, not for connection to the Internet. For Internet connection, connect to your VSAT modem.

The maximum cable length per connection is 100 m. Depending on the VSAT modem connected, a LAN connector may be used for modem control.

**Important** The EXPLORER 8100 system is not designed to be connected directly to the Internet. It must be located behind a dedicated network security device such as a fire wall.  
You should change the default passwords as anyone with access and malicious intent can render the EXPLORER 8100 inoperable.

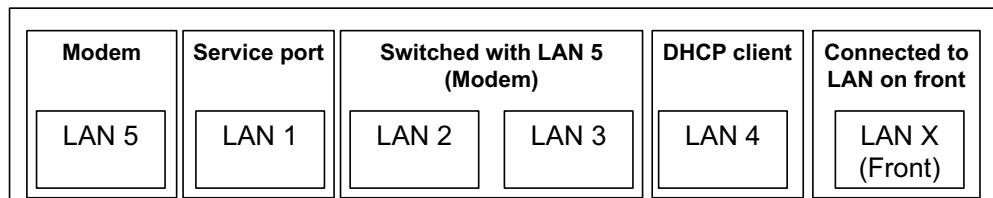


Figure 4-4: LAN connectors on rear panel (default setup)

Cable type: CAT5, shielded.

For information how to configure the LAN network see *To configure the LAN network* on page 6-11.

Outline	Pin	Pin function	Wire color
	1	Tx+	White/orange
	2	Tx-	Orange
	3	Rx+	White/green
	4	Not connected	Blue
	5	Not connected	White/blue
	6	Rx-	Green
	7	Not connected	White/brown
	8	Not connected	Brown

Table 4-6: Ethernet connector, outline and pin assignment

### 4.1.9 User I/O

The User I/O connector is an 8-pin circular connector for user inputs and outputs, such as muting the antenna or signalling Rx lock.

A short cable with a mating connector is available from Cobham SATCOM (part number S-37-146760).

#### Pinout and functions

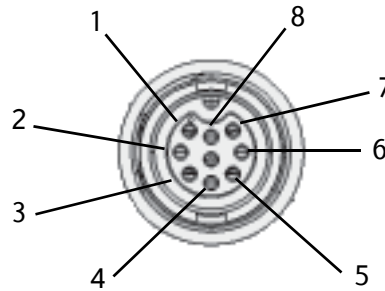


Figure 4-5: User I/O connector, pinout

Pin	Pin function	Acronym	Direction	Type	Description	Wire color <sup>a</sup>
1	ACU Chassis	GND	common	-	-	Black
2	RX Lock	RXL	output	12 or 24 V logic	High when RX locked	Brown
3	Stow indicator switch	STW	output	Switch in antenna	Connected to GND (closed) when antenna stowed, otherwise open	Orange
4	TX Mute	TXM	input	3-32 V logic	Antenna muted when high	Yellow
5	IF9 Aux	AUX0	input	3-32 V logic	Spare input	Green
6	IF29 Aux1	AUX1	input	3-32 V logic	Spare input	Blue
7	IF29 Aux2a	AUX2A	input or output	3-32 V logic or open drain	Spare input/output	Violet
8	IF29 Aux2b	AUX2B	input or output	3-32 V logic or open drain	Spare input/output	White

Table 4-7: User I/O connector, Pin assignment, functions and wire color

a. The wire colors apply to the corresponding I/O cable available from Cobham SATCOM.

For specifications, see the next section.

## Electrical specifications

Pin	Acronym	Input/Output	Parameter	Specification
2	RXL	Output	RXL H voltage	12 or 24 V software selectable
			RXL L voltage	0 V
			RXL H source current	20 mA for a LED or a sensitive relay
			RXL L sink current	0 mA
			Protection	ESD and overcurrent
3	STW	Output	Switch voltage, max.	48 V <sub>peak</sub>
			Switch current, max.	2 A (resistive load)
4	TXM	Input	Input H voltage	> 1.0 V input ref. to GND
5	AUX0		Input L voltage	< 0.4 V input ref. to GND
6	AUX1		Input H sink current	< 0.5 mA @ 3.3 V, < 5.0 mA @ 32 V
7	AUX2a <sup>a</sup>		Input L source current	< 0.5 mA
8	AUX2b <sup>a</sup>		Input allowed voltage range	32 V ref. to GND
			Input Protection	ESD
7	AUX2a <sup>a</sup>	Output	Output H voltage	48 V <sub>peak</sub> , 15 KOhm internal pull up to 5.7 V
8	AUX2b <sup>a</sup>		On resistance	< 1 Ohm @ 200 mA
			Sink current	450 mA max. continuous
			Switch time	< 8 μs
			Output protection	ESD Overvoltage & overcurrent

Table 4-8: User I/O connector, electrical specifications

- a. AUX2a and AUX2b can be either inputs or outputs. AUX2a and AUX2b must be the same (both inputs or both outputs).

## 4.2 Interfaces of the EXPLORER 8100 antenna

### 4.2.1 VSAT air interface

The antenna operates in the Ku-band (10.7 to 14.5 GHz) or the Ka-band (19.2 to 30 GHz). Service capabilities are determined by the connected VSAT modem.

### 4.2.2 GNSS air interface

The EXPLORER 8100 antenna has a GNSS receiver for positioning input from the Positioning system.

### 4.2.3 Earth magnetic field interface (electronic compass)

The EXPLORER 8100 has an electronic compass to support the pointing process. You must calibrate the compass when you install the antenna. see *Compass calibration* on page 6-3.

### 4.2.4 Connectors on the antenna

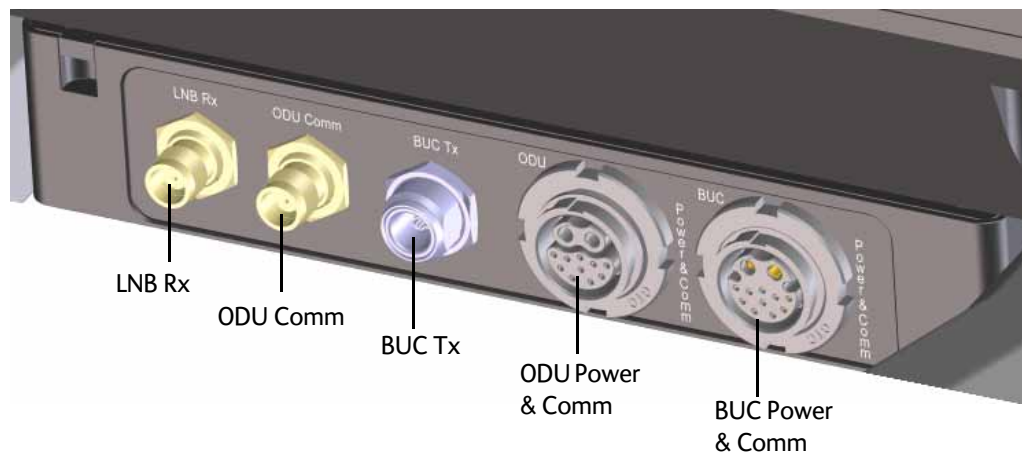


Figure 4-6: Connectors on antenna

A cable bundle with all necessary cables between antenna and ACU is delivered with the system. There are 5 connectors on the antenna for connection to the ACU:

- **LNB Rx:** SMA connector with signal from the LNB to the ACU and power to the LNB
- **ODU Comm:** SMA connector used for Housekeeping communication between the ACU and the antenna.
- **BUC Tx:** N-connector for signal and power from the ACU to the BUC (max. 432 W)
- **ODU Power & Comm:** Circular connector for antenna power (ODU power) and information of the antenna to the ACU. For pinout see *Connectors for antenna connection* on page 4-3.
- **BUC Power & Comm:** For future use.

## 4.2.5 Emergency stop button

The antenna has an emergency stop button for service purposes or emergency stop. In normal operation the switch is on. When you switch it off (push the button) it stops in the latest position and brakes the DC Motors and turns the BUC off.

To stop the antenna, push in the red emergency stop button at the back of the antenna dish.



Figure 4-7: Emergency stop button

### Important

If you want to manually stow the antenna, it is not enough to stop the antenna. For safety reasons you must remove power from the system before manually stowing the antenna. For details on how to manually stow the antenna, see *To stow and deploy the antenna manually* on page 7-10.

To release the emergency stop, turn the emergency stop button and move away from the antenna. The antenna restarts.

## 4.3 Interfaces of the VSAT modem

For interfaces of the VSAT modem and how to connect a VSAT modem correctly to the ACU, see the user documentation of the VSAT modem. For step-by-step guidelines how to set up the VSAT modem see Appendix C, *VSAT modem settings*.

# Initial setup and basic functions

This chapter describes the initial setup and basic functions of the EXPLORER 8100.

For information on configuration with the web interface and how to use the display and keypad, see *Setup and operation* on page 6-1.

This chapter has the following sections:

- *To drive with the antenna installed*
- *Initial setup*
- *Start up and basic functions*

## 5.1 To drive with the antenna installed

The antenna must be stowed when you drive the vehicle. The maximum speed depends on your installation, but it must never exceed 130 km/h.



**WARNING!** Incorrect installation of the antenna may cause the antenna to fall off the vehicle or stress the mounting base. Thrane & Thrane A/S assumes no liability for any damage caused by the antenna falling off the vehicle or stressing the mounting base. It is the responsibility of the customer to ensure a safe and correct installation of the antenna. The instructions in the Installation manual are only guidelines.

## 5.2 Prerequisites

### 5.2.1 Location for transmission

#### Line of sight

Make sure the vehicle with the EXPLORER 8100 is parked where there is free view to as much of the sky as possible.

If possible, park the vehicle in such a way that the antenna, when deploying, points in the approximate direction of the satellite. **This is to avoid excessive movements of the antenna and to improve the acquisition time.** If the satellite elevation is close to Zenith, the antenna elevation angle should preferably be less than 82 degrees.

#### Space for antenna movement

Make sure the vehicle is parked in a place where the antenna can move freely in all directions, according to the Stay clear area shown in Figure 2 on page v.

If you cannot avoid obstacles, you must define a blocking zone to make sure the equipment is not damaged. See *Blocking zone* on page 6-11.

## Unexpected antenna movements

The movements of the EXPLORER 8100 can be very powerful and hazardous to human beings. For this reason, the EXPLORER 8100 has a **Limited motion** feature that prevents or limits unexpected movements of the antenna, e.g. if the antenna has to reposition after a period with no movements. In this case, the user must actively choose to continue. This feature can be disabled if you need to avoid user interaction to allow the antenna to continue operation, but it is strongly recommended to leave the Limited motion feature enabled. See *Limited motion* on page 6-16.



**WARNING!** Make sure nobody can get close to the antenna, especially if you disable the **Limited motion** feature! Observe the stay clear area whenever the antenna is powered. See *Mechanical “stay-clear” area* on page v.

## Avoid magnetizable material

Make sure the vehicle with the EXPLORER 8100 is not parked close to large areas of magnetizable material, as this could interfere with the precision of the system.

### 5.2.2 Wind speed considerations

The EXPLORER 8100 antenna is designed to operate under wind speeds of 72 km/h (45 mph) gusting up to 97 km/h (60 mph) while anchored and deployed and survive winds of 119 km/h (74 mph) while anchored and deployed. Note that the antenna may point away from the satellite in winds blowing faster than the operational wind speed limit.

#### Important

Do not operate the terminal at wind speeds exceeding the operational wind speeds. In case the wind speeds exceed the operational wind speed limit while the antenna is already assembled or operational, bring the antenna to the stow position. In case the wind speeds exceed the survival wind speed limit while the antenna is already assembled or operational, and you cannot stow the antenna with the electronic stow function, bring the antenna manually back to the stow position. See *To stow and deploy the antenna manually* on page 7-10.

## 5.3 Initial setup

After you have installed and connected antenna, ACU and modem, you must make some initial configuration in the web interface before you can use the system. Go through the following steps to set up your EXPLORER 8100:

1. Make a Compass calibration. See *Compass calibration* on page 6-19.
2. **Ku-band version only:** Make a cable calibration. See *Ku-Band version only: Cable calibration* on page 6-21.
3. Create satellite profiles and modem profiles. See *Satellite profiles* on page 6-7 and *Modem profiles* on page 6-6.
4. If you want to control the system using a WLAN connection, you must first set up the use of WLAN in the ACU. See *To configure the LAN network* on page 6-11 and *WLAN settings* on page 6-14.



After calibration and creation of satellite profiles and modem profiles you can deploy the antenna as described in the next section.

## 5.4 Start up and basic functions

### Important

First time after installation or service, you must calibrate the EXPLORER 8100 and configure satellite and modem profiles as described in the previous section.

After power on you must deploy the antenna. How to do this is described in the following sections. Once you have finished the transmission you must stow the antenna again.

During commissioning you might need to manually jog the antenna, see *To line up or jog the antenna* on page 6-22.



**WARNING!** Stay clear of the antenna! Be aware of movements and pinch points, especially while the antenna is being positioned, deployed or stowed.

1. Switch on the ACU and the VSAT modem. The ACU starts up and goes through an initialization procedure.
2. Wait until the **Power LED** and the **Fail/Pass LED** on the ACU light steady green and the display shows **Not ready: Not deployed**. Then you can deploy the antenna.

To deploy and stow the antenna you can use the keypad and display on the ACU, a smartphone or tablet, or a PC and the built-in web interface.

You must stow the antenna before moving the vehicle.

### 5.4.1 To deploy the antenna

#### Note

It may take some time after the antenna is deployed before the modem is ready to start the acquisition procedure. If this time exceeds the time-out limit, you will get a popup in the display and in the web interface asking you to Deploy again. This is for safety reasons, in order to avoid sudden unexpected movements of the antenna. See *Limited motion* on page 6-16.

#### To deploy the antenna using the keypad and display

When the system has started up, do as follows:

1. **Shortcut:** Press and hold ▲ for 2 seconds.

#### Note

It may take up to 10 seconds before the antenna starts to deploy.

To learn how to use the keypad see *Keypad and display menus* on page 6-17. You can also deploy the antenna using the display menu system.

2. Wait until the ACU display shows **TRACKING**. You may have to select **Deploy** again to allow the acquisition procedure, see note above.

3. Check that your modem is ready. The indications may differ depending on the modem type, refer to the documentation for your modem.

When the modem is ready, you can use it to connect to the Internet via the VSAT satellite system.

### To deploy the antenna using the mobile web interface

1. Connect your smartphone or tablet to the WLAN access point of the ACU. For information on WLAN setup, see *WLAN settings* on page 6-14.
2. In the browser of your smartphone or tablet, type in the IP address for the web interface. By default the IP address is `http://192.168.0.1`.
3. When the system has started up, tap **Deploy**.
4. Check the status on your smartphone/tablet. You may have to confirm before the acquisition procedure can start, if too much time has passed after the deployment of the antenna.
5. Check that your modem is ready. The indications may differ depending on the modem type, refer to the documentation for your modem.

When the modem is ready, you can use it to connect to the Internet via the VSAT satellite system.

### To deploy the antenna using the web interface

1. Connect a PC to the **LAN1** or front **LAN** connector at the ACU. You may also use WLAN, if it is configured.
2. Open an Internet browser and type the IP address (default `http://192.168.0.1`).
3. When the system has started up, click the **Deploy** button.

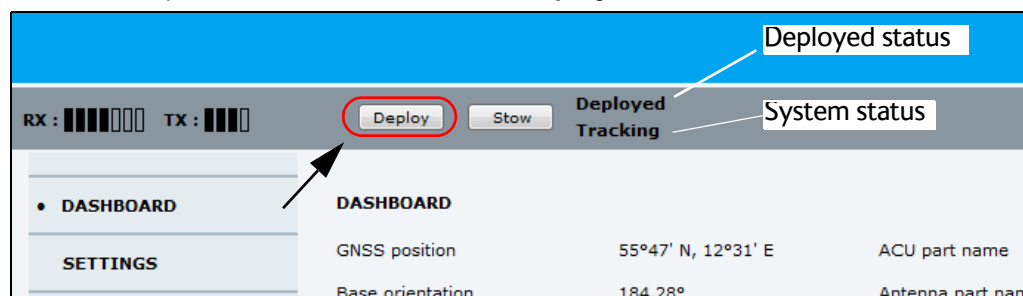


Figure 5-1: To deploy the antenna using the web interface

4. Check the status in the web interface. You may have to confirm before the acquisition procedure can start, if too much time has passed after the deployment of the antenna.
5. Wait until the system status shows **Tracking**.
6. Check that your modem is ready. The indications may differ depending on the modem type, refer to the documentation for your modem.

When the modem is ready, you can use it to connect to the Internet via the VSAT satellite system.

## 5.4.2 To stop the antenna

You can stop the antenna, e.g. if some object is interfering with the movement of the antenna and you cannot access the stop button. If you are close to the ACU, you can use the on/off button to switch off the system. This will immediately stop the antenna movement.

You can also use the electronic stop function, which is described below.



**WARNING!** This is not the same function as the emergency stop button! In emergency situations, use the stop button if possible. The stop button switches off the motors, whereas the electronic stop function just stops the movement.

### To stop the antenna using the display and keypad

To learn how to use the keypad see *Keypad and display menus* on page 6-17.

1. Press **OK** to scroll to the **OPERATION** page and press **OK** again to access the page.
2. Press **▼** until **STOP** is selected, and press **OK**.
3. Check that the status shows **STOPPED**.
4. To start the antenna again, select **OPERATION > START**.  
The antenna restarts. Select **OPERATION > DEPLOY** when you are ready to continue.

### To stop the antenna using the mobile web interface

1. Connect your smartphone or tablet to the WLAN access point of the ACU. For information on WLAN setup, see *WLAN settings* on page 6-14.
2. In the browser of your smartphone or tablet, type in the IP address for the web interface. By default the IP address is `http://192.168.0.1`.
3. Tap **Stop**.  
The **Stop** button changes to **Start**.
4. To start the antenna again, tap **Start**.  
The antenna restarts. Tap **Deploy** when you are ready to continue.

### To stop the antenna using the web interface

1. Connect a PC to the **LAN1** or front **LAN** connector at the ACU.  
You may also use WLAN, if it is configured.
2. Open an Internet browser and type the IP address (default `http://192.168.0.1`).
3. At the top, click the red **Stop** button.



Figure 5-2: To stop the antenna using the web interface

The **Stop** button changes to **Start** and the system status shows **Stopped**.

4. To start the antenna again, click **Start**.  
The antenna restarts. Select **Deploy** when you are ready to continue.

### 5.4.3 To stow the antenna

The antenna must be set into the stow position before moving the vehicle.



**WARNING!** Be aware of pinch points while the antenna is being positioned, deployed or stowed.



You can stow the antenna manually, if for some reason the system is inoperable (loss of power or similar). For details, see *To stow and deploy the antenna manually* on page 7-10.

#### To stow the antenna using the keypad and display

**Shortcut:** Press and hold ▼ for 2 seconds.

To learn how to use the keypad see *Keypad and display menus* on page 6-17.

To stow the antenna using the display menu system, do as follows:

1. Press **OK** to scroll to the **OPERATION** page and press **OK** again to access the page.
2. Press ▼ until **STOW** is selected, and press **OK**.
3. Check that the status shows **STOWED**.

#### To stow the antenna using mobile web interface

1. Connect your smartphone or tablet to the **WLAN** access point of the ACU. For information on **WLAN** setup, see *WLAN settings* on page 6-14.
2. In the browser of your smartphone or tablet, type in the IP address for the web interface. By default the IP address is `http://192.168.0.1`.
3. Tap **Stow**.
4. Check that the status shows **Stowed**.

#### To stow the antenna using the web interface

1. Connect a PC to the **LAN1** connector.
2. Open an Internet browser and type the default IP address: `http://192.168.0.1`.

3. At the top of the page, click the button **Stow**.

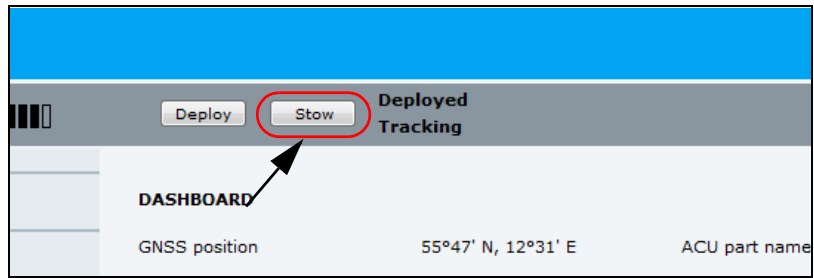


Figure 5-3: To stow the antenna using the web interface

4. Check that the status shows **Stowed**.

# Setup and operation

This chapter has the following sections:

- *The web interface*
- *Configuration web interface*
- *Keypad and display menus*
- 

## 6.1 The web interface

The EXPLORER 8100 has a built-in web interface, which has two levels:

- **Mobile web interface**, used for basic operations and status. Accessed from a smartphone or tablet.
- **Computer web interface**, used for configuration, line-up, troubleshooting, extended status information etc. Accessed from a computer.

### 6.1.1 Mobile web interface

When you access the web interface from a smartphone or tablet you get access to the mobile web interface, which offers the following basic operations and status:

- Deploy, stow and stop the antenna
- Activate satellite profile
- See status and events
- Access the configuration web interface

#### To access the mobile web interface of the ACU

1. Power up the EXPLORER 8100 system, i.e. switch on the ACU. Wait until the LEDs on the front plate of the ACU show that the system is ready to be accessed.
  - Power LED: Green
  - Fail/Pass LED: Steady green.
2. Connect your smartphone or tablet to the WLAN of the EXPLORER 8100. For details on WLAN setup, see *WLAN settings* on page 6-14.
3. Open your Internet browser and enter the IP address of the ACU. The default IP address is <http://192.168.0.1>.

The mobile web interface opens.

The deploy, stow and stop functions are described in *Start up and basic functions* on page 5-3.



Figure 6-1: Mobile web interface, main screen

To access the menu, tap the ikon in the top right corner

**Status** shows information such as system status, host name, position, heading, selected satellite profile, modem etc.

**Satellites** lets you select which satellite to activate, see the next section.

**Eventlist** shows a list of currently active events (if any).

**Desktop** gives access to the “computer web interface”, i.e. the full version of the web interface.

**Help** opens the user & installation manual for the EXPLORER 8100

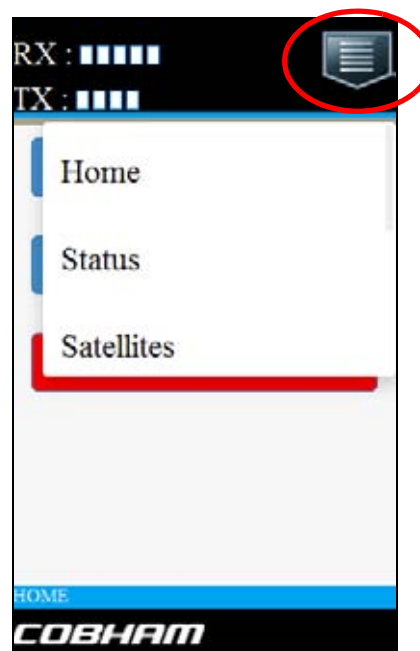


Figure 6-2: Mobile web interface, menu

### To select and activate a satellite profile

1. From the menu, select **Satellites**.
2. Select the satellite profile you want to activate.
3. Tap **Activate**.

## 6.1.2 Configuration web interface

Use the built-in web interface of the EXPLORER 8100 ACU to make a full configuration of the EXPLORER 8100 with the correct VSAT modem, the satellite positions you intend to use and other parameters. You can use a standard Internet browser.

### To access the full web interface

To access the web interface of the ACU do as follows:

1. Power up the EXPLORER 8100 system, i.e. switch on the ACU. Wait until the LEDs on the front plate of the ACU show that the system is ready to be accessed.
  - Power LED: Green
  - Fail/Pass LED: Steady green.
2. Connect a PC to LAN interface 1 (Service port, standard Ethernet) of the ACU or to the front LAN connector of the ACU. You can also connect to the WLAN interface if configured.
3. Open your Internet browser and enter the IP address of the ACU. The default IP address is <http://192.168.0.1>.
4. By default, the web interface shows the **DASHBOARD** page. However, you can set up a password protection, so that you have to log in before you can get access to the web interface. See *User permissions (guest login)* on page 6-25.

Section	Parameter	Value
DASHBOARD	GNSS position	55°47' N, 12°31' E
	Base orientation	184.28°
	Satellite profile	1W Generic
	Satellite position	1°W
POINTING	Azimuth, elevation geo	195.4° 24.3°
	Azimuth, elevation rel	11.0° 25.2°
	Polarisation skew	9.0°
TX	BUC TX	On
MODEM	Model	Generic modem
	RX locked status	Locked
	Signal level	0(pwr)
	RX IF frequency	1857.000000 MHz
	TX IF frequency	1200.000000 MHz
	TX allowed	Yes
	TX mute	Not Muted

Figure 6-3: EXPLORER 8100 Dashboard (example, Ku-Band)

When the Dashboard (or the Guest login page) is displayed, you know that the connection to the EXPLORER 8100 can be established. The web interface is ready for use. You can continue to configure the system.



If you cannot establish a connection there might be problems with the Proxy server settings of your PC (“Use proxy server” must be disabled in your PC).

If you want to use another LAN port you must configure it according to your network requirements. For information how to configure the LAN connectors *To configure the LAN network* on page 6-11.

## Information and controls in the top bar of the web interface

The top bar, which is independent of the selected page, shows the signal strength, the deployed status, the system status, and, if an event is active, a warning icon.

The buttons **Deploy**, **Stow** and **Stop** are also available from the top bar. For details on these functions, see *Start up and basic functions* on page 5-3.

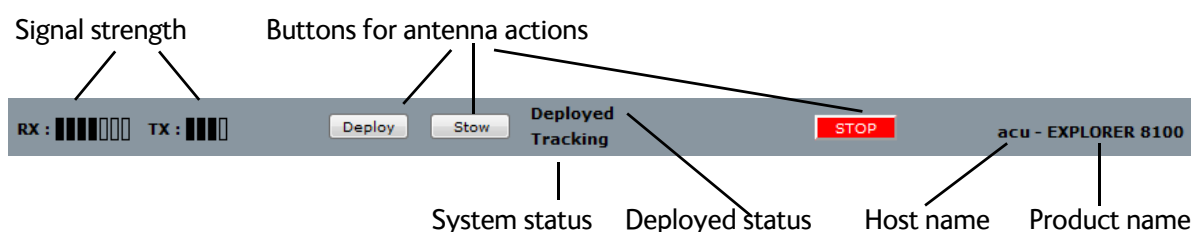


Figure 6-4: Top bar in Dashboard

Examples of system status:

- Antenna SW upload
- Antenna POST (Power-On Self Test)
- Ready (waiting for data from the modem or no satellite profile selected)
- Tracking (antenna is locked to the satellite signal and ready to send/receive).
- Not ready: Not deployed (the system is waiting for the user to deploy the antenna)
- Safe mode (error, followed by an error description)
- <active event message>

## Information fields on the Dashboard

**Note** The information on the Dashboard varies depending on the antenna and the used satellite and modem profiles.

DASHBOARD	Description
Position	Current position, reported by the GNSS module or entered manually

Table 6-1: DASHBOARD information fields

Base orientation	Orientation of the mounting base relative to estimated North
Satellite profile	Name of the currently active satellite profile
Satellite position	Position of the satellite selected in Satellite profile
RX polarization	Horizontal, Vertical, Left-hand or Right-hand
TX polarization	Horizontal, Vertical, Left-hand or Right-hand
RX RF frequency	Receiving frequency
LNB LO frequency	The LNB Local Oscillator frequency
TX RF frequency	Transmitting frequency
BUC LO frequency	The BUC Local Oscillator frequency
Tracking RF frequency	Current RF tracking frequency
ACU part name, Antenna part name, ACU serial number, Antenna serial number, Software version	Part names, serial numbers for ACU and antenna, software version of the EXPLORER 8100
<b>POINTING</b>	<b>Description</b>
Azimuth, elevation geo	Current value for geographic azimuth and elevation
Azimuth, elevation rel	Current value for relative azimuth and elevation
Polarization skew	Current value for polarization skew
<b>MODEM</b>	<b>Description</b>
Model	VSAT modem name, entered in SETTINGS > Modem profiles.
RX locked status	Shows whether or not the system has locked to the incoming signal.
Signal level	Current input signal level from VSAT modem. iDirect openAMIP modem: (PWR) 0-500, delivered by the connected modem. For values <250 the antenna searches after a new signal. Other modem: Signal level in dB.
RX IF frequency	RX IF frequency read from the VSAT modem
TX IF frequency	TX IF frequency read from the VSAT modem
TX allowed	On or Off. Indicates if the VSAT modem supplies the 10 MHz reference signal on its TX connector (On) and if an iDirect OpenAMIP modem indicates modem Locked and Tx ON in the OpenAMIP message L (L 1 1).
TX mute	Muted or Not muted. Indicates whether or not the antenna is muted. You can mute the antenna using the TX mute input on the User I/O connector. See <i>User I/O</i> on page 4-7.

Table 6-1: DASHBOARD information fields

TX	Description
BUC TX	On or Off. Shows if the EXPLORER 8100 has enabled the BUC or not. It is the same TX ON/TX OFF as shown in the display of the ACU, see <i>Keypad and display menus</i> on page 6-28.
BUC output power	Shows whether or not the BUC is transmitting and the power level. At the P1dB compression point 4 bars are filled.

Table 6-1: DASHBOARD information fields

### 6.1.3 Modem profiles

A modem profile contains all VSAT modem settings that are necessary for a successful connection to the satellite. The data you have to fill in are provided by your VSAT service and modem provider. You must add at least one modem profile.

MODEM PROFILES		
Profile name	Modem	
Gilat modem	Gilat SkyEdge II	<a href="#">Edit</a> / <a href="#">Delete</a>
Reference modem	Service modem	<a href="#">Edit</a> / <a href="#">Delete</a>
Generic modem	Generic modem	<a href="#">Edit</a> / <a href="#">Delete</a>
STM SatLink	STM SatLink 2900	<a href="#">Edit</a> / <a href="#">Delete</a>
iDirect Evolution (Serial)	iDirect Evolution (Serial)	<a href="#">Edit</a> / <a href="#">Delete</a>
iDirect Evolution (OpenAMIP)	iDirect Evolution (OpenAMIP)	<a href="#">Edit</a> / <a href="#">Delete</a>
Service modem	Service modem	<a href="#">Edit</a> / <a href="#">Delete</a>
<a href="#">New entry</a>		

Figure 6-5: Web interface: SETTINGS, modem profiles — list (example)

#### Modem profile – New entry and Edit

On the page **Modem profiles** you create, edit or delete modem profiles.

To add or edit a modem profile, do as follows:

1. Select **SETTINGS > Modem profiles** and click **New entry** or **Edit**.

The screenshot shows the 'ADD MODEM PROFILE' form. It includes a 'Profile name' text input field and a 'Modem' dropdown menu. The dropdown menu is open, showing a list of modem models including '<select modem>', 'iDirect iNFINITI (Serial)', 'iDirect iNFINITI (OpenAMIP)', 'Generic OpenAMIP', 'iDirect Evolution (Serial)', 'iDirect Evolution (OpenAMIP)', 'COMTECH CDM 570L', 'COMTECH CDM 625L', 'STM SatLink 2900', 'Generic modem', 'Service modem', and 'Gilat SkyEdge II'. Below the input fields are 'Apply' and 'Cancel' buttons.

Figure 6-6: Web interface: SETTINGS, Modem profile – supported modems (Ku-Band)

**Note** For the Ka-Band system there is currently only one modem, the Surfbeam II modem.

2. Fill in a modem profile name of your own choice.
3. Select one of the supported modems from the drop down list. Once you have selected a VSAT modem, entry fields required for this VSAT modem are displayed.
 

**Generic OpenAMIP:** If you have an OpenAMIP modem that is not included in the list, select Generic OpenAMIP.

**Generic modem:** If you have another modem that is not included in the list, select the generic modem. With this modem profile you enter all information about the modem manually.

**Service modem:** This is mainly used for reference satellites<sup>1</sup> and for troubleshooting purposes.
4. Fill in or edit the data provided by your VSAT service provider.
  - Enter the passwords, if needed.
  - Select the modem baud rate
  - Select whether you want to use the 10 MHz reference from the ACU (Internal) or the VSAT modem (VMU). “Cleaned” means that any noise on the 10 MHz reference signal is removed before using the reference.

**Important** The EXPLORER 8100 can work either using the Rx or Tx 10 MHz reference signals provided by the modem or using its own built-in 10 MHz reference (RX only). The setting in the ACU must match the setting in the modem.

- **GNSS output:** Some modems need the current GNSS position from the ACU. If the modem needs the GNSS position, you must select the baud rate for the RS-232 interface from the **GNSS output** dropdown list. Otherwise select Disabled.
  - For generic modem: Select the RSSI Lock Type and type in the RSSI Lock Level.
  - **For OpenAMIP IP address:** Make sure that you have entered this IP address also for the LAN connector that is used for the OpenAMIP modem, see *To configure the LAN network* on page 6-11.
5. Click **Apply** to add the new profile to the list of modem profiles or to accept the edits.

## 6.1.4 Satellite profiles

On the page **Satellite profiles** you add, edit, delete and activate satellite profiles. A satellite profile contains all settings that are necessary for a successful connection to the satellite, including a modem profile. Most of the data you have to fill in are provided by your VSAT service provider.

**You must activate one satellite profile.**

To activate a satellite profile, click **Activate** next to the profile name.

**Note** You must add at least one modem profile before you can add a satellite profile. See *Modem profile – New entry and Edit* on page 6-6.

1. For details on how to use a reference satellite profile, see *To use a reference satellite (Ku only)* on page 6-10.

## To select a reference satellite (Ku only)

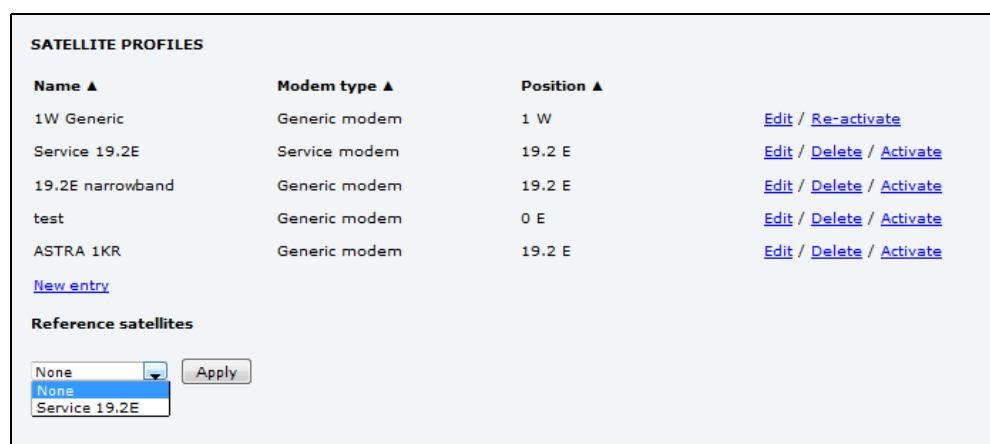
If you are going to use a reference satellite, select the satellite from the dropdown list and click **Apply**.

**Note** | First you have to create a reference satellite profile.<sup>1</sup>

## Satellite profiles – New entry and Edit

**Note** | You cannot edit nor delete an active profile. Make sure the profile is not active before you edit or delete it.

1. Select **SETTINGS** or **Satellite profiles**.
2. Click **Edit** or **New entry**.



Name ▲	Modem type ▲	Position ▲	
1W Generic	Generic modem	1 W	<a href="#">Edit</a> / <a href="#">Re-activate</a>
Service 19.2E	Service modem	19.2 E	<a href="#">Edit</a> / <a href="#">Delete</a> / <a href="#">Activate</a>
19.2E narrowband	Generic modem	19.2 E	<a href="#">Edit</a> / <a href="#">Delete</a> / <a href="#">Activate</a>
test	Generic modem	0 E	<a href="#">Edit</a> / <a href="#">Delete</a> / <a href="#">Activate</a>
ASTRA 1KR	Generic modem	19.2 E	<a href="#">Edit</a> / <a href="#">Delete</a> / <a href="#">Activate</a>

[New entry](#)

**Reference satellites**

None ▼

None  
Service 19.2E

Figure 6-7: Web interface: SETTINGS - list of satellite profiles (example)

Each satellite profile has one assigned modem profile. The parameters vary depending on the selected modem profile.

For a Generic modem you enter all parameters in the satellite profile manually.

3. Enter or edit the Satellite profile name.

**Note** | It is helpful to assign a name containing the location where the Satellite profile is to be used (e.g. *Central America*) and possibly the provider.

4. Select a modem profile. The page automatically displays the parameters available for the selected modem profile.

For instruction how to add a modem profile see *Modem profile – New entry and Edit* on page 6-6.

5. Enter the data for the satellite that you want to use. For satellite data see *DVB-S/DVB-S2 satellites for Ku-Band* on page E-1 or [www.lyngsat.com](http://www.lyngsat.com). If you have selected a satellite from the list, some of the information is filled in automatically.

6. Click **Apply** to save the settings for the satellite profile.

Depending on the selected modem profile, some or all of the below settings may be available. You get most of the information from your VSAT provider.

Setting	Values	Explanation
Predefined satellites	User defined data or selection of satellites	Select a satellite from the list, or select <b>User defined data</b> and enter all information manually.
Use reference satellite	Checkbox	Select <b>Use reference satellite</b> if you are going to use a reference satellite. See <i>To use a reference satellite (Ku only)</i> on page 6-10.
Satellite position	degrees E or W	Position of the satellite
Polarisation skew	degrees	See documents from VSAT provider
Maximum inclination	degrees	Sets the satellite search window size to match inclined orbit satellites.
Elevation cutoffl	degrees	The minimum elevation angle for the antenna to function. According to FCC (FCC §25.205) regulations the Elevation cutoff must be minimum 5 degrees.
RX polarisation	Horizontal or vertical	Polarization of the desired RX signal
TX polarisation	X-pol or empty	Polarization of the TX signal - relative to the desired RX signal. Orthogonal (X-pol) or same (Co-pol).
RX IF frequency	MHz	RX IF frequency from the VSAT modem
LNB LO frequency	9.75 or 10.75 GHz	Select <b>9.75</b> if the RX frequency is between 10.7 GHz and 11.7 GHz Select <b>10.75</b> if the RX frequency is between 11.7 GHz and 12.75 GHz
RX RF frequency	GHz	Receiving frequency
TX RF frequency	GHz	Transmitting frequency
Tracking type	Narrow band, VSAT modem RSSI, DVB-S/DVB-S2 or Wideband power	Select which signal should be used for tracking.
RX frequency	Modem or User defined	Select <b>Modem</b> to use the modem RX frequency or select <b>User defined</b> and enter the RX frequency manually.

Table 6-2: Settings for satellite profile

## To use a reference satellite (Ku only)

If your VSAT modem cannot communicate to the antenna that it is locked to the correct satellite, you can initially use a reference satellite that the antenna can identify without the modem.

To use a reference satellite, do as follows:

1. On the Modem profiles page, create and save a modem profile using the Service modem.
2. On the Satellite profiles page, create and save a reference satellite profile that uses the Service modem profile.
3. Create your real satellite profile for the connected modem.
4. In the real satellite profile, select **Use reference satellite**.
5. In the **Satellite profiles** page under **Reference satellites**, select the reference satellite profile from step 2 above and click **Apply**.
6. Activate the real satellite profile.

With this satellite profile activated, every time you deploy the antenna it will start up using the reference satellite and automatically switch to the real satellite when possible.

## 6.1.5 Blocking zone

If possible, avoid any objects within the stay clear area shown in *Mechanical “stay-clear” area* on page v. If it cannot be avoided, you must enter a blocking zone for the area where the object is located. When the antenna meets a blocking zone it stops and the display and the web interface will show “Blocking zone”.

To set up a blocking zone:

1. Estimate the necessary elevation angle to keep the antenna clear of the blocking object.



The elevation set in the Blocking zones page is the elevation of the signal beam. Some parts on the antenna will be below the elevation angle (e.g. the Forward Wave Guide), so you must make the elevation angle larger to keep all antenna parts clear of the object(s).

2. In the web interface, select **SETTINGS > Blocking zones**.
3. Select **Active**
4. Type the minimum elevation angle to keep the antenna clear of your blocking object.
5. Click **Apply**.

After defining and activating the blocking zone you can test it using the Jog function. Jog the antenna carefully until it meets the defined blocking zone. Observe that it stops at the blocking zone and that the display and the web interface show a warning.

## 6.1.6 To configure the LAN network

On this page you can set up the LAN network and enter a host name. The host name helps identifying the EXPLORER 8100 system.



The EXPLORER 8100 system is not designed to be connected directly to the Internet. It must be located behind a dedicated network security device such as a fire wall. You should change the default passwords as anyone with access and malicious intent can render the EXPLORER 8100 inoperable.

To configure the LAN network, do as follows:

1. Select **SETTINGS > Network**.
2. Make the necessary changes on this page and click **Apply**.  
For available options for the network configuration, see Table 6-3 on page 6-13.



**COBHAM**

Deployed Tracking STOP acu - EXPLORER 8100

**NETWORK**

Host name: acu

**LAN Port 1: Service**

Mode: Static

IP address: 192 . 168 . 0 . 1

Netmask: 255 . 255 . 255 . 0

DHCP server:

DHCP server start: 192 . 168 . 0 . 200

DHCP server end: 192 . 168 . 0 . 209

**LAN Port 2**

Switched with port 5

**LAN Port 3**

Switched with port 5

**LAN Port 4: LAN**

Mode: DHCP Client

IP address: 10 . 196 . 20 . 207

Netmask: 255 . 255 . 255 . 0

**LAN Port 5: Modem**

Mode: Static

IP address: 10 . 224 . 22 . 210

Netmask: 255 . 255 . 255 . 240

DHCP server:

DHCP server start: 192 . 168 . 1 . 10

DHCP server end: 192 . 168 . 1 . 15

**DNS setup**

DNS source: Static

Primary DNS: 0 . 0 . 0 . 0

Secondary DNS: 0 . 0 . 0 . 0

**Gateway setup**

Default gateway source: LAN Port 4

Default gateway: 10 . 196 . 20 . 1

Figure 6-8: Web interface: SETTINGS, Network (default settings)

**Important**

Make sure that the networks do not use IP address ranges that overlap.

Sections	Preferred use
NETWORK Host name	The host name is used for identifying the EXPLORER 8100, and is displayed in the web interface (right side of top line, next to the product name). The default host name is acu. You can change the name. Letters (a-z), digits (0-9) and hyphen (-) are allowed as legal characters. Note: The host name must start with a letter.
LAN Port 1	LAN port 1 is the service port and is used to access the web interface. By default this port has the static IP address http://192.168.0.1; the current value can be shown in the EXPLORER 8100 display (NETWORK > PORT 1 IP). If you want a different setup for LAN port 1, you can change the IP settings. You get the default settings back by resetting to factory default.
LAN Port 2, 3 and 5	By default, LAN port 5 is dedicated to the modem connection. If you want a different setup for LAN port 5, you can change the IP settings. LAN 3 and 5 are switched with LAN 2, i.e. they are always on the same network and have the same IP settings as LAN 5.
LAN Port 4	LAN port 4 is configured to be a DHCP client. You can change the IP settings according to your needs.
WLAN	The wireless port can be connected to one of the other ports. Set here which of the ports 1 to 5 you want to access with WLAN. If you want to access the web interface with WLAN, select the service port (LAN 1 by default). For details on the WLAN interface setup, see <i>WLAN settings</i> on page 6-14.

Table 6-3: Setup of LAN network

## Static IP or DHCP Client



The DHCP server is enabled by default.

If you select **DHCP client** the network IP address and sub-net mask must be provided by a DHCP server on that network. If you select **Static** you must specify a unique IP address and a sub-net mask.

## DHCP Server Settings

When **Mode** is set to **Static**, you can select to let the LAN port act as a **DHCP server**.

The DHCP start and end addresses must be on the same subnet as the port's static IP.

## DNS setup

If you have access to a Domain Name Server (DNS) you can specify the address of the email server by using the server name instead of its IP address. This can be used in Outgoing mail server in *Email setup* on page 6-16.

You may statically specify the address of one or two DNS. Select the DNS source as static and fill in IP address or addresses.

Alternatively, if your DHCP server can provide a DNS address and you have selected DHCP client above, then select the same LAN as your DNS source.

## Gateway setup

If the ACU needs to communicate with network units outside the specified sub-nets, you must specify a default gateway (typically a router).

The default gateway can be set as a static IP address. Then set the default gateway source to static and enter the IP address of the default gateway. To remove the default gateway set it to 0.0.0.0.

Alternatively, if your DHCP server is able to provide a default gateway address and you have selected DHCP client above, then select the same LAN as your default gateway source.

## 6.1.7 WLAN settings

On the **WLAN** page you can enable and set up the WLAN access point. Do as follows:

1. First, on the **SETTINGS > NETWORK** page, link the WLAN interface to one of the LAN interfaces. Typically, you link WLAN to LAN 1, which is used to access the web interface of the EXPLORER 8100. See *To configure the LAN network* on page 6-11.
2. Select **SETTINGS > WLAN** from the left navigation pane.

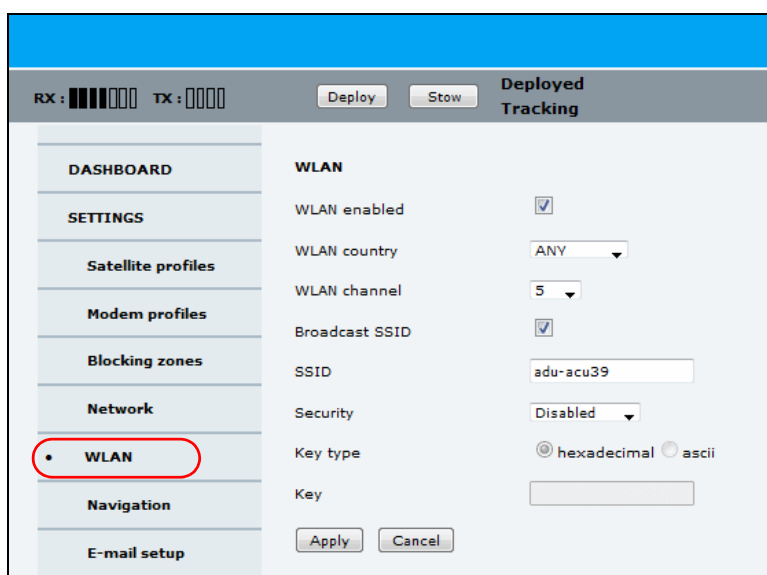


Figure 6-9: Web interface: SETTINGS > WLAN

3. Enable or disable the WLAN (default: **Disabled**).
4. Select the **Country** for your present location.
5. **WLAN channel** can be changed, channels available depend on the setting for **Country**.
6. For **Broadcast SSID**, select **Enabled** (default) or **Disabled**.  
**Enabled:** WLAN access point is shown to other users.  
**Disabled:** WLAN access point is hidden.

7. Type in the **SSID** of your choice or accept the default SSID, which is **Cobham**. The SSID is the name of the wireless local area network. It is a text with maximum 32 characters.
8. Select the **Security** standard. Select one of the following encryption standards:
  - **Disabled** (default)
  - **WEP-64**, enter the encryption key in hexadecimal format.
  - **WEP-128**, enter the encryption key in hexadecimal format.
  - **WPA-PSK**, enter the encryption key in hexadecimal or text format.
  - **WPA2-PSK**, enter the encryption key in hexadecimal or text format.
9. Type in the **Encryption key** for the selected Security standard. This is not applicable if you have selected **Disabled**.
10. Click **Apply**.

## 6.1.8 Navigation

On this page you can enter a fixed position or a fixed base heading. You can also select whether or not you want antenna stabilization. Do as follows:

1. Select **SETTINGS > Navigation** from the left navigation pane.
2. Set the **Heading** and **Position** and select the **Antenna Stabilization** mode:

Item	Description
<b>Heading (Compass direction)</b>	<b>Automatic</b> - magnetic heading is used (default setting). <b>Manual</b> - enter a value for the direction of the EXPLORER 8100 as an alternative to the magnetic heading (0 to 360 degrees, precision $\pm 20^\circ$ ).
<b>Position</b>	<b>GNSS</b> - GNSS module is used for current position (default setting). <b>Manual</b> - enter values from other position source. (Accuracy should be better than 50 m.)
<b>Antenna Stabilization</b>	<b>Continuous</b> - The antenna continuously compensates for movements in the vehicle to keep a stable position in relation to the satellite (Default setting). <b>Off</b> - Antenna stabilization is not used <b>Automatic</b> - The antenna periodically adjusts the position to compensate for movements in the vehicle.
<b>Limited motion</b>	Enable or disable the Limited motion feature. See the next section, <i>Limited motion</i> . <b>Default enabled</b> . For safety reasons, it is strongly recommended to leave this feature <b>enabled</b> !

Table 6-4: Web interface: SERVICE > Navigation

3. Click **Apply** for each of the new settings.

## Limited motion

The antenna movements of the EXPLORER 8100 can be hazardous to people who are close to the antenna. Always **stay out of the Stay clear area** shown in *Mechanical “stay-clear” area* on page v. If you have to enter the stay clear area, stop the antenna with the stop button or power off the system from the ACU.

The Limited motion feature helps to reduce the risk in connection with unexpected movements of the antenna. It is strongly recommended to **keep this feature enabled!**

There are two levels of protection in the Limited motion feature:

1. The user is asked to confirm before the antenna moves.

**Example:** The signal is blocked, so the modem wants the antenna to switch to another satellite. This could cause large movements of the antenna, so the user is asked to confirm before the antenna is allowed to move.

2. The movements are confined to a certain range (60 degrees?) in Azimuth and Elevation.

**Example:** A motor in the antenna is defective. The antenna may move unexpectedly, but if it attempts to move outside the allowed range, the motors are shut down.

## 6.1.9 Email setup

To be able to send diagnostics reports and other system information using e-mail you must set up a couple of parameters. Contact your IT department for the specific data.

To configure the e-mail setup, do as follows:

1. Select **SETTINGS > E-mail setup** from the left navigation pane.

Figure 6-10: Web interface: SETTINGS > Email setup

2. Enter the data for Outgoing mail server (SMTP), SMTP port number, SMTP authentication, User name and password. This data is typically provided by your IT department.

**Note** You must set **Outgoing mail server** to an IP address if DNS has not been set up in **DNS setup** in *To configure the LAN network* on page 6-11.

## 6.1.10 Reports, syslog and SNMP traps

You can set up the system to send the following reports and messages:

- Diagnostics report
- Remote syslog
- SNMP traps

### To send a diagnostics report

You can send automatically generated diagnostic reports at fixed intervals. The diagnostic report contains information relevant for the service personnel during troubleshooting. To set up sending a diagnostics report, do as follows:

**Note** You must first set up the Email. See the previous section, *Email setup*.

1. Select **SETTINGS > Reporting** from the left navigation pane.

The screenshot shows the 'REPORTING' configuration page in the web interface. The left navigation pane includes categories like DASHBOARD, SETTINGS, SERVICE, ADMINISTRATION, and HELPDESK. Under SETTINGS, 'Reporting' is selected and highlighted with a red circle. The main content area displays the following configuration options:

- REPORTING**: A red message at the top states "Please configure e-mail first."
- Diagnostics report**:
  - E-mail sender: [Text input field]
  - E-mail recipients: [Text input field]
  - Send interval: [Dropdown menu showing "e-mail disabled"]
  - Buttons: Apply, Cancel, Send Now
- Remote syslog**:
  - Remote syslog enable: Radio buttons for On and Off (Off is selected)
  - Remote syslog IP address: [IP address input field]
  - Buttons: Apply, Cancel
- SNMP traps**:
  - SNMP traps enable: Radio buttons for On and Off (Off is selected)
  - SNMP traps IP address: [IP address input field]
  - SNMP traps Community: [Text input field]
  - Buttons: Apply, Cancel

Figure 6-11: Web interface: SETTINGS > Reports

2. Under Diagnostics report, enter the following:
  - E-mail sender
  - E-mail recipients (comma separated)
  - Send interval: Select **e-mail disabled** (default), **day** with 2-minute samples, **week** with hourly samples or **month** with hourly samples. The report contains statistics data for the selected intervals.
3. Click **Apply**.

You can also send the report at any time by clicking **Send now**. Use **Send now** to validate the e-mail setup. See also *Help desk and diagnostics report* on page 7-2.

## Remote syslog

You can set up the antenna to send each syslog message to a syslog server to advise the system administrator of the current status of the antenna.

To set up sending syslog messages to a syslog server, do as follows:

1. Select **SETTINGS > Reporting**.
2. In the section **Remote syslog** select **On** to enable remote syslog (default: Off).
3. Enter the IP address of the syslog server to which the syslog messages will be sent.
4. Click **Apply**.

## SNMP traps

SNMP traps, or notifications, are network packets which advise the system administrator about significant events in the antenna, e.g. alarms and system error messages. They are generated by the antenna and can be sent automatically to an SNMP trap receiver/manager).

To set up reporting SNMP traps to an SNMP server, do as follows:

1. Select **SETTINGS > Reporting**.
2. In the section **SNMP traps** select **On** to enable sending of SNMP traps (default: Off).
3. Enter the IP address of the SNMP trap receiver/manager to which the SNMP traps will be sent.
4. Enter the Community name. This is the name of the SNMP trap receiver/manager. This is needed for authentication of the SNMP trap request.
5. Click **Apply**.

## 6.1.11 Compass calibration

The first time you start up the system, you must make a compass calibration.

**Note** You can set up whether or not you need administrator password to access calibration. See *User permissions (guest login)* on page 6-25.

With the system installed in the vehicle, park the vehicle and make a compass calibration in 4 directions with approximately 90 degrees between them.

Do as follows:

1. Make sure the antenna is stowed before calibration.
2. Locate a flat area for parking the vehicle. Make sure there are no large magnetizable objects (e.g. containers or trucks) close to the parking spot - it could affect the precision of the system.
3. Find fix points for parking the vehicle in four directions with approximately 90 degrees ( $\pm 10$  degrees) between them. You can start in any direction, it does not necessarily have to be North-East-South-West.

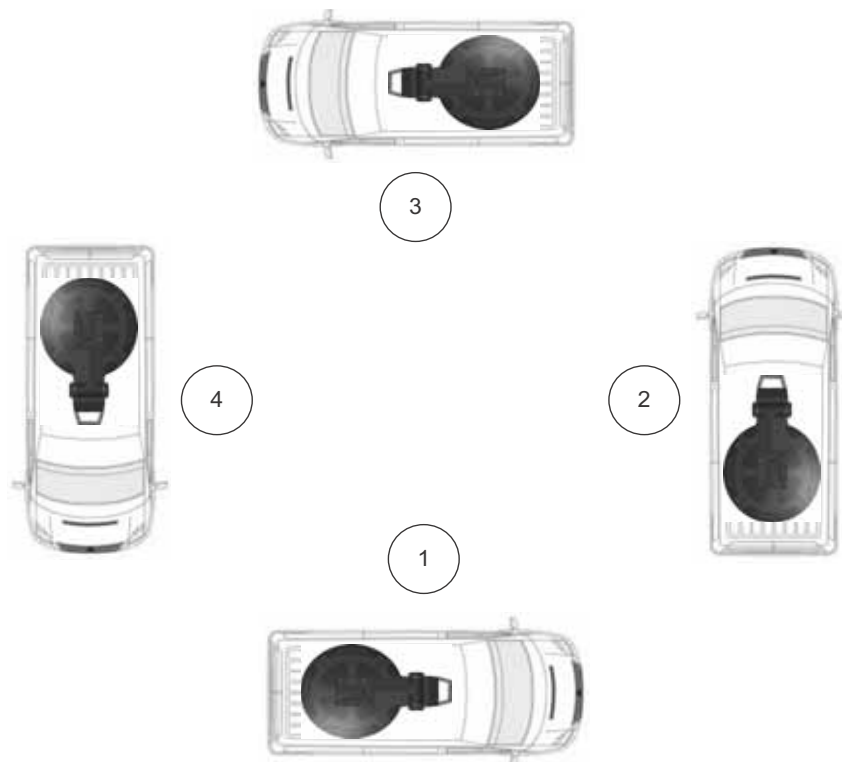


Figure 6-12: Compass calibration, vehicle positions

4. Park the vehicle in the first position.
5. Switch on the ACU. The ACU starts up and goes through an initialization procedure.
6. Wait until the Power LED and the Fail/Pass LED light steady green.
7. Connect a computer, start your browser and access the web interface.
8. Click **SERVICE > Calibration** and locate the section **Compass calibration**.



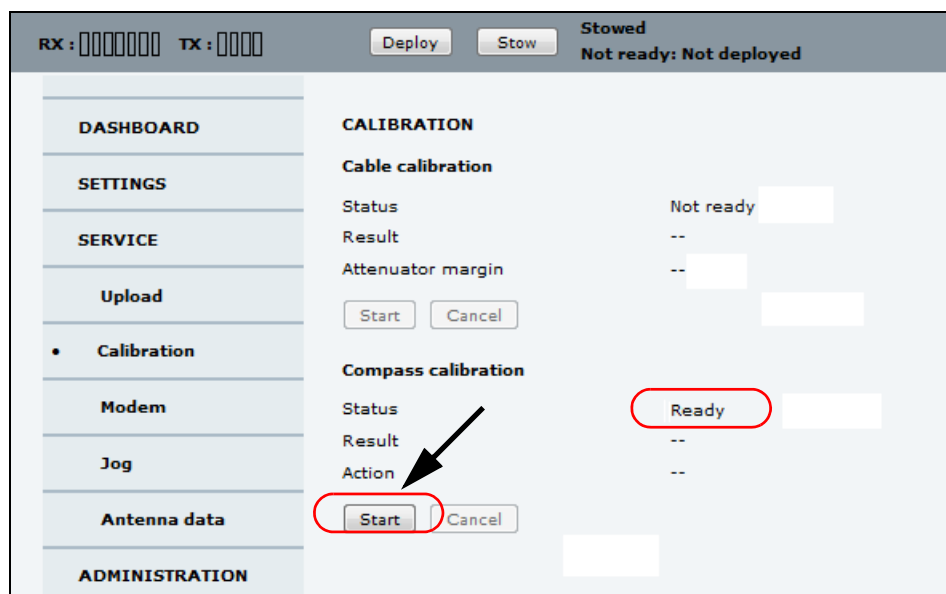


Figure 6-13: Web interface: SERVICE, Calibration, Compass calibration

9. When the **Status** field under **Compass calibration** shows **Ready**, click **Start**. The first calibration step begins. When the first step is completed, the **Result** field shows **Done** and the **Start** button changes to a **Continue** button.
10. When the first part is completed, move the vehicle so that it is parked approximately on a 90 degrees angle relative to the previous position, see Figure 6-12.
11. Click **Continue**.
12. When the **Result** field shows **Done**, move the vehicle 90 degrees again, so that it is parked approximately on a 180 degrees angle relative to the first position and click **Continue**.
13. When the **Result** field shows **Done**, move the vehicle 90 degrees again, so that it is parked approximately on a 270 degrees angle relative to the first position and click **Continue**.
14. When the **Result** field shows **Done** and the button changes to **Start** again, the compass calibration is completed.

## 6.1.12 Ku-Band version only: Cable calibration

If you have the Ku-Band version of the EXPLORER 8100, use the web interface to make a cable calibration to ensure that Tx power is calibrated at all frequencies.

### Important

For the system to work properly you must make a cable calibration in the following cases:

- After installation
- After replacing antenna cables
- After service



**WARNING!** Stay clear of the antenna during Cable calibration! The antenna is moving and transmitting during the calibration procedure. For Stay clear area see *Mechanical "stay-clear" area* on page v. For radiation safety distance, see *Microwave radiation hazards* on page iv.

1. Deploy the antenna.
2. On the page **SERVICE > Calibration** click **Start** in the section **Cable calibration**.

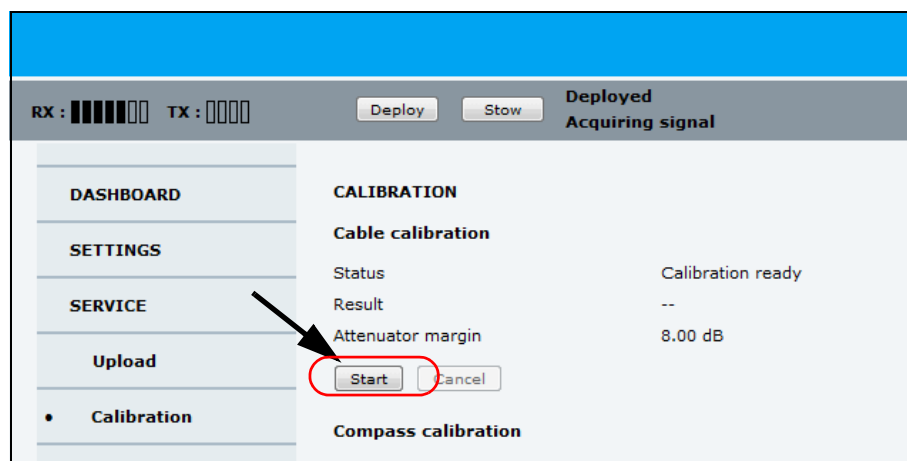


Figure 6-14: Web interface: SERVICE, Calibration, Cable calibration

3. Wait typically for 2 minutes for the calibration to finish.

A message is displayed when the calibration has been completed successfully. This screen shows how much attenuation margin is left for the antenna cable. This indicates whether the antenna cable and connectors are in good condition and well crimped.

When servicing the system it is recommended to make a cable calibration to check if the antenna cable is still in good order. If the attenuator margin changes by 2 dB or more after a cable calibration, it is recommended to do a P1dB compression measurement with the satellite operator to verify that the VSAT modem configuration is correct.

The EXPLORER 8100 is calibrated now. If the calibration failed there will be a message on the calibration screen.

### 6.1.13 To line up or jog the antenna

You can use the Lineup/Jog function to deliberately offset the antenna position. This may be used for testing and troubleshooting and sometimes also during commissioning.

1. Connect a PC to the LAN1 or front LAN connector at the ACU.  
You may also use WLAN, if it is configured.
2. Open an Internet browser and type the default IP address: `http://192.168.0.1`.
3. If the antenna is not already deployed, click **Deploy** in the top bar of the web interface.
4. Navigate to the page **SERVICE > Jog** and click **Activate Jog** or **Activate Lineup**.
  - Lineup is typically used during commissioning. If you selected Lineup, the antenna will be able to transmit during the Lineup procedure. You can enter offsets for the position coordinates of the active profile, but you cannot change the coordinates of the active profile.
  - If you selected Jog, the antenna will not be transmitting, and you can enter any position coordinates.

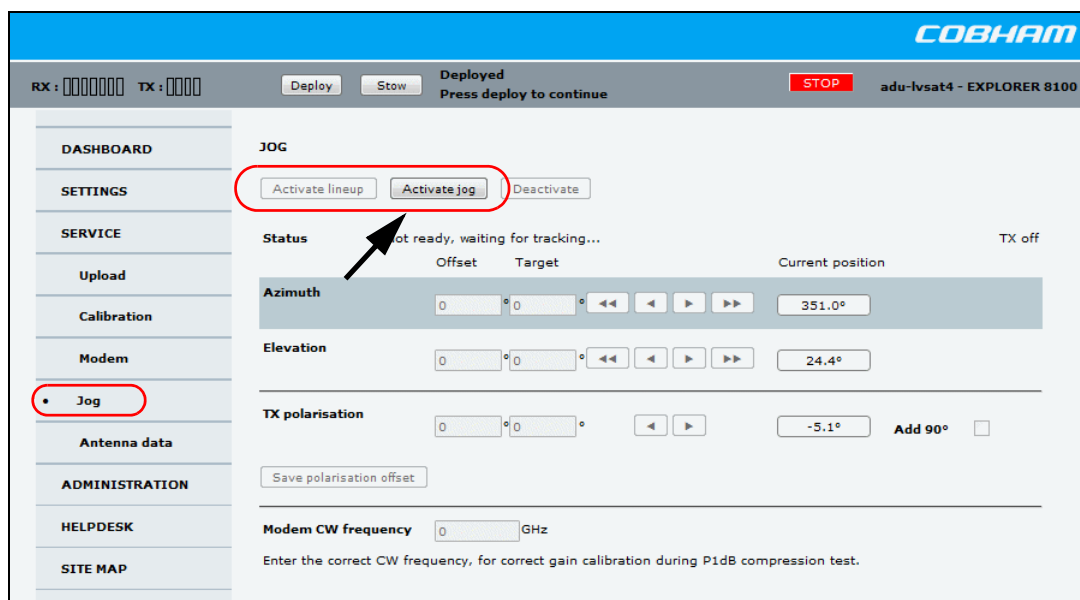


Figure 6-15: To line up or jog the antenna using the web interface

5. Click the arrow buttons for Azimuth or Elevation to change the offset, or type in specific values.
  - ◀ and ▶ change the offset with 0.1° increments.
  - ◀◀ and ▶▶ change the offset with 1.0° increments.
 The current position as well as the offset is shown on the screen.

**Note** | There may be slight deviations (or “random walk”) of a few tenths degrees.

6. **For Ka-Band:** Select **Deactivate** to return to normal operation and reactivate the selected satellite profile.
7. **For Ku-Band only:** Continue to the next steps.

8. Click the arrow buttons for TX polarization to change the offset, or type in a specific value. You may also select **Add 90°**.  
The current position as well as the offset is shown on the screen.
9. Click **Save polarization offset**.
10. Enter the correct **Modem CW frequency**.  
This is provided by the satellite operator, typically when talking to the satellite operator on the phone before doing a P1dB compression measurement.
11. When the lineup or jog procedure is ended, select **Deactivate** to return to normal operation and reactivate the selected satellite profile.

For information on the submenus **Modem** and **Antenna data**, see chapter 7, *Service and maintenance*.

## 6.1.14 Administration

In this section of the web interface you can configure the following administrative settings:

- *Access to the administration settings (user name, password)*
- *User permissions (guest login)*
- *To import and export a system configuration*
- *Reset to factory default*

### Access to the administration settings (user name, password)

You can log on as an administrator or as guest (user name: guest, password: guest). The Administration settings require an Administration user name and password. To log on as administrator, do as follows:

1. Enter the IP address of the EXPLORER 8100.
2. If you are prompted, enter the Administration user name and password. If not, select **ADMINISTRATION** and then enter the administrator user name and password.  
The default user name is **admin** and the default password is **1234**.
3. Click **Logon**.
4. Select **ADMINISTRATION**.  
The Administration page is now updated to let you change the user name and password or log off Administration.

To change the administrator password, do as follows:

1. In the **ADMINISTRATOR > User login** page, locate the section **Change Logon**.

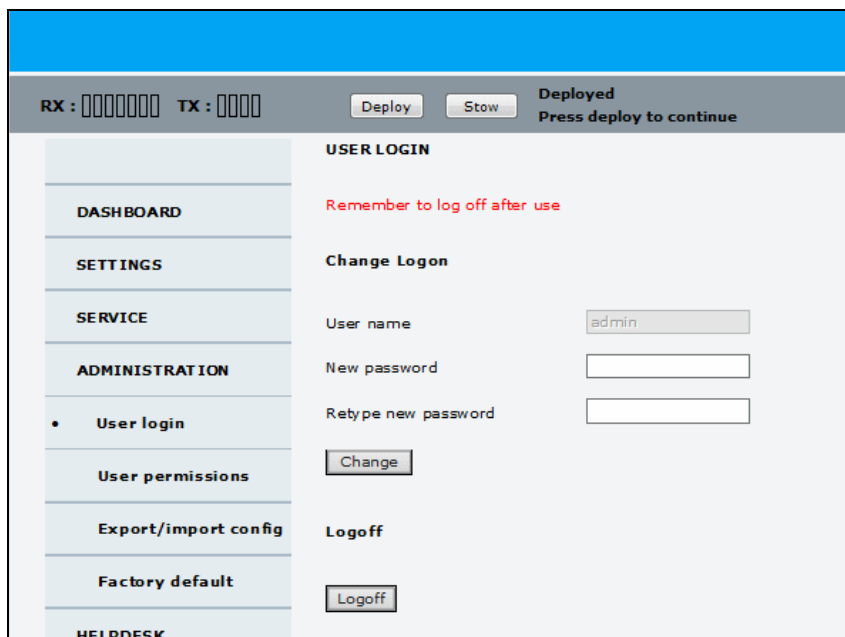


Figure 6-16: Web interface: Administration, change administrator logon and password

2. Type in the new password and retype it on the next line.
3. Click **Change**. At the next logon the new password is required.

To reset the administrator password, do as follows:

1. Contact your service partner for a reset code. Report the serial number of the ACU. You find it in the **Dashboard, ACU serial number**.
2. Click the link **Forgot administrator password?** on the **LOGON** page.
3. Type in the reset code obtained from your service partner and click **Reset**.
4. Type in the user name **admin**, the default password **1234** and click **Logon**.

### To log off administration

If you have not entered anything for 30 minutes under **ADMINISTRATION**, you are logged off automatically. To log off manually, click **Logoff** in the **ADMINISTRATION** page.

## 6.1.15 User permissions (guest login)

You can manage user access to certain functions of the EXPLORER 8100 system. You can allow or deny users that are not administrators (user name: guest, password: guest) access to certain functions and make these pages read-only. This is useful if you want to protect the system against unintended changes or tampering of the system.

**Important**

Study this screen thoroughly and decide which areas of the EXPLORER 8100 system you want to give non-administrator users (user name: guest) access to.

To set up the user permissions for guest users, do as follows:

1. Select **ADMINISTRATION > User permissions**.
2. For each item under **ALLOW USERS TO**: select
  - **Yes** to allow the **guest user** access
  - **No** to block the **guest user** access to the settings. Then the pages are read-only, changes cannot be made by the guest user.

**Change network:** Locks the page **SETTINGS > Network**. Use this page to change IP configuration of the LAN connectors of the ACU. For further information see *To configure the LAN network* on page 6-11.

3. Click **Apply**.

## 6.1.16 To import and export a system configuration

If you need to reuse a configuration in another EXPLORER 8100, you can save the current configuration to a file, which can then be loaded into another EXPLORER 8100. You can also use this feature for backup purposes.

**Important**

Load and save configurations can only be done with the same software version in the units involved.

The configuration file contains all the settings you have entered during system setup: satellite profiles, modem profiles, LAN setup, user permissions etc.

To save a configuration to a file, do as follows:

1. Select **ADMINISTRATION** > **Export/import config**.

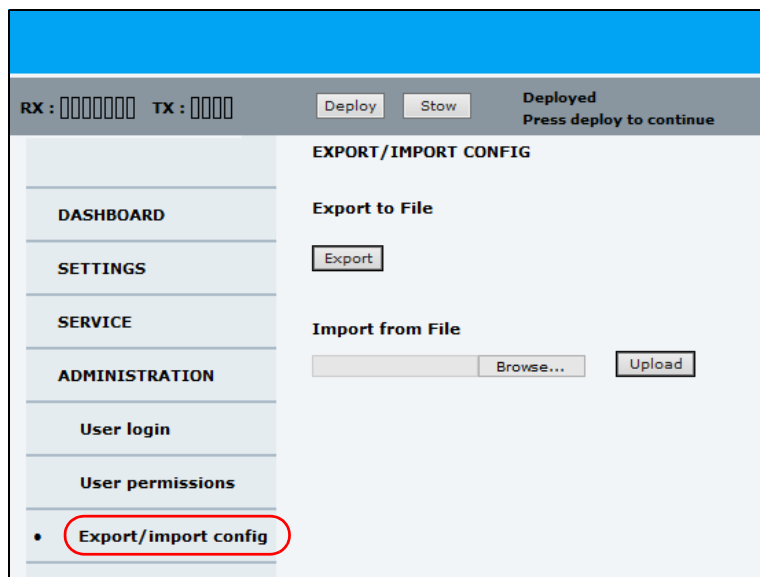


Figure 6-17: Web interface: Administration, Export/import configuration

2. Click the button **Export**. Follow the download instructions on the screen. You can use this configuration file for upload to another EXPLORER 8100,

To load a configuration from a file, do as follows:

1. Select **ADMINISTRATION** > **Export/import config**.
2. Click the button **Browse** and locate the configuration file (.cfg file) you want to upload. Then click the button **Open**.
3. In the web interface click the button **Upload**.

To clone a system configuration, do as follows:

1. Reset to factory default, see the following section for details.
2. Import a configuration from file, see section above.

## 6.1.17 Reset to factory default

To reset to factory default settings, do as follows:

1. Select **ADMINISTRATION > Factory default**.

**Important**

Reset to factory default will delete or reset all the settings listed below!

- Navigation settings
- All added satellite profiles
- All added modem profiles
- Changes in the network setup
- User permissions
- ACU display: brightness setting

2. Click **Reset to factory default**.

**Note**

**After resetting to factory default:** When you power on the system, make sure the antenna is connected to the ACU. If not, the list of available modem types under **SETTINGS > Modem profiles** may not be correct, because the ACU cannot determine whether the antenna type is Ka or Ku.

## 6.1.18 Help desk

The Help desk pages in the web interface are described in the Service chapter under *Help desk and diagnostics report* on page 7-2.



## 6.2 Keypad and display menus

### 6.2.1 Keypad and display

With the display menu you can do basic operations such as deploy, stow and stop the antenna or apply the service function. You can also select which satellite profile to use.

In the menu system you can also see how the system has been configured. To configure the system, use a connected PC and the web interface.

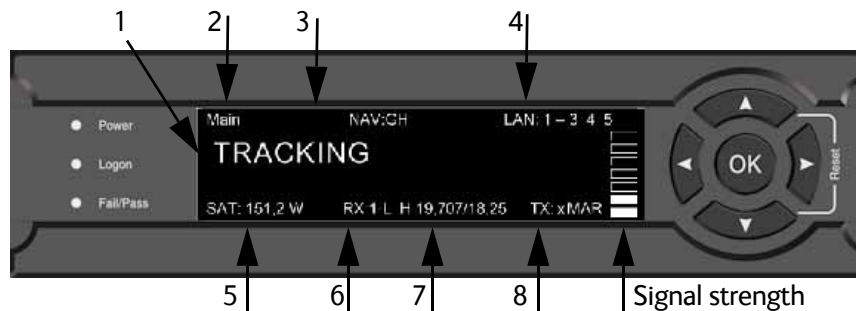


Figure 6-18: Display and keypad of the ACU (example)

1. Current status of the EXPLORER 8100 (examples):  
**NOT READY: NOT DEPLOYED**  
**TRACKING**  
**ANTENNA SW UPLOAD**  
**ANTENNA POST (Power-On Self Test)**  
**READY (waiting for data from the modem or no satellite profile selected)**  
**SAFE MODE (used e.g. for software recovery)**
2. Current menu, see *The menu tree* on page 6-30.
3. **NAV**: Navigational information  
 First letter: **G** (Valid position signal received from the GNSS module) or **g** (No valid GNSS fix)  
 Second letter: **H** (Valid heading data) or **h** (No valid heading data).
4. **LAN**: LAN connectors used, 1, 2, 3, 4, 5, –.
5. **SAT**: Longitude, satellite position of the currently active satellite profile.
6. **RX**:  
 1 (RX Lock, - or 1),  
 L (RX polarization of currently active satellite profile: L (left-hand), R (right-hand), H (Horizontal) or V (Vertical)).
7. RF tracking frequency in GHz and LNB LO Frequency.
8. **TX**: <TX mute> <Modem TX> <ODU TX> <TX pol>
  - <TX mute> = [x,X] (Muted by external signal on User I/O connector: X (muted) or x (not muted)).
  - <Modem TX> = [m,M], M (valid TX signal on modem) or m (no valid TX signal on modem)
  - <ODU TX> = [a,A] A (valid TX signal on antenna) or a (no valid TX signal on antenna)

- <Tx pol> = [-,L,R,H,V] (TX polarization of currently active satellite profile: L (left-hand), R (right-hand), H (Horizontal), V (Vertical) or - (unknown).

After 1 hour the display is dimmed to lowest intensity. Press any key to light up the display.

## 6.2.2 Brightness of the display

To adjust the brightness do the following:

1. Press and hold **OK** for a short moment until **BRIGHTNESS XXX%** is displayed (XXX is the current brightness value).
2. Hold **OK** + press **▲** to brighten or **▼** to darken display.
3. Release **OK** to leave the brightness menu.

## 6.2.3 Navigating the menus

Use the keypad to navigate the menus.

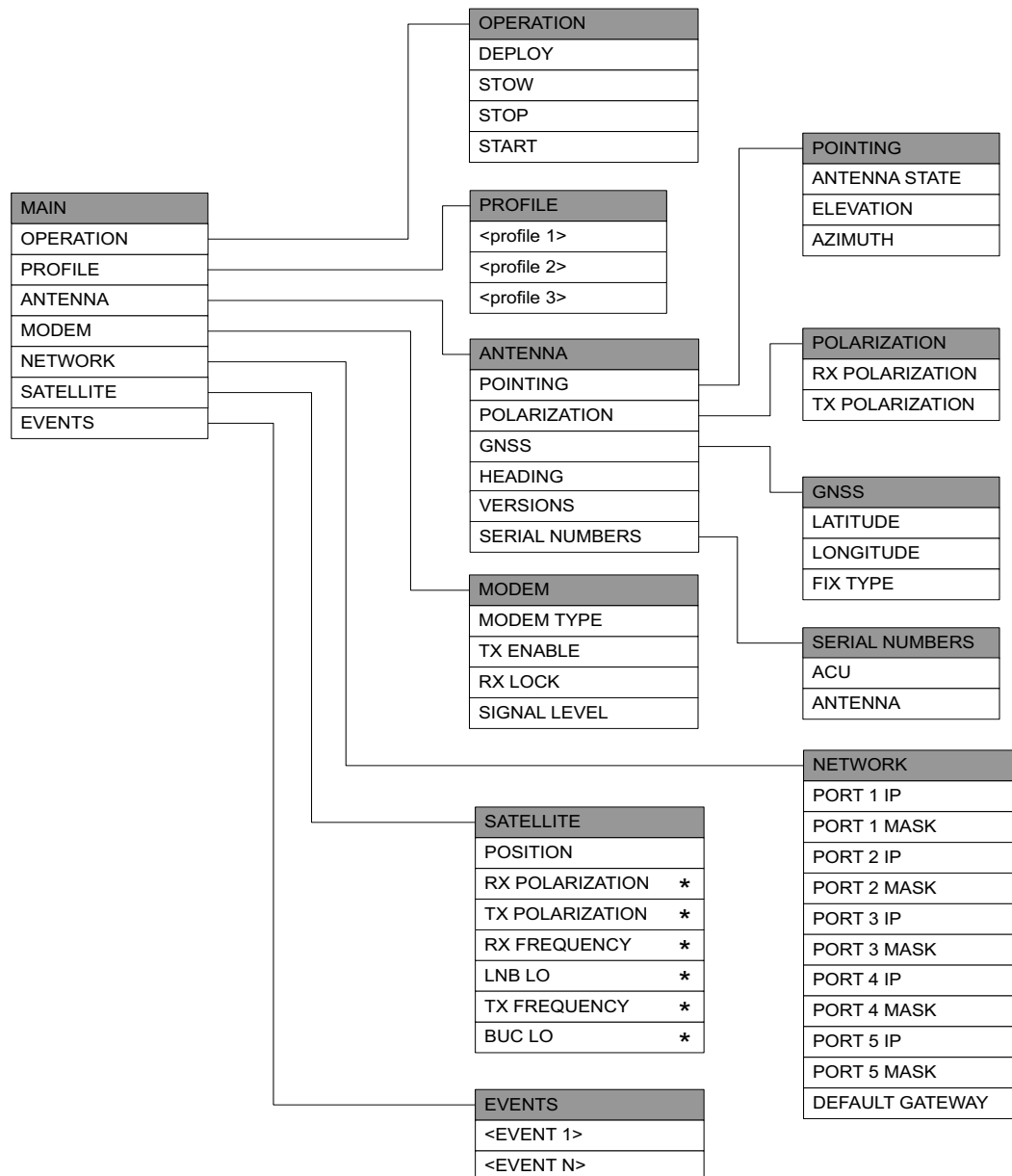
- Press **OK** or **▶** to select a menu item.
- Use the arrow keys **▲** and **▼** to go through the menu items or enter a number, digit by digit.
- Use the arrow keys **◀** and **▶** to go through the settings and move from one digit to the next.
- Press **OK** to select a setting.
- Press **◀** again to move one level up. If applicable, confirm to store the new setting by pressing **OK**.



## 6.2.4 The menu tree

With the display menu you can do basic operations such as deploy, stow and stop the antenna or apply the service function. You can also select which satellite profile to use.

In the menu tree you can also see how the system has been configured. To configure the system, use a connected PC and the web interface.



\* Only present for Ku band

Figure 6-19: Menu tree in the display

## Top-level menu

Top-level menu	Description
MAIN	View with current status of the EXPLORER 8100. The status screen is displayed again after a time out of 10 minutes. New events are shown in this display. If an event is displayed, press <b>OK</b> to jump directly to the menu <b>EVENTS</b> for viewing the currently active events. Press any key (except left arrow) to enter the menu at <b>MAIN</b> .
OPERATION	Allows you to deploy, stow or stop the antenna.
PROFILE	Allows you to select which satellite profile to use.
ANTENNA	Shows the current antenna parameters, position, polarization, software version and serial numbers of the antenna and ACU.
MODEM	Modem information, including modem type, signal level and status for TX enable and RX lock
NETWORK	Shows the IP addresses and netmasks of the LAN connectors on the ACU, and the default gateway.
SATELLITE	Current satellite information. This information is configured using the web interface.
EVENTS	View system events. Number of active events are shown as: X ACTIVE EVENTS in the <b>MAIN</b> display. Press <b>OK</b> to see the list.

Table 6-5: Top-level menus

## Menu descriptions

OPERATION	Description
DEPLOY	Press <b>OK</b> to deploy the antenna
STOW	Press <b>OK</b> to stow the antenna
STOP	Press <b>OK</b> to stop the antenna immediately. The status shows STOPPED
START	Press <b>OK</b> to start the antenna when it has been stopped. After starting the antenna you must deploy it again.

Table 6-6: OPERATION menu

PROFILE	Description
<PROFILE>	Lists the available satellite profiles. Use ▲ and ▼ to go through the profiles and press OK to select the profile you want to activate.

Table 6-7: PROFILE menu

ANTENNA	Description
POINTING	ANTENNA STATE: Current state of the antenna, e.g. TRACKING ELEVATION: Current elevation angle of the antenna AZIMUTH: Current azimuth of the antenna, with reference to North
POLARIZATION	RX POLARIZATION: HORIZONTAL, VERTICAL, LEFT or RIGHT TX POLARIZATION: HORIZONTAL, VERTICAL, LEFT or RIGHT
GPS	LATITUDE: current latitude, read from GNSS module LONGITUDE: current longitude, read from GNSS module FIX TYPE: 2D or 3D or USER (USER means the position is entered manually)
HEADING	Orientation of the mounting base in relation to estimated North.
VERSIONS	Current software version of the antenna
SERIAL NUMBERS	Serial numbers of the antenna and the ACU

Table 6-8: ANTENNA menu

MODEM	Description
MODEM TYPE	Current modem type.
TX ENABLE	On or off, information delivered by the connected VSAT modem.
RX LOCK	On or off, information delivered by the connected VSAT modem.
SIGNAL LEVEL	Current input signal level from the VSAT modem, in dB.

Table 6-9: MODEM menu

NETWORK	Description
PORT 1 IP	Current IP address for LAN1 (service port)
PORT 1 MASK	Current netmask for LAN1
PORT 2 IP	Current IP address for LAN2 (modem port)
PORT 2 MASK	Current netmask for LAN2 (modem port)
PORT 3 IP	Current IP address for LAN3

Table 6-10: NETWORK menu

NETWORK	Description
PORT 3 MASK	Current netmask for LAN3
PORT 4 IP	Current IP address for LAN4
PORT 4 MASK	Current netmask for LAN4
PORT 5 IP	Current IP address for LAN5
PORT 5 MASK	Current netmask for LAN5
DEFAULT GATEWAY	Current default gateway

Table 6-10: NETWORK menu (Continued)

SATELLITE	Description
POSITION	Current satellite position
RX POLARIZATION <sup>a</sup>	-, HORIZONTAL, VERTICAL, LEFT or RIGHT
TX POLARIZATION <sup>a</sup>	-, HORIZONTAL, VERTICAL, LEFT or RIGHT
RX FREQUENCY <sup>a</sup>	Current RX frequency
LNB LO <sup>a</sup>	LNB LO frequency
TX FREQUENCY <sup>a</sup>	Current TX frequency
BUC LO <sup>a</sup>	BUC LO frequency

Table 6-11: SATELLITE menu

a. Only for Ku antenna

EVENT	Description
<EVENT>	<p>In this menu all active events are listed. Use ▲ and ▼ to go through the active events.</p> <p>Events can be of the type WARNING or ERROR.</p> <p>If a new event occurs or there is a change in the event list while you are in the <b>EVENTS</b> menu, a * is shown in the upper left corner of the display, next to the menu name. Press <b>OK</b> to update the <b>EVENTS</b> list, the * will be removed.</p> <p>A &gt; means the event text is longer than the display. Press &gt; to see the remaining text.</p>

Table 6-12: EVENTS menu

**Example:** **EVENT 1/4\***: This is the first event out of a list of 4 and there has been a change in the list. **EVENT 1/4** will always be shown, the \* indicates a change.

## 6.3 SNMP support

The EXPLORER 8100 supports SNMP v2 requests to retrieve configuration and present settings. SNMP is always enabled on all Ethernet interfaces. The SNMP community string is **public**. The EXPLORER 8100 offers via SNMP most of the data that are available from the DASHBOARD web pages. Detailed documentation about supported OIDs can be found in the EXPLORER 8100 MIB file.

The MIB entries are grouped as shown below:

- System configuration
- Navigation coordinates
- Antenna pointing
- Dashboard and profile
- Tracking receiver

**Note** | None of the SNMP values need to be polled more often than once a minute. Polling SNMP values more frequently will impact the performance of the ACU.

You can download the ACU MIB file directly from the ACU:

1. Go to the **HELPDESK** page.
2. Click the link **Download MIB file**

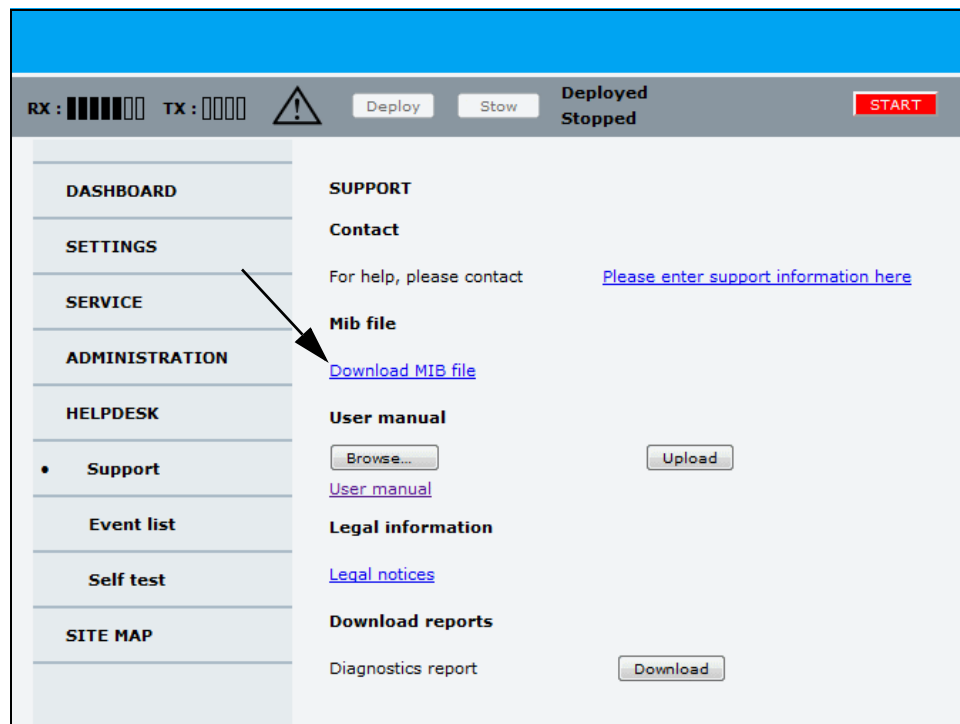


Figure 6-20: Download of MIB file

3. Save the file on your computer.

You can also download the ACU MIB from Cobham eSupport web site.

# Service and maintenance

This chapter has the following sections:

- *General support*
- *Software update*
- *Status signalling with LEDs and status messages*
- *To return units for repair*

## 7.1 General support

### Contact for support

If this manual does not provide the remedies to solve your problem, contact your service provider.

### 7.1.1 Preventative maintenance

The EXPLORER 8100 is constructed to require a minimum amount of regular maintenance.



**WARNING!** Potentially hot surface when the system is operated in hot environments without the possibility for ventilation. Contact may cause burn. Allow to cool before servicing.

Make the following checks on a regular basis:

- Inspect the reflector front surface for physical damage including chips and cracks. Any substantial damage can affect antenna performance and may require the reflector to be replaced.
- Check the feed horn membrane for cracks or damage.
- Check that the mechanical connection between reflector arm and Feed arm is firm. There must be no slackness in the connection between reflector arm and Feed arm.
- Check the flexible wave guide between the BUC and the feed for cracks or damage.
- Check that the polarization module can rotate.
- Use low-pressure washing and soft scrubbing to rinse off grit and reduce wear.



## 7.1.2 Help desk and diagnostics report

During the installation you can enter the support contact for this installation.

1. To access the Help desk (Support page), select **HELPDESK** from the left navigation pane.



Figure 7-1: Web interface: HELPDESK


2. Under **Contact**, click the link, enter support contact information and click **Apply**.
3. Under **MIB file**, you can download a MIB file from the ACU for retrieving configuration and present settings via SNMP. For details, see section 6.3 *SNMP support* on page 6-34.
4. Under **User manual** you can either see the built-in user manual or upload a newer version of the manual from your PC to the ACU.
  - Click the **User manual** link to see the manual.
  - To upload a different version to the ACU, click **Browse...** and select the manual from your PC, then click **Upload**.
5. At **Legal notices** you can see the licence text for the source code of the parts of the EXPLORER 8100 software that fall under free and open source software.
6. In the section **Download Reports** click the button **Download**. The Diagnostic report (txt file) is downloaded to your computer.

The Diagnostics report contains information relevant for the service personnel during troubleshooting. It is also useful documentation of the current setup. It contains all parameters set during configuration. The main sections are:

- Software
- System
- Hardware

- Setup - System data
- Network - LAN Configuration
- Modems
- Satellites - Satellite profiles
- Operation - Current modem and navigation parameters.
- POST - results of the Power-On-Self-Test
- Active Events - lists the currently active events
- Events - List of all cleared events.
- System log

### 7.1.3 Event list

When an event is registered, the web interface shows an event icon  in the icon bar as long as the event is active. The ACU display shows also active events. To view the event list with active events, click the event icon from the icon bar at the top of the web interface, or select **HELPDESK > Event list** from the left navigation pane.

The **Event list** page shows a detailed list of active events and notifications including the time of the first occurrence, ID and severity of the event message, and a short text describing the error. Active events are cleared from the event list when the error is cleared. They are moved to the section **Notifications** and are displayed for 24 hours. All entries in the section **Notifications** are deleted automatically after 24 hours and after restart of the system. For a list of all events with description, error code (ID), explanation and remedy see *System messages* on page D-1.

### 7.1.4 Self test

You can start a self test of the EXPLORER 8100 antenna and ACU.

1. Click **Self test** in the **HELPDESK** page.
2. Click the menu item **Self test**.

**Important**

Warning! The EXPLORER 8100 will reboot to perform the self test. Rebooting the ACU will terminate all existing connections.

## 7.1.5 Restart

To restart the system do the following:

1. Press and hold ▲ and ▼ until the ACU display shuts down and the antenna reboots.



Figure 7-2: To restart the system

2. Wait until the antenna has rebooted and is operational again. The last active satellite profile will be used.

If you want to reset the EXPLORER 8100 to factory defaults, see *Reset to factory default* on page 6-27.

## 7.2 Software update

### 7.2.1 Prerequisites

The following items are required to make a software update:

- One computer with a standard Ethernet port available.
- A standard Internet browser.
- 1024×768 pixels or higher display resolution (best viewed with small fonts).
- One straight LAN cable.
- Access to the file with the new software.

### 7.2.2 Software update procedure

#### To update the EXPLORER 8100

The antenna software is automatically updated when the ACU software has been updated.

**Note** | Software update should only be done by qualified service personnel.

1. Power up the EXPLORER 8100 system, i.e. switch on the ACU.
2. Connect a PC to LAN interface 1 (Service port, standard Ethernet).

If you want to use another LAN port to access the web interface you must configure it according to your network requirements. See *To configure the LAN network* on page 6-8 for more information.

3. Open your Internet browser and enter the IP address of the EXPLORER 8100. The default IP address is `http://192.168.0.1`.
4. Type in the user name **admin** and the password **1234** to access the **Dashboard**.
5. The web interface shows the **DASHBOARD** page.
6. Click **SERVICE** in the navigation pane.  
The **UPLOAD** page is displayed.

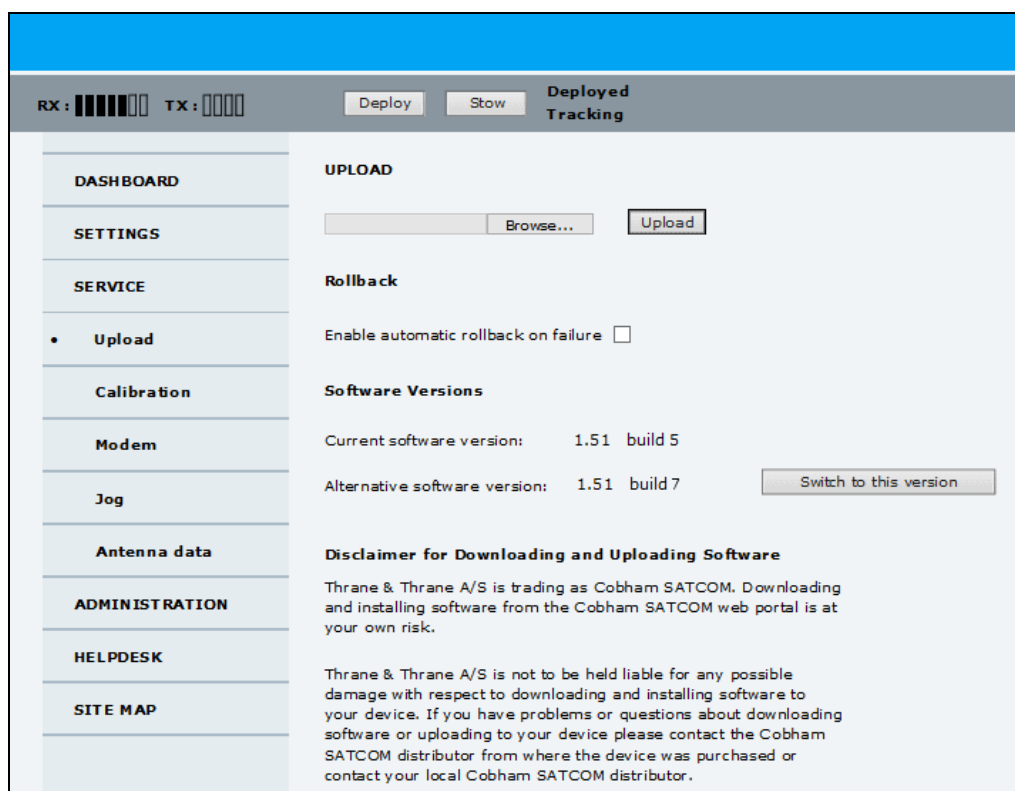


Figure 7-3: Software update with the web interface

7. Click **Browse...** and locate the new software file.
  8. Click **Upload**.
- Important** Do not browse away from the upload page. This will terminate the upload process. Wait for the browser to reload automatically.
9. You can select **Enable automatic rollback on failure**, then the system returns to the previous software if the installed software fails.
  10. Click **Switch to this version** if you want to force the system to use the alternative software version stated under **Software versions**.

Note that the upload procedure takes a couple of minutes. When done, the ACU automatically restarts with the new software version.

The start-up procedure after a software upload takes longer than the usual start-up time, as the software in the antenna must also be updated. The ACU display shows: **ANTENNA SW UPLOAD**.

## To verify the software update

1. The software version can be viewed in the **DASHBOARD** window of the web interface.
2. After completing the software update procedure, the EXPLORER 8100 will perform a POST (Power On Self Test).
3. When the POST has finished, the green Pass/Fail LED on the keypad must become steadily green. Verify that the Pass/Fail LED is not red nor flashing orange once every 2 seconds. Wait until the Pass/Fail LED is green.
4. Verify that the software update has been completed successfully. You find the software version number in the **DASHBOARD** window of the web interface.

The screenshot shows the Explorer 8100 web interface dashboard. The interface includes a navigation menu on the left with categories: DASHBOARD, SETTINGS, SERVICE, ADMINISTRATION, HELPDESK, and SITE MAP. The main content area displays various system parameters in a table-like format. The 'Software version' parameter is highlighted with a red circle, showing the value '1.51 build 5'. Other parameters include GNSS position, Base orientation, Satellite profile, RX polarisation, TX polarisation, RX RF frequency, LNB LO frequency, TX RF frequency, BUC LO frequency, Tracking RF frequency, MODEM status, and POINTING data.

Category	Parameter	Value	
DASHBOARD	GNSS position	55°47' N, 12°31' E	
	Base orientation	184.28°	
SERVICE	Satellite profile	1W Generic	
	Satellite position	1°W	
ADMINISTRATION	RX polarisation	Vertical	
	TX polarisation	X-pol	
SITE MAP	RX RF frequency	12.607000 GHz	
	LNB LO frequency	10.750000 GHz	
	TX RF frequency	14.000000 GHz	
	BUC LO frequency	12.800000 GHz	
	Tracking RF frequency	12.607000 GHz	
	MODEM	Model	Generic modem
	RX locked status	Locked	
POINTING	Signal level	0(pwr)	
	RX IF frequency	1857.000000 MHz	
	TX IF frequency	1200.000000 MHz	
	TX allowed	Yes	
	TX mute	Not Muted	
TX	BUC TX	On	
	ACU part name	TT-7140A	
	Antenna part name	TT-8147A	
POINTING	ACU serial number	81047085	
	Antenna serial number	12345678	
POINTING	Software version	1.51 build 5	
	Azimuth, elevation geo	195.4° 24.3°	
POINTING	Azimuth, elevation rel	11.0° 25.2°	
	Polarisation skew	9.0°	

Figure 7-4: Verifying software update

## Software recovery procedure (SAFE MODE)

To recover from a failed software upload, turn off the ACU and turn it on again. Then repeat the upload procedure as described in *Software update* on page 7-4. If this does not help, use the following procedure:

1. Switch off the ACU.
2. Press and hold down the arrow keys ◀ and ▶ simultaneously.
3. While holding down ◀ and ▶, Switch on the ACU and wait for the display to show **SAFE MODE** in the top left corner.

4. Release the arrow keys.
5. Connect a PC to LAN port 1 (service port) of the ACU.
6. Set the IP address of the PC to static: **IP:192.168.0.2, Subnet: 255.255.255.0.**
7. Open an Internet browser and type `http://192.168.0.1` (Default IP address of the ACU). The software upload page opens.
8. Click **Browse...** and locate the software file.
9. Click **Upload**.

The upload procedure takes a couple of minutes. When done, the ACU automatically restarts with the new software version.

**Important** | Do not browse away from the upload page. This will terminate the upload process. Wait for the browser to reload automatically.

### Software update (VSAT modem)

Refer to the documentation for your VSAT modem.

## 7.3 Status signalling with LEDs and status messages

### Built-In Test Equipment

The EXPLORER 8100 has a Built-In Test Equipment (BITE) function in order to make fault diagnostics easy during service and installation. The BITE test is performed during:

- Power On Self Test (POST), which is automatically performed each time the system is powered on.
- Person Activated Self Test (PAST), which is initiated by starting a self test in the web interface **HELPDESK > Self test**.

For details on error messages after a POST or a self test see *Event list* on page 7-3.

### Means of signalling

The EXPLORER 8100 provides various methods for signalling the system status.

LEDs on the front panel of the ACU are used to signal:

- Power on/off
- Logon
- Fail/Pass

See *LEDs on the keypad of the EXPLORER 8100* on the next page.

**Display and web interface:** In addition to general status messages, the display and the built-in web interface of the ACU show any events (BITE error codes) with a short message describing each error.

See *System messages* on page D-1.

### 7.3.1 LEDs on the keypad of the EXPLORER 8100

There are 3 LEDs: Power, Logon and Fail/Pass LED.

LED	Behavior	Description
Power	Steady green	Power supply OK
	Steady red	Power supply failure
	Off	No power
Logon	Flashing green	Current status is displayed: <ul style="list-style-type: none"> <li>• Searching satellite</li> <li>• Identifying satellite</li> <li>• Carrier lock &amp; TX enabled from modem</li> </ul>
	Steady green	Satellite link established
	Off	No satellite link acquired
Fail/Pass LED	Steady red	A fault which prevents operation is present in the system (ACU, antenna, MODEM).
	Flashing green	A Power On Self Test (POST) or Person Activated Self Test (PAST) in progress. The current status is displayed.
	Flashing red	Active BITE failure or warning. The event is shown in the ACU display.
	Steady green	No faults.

Table 7-1: LEDs on the ACU



## 7.4 To stow and deploy the antenna manually



**CAUTION!** Always release the stow lock before you operate the antenna manually! The stow lock will be damaged if it is not released before you operate the antenna manually.

### 7.4.1 Manual stow

If for some reason the system is inoperable, e.g. due to loss of power or similar, you can stow the antenna manually.

Do as follows:

1. Find the Hex L key and the Hand crank included in the delivery.
2. If the Feed arm of the antenna is not pointing straight, aligned with the antenna base frame, you must adjust the Azimuth as described in the next steps.



Figure 7-5: Manual stow, azimuth

3. Find the adjustment location for Azimuth shown in the picture below and unscrew the cover for the adjustment bolt.

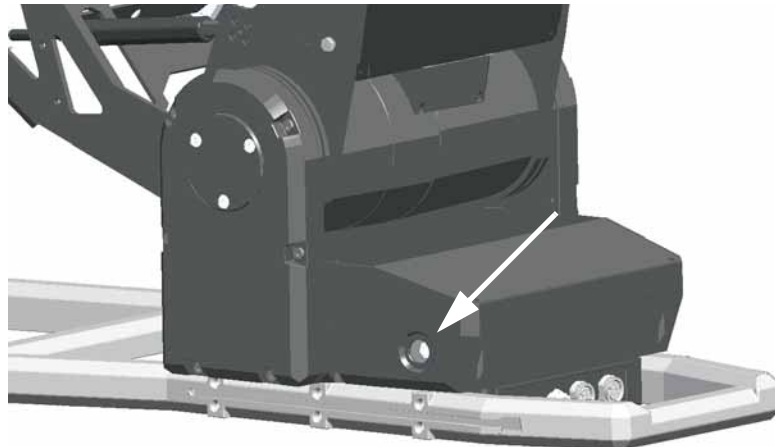


Figure 7-6: Manual stow, azimuth adjustment

4. Use the Hand crank on the Azimuth adjustment bolt to adjust the Azimuth until the antenna is aligned with the base frame of the antenna.
5. **For Ku-version only:** Before adjusting the Elevation, turn the OMT/LNB assembly 45 degrees by hand to make sure that the Flexible Wave Guide does not get caught between the Feed arm and the base frame.

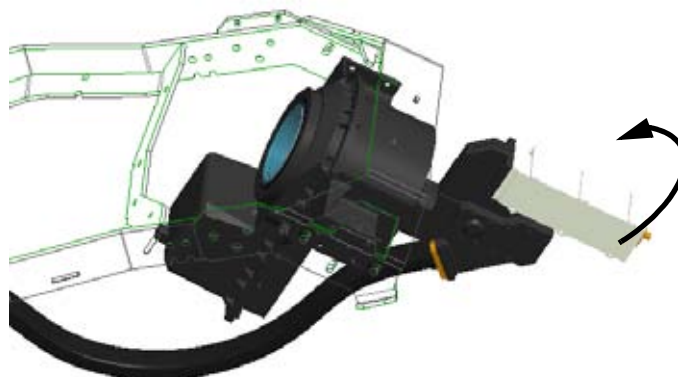


Figure 7-7: Manual stow, Turn OMT/LNB assembly 45 degrees

6. In both sides of the antenna, use the hex L key to remove the screws for the circular covers, shown below.

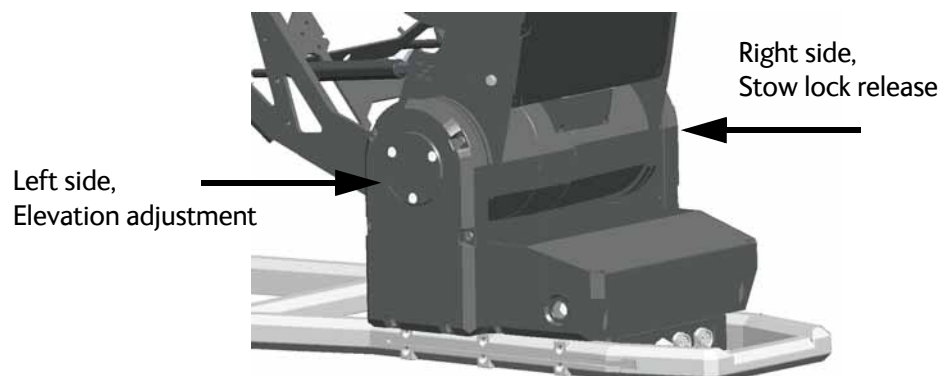


Figure 7-8: Manual stow, covers for elevation adjustment and stow lock release

7. On the right side, insert the hex L key at the top of the L-shaped hole, tip it downwards and follow the direction of the hole to the left to release the lock.

**Important** | Leave the hex L key in the Released position while adjusting the elevation.

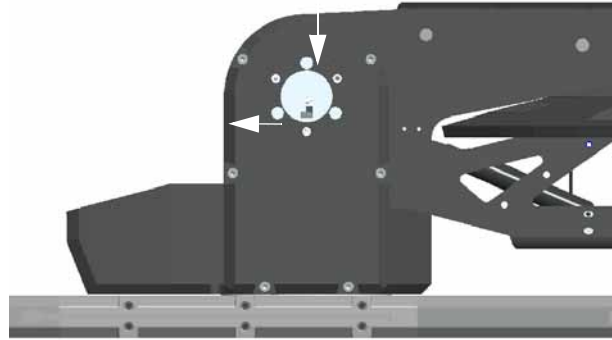


Figure 7-9: Manual stow, release stow lock

8. In the left side, use the Hand crank to adjust the Elevation downwards.

**Note** | Manual adjustment of the Elevation requires more force than adjustment of the Azimuth.

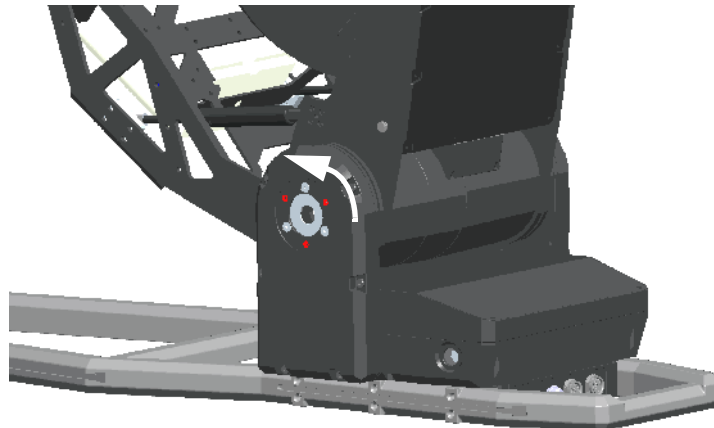


Figure 7-10: Manual stow, elevation adjustment

9. When the Feed arm is close to the base frame, check that the rubber bumpers on the base frame touch the feed arm correctly in both sides (straight and symmetrically).
10. Continue adjusting with the Hand crank until the rubber bumpers are slightly compressed and the antenna is completely stowed.
11. Remove the screw driver from the Elevation stow lock release mechanism.
12. Remount the three covers (Elevation adjustment, Elevation stow lock release and the small cover for the Azimuth adjustment).

## 7.4.2 Manual deploy



**CAUTION!** Always release the stow lock before you deploy the antenna manually! The stow lock will be damaged if it is not released before deployment of the antenna.

Do as follows:

1. In both sides of the antenna, use a hex L key to remove the screws for the circular covers, shown below.

Left side,  
Elevation adjustment



Right side,  
Stow lock release

Figure 7-11: Manual deploy, covers for elevation adjustment and stow lock release

2. Insert the hex L key at the top of the L-shaped hole, tip it downwards and follow the direction of the hole to the left to release the lock.

**Important**

Leave the hex L key in the Released position while adjusting the elevation.

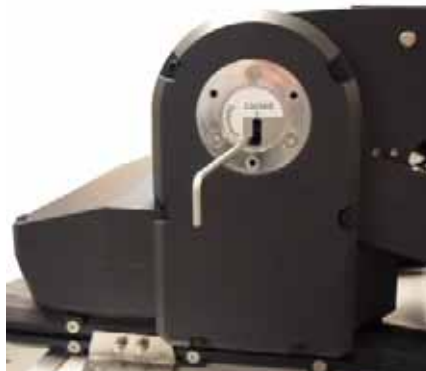


Figure 7-12: Manual deploy, release stow lock

3. Go back to the left side of the antenna, remove the cover for the Elevation adjustment and use the Hand crank to adjust the Elevation to the wanted position.

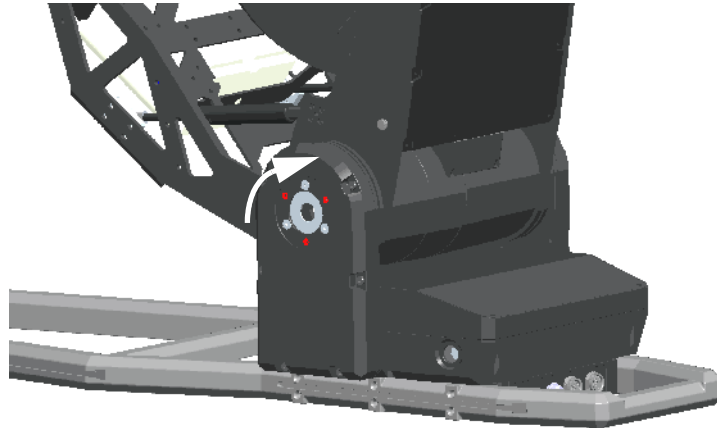


Figure 7-13: Manual deploy, elevation adjustment

4. When the Feed arm is free of the stow brackets, you can adjust the azimuth as described in step 3 and step 4 in the previous section.
5. Remove the screw driver from the Elevation stow lock release mechanism.
6. Remount the covers for the adjustment locations (Elevation adjustment, Elevation stow lock release and the small cover for the Azimuth adjustment).

## 7.5 To return units for repair

Should your Cobham SATCOM product fail, please contact your dealer or installer, or the nearest Cobham SATCOM partner. You will find the partner details on [www.cobham.com/satcom](http://www.cobham.com/satcom) where you also find the Cobham SATCOM Self Service Center web-portal, which may help you solve the problem. Your dealer, installer or Cobham SATCOM partner will assist you whether the need is user training, technical support, arranging on-site repair or sending the product for repair. Your dealer, installer or Cobham SATCOM partner will also take care of any warranty issue.

### 7.5.1 Antenna data

The ACU contains a backup of the antenna data from the PCM unit in the antenna. When the ACU or antenna has been exchanged, you must make sure the units are using the same antenna data:

1. Select **Service > Antenna data**.

ANTENNA DATA		
Antenna Data	PCM Unit	Backup Unit
Antenna type	TT-8147A (13)	TT-8147A (13)
Unit-sn	Unit-Serial-Number	Unit-Serial-Number
Status	Valid	Valid
	<input type="button" value="Select"/>	<input type="button" value="Select"/>

Figure 7-14: Antenna data for exchanged units

2. Select the unit that has **not** been exchanged, in order to use the existing antenna data for both units.

**Example:** If the ACU has been exchanged, select **PCM unit** in order to copy the existing antenna data into the new ACU.

# Technical specifications

This appendix has the following sections:

- *Antenna specifications*
- *Antenna dimensions*
- *ACU specifications*
- *ACU dimensions*

## A.1 General specifications

Item	Specification
Certification	CE (Safety, EMC & use of spectrum etc.), FCC and IC (radiation pattern etc.), Eutelsat (pointing, radiation pattern etc.)
System power supply range (input via ACU)	100-240 VAC, 50-60 Hz nom. 90-264 VAC, 43-67 Hz max range
Total system power consumption 8 W Ku-BUC 3 W Ka-TRIA	190 W typ. 440 W peak 160 W typ. 410 W peak

Table A-1: General specifications

## A.2 Antenna specifications

Table A-2: Antenna specifications

Reflector	
Size (nominal)	1.0 m
Optics	Offset, Prime focus, F/D ~0.8
Material	Carbon fiber sandwich

Ka-Band w. eTRIA	Receive	Transmit
Feed	Switchable circular X-pol, included in eTRIA	
Frequency range (GHz)	19.7 - 20.2	29.5 - 30.0
Gain (dBi) @ eTRIA in/output	43.9 - 44.5	47.3 - 48.1

Ka-Band w. eTRIA	Receive	Transmit
Axial ratio (dB) within -1dB contour	1.66	1.7
Polarization	LHCP or RHCP	RHCP or LHCP
eTRIA output power (W)	3	
G/T (dB/°K)	22.2	

Ku-Band	Receive	Transmit
Feed	Rotating linear X-pol 2-port	
Frequency range (GHz)	10.70 - 12.75	13.75 - 14.50
Gain (dBi) @ LNB input/BUC output	39.3 - 40.8	42 - 42.2
X-pol discrimination min. (dB) within -1dB contour	21.3	24.1
Polarization	Linear	Linear X-pol
Max On-Axis EIRP Spectral Density (dBW/40 kHz) per FCC 25.226 (1.5°)/FCC 25.226 (2.0°)/Eutelsat EESS502 (1.0°)	34.5 / 36.4 / 34.5	
G/T (dB/°K) @ 30° elev. @ 25° C (10.70 - 12.75 GHz)	18.3 - 19.5	
BUC output power (P1dB min.) (W)	8	

Mechanical characteristics	
Axis Drive System	2-Axis Positioner + pol axis for Ku-band
Positioner Geometry	Elevation over Azimuth
Travel:-Azimuth	±195°
Travel:-Elevation	0° to 100° relative to antenna base
Emergency Drive	Hand crank on Azimuth & Elevation
Travel:-Polarization (Ku only)	-95° to +95°
Vehicle tilt for full sky coverage (10 - 90° satellite elevation over the horizon)	10° (~18%) max.
Vehicle tilt, operational	32° (~62%) max.
Satellite orbit inclination	15° max.
Positioner angular speed	9°/s max.
Live tracking	Yes - if enabled by user



Mechanical characteristics	
Roof mount	Yes
Thule bar mount	Yes
Trailer mount	No - additional vibration damping required, contact factory

Weights and measures	
Antenna weight Ku / Ka	67 / 64 kg (153 /141 lbs) incl. BUC, LNB etc.
Antenna length	156 cm (61.5")
Antenna, stowed height	35.1 cm (13.8")
Antenna, deployed height	142.5 cm (56.1")

Environmental characteristics	
Wind Speed - Operational pointing	72 km/h (45 mph), gusting up to 97 km/h (60 mph)
Wind Speed - Deployed, survival	119 km/h (74 mph)
Wind Speed - Stowed, survival	162 km/h (101 mph)
Vehicle max. velocity <sup>a</sup> (stowed)	130 km/h
Temperature - Operational	-30 to +55 °C (-22 to +131 °F)
Temperature - Survival	-40 to +80 °C (-40 to +176 °F)
Temperature - Storage	-40 to +85 °C (-40 to +185 °F)
Solar radiation	1120W/m <sup>2</sup> to MIL-STD-810F 505.4
IP class	IP55
Ice survival	5 mm (0.2")
Humidity	0 to 100% (condensing)
Air Pressure, operational	3 km (10000 ft.) AMSL
Air Pressure, transport	4572 m (15000 ft) AMSL, MIL-SPEC-810E 500.4
Shock (handling & transportation)	Half sine, 20g/11ms, 3 axis
Rail transport (X & Y horizontal shock)	Saw tooth 50g/50ms

- a. Note that this specification depends on a number of factors, such as mounting method, wind speed, terrain etc.

## A.3 Antenna dimensions

The dimensions shown here are in millimeters, with inches shown in brackets.

### A.3.1 Side view (stowed)

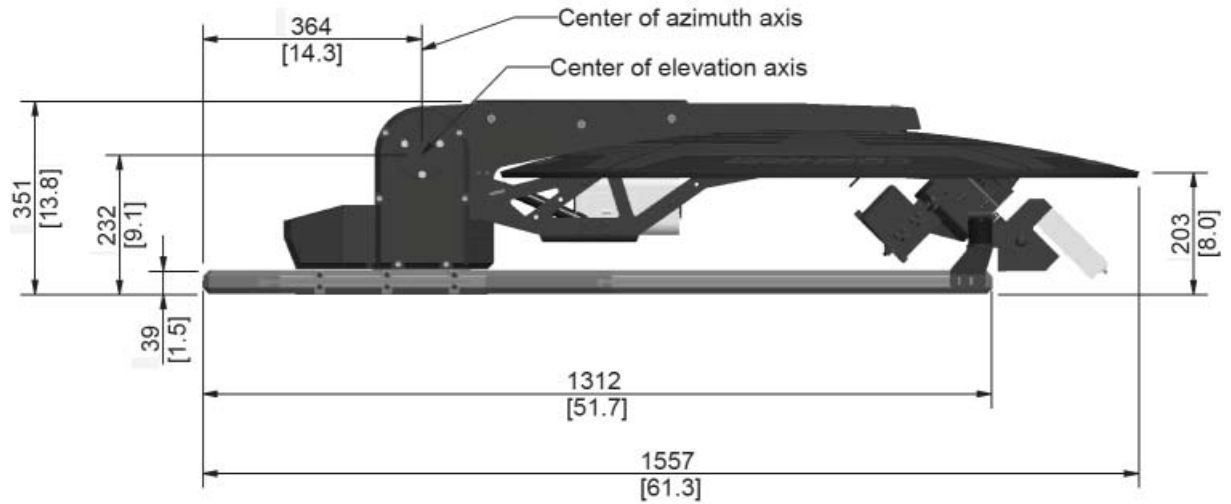


Figure A-1: Antenna: Side view (stowed)

### A.3.2 Top view (stowed)

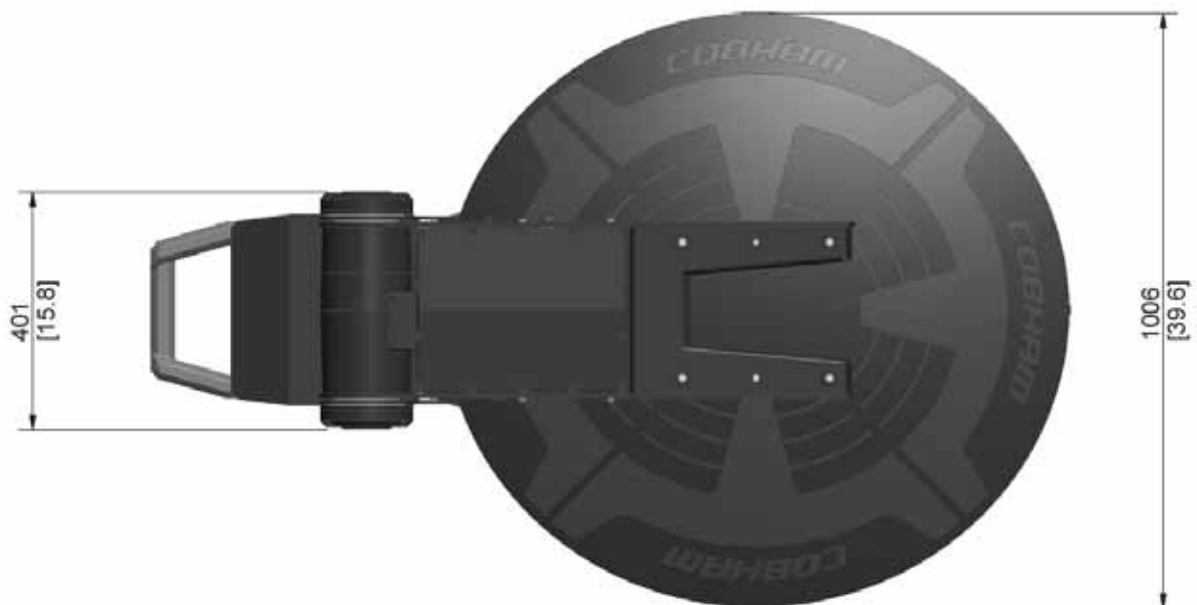


Figure A-2: Antenna: Top view (stowed)

### A.3.3 Side view (deployed)

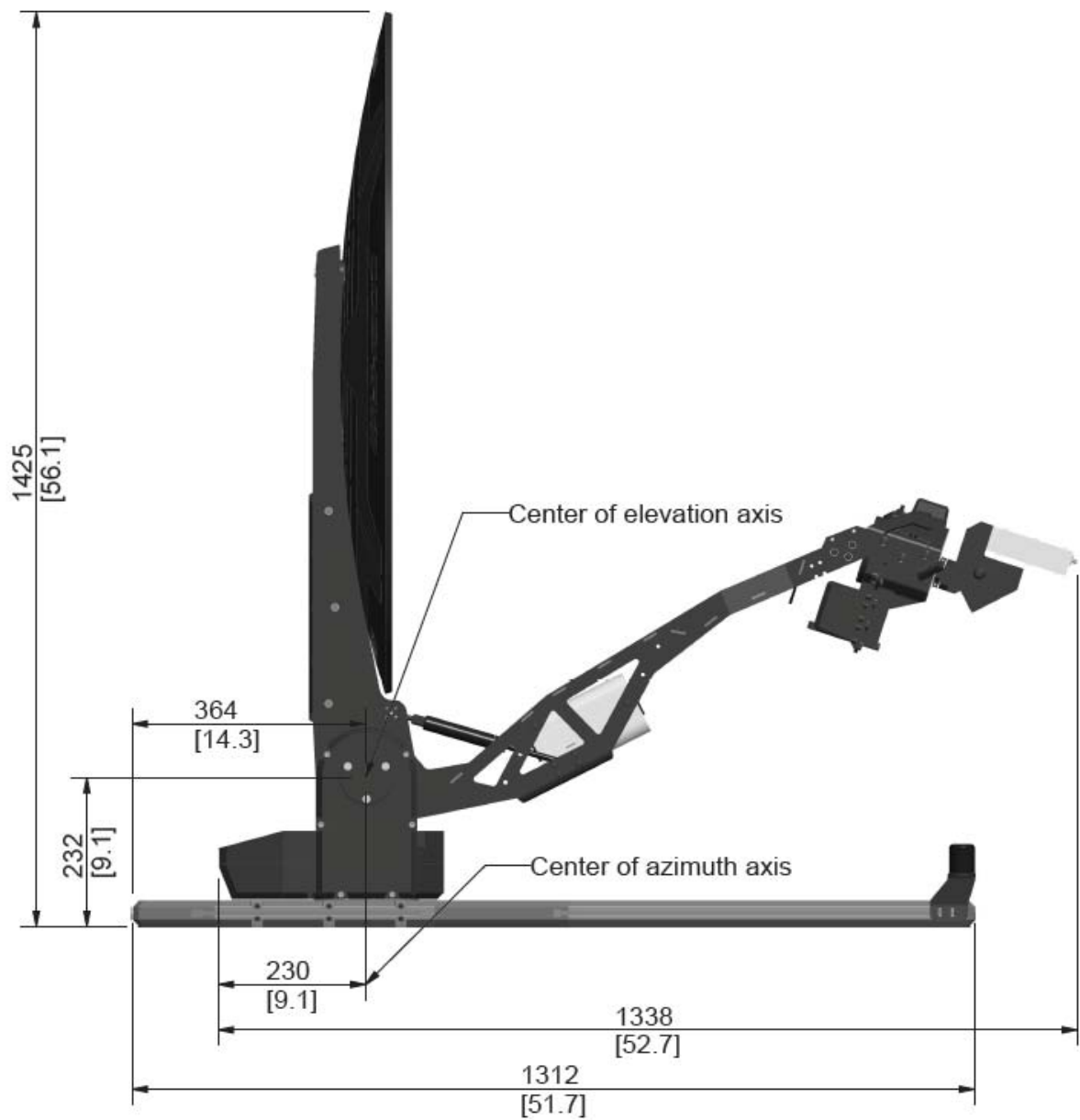


Figure A-3: Antenna: Side view (deployed)

### A.3.4 Measures for antenna installation

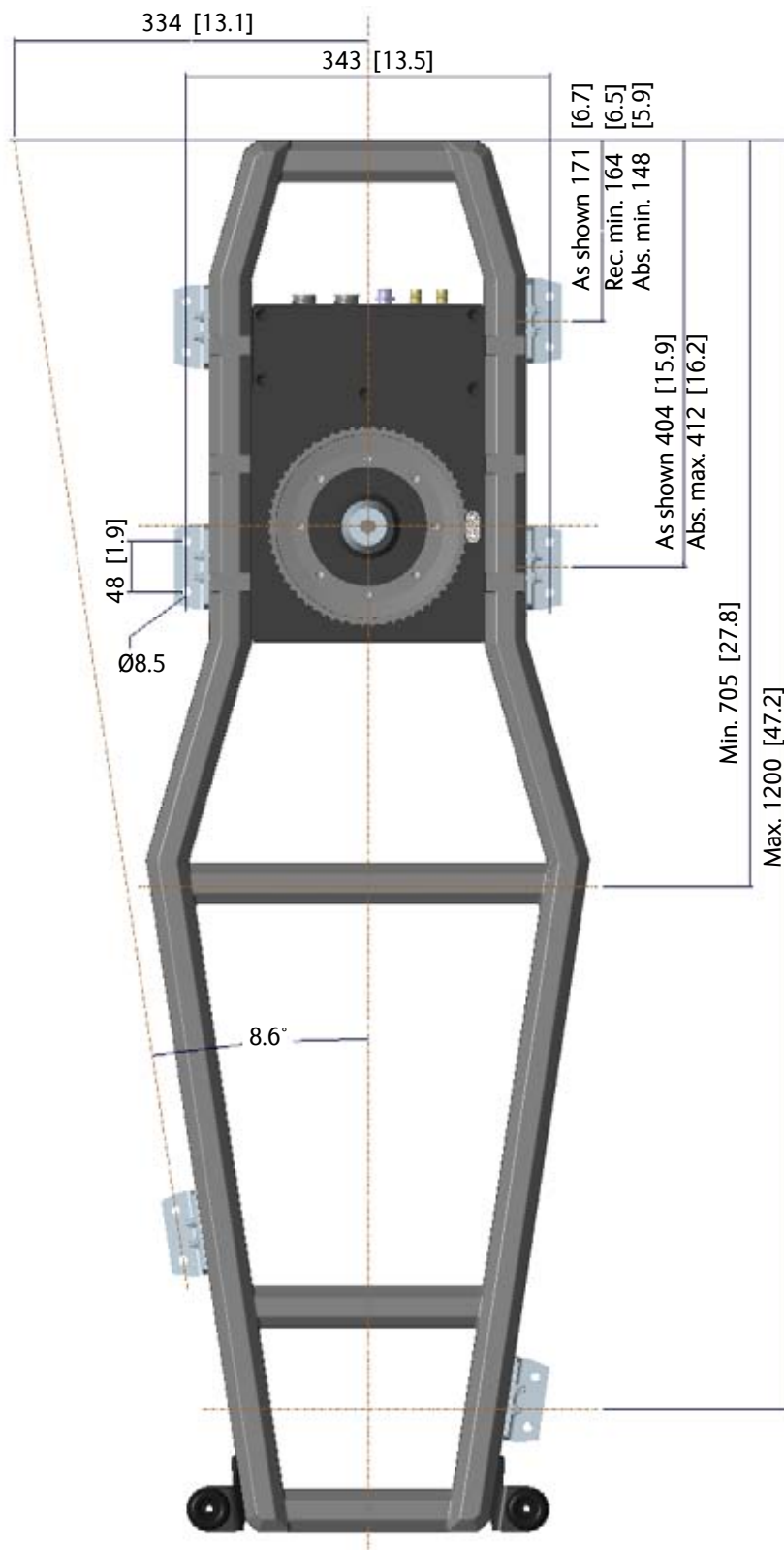


Figure A-4: Measures for antenna installation

## A.4 ACU specifications

Item	Specification
Dimensions, rack mount H x W x D	1 U, 19 inch 43.7 x 482.6 x 475.6 mm (1.72 x 19.0 x 18.7 inches)
Weight	4.3 kg (9.5 lbs)
Ambient temperature	Operational: -25°C to +55°C Survival: -40°C to +80°C Storage: -40°C to +85°C
Humidity	95% (non-condensing)
IP class	IP20
Interfaces	1 x RX Out (to modem RX in) 1 x TX In (from modem TX out) 1 x LNB RX (from LNB RX on antenna) 1 x BUC TX (to BUC TX on antenna) 1 x ODU Power & Comm. (to ODU Power & Comm. on antenna) 1 x BUC Power & Comm. (to BUC Power & Comm. on antenna) 1 x ODU Comm. (to ODU Comm. on antenna) 5 x Ethernet, RJ45 1 x WLAN 1 x RS-232 1 x RS-422 1 x AC power input 1 x Ground stud
Input power	See <i>System power supply range</i> and <i>Total system power consumption</i> on page A-1.
Display and controls	OLED display, 5 push buttons, 3 discrete indicator LEDs and ON/OFF switch

Table A-3: Technical specifications for the ACU

## A.5 ACU dimensions

The dimensions shown here are in millimeters, with inches shown in brackets.

### A.5.1 ACU front and top

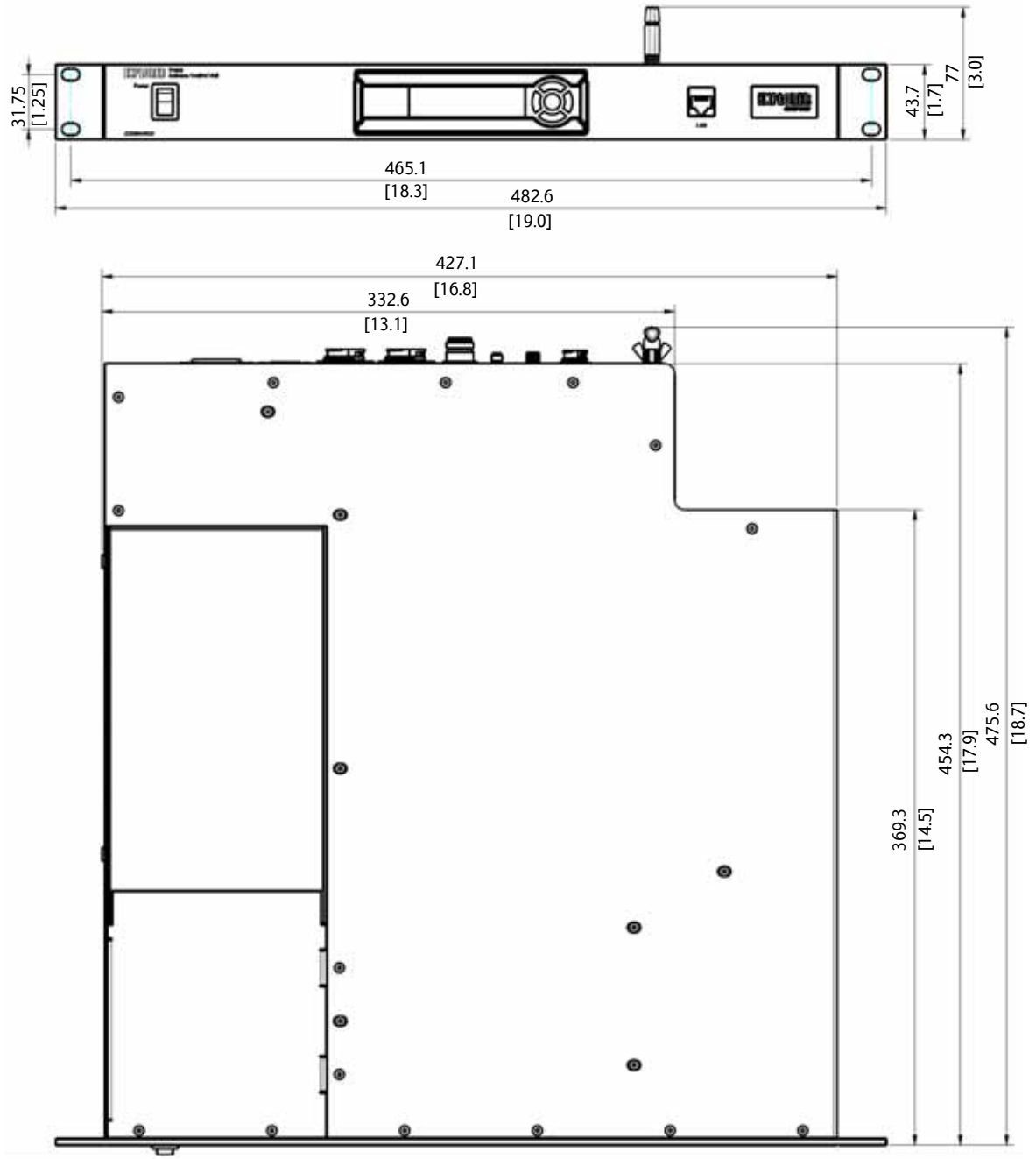


Figure A-5: ACU dimensions, front and top

### A.5.2 ACU left and right side

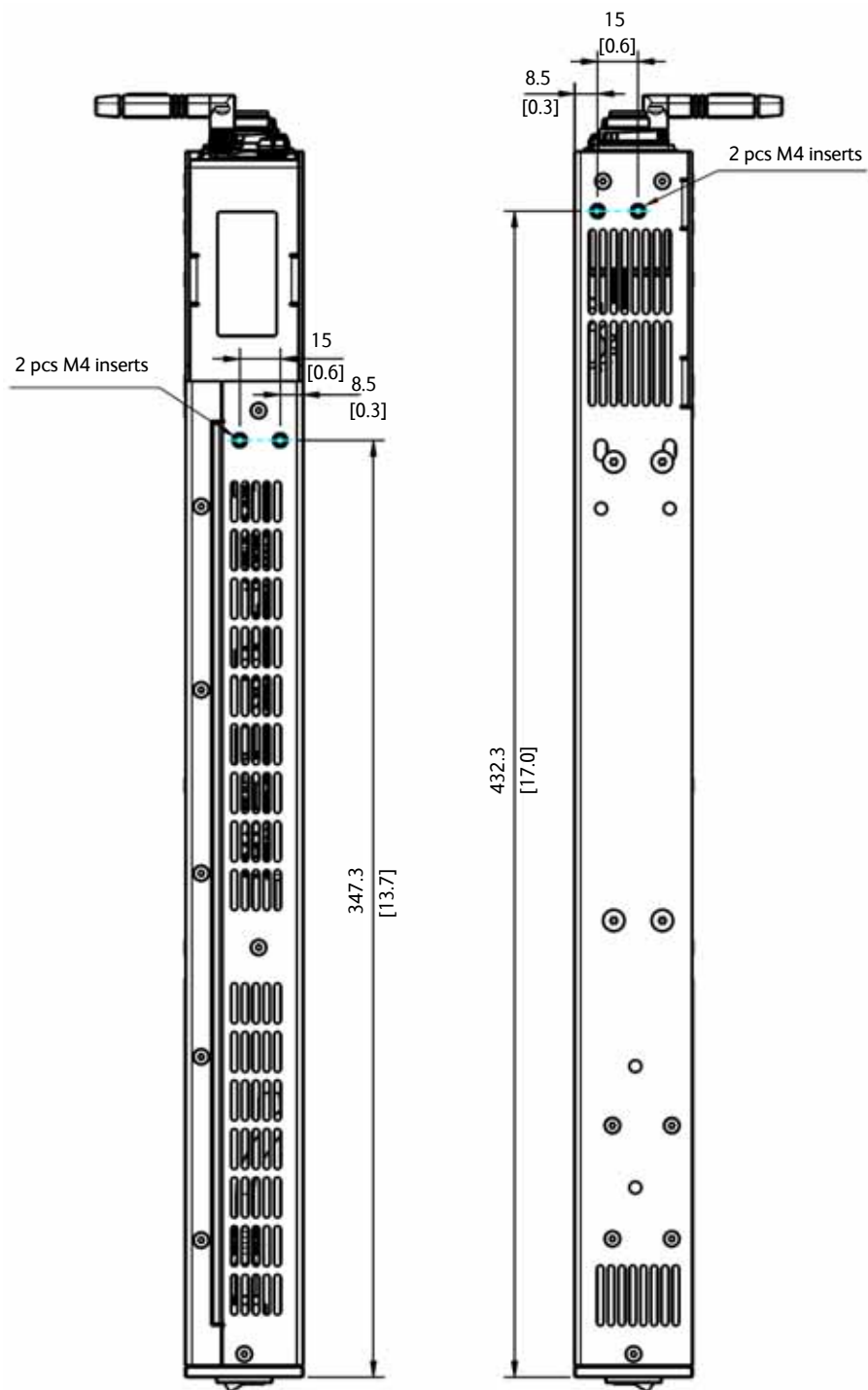


Figure A-6: ACU dimensions, left and right side

# VSAT modem cables

This appendix contains cable specifications for cables between the ACU and a VSAT modem.

- *Modem Cable COMTECH Serial & RSSI TT7016A*
- *iDirect & SkyEdge II VSAT modem serial cable*



# B.1 Modem Cable COMTECH Serial & RSSI TT7016A

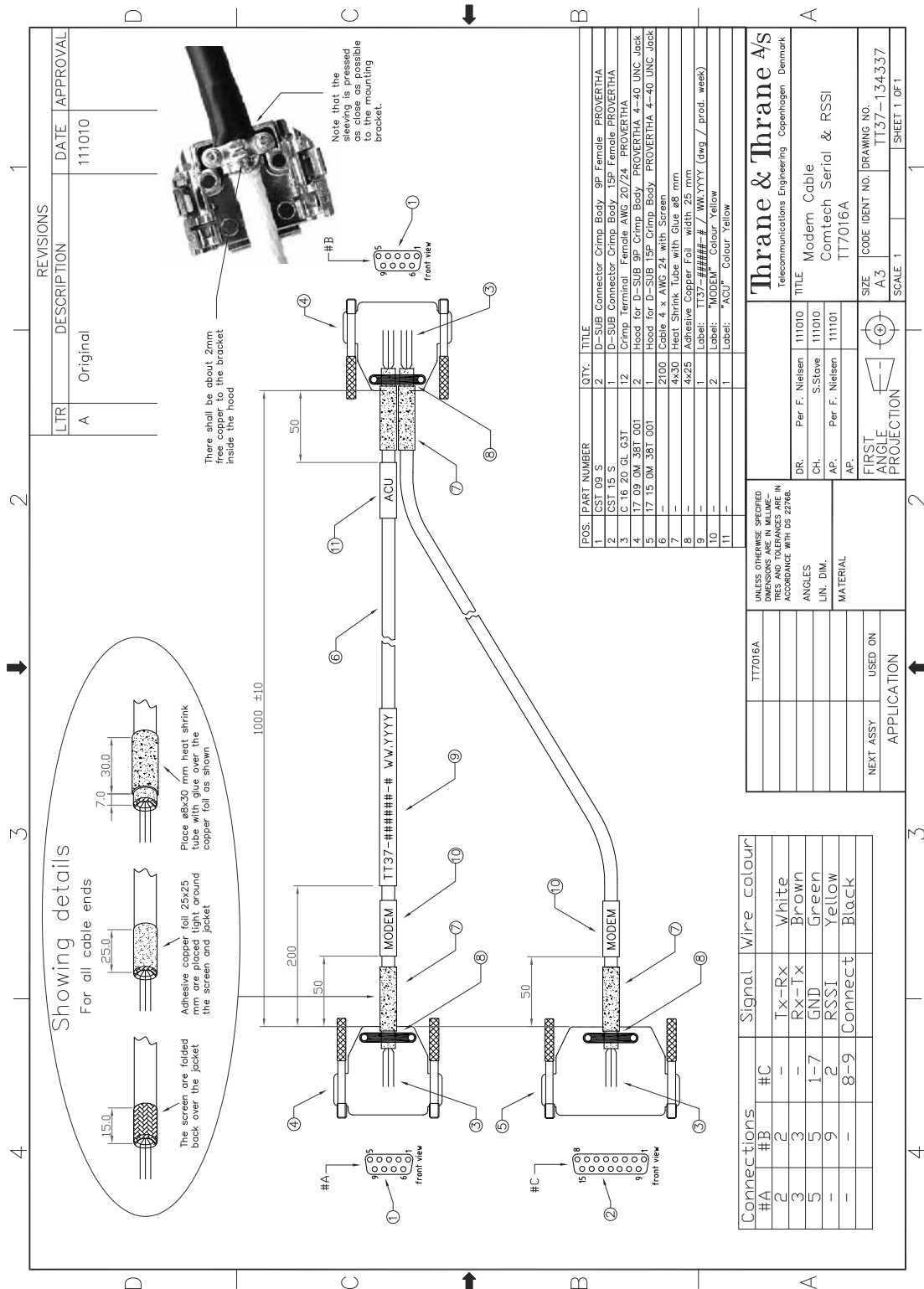


Figure B-1: Modem Cable COMTECH Serial & RSSI TT7016A

## B.2 iDirect & SkyEdge II VSAT modem serial cable

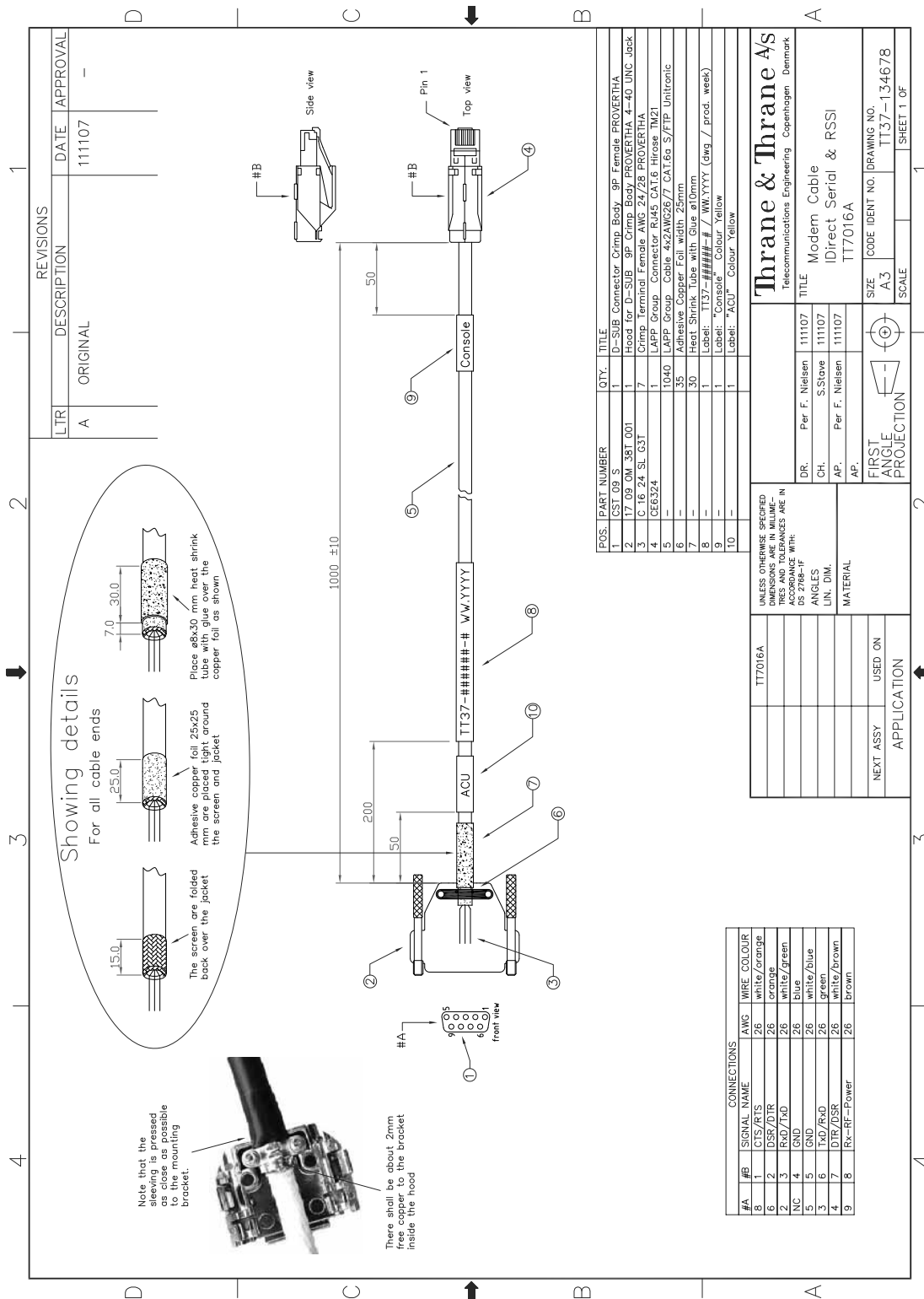


Figure B-2: Modem Cable iINFINITI iDirect VSAT modem

# VSAT modem settings

In this appendix you find detailed information on how to set up supported VSAT modems.

**Important**

The information in this appendix may not be up to date. The VSAT modems are 3rd party products in relation to Cobham SATCOM, and Cobham SATCOM has no influence on the functionality of these products.

The following information is only a guideline based on the functionality of the modems at the time of writing.

The appendix has the following sections:

- *OpenAMIP setup for iDirect iNFINITI & Evolution*
- *Serial setup for iDirect iNFINITI & Evolution*
- *COMTECH 570L*
- *STM SatLink 2900 VSAT modem*
- *Gilat SkyEdge II VSAT modem*

## C.1 OpenAMIP setup for iDirect iNFINITI & Evolution

### C.1.1 Protocol and interfaces

#### Introduction

The following sections describe the protocol and interface between the EXPLORER 8100 ACU and an iDirect OpenAMIP VSAT modem. OpenAMIP operation is normally used by service providers offering global VSAT service because the protocol supports roaming between satellites (Automatic Beam Switching).

OpenAMIP, an ASCII message based protocol invented and Trademarked by iDirect is a specification for the interchange of information between an antenna controller (ACU) and a VSAT modem. This protocol allows the VSAT modem to command the ACU to search and lock to a particular satellite as well as allowing exchange of information necessary to permit the VSAT modem to initiate and maintain communication via the antenna and the satellite. In general, OpenAMIP is not intended for any purpose except to permit a modem and the ACU to perform synchronized automatic beam switching.

#### Connections

Connect the ACU and iDirect modem with the following cables:

- Ethernet cable for TCP/IP data communication
- RS-232 console cable for signal strength indication (part number: 407090A-020)

#### Important

It is important to connect this cable to achieve satisfactory acquisition of the satellite. This is due to missing information in the iDirect OpenAMIP software before version 3.1.1.2/13.0.1.2. RSSI information on the dashboard will only be available with this cable connected.

- 75 Ohm RF cables F-F connectors for rx and tx frequencies.

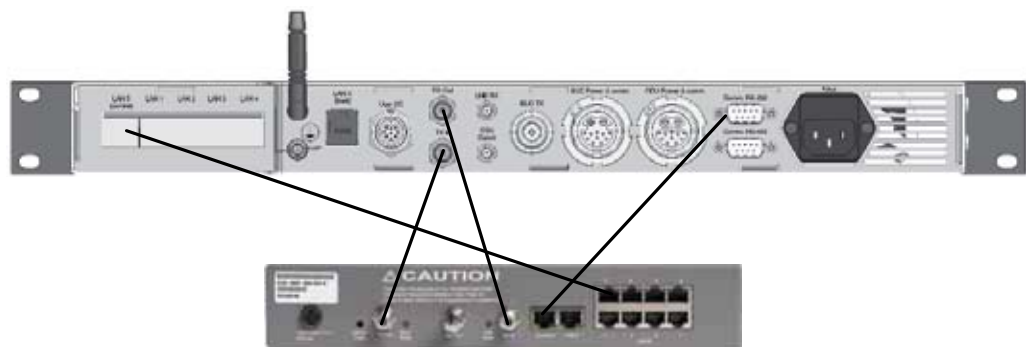


Figure C-1: Connecting iDirect iNFINITI 5000 series to the ACU (OpenAMIP)

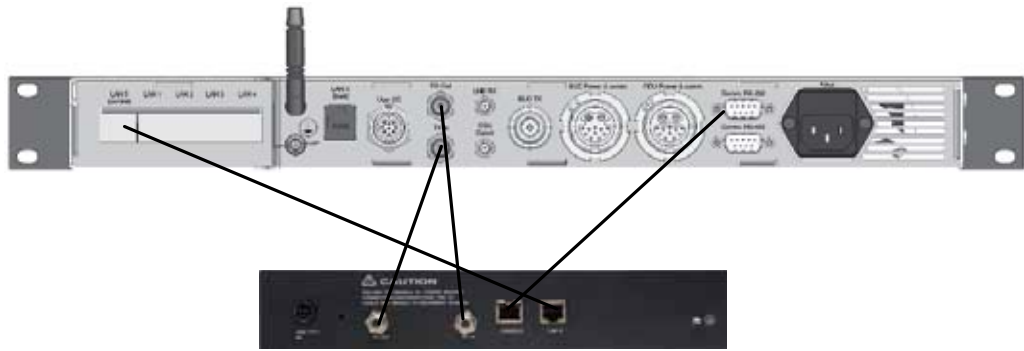


Figure C-2: Connecting iDirect Evolution X5 to the ACU (OpenAMIP)

The pin allocation for the RS-232 Console cable is shown below. See also Appendix B on page B-1 for a cable drawing.

Console port (DTE)	RJ-45 pin	Color code	RJ-45 to DB-9 adapter pin	Console device
RTS	1	Blue	8	CTS
DTR	2	Orange	6	DSR
TxD	3	Black	2	RxD
GND	4	Red	NC	GND
GND	5	Green	5	GND
RxD	6	Yellow	3	TxD
DSC	7	Brown	4	DTR
Rx-RF Power	8	White/Grey	9	--

Table C-1: RS-232 Console cable for iDirect VSAT modem

## Protocol

The EXPLORER 8100 ACU supports all OpenAMIP commands except the X command which is optional. All the supported OpenAMIP commands are shown in the following figure.

iDS/iDX Release	Messages Sent from Remote		Options File Keys	Options File Group	Messages Sent from Antenna	
	Message	# Parameters			Message	# Parameters
iDX 2.0.x	A		keepalive_interval Default value of 15 seconds. Will not appear in Options file unless overwritten.	[ANTENNA]	a	
	B	2	rx_lcl_osc, tx_lcl_osc	[SATELLITE]		
	H	2	hunt_frequency, hunt_bandwidth	[SATELLITE]		
	K	1	max_skew Maximum skew of the beam short axis to the geosynchronous arc.	[SATELLITE]		
	P	2	polarity, tx_polarity	[SATELLITE]		
	S	3	longitude, max_lat, pol_skew	[SATELLITE]	s	2
	T	2	tx_frequency, tx_bandwidth	[SATELLITE]		
	W	1	latlong_interval Message contains single value in seconds. Does not generate Options file key.	[MOBILE]	w	4

Figure C-3: Supported OpenAMIP commands

Messages sent from VSAT modem	Explanation
S -15.000000 0.000000 0.000000	Longitude, Max_lat, Pol_skew
H 1451.815000 1.905000	Hunt_frequency, Hunt_bandwidth
P H V	Rx_polarity, Tx_polarity
B 11250.000000 12800.00000	Rx-lcl_osc, Tx_lcl_osc
T 1403.290000 0.618000	Tx_frequency, Tx_bandwidth
A 15	Keepalive_interval in mS [ACU: s message]
W 300	latlong_interval in seconds [ACU: w message]
L 1 1	Rx lock, Tx allowed
K 90.000000	Max_skew

Table C-2: Messages sent from the VSAT modem to the ACU (examples)

Messages sent from the ACU to the VSAT modem	Explanation
s 1 1	Functional, Tx OK
w 1 55.794010 12.52272 985523005	GPS valid, Latitude, Longitude, Time

Table C-3: Messages sent from the ACU to the VSAT modem (examples)

**Note**

The iDirect modems only sends the satellite information once when booting. If the ACU has not received the information for some reason, the system cannot point. In that case the modem will automatically boot after 5 minutes and send the satellite information again.

The signal strength from the modem is measured on RS-232 pin 9. It is a DC voltage in the range of 0 - 5 VDC.

Ranges for signal strength	
VDC	Antenna status
0-2.5	RF energy is detected, but from the wrong satellite.
2.6-5.0	Carrier lock, correct satellite.

Table C-4: Ranges for signal strength for iDirect OpenAMIP VSAT modem

The signal strength is displayed in the web interface on the Dashboard as 0 – 500. The minimum value for an Internet connection is 250 - 260.

## C.1.2 Sample options file

The following section presents a sample iDirect OpenAMIP Options File. The highlighted parameters in bold are important and needed for the VSAT system to function correctly.

See comments in brackets for explanation of the use.

### [ANTENNA]

```

addr = 10.1.6.2
  (ACU LAN1 IP setting)
connect_timeout = 30
dedicated_interface = ixp0
manufacturer = OpenAMIP
max_skew = 90.000000
model = OpenAMIP
port = 2000
  (ACU Modem Profile setting)

```

```
[BEAMS]
    beam_88 = E36B
    maxbeam = 88
[BEAMS_LOCAL]
    inhibit_tx_ifzero = 0
[BTP]
    device_mode = tdma
    device_name = btp
    device_path = /dev
[BTP_REQ]
    device_mode = tdma
    device_name = btp_req
    device_path = /dev
[COMPRESSION]
    Threshold = 90
[DEBUG]
    cpu_util_test_enabled = 0
[DVBS2]
    frame_length = 125.000000
    frame_size = short
    mode = acm
    ncr_interval = 3375000
    pilot = 1
    rc_roll_off = 0.200000
[ENC]
    auth_level_required = 0
    enc_enabled = 0
    enc_layer_enabled = 0
    enc_mode = 0
    peer_mode = 1
[ETH0]
    interface = ixp0
    phy_count = 1
[ETH0_1]
    address = 10.1.6.1
    netmask = 255.255.255.128
    (ACU LAN1 subnet setting)
    rip_enabled = 0
    web_server_enabled = 0
```



```
[FREQ_TRANS]
  down_translation = 11300.000000
  up_translation = 12800.000000
  (BUC LO)

[GUI_SERVER_PROXY]
  port = 14599

[LAN]
  lan_gw_ip = 0.0.0.0
  lan_ip = 10.1.6.1
  lan_subnet_ip = 255.255.255.128

[MAPSERVER_0]
  hostname = 172.28.1.11
  port = 5003

[MOBILE]
  gps_input = 2
  (2 => GPS via OpenAMIP)
  gps_validation_active = 1
  init_tx_power_offset = 0.000000
  is_mobile = 1
  latlong_acq_interval = 300
  latlong_fail_interval = 10
  latlong_interval = 300
  tx_handshake_enabled = 0
  (BUC mute/unmute is handled by the VSAT terminal!)

[MODEM_INSTALLATION]
  reflector_offset_angle = 0.000000
  remote_lat = 35.890000
  remote_long = 14.480000
  spacecraft_long = 35.900000

[MODEM_PARAMETERS]
  ref_carrier_fec_block_size = 100
  ref_carrier_modcod_coding_rate = 2
  ref_carrier_modcod_modulation = 1
  ref_carrier_symbol_rate = 360000.000000
  rx_acqrange = 100000
  rx_diff = 0
  rx_freq = 1263381999
  rx_mode = 2
  rx_only = 0
  rx_scram = 1
  rx_specinv = 0
  rx_symrate = 2778000.000000
  tx_bitrate = 1
```

```
tx_power_in_dbm = -32.000000
tx_specinv = 0
[NET_ENC]
  id = 10
  is_encrypted = 0
[NMS]
  broadcast_ip = 172.28.1.11
  download_monitor_credentials = 1
  download_monitor_group = 239.192.0.0
  download_monitor_port = 9000
  event_server_ip = 172.28.1.11
  event_server_port = 2860
  generated_by = NMS-14.0.2
  is_nms_managed = 1
  keep_alive_port_number = 2860
  NRD_remote_status_port_number = 2859
  NRD_server_ip = 172.28.1.11
  server_ip = 172.28.1.11
  service_monitor_interval = 1000
  timeout = 20000
[ODU]
  lnb_dc_voltage = 18
  lnb_tone_enable = 0
  music_present = 0
  odu_disable_tx_pwm = 0
  odu_rx_10_mhz = 0
  odu_rx_dc_power = 1
  odu_tx_10_mhz = 1
  (10 MHz Reference to enable BUC unmute)
  odu_tx_dc_power = 1
[OOB]
  mem_high_percent = 90
  mem_low_percent = 75
[OPTIONS_FILE]
  carrier_type = 0
  code_version = 14.0.2.7
  did = 117491203
  disable_options_flash_command = 0
  generated_by = NMS-14.0.2
  is_mesh = 0
  mobile_remote_type = 1
  modem_hardware = X5
  modem_sn = 123456
  modem_type = Remote
```

```
product_mode = dvbs2
upstream_product_mode = idirect_tdma

[POWER_MANAGEMENT]
enable = 0
sleep_timeout = 0

[ROUTE_1_0]
gateway = 0.0.0.0
interface = sat0
metric = 1
netmask = 0.0.0.0
network = 0.0.0.0

[RX1]
device_mode = scpc
device_name = rx1
device_path = /dev

[SAT0_1]
address = 10.0.0.13
netmask = 255.255.240.0
rip_enabled = 0
web_server_enabled = 0

[SATELLITE]
channelname = E36B
hunt_bandwidth = 0.000000
hunt_frequency = 1233.660000
longitude = 35.900000
max_lat = 0.000000
max_skew = 90.000000
min_look_angle = 0.000000
name = E36B
noise_reference_frequency = 0.000000
pol_skew = 0.000000
polarity = V
rx_lcl_osc = 11300.000000
skew_margin = 90.000000
tx_bandwidth = 0.000000
tx_frequency = 1234.560000
  (Correct tx freq. ensures same PldB @ all frequencies!)
tx_lcl_osc = 12800.000000
  (BUC LO)
tx_polarity = X
```

## [SECURITY]

```
admin_password =
$idi3$0oAshW$01pJQAAWxgQxLnasMrdrUygxRQ8UHrLjCWW8AwRJuYd1
JvhpLjZ3QZZNufOT46pY.bzzsX0VH0jaaXcdGDEVsS
os_password = $1$/K.qAA$oBJORr9q34ycG7juIu60I.
password =
$idi3$/B2K3p$.gpGIC9BkGi/lPPh0b90OfwvFmSmEVFTyWKhqa3X.w9h
Q2oDeXpsYt3qCmJO1H7B.oYElSxyF0ja0AiKStaxTV
```

## [SOF]

```
device_mode = tdma
device_name = sof
device_path = /dev
```

## [SYSTEM\_TRAY]

```
interval = 5000
mode = 1
port = 2859
server = 172.28.1.11
service_monitor_group = 239.255.255.1
service_monitor_port = 9001
```

## [TDMA]

```
tx_watchdog_timeout_in_frames = 2
```

## [TX]

```
device_mode = tdma
device_name = tx
device_path = /dev
```

## [TX\_SOF]

```
device_mode = tdma
device_name = tx_sof
device_path = /dev
```

## [UCP]

```
max_power_level_in_db = -25.000000
power_uplink_control_processing = 1
```

## [UDP]

```
force_rtp_fullheader = 1
force_udp_fullheader = 1
max_hdr_comp_packet_size = 180
passthru = 1
payload_comp = 0
```

## [VLAN]

```
mode = 0
vid = 1
```

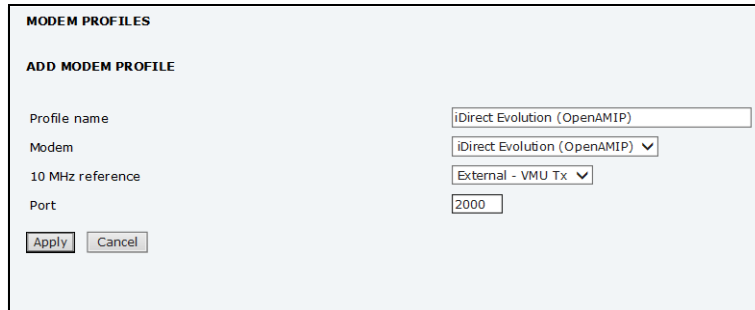
The option file must use the following information:

Section in the option file	Requirements
[SATELLITE]	<p>The modem provides RX and TX frequency information via a data connection to the EXPLORER 8100.</p> <p>The single-cable solution makes it possible to configure the VSAT modem to use any LO frequency in the range from 9.6 GHz to 11.3 GHz. The EXPLORER 8100 will tune to the correct Ku-Band frequency and provide the correct L-Band frequency to the VSAT modem.</p> <p>Example: “rx_lcl_osc = 11250.000000”</p> <p>EXPLORER 8100 has an extended 8 Watt BUC with LO up conversion frequency of 12.8 GHz.</p> <p>— Example: “tx_lcl_osc = 12800.000000”</p> <p><b>Note:</b> EXPLORER 8100 supports any LNB frequency due to the 1-cable design.</p>
[MOBILE]	<p>The iDirect modem must be set to mobile unit and receive the GPS information from the ACU with the command “w &lt;Valid&gt; &lt;Lat&gt; &lt;Lon&gt; &lt;Time&gt;”.</p> <p><b>Example:</b> “is_mobile = 1”</p> <p>Tx handshake must not be enabled in the iDirect modem.</p> <p><b>Example:</b> “tx_handshake_enabled = 0”</p>
[ODU]	<p>The EXPLORER 8100 can work either using the Rx or Tx 10 MHz reference signals provided by the modem or using its own built-in 10 MHz reference signal. It is recommended to use the Tx 10 MHz reference signal from the modem. See also page 6-7 (setup of modem profiles).</p> <p><b>Example:</b> “odu_rx_10_mhz = 1”</p> <p>The EXPLORER 8100 needs the Tx 10 MHz reference signal in order to allow TX ON.</p> <p><b>Example:</b> “odu_tx_10_mhz = 1”</p>

Table C-5: Information in the VSAT modem option file

### C.1.3 Configuration example (OpenAMIP)

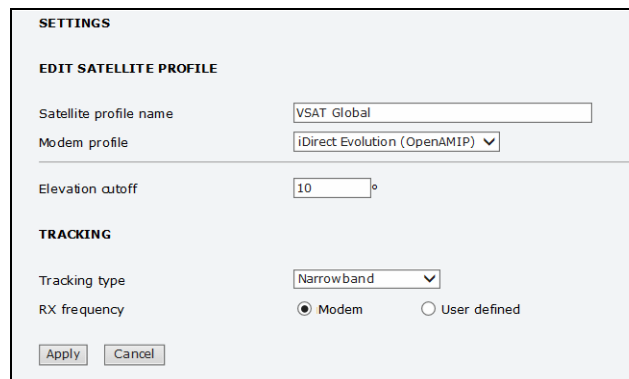
Examples of modem profile and satellite configuration from the ACU web interface are shown in the figures below.



The screenshot shows a web interface titled "MODEM PROFILES" with a sub-section "ADD MODEM PROFILE". It contains the following fields and controls:

- Profile name: Text input field containing "iDirect Evolution (OpenAMIP)".
- Modem: Dropdown menu showing "iDirect Evolution (OpenAMIP)".
- 10 MHz reference: Dropdown menu showing "External - VMU Tx".
- Port: Text input field containing "2000".
- Buttons: "Apply" and "Cancel".

Figure C-4: Modem profile, OpenAMIP (example)



The screenshot shows a web interface titled "SETTINGS" with a sub-section "EDIT SATELLITE PROFILE". It contains the following fields and controls:

- Satellite profile name: Text input field containing "VSAT Global".
- Modem profile: Dropdown menu showing "iDirect Evolution (OpenAMIP)".
- Elevation cutoff: Text input field containing "10" with a degree symbol.
- TRACKING section:
  - Tracking type: Dropdown menu showing "Narrowband".
  - RX frequency: Radio buttons for "Modem" (selected) and "User defined".
- Buttons: "Apply" and "Cancel".

Figure C-5: Satellite profile, OpenAMIP (example)

Simple OpenAMIP protocol in iDS 8.0.2.7 is **NOT** supported by the EXPLORER 8100.  
Full OpenAMIP protocol from iDX 2.0 and up is supported by the EXPLORER 8100.

## C.1.4 Troubleshooting

It is expected that the modem has been connected with cables to the ACU and that an iDirect OpenAMIP modem profile and satellite profile have been configured in the web interface of the EXPLORER 8100 and has been activated. For further details see *Configuration example (OpenAMIP)* on page C-12.

It is recommended to connect the service PC to LAN port 1 of the ACU in order to have access to the web server of the EXPLORER 8100 and IP connection to the attached iDirect OpenAMIP modem.

A telnet or ssh client and Internet browser is needed in order to go through the troubleshooting guidelines. It is recommended to use the telnet/ssh client program called PuTTY, which is available for free on the Internet (<http://www.putty.org/>).

1. Default login to iDirect modems are: User name: admin, Password: P@55w0rd!
2. Every time a setting is changed in the iDirect modem, it must be stored in flash using the following command line command:  
`options flash`
3. After changing a setting and storing the new setting the modem has to boot its application in order to read and use the new setting. This is done with the command line command:  
`reset application`

The iDirect options file is divided into sections; the section name is always CAPITAL letters. Each section has several parameters, and each parameter has a value. See the following example:

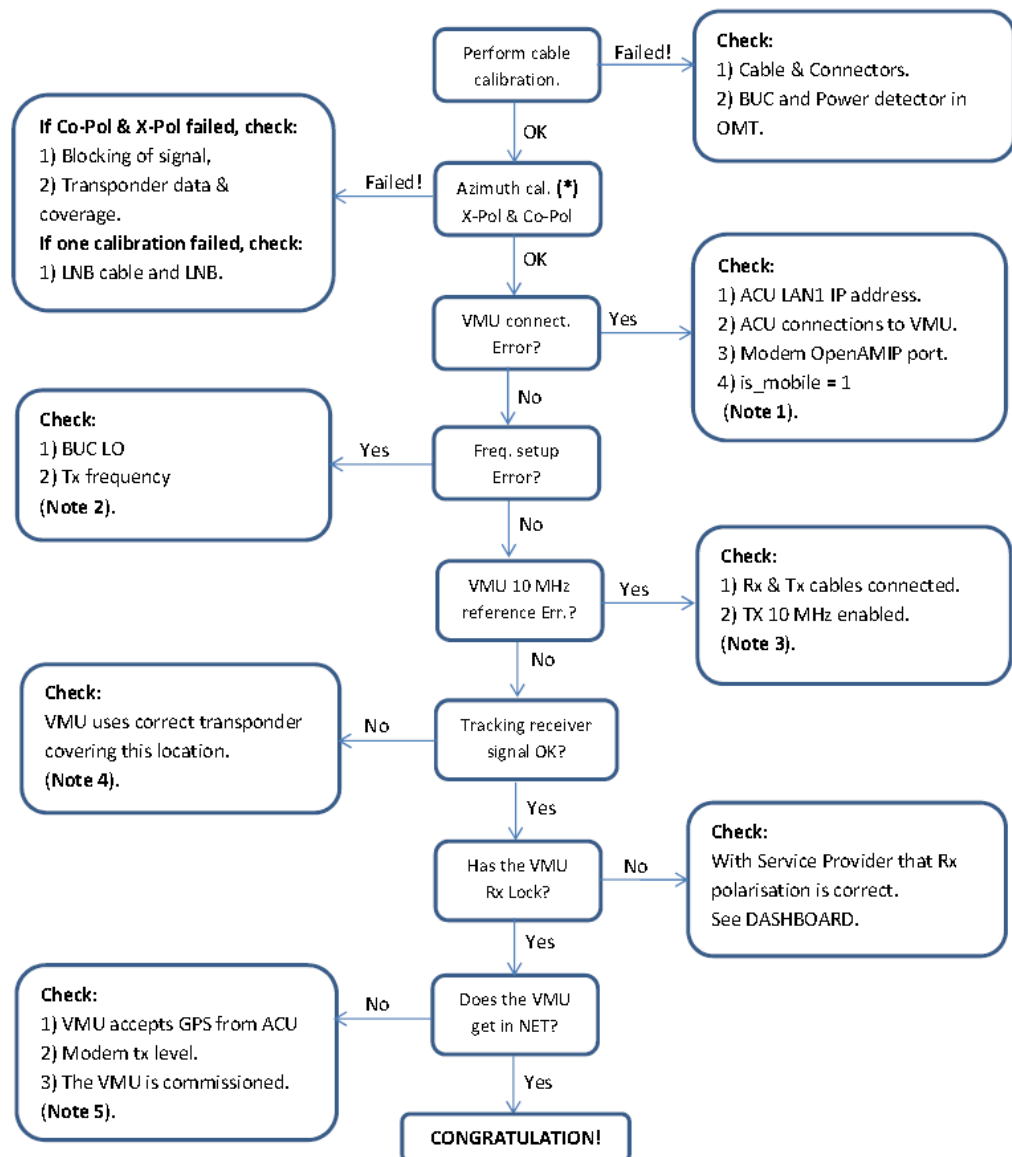
```
[MOBILE]
  gps_input = 2
  init_tx_power_offset = 0.000000
  is_mobile = 1
  latlong_interval = 60
  tx_handshake_enabled = 0
```

To change a setting in the MOBILE section use the `options set` command. See example of command here:

```
options set MOBILE gps_input 2
```

Note that setting the `gps_input` parameter to value 2 is written without an equal sign but only with a space character between parameter name and the value.

You can use the following flow chart and the instructions in the notes later in this appendix.



\* Use same transponder polarity with both calibrations.

Figure C-6: iDirect OpenAMIP troubleshooting

**Note 1:** Connect to modem with Telnet or serial and issue the following commands:

```

options show ANTENNA
Check: IP address, port # and manufacturer = OpenAMIP.
options show MOBILE
Check: is_mobile = 1
  
```

**Note 2:** Connect to modem with telnet and issue command:

```

options show SATELLITE
Check: tx_lcl_osc = 12800.000000,
Check: tx_frequency is between: 950.000000 to 1700.000000
Check: rx_lcl_osc + hunt_frequency is between: 10.7 GHz to 12.75 GHz
  
```



**Note 3:** Connect to the modem with Telnet and issue commands:

```
options show ODU
Check: odu_tx_10_mhz = 1
options show MOBILE
Check: tx_handshake_enabled = 0
```

**Note 4:** Connect to the modem with Telnet and issue command:

```
beamselector list
```

Write down the transponder number for one of the beams that has line of sight.  
Use the command: beamselector switch <number> -f to force the VSAT modem to use this transponder. E.g:

```
beamselector switch 323 -f
```

Use the command: beamselector lock to lock the VSAT modem to this transponder and stay there (until power cycle or reset application).

**Note 5:** Connect to the modem with Telnet and issue commands:

```
options show MOBILE
Check: gps_input = 2
tx power
```

Try to increase the tx power step by step up to max. -5 dBm, which is around EXPLORER 8100 P1dB level. E.g. tx power -10

## Examples of commands

```
options set SATELLITE tx_frequency 1450
options set MOBILE gps_input 2
options set MOBILE is_mobile 1
options set MOBILE tx_handshake_enabled 0
options set ODU odu_tx_10_mhz 1
options flash
```

If this fails then the options file is write protected!  
Change disable\_options\_flash\_command = 0 first!

```
options set OPTIONS_FILE disable_options_flash_command 0
reset application
```

Starts the VSAT modem application (soft boot)

- Notice that changing options file locally can help determine wrong settings. The settings will probably be changed back to original settings when the VSAT modem gets synchronized with the hub.
- Tell the NOC about the faulty settings so they can correct configuration.

## C.2 Serial setup for iDirect iNFINITI & Evolution

### C.2.1 Protocol and interfaces

#### Introduction

The following sections describe the protocol and interface between the ACU and an iDirect Serial modem. Serial operation is normally used by service providers offering regional VSAT service.

#### Connections

Connect the ACU and iDirect modem with the following cables:

- RS-232 console cable for control communication
- 75 Ohm RF cables F-F connectors for rx and tx frequencies.



Figure C-7: Connecting iDirect iNFINITI 5000 series to the ACU (Serial)



Figure C-8: Connecting iDirect Evolution X5 to the ACU (Serial)

The pin allocation for the RS-232 Console cable is shown in Table C-1 on page C-3. See also Appendix B on page C-1 for a cable drawing.

## C.2.2 Console port settings

The iDirect modem must be configured to use the following console port settings:

- Baud rate: 4800 or 9600
- Data bits: 8
- Parity: None
- Stop bit: 1

### Passwords

The EXPLORER 8100 ACU will log in to the modem using root and user passwords. The default passwords are:

- Root: P@55w0rd!
- User: iDirect

### Supported commands

After login to the modem the ACU will issue commands to the modem every second. The following commands are supported by the EXPLORER 8100 ACU:

- rx snr
- options show FREQ\_TRANS
- rx freq
- tx freq
- latlong <lat> <long>

The signal strength command: rx snr is issued every 2 seconds. The rest of the commands are issued one by one every 2 seconds between each signal strength command. Meaning each of the other commands is issued every 8 seconds.

The signal strength in the ACU display and web interface is shown as dB., e.g: 8.5 dB. The minimum value for Internet connection is around 2-3 dB.

## VSAT modem option file

The option file of the VSAT modem must also include the following information:

Section in option file	Description
Satellite information	Receive frequency of the transponder. Used with "rx freq" command Transmit frequency if known otherwise just a dummy tx frequency (e.g. 1.450 MHz). Used with "tx freq" command.
EXPLORER 8100 information	The modem provides RX and TX frequency information via a data connection to the EXPLORER 8100.  The single-cable solution makes it possible to configure the VSAT modem to use any LO frequency in the range from 9.6 GHz to 11.3 GHz. The EXPLORER 8100 will tune to the correct Ku-Band frequency and provide the correct L-Band frequency to the VSAT modem.  The EXPLORER 8100 has an extended 8 Watt BUC with LO up conversion frequency of 12.8 GHz.
GPS	The iDirect modem must be set to mobile unit and receive the GPS information from the ACU with the command "latlong <lat> <long>".  Tx handshake must be disabled in the iDirect modem.
Rx 10 MHz	The EXPLORER 8100 can work either using the Rx or Tx 10 MHz reference signals provided by the modem or using its own built-in 10 MHz reference signal. It is recommended to use the Tx 10 MHz reference signal from the modem. See also page 6-7 (setup of modem profiles).
Tx 10 MHz	The EXPLORER 8100 needs the Tx 10 MHz reference signal in order to allow TX ON.

Table C-6: Requirements for VSAT modem option file, Serial

### C.2.3 Configuration example (Serial)

Examples of modem profile and satellite configuration from the ACU web interface are shown in the figures below.

The screenshot shows the 'MODEM PROFILES' section of a web interface. Under the heading 'ADD MODEM PROFILE', there are several input fields and dropdown menus. The 'Profile name' field contains 'iDirect Evolution (Serial)'. The 'Modem' dropdown menu is set to 'iDirect Evolution (Serial)'. The 'Modem root password' field contains 'p@55w0rd!'. The 'Modem user password' field contains 'iDirect'. The 'Baud rate' dropdown menu is set to '4800 Baud'. The '10 MHz reference' dropdown menu is set to 'External - VMU Tx'. At the bottom of the form are 'Apply' and 'Cancel' buttons.

Figure C-9: Modem profile, Serial (example)

The screenshot shows the 'SATELLITE PROFILES' section of a web interface. Under the heading 'ADD SATELLITE PROFILE', there are several input fields and dropdown menus. The 'Satellite profile name' field contains 'VSAT Regional'. The 'Modem profile' dropdown menu is set to 'iDirect Evolution (Serial)'. The 'Predefined satellites' dropdown menu is set to 'User defined data..'. The 'Satellite position' field contains '37.5 W'. The 'Polarisation skew' field contains '0'. The 'Maximum inclination' field contains '0'. The 'Elevation cutoff' field contains '10'. The 'RX polarisation' section has radio buttons for 'Horizontal' (selected) and 'Vertical'. The 'TX polarisation' section has a radio button for 'X-pol'. Under the heading 'TRACKING', the 'Tracking type' dropdown menu is set to 'Narrow band'. The 'RX frequency' section has radio buttons for 'Modem' (selected) and 'User defined'. At the bottom of the form are 'Apply' and 'Cancel' buttons.

Figure C-10: Satellite profile, Serial (example)

---

## C.3 COMTECH 570L

### C.3.1 Protocol and interfaces

The following sections describe how to connect the ACU to a COMTECH 570L VSAT modem.

#### Protocol

The ACU supports 4800 or 9600 baud on the serial port. You can set the baud rate of the COMTECH 570L at its front MMI.

The ACU issues the following commands on the serial interface to the COMTECH 570L modem:

- 0000/EBN?
- 0000/TFQ?
- 0000/LLO?
- 0000/BLO?
- 0000/RFQ?

An example of the serial communication between the ACU and the COMTECH 570L modem is shown below:

```
0000/EBN?  
0000EBN=11.8  
0000/TFQ?  
0000/TFQ=1310.7956  
0000/EBN?  
0000/EBN=11.8  
0000/LLO?  
0000/LLO=10000+  
0000/EBN?  
0000/EBN=11.9  
0000/BLO?  
0000/BLO=12800-  
0000/EBN?  
0000/EBN=11.8  
0000/RFQ?  
0000/RFQ=1367.5500
```

Command	Description
EBN?	This command is used to show the signal strength in the web interface and on the display of the EXPLORER 8100 to determine if the COMTECH 570L modem is in Rx Lock.  The signal strength goes from 0dB - 16dB, +16dB indicates a signal greater than 16dB, 99.9dB indicates no Rx Lock.
TFQ?	TFQ (Transmit Frequency) is used to calibrate the Tx chain in real time, in order to have same output power independent of frequency, temperature and antenna cable length.
LLO?	LLO (LNB LO) is used to set up the LNB LO frequency for the system. <b>All LNB LO frequencies are supported by EXPLORER 8100.</b>
BLO?	BLO (BUC LO) is used to read the BUC LO. This makes the ADU compatible with future VSAT products using a different BUC LO.
RFQ?	RFQ (Receive Frequency) is used as tracking frequency for VSAT.

Table C-7:

## Connections

Connect the ACU and the COMTECH 570L with the following cables:

- Standard RS-232 serial cable (using 300KHz Narrow Band tracking receiver)
- Or COMTECH Serial & RSSI cable (using Modem RSSI tracking)
- 2 pcs. 75 Ohm RF cables F-F connectors for rx and tx frequencies.

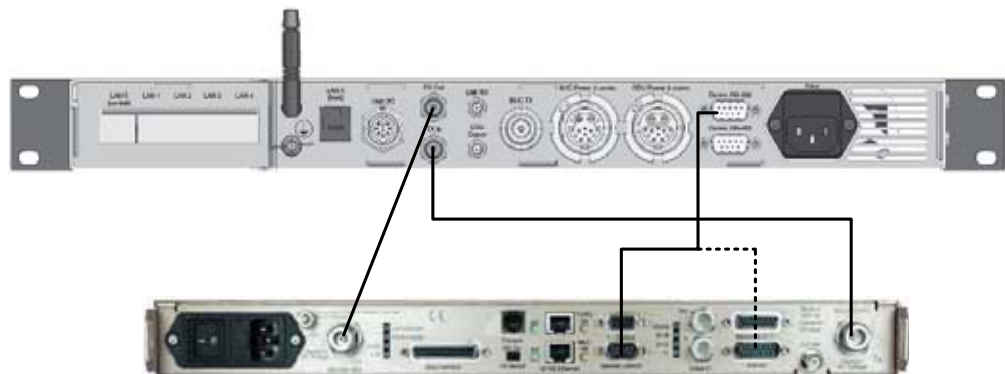


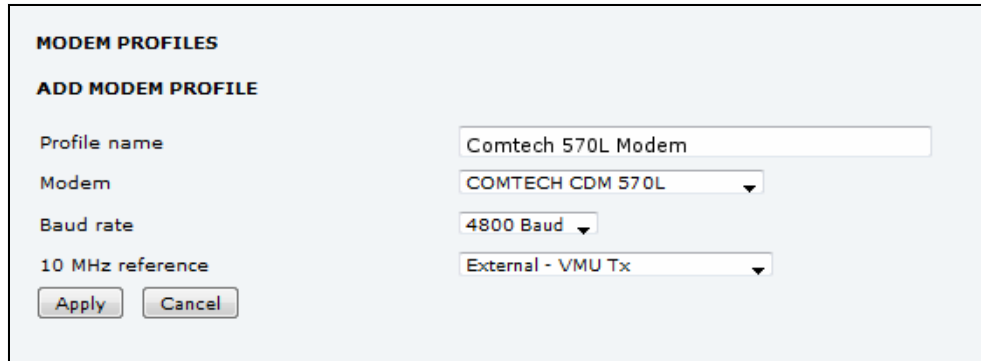
Figure C-11: Connecting COMTECH 570L to the ACU (example)

In most cases it is recommended to use the antenna that is built into the 300 KHz narrow band tracking receiver to track the satellite, and you can connect the ACU to the VSAT modem with a standard RS-232 serial cable.

For Modem RSSI tracking use a cable according to the specifications at *Modem Cable COMTECH Serial & RSSI TT7016A* on page B-2 (Cobham part number: 407090A-021).

### C.3.2 Configuration example (COMTECH 570L)

Examples of the modem profile and satellite configuration from the ACU web interface are shown in the figures below.



**MODEM PROFILES**

**ADD MODEM PROFILE**

Profile name: Comtech 570L Modem

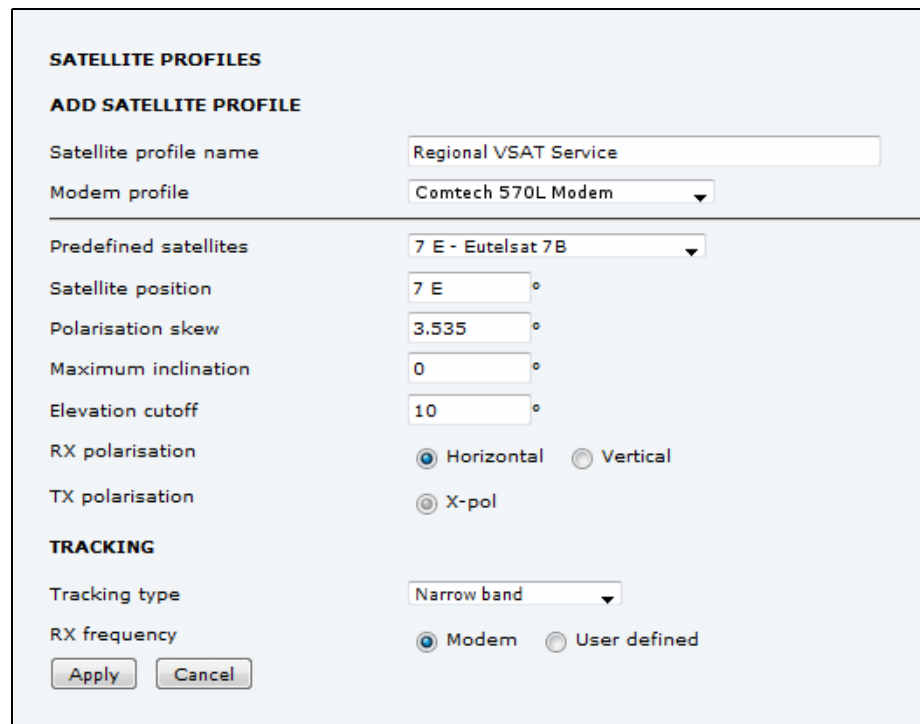
Modem: COMTECH CDM 570L

Baud rate: 4800 Baud

10 MHz reference: External - VMU Tx

Apply Cancel

Figure C-12: Modem profile, COMTECH 570L (example)



**SATELLITE PROFILES**

**ADD SATELLITE PROFILE**

Satellite profile name: Regional VSAT Service

Modem profile: Comtech 570L Modem

Predefined satellites: 7 E - Eutelsat 7B

Satellite position: 7 E °

Polarisation skew: 3.535 °

Maximum inclination: 0 °

Elevation cutoff: 10 °

RX polarisation:  Horizontal  Vertical

TX polarisation:  X-pol

**TRACKING**

Tracking type: Narrow band

RX frequency:  Modem  User defined

Apply Cancel

Figure C-13: Satellite profile, COMTECH 570L (example)



## C.4 STM SatLink 2900 VSAT modem

### C.4.1 Interfaces and VSAT modem configuration

The following sections describe how to connect an ACU to an STM SatLink 2900 VSAT modem. The STM SatLink 2900 and the EXPLORER 8100 are fully integrated and require almost no user setup.

STM SatLink 2900 software version required: 14.2.0 or higher.

#### Connections

Connect the ACU and STM SatLink 2900 with the following cables:

- Ethernet cable for TCP/IP data communication. Connect LAN A on the VSAT modem to LAN 1 on the ACU.
- 75 Ohm RF cables F-F connectors for RX and TX frequencies

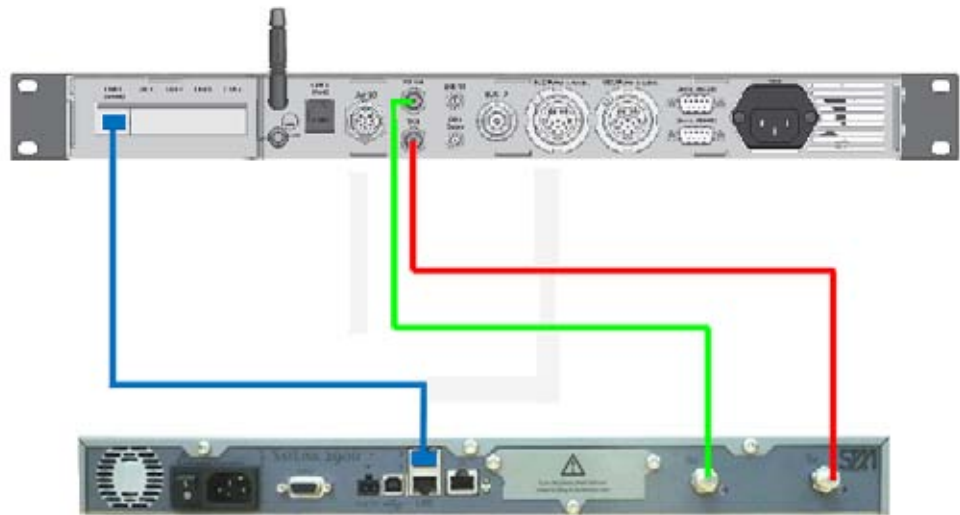


Figure C-14: Connecting STM SatLink 2900 VSAT modem to the ACU

#### Modem configuration requirements

Type the following command in a modem console to set up the STM Satlink 2900 modem to use the EXPLORER 8100:

```
odu antenna 30
odu txtype 62
odu lnb 62
```

To display the antenna setup for the STM Satlink 2900 modem, type:

```
odu antctrl show
```

**Example:**

```
odu antctrl show
Antenna Controller Configuration
-----
Type                : Thrane & Thrane EXPLORER 8100
Enabled             : All
IP address          : 10.110.2.226
Polling frequency   : 5 sec
Antenna Stability Tries : 300

Antenna Controller Status
-----
Controller detected  : no
Packets sent        : 0
Packets received    : 0
```

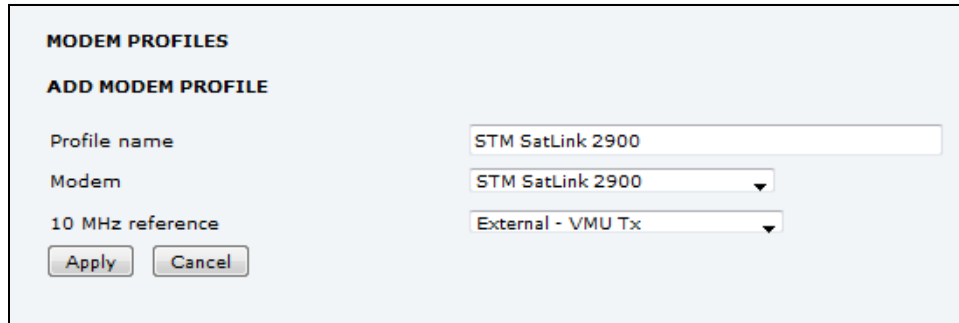
## C.4.2 ACU configuration

To set up the ACU to work with an STM Satlink 2900 VSAT modem, do as follows:

1. Add a modem profile with the STM Satlink 2900 modem. See *Modem profile – New entry and Edit* on page 6-6.
2. Add a satellite profile using the STM Satlink modem profile just created. See *Satellite profiles – New entry and Edit* on page 6-8.
3. Edit the network settings and input the IP information supplied with the modem. See *To configure the LAN network* on page 6-11.
4. Activate the satellite profile.

### C.4.3 Configuration example (STM Satlink 2900)

Examples of modem profile and satellite configuration from the ACU web interface are shown in the figures below.



**MODEM PROFILES**

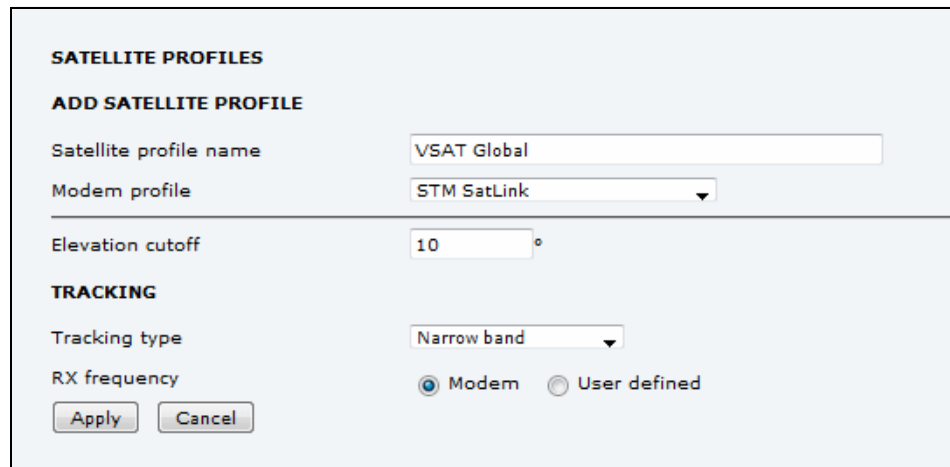
**ADD MODEM PROFILE**

Profile name

Modem

10 MHz reference

Figure C-15: Modem profile, STM SatLink 2900 (example)



**SATELLITE PROFILES**

**ADD SATELLITE PROFILE**

Satellite profile name

Modem profile

Elevation cutoff  °

**TRACKING**

Tracking type

RX frequency  Modem  User defined

Figure C-16: Satellite profile, STM SatLink 2900 (example)

## C.5 Gilat SkyEdge II VSAT modem

### C.5.1 Interfaces and VSAT modem configuration

The following sections describe how to connect an ACU to a Gilat SkyEdgeII VSAT modem. The Gilat SkyEdge II and the EXPLORER 8100 are fully integrated and require only little user setup.

#### Connections

Connect the ACU and Gilat SkyEdge II with the following cables:

- 75 Ohm RF cables F-F connectors for RX and TX frequencies
- Serial cable for communication with the modem. Connect SERIAL on the VSAT modem to RS-232 on the ACU.

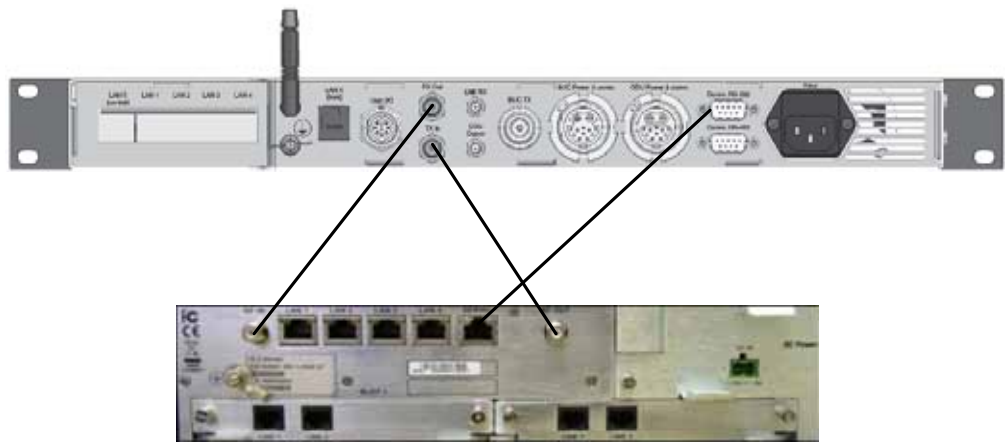


Figure C-17: Connecting Gilat SkyEdge II VSAT modem to the ACU

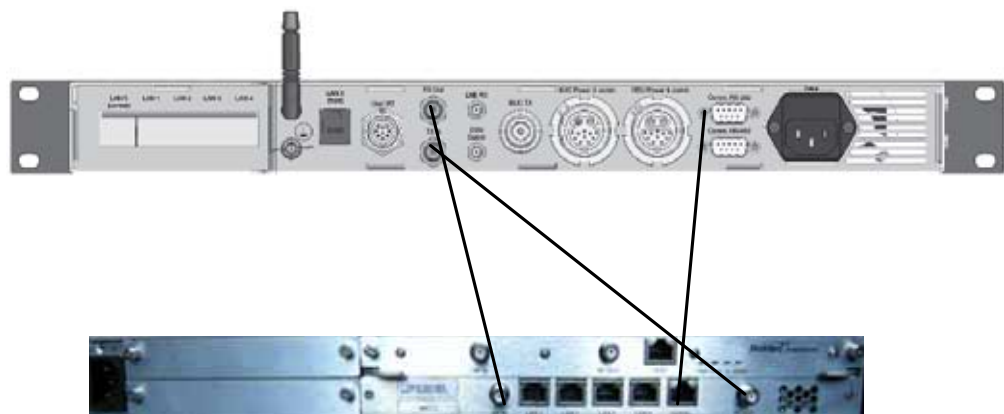


Figure C-18: Connecting Gilat SkyEdge II VSAT modem (rack) to the ACU

## Modem configuration requirements

1. Connect a PC with an Ethernet cable to LAN port 1 of the VSAT modem.
2. Set the PC to static IP address: 192.168.1.2
3. Start an Internet browser (e.g. Internet Explorer) and go to URL://192.168.1.1 in order to get access to the web server of the VSAT modem.
4. Login with: User name: inst and Password: \$Sat2598\$
5. Go to the menu **Installer**.

Parameter	Settings
RF Downlink frequency	In the section <b>General</b> the RF Downlink frequency is shown. Write it down as it is going to be used for the selection of LNB LO. Further down on the page you find the BUC and LNB LO frequencies.
LNB LO	Depending on the RF Downlink frequency select an appropriate LNB LO of 9.75 or 10.75 GHz which will result in an L-band frequency between 1070 and 1275 MHz which is within the operating frequency band of the SkyEdge II Access modem.
BUC LO	Select the BUC to be 12.8 GHz as this is the BUC LO of the EXPLORER 8100. Remember to inform the hub operator about this when doing line up and commissioning.
BUC 10MHz Reference Signal	The BUC 10MHz Reference Signal must be configured to ON, otherwise the EXPLORER 8100 will never allow TX. Scroll further down to enable GPS for the Location Coordinates. This enables the serial protocol of the modem so it can communicate with the ACU.

Table C-8: Configuration of Gilat SkyEdge II VSAT modem

6. Go to the top of the page and press the **Submit** button and **OK** to save the new settings.

The VSAT modem is now configured to be used with the EXPLORER 8100.

### C.5.2 ACU configuration

To set-up the ACU to work with a Gilat SkyEdge II VSAT modem, do as follows:

1. Add a modem profile with the Gilat SkyEdge II modem. See *Modem profile – New entry and Edit* on page 6-6.
2. Add a satellite profile using the Gilat SkyEdge II modem profile just created. See *Satellite profiles – New entry and Edit* on page 6-8.
3. Edit the network settings and input the IP information supplied with the modem. See *To configure the LAN network* on page 6-11.
4. Activate the satellite profile.

See also the configuration example in the following section.

### C.5.3 Configuration example (Gilat SkyEdge II)

Examples of modem profile and satellite configuration from the ACU web MMI are shown in the figures below.

**MODEM PROFILES**

**ADD MODEM PROFILE**

Profile name:

Modem:

Baud rate:

10 MHz reference:

Figure C-19: Modem profile, Gilat Sky Edge II (example)

**SATELLITE PROFILES**

**ADD SATELLITE PROFILE**

Satellite profile name:

Modem profile:

---

Predefined satellites:

Satellite position:  °

Polarisation skew:  °

Maximum inclination:  °

Elevation cutoff:  °

RX polarisation:  Horizontal  Vertical

TX polarisation:  X-pol

LNB LO frequency:  GHz

TX RF frequency:  GHz

**TRACKING**

Tracking type:

RX frequency:  Modem  User defined

Figure C-20: Satellite profile, Gilat Sky Edge II (example)

# System messages

This appendix has the following sections:

- *Event messages – overview*
- *Lists of events*

## D.1 Event messages – overview

The EXPLORER 8100 detects events during

- POST (Power On Self Test) – a self test performed at every power-up.
- PAST (Person Activated Self test) – started in the web interface
- CM (Continuous Monitoring) – automatically performed while the system is in operation.

When the EXPLORER 8100 detects an event that requires your action, it issues an event message and the red Fail/Pass LED in the LED panel of the ACU is lit. As long as an event is active, it is shown in the ACU display and the web interface (in HELPDESK > Event list or click the event icon on the DASHBOARD).

**Note** Active events and notifications are shown. As soon as the event is cleared, it is not displayed any longer. It is then moved to the Notifications section. Notifications are cleared after 24 hours.

State the Event ID when contacting your service partner.

The event description might contain a number of digits in brackets, e.g. (00000005). This is supplemental information and used for service and diagnostics purposes.

## D.2 Lists of events



These lists include event messages for other products as well as the EXPLORER 8100, so some of the listed event messages will never appear in the EXPLORER 8100.

### D.2.1 ACU events

Error code (ID)	Severity	Description	Explanation
08060-0	WARNING	Antenna modem	ACU/Antenna communication error detected (framing and parity). If the situation is persistent, check if cable specifications comply (length and attenuation).
08061-0	WARNING	VMU linux shell password	The specified password (root) for the satellite modem is not accepted by the modem.
08062-0	WARNING	VMU debug shell password	The specified password (user) for the satellite modem is not accepted by the modem.
08063-0	ERROR	Antenna connection	The ACU has lost connection with the antenna.
08064-0	ERROR	ADM PLL lock	The intermediate frequency PLL is not in lock. Check the 10 MHz reference signal.
08065-0	WARNING	GNSS data	Missing GNSS data (fix).
08066-0	WARNING	Heading data	Missing heading information. Check cable and heading provider device.
08067-0	ERROR	PCB temperature	ADM temperature too high. Make sure there is compliance with the environmental specifications.
08068-0	ERROR	PSM power	The PSM fails to provide the requested supply voltage.
08069-0	WARNING	Blocking Zone	The antenna has entered a blocking zone.
0806A-0	WARNING	VMU connection	The ACU has lost connection to the satellite modem.
0806B-0	WARNING	ROSS connection	The ACU has lost connection with the ROSS device.
0806C-0	ERROR	VMU frequency setup	There is a mismatch in the frequency setup. Probably the satellite modem is not configured correctly to match the requirements of the ACU and antenna. A common mismatch is the absence of Rx or Tx LO parameter in the satellite modem.

Table D-1: Event messages for ACU



Error code (ID)	Severity	Description	Explanation
0806D-0	ERROR	Antenna power	The antenna supply voltage is outside the allowed limits. This may happen if the PSM fails to provide the requested supply voltage.
0806E-0	ERROR	VMU reference signal	There is no VMU Rx or Tx reference signal. Whether this is Rx or Tx reference depends on the user's selection on the modem profile page in the web interface. Make sure the VMU Rx/Tx cable is connected and that the VMU is configured to output the RX/TX reference signal.
0806F-0	WARNING	ROSS synchronization	The ACU has become out of sync with the ROSS device, most likely because the ACU has been replaced, or the ROSS satellite profile is new. A manual (forced) handoff sequence must be initiated from the ROSS, refer to the ROSS manual.
08078-0	WARNING	VMU TX frequency invalid	The satellite modem provided a TX frequency of zero. This may degrade tx performance. To remove this warning re-configure the modem to provide the correct tx frequency.
08100-0	ERROR	PSM low voltage (22 V)	The ADM measures a different antenna voltage than expected. If the problem is not solved by a restart, and the PSM is not reporting any errors, the ADM is probably defective.
08101-0	ERROR	PSM high voltage (48 V)	The ADM measures a different antenna voltage than expected. Check for short circuit of the antenna coax connector. If the problem is not solved by a restart, and the PSM is not reporting any errors, the ADM is probably defective.
08102-0	ERROR	PSM 5 V power	Internal voltage supply error of the ADM.
08103-0	ERROR	ADM hotswap	The ACU is not able to supply the correct voltage to the antenna. Check for short circuits in coax cable and the antenna
08104-0	ERROR	Antenna communication	The ACU cannot communicate with the antenna. Check cable and antenna.
08107-0	ERROR	ADM FPGA load	The ADM FPGA cannot be initialised and loaded.
08108-0	ERROR	TX Power Detector calibration	The power detector calibration is not valid.

Table D-1: Event messages for ACU (Continued)

Error code (ID)	Severity	Description	Explanation
08109-0	ERROR	Antenna XIM data	There is a mismatch in the antenna configuration data. Either the PCM or the VIM in the antenna are malfunctioning or one of them has been replaced. In the latter case, select which is the original device in the web interface and restart the system.
0810A-0	ERROR	ADM production data	Production data has been corrupted.
0810B-0	ERROR	Antenna software version	An error has occurred during upload of software to the antenna, the antenna software version is not as expected. Either the software in the ACU does not meet the minimum version required by the antenna, the software image in the ACU is corrupted or the upload procedure failed because of a communication error.
0810C-0	ERROR	File system integrity	One or more file system partitions are corrupt. You may have lost your settings and collected statistics. If restarting the system does not help, contact your service partner.
08840-0	WARNING	Master PLL lock	The master PLL has lost lock. Check the input reference signal.
09000-0	ERROR	KDM 3V3 supply	Internal 3V3 voltage supply error in the KDM.
09001-0	ERROR	KDM 12V supply	Internal 12V voltage supply error in the KDM.
09002-0	ERROR	KDM display	Display hardware error in the KDM.
09010-0	ERROR	KDM link/SW version	Link to the KDM module could not be established. Either the KDM board is malfunctioning, or - if the system software has just been updated - the software is too old and is not compatible with the KDM hardware.
0B000-0	ERROR	PSM production data	Missing or invalid production data in the PSM. Replace it.
0B001-0	ERROR	NMEA 2000 identifier	Missing or invalid production data in the PSM. Replace it.
0B010-0	ERROR	PSM link/SW version	Link to the PSM module could not be established. Either the PSM board is malfunctioning, or - if the system software has just been updated - the software is too old and is not compatible with the PSM hardware.
0B060-0	WARNING	NMEA 0183 parse error	Parse errors detected on the NMEA 0183 interface. Check NMEA 0183 cable, signal levels etc.

Table D-1: Event messages for ACU (Continued)

## D.2.2 Antenna events

Event ID	Severity	Description	Explanation
0A001-0	ERROR	Production data	Production data is invalid.
0A002-0	ERROR	XIM internal	Antenna configuration data stored in the PCM module is invalid.
0A003-0	ERROR	XIM external	Antenna configuration data stored in the VIM/TIM module is invalid.
0A004-0	ERROR	XIM I/X match	Antenna configuration data stored in the PCM module does not match the configuration data stored in the VIM/TIM module.
0A005-0	ERROR	Antenna type	The configured antenna type is not supported or unknown.
0A006-0	ERROR	PCM FPGA load	The PCM FPGA cannot be initialised and loaded correctly.
0A007-0	ERROR	XIM FPGA load	The VIM/TIM FPGA cannot be initialised and loaded correctly.
0A008-0	ERROR	XIM production	Production/calibration data stored in the VIM/TIM module is invalid.
0A00A-0	ERROR	GNSS initialisation	The GNSS device cannot be initialised. Check cable and GNSS device.
0A014-0	ERROR	AMB device discovery	Missing one or more of the following devices: ISM, DDM and PMM. Check cables.
0A015-0	ERROR	Azi DDM ABS device	Cannot initialise the azimuth DDM. Info: 0x00000000: Device not found (possible cabling problem) 0x0000bbaa: Device internal error (replace device) aa=status, bb=state.
0A016-0	ERROR	Xel DDM ABS device	Cannot initialise the cross-elevation DDM. Info: See 0A015-0.
0A017-0	ERROR	Ele DDM ABS device	Cannot initialise the elevation DDM. Info: See 0A015-0.
0A018-0	ERROR	ISM ABS device	Cannot initialise the ISM Info: 0x00000000: Device not found (possible cabling problem) 0x000cbbaa: Device internal error (replace device) aa=status, bb=state, c=calibration data error.
0A019-0	ERROR	PMM ABS device	Cannot initialise the PMM. Info: See 0A015-0.
0A01A-0	ERROR	BCM ABS device	Cannot initialise the BCM. Info: See 0A015-0.

Table D-2: Event messages for antenna

Event ID	Severity	Description	Explanation
0A01E-0	ERROR	Sensor sanity	Too many invalid values measured by the ISM during initialisation. Check for vibrations or malfunctioning ISM.
0A021-0	ERROR	Azi axis calibration	Azimuth axis zero reference not found. Check belt and zero reference module. Info: 0x00000001: Timeout (operation did not complete in time) 0x00000010: Encoder or mechanical problem 0x00000020: Zero reference not found 0x00000040: End stop not found.
0A022-0	ERROR	Xel axis calibration	Cross-elevation axis zero reference or end stops not found at expected locations. Check belt, zero reference module, and end stops. Info: See 0A021-0.
0A023-0	ERROR	Ele axis calibration	Elevation axis zero reference or end stops not found at expected locations. Check belt, zero reference module, and end stops. Info: See 0A021-0.
0A024-0	ERROR	Pol axis calibration	Polarisation axis zero reference or end stops not found at expected locations. Check movement of the polarisation unit and the zero reference module. Info: See 0A021-0.
0A025-0	ERROR	Antenna calibration	One or more errors occurred during antenna start-up Info: 0x00000001: Timeout (calibration did not complete in time) 0x00000010: Azimuth axis 0x00000020: Cross-elevation axis 0x00000040: Elevation axis 0x00000080: Polarisation axis
0A028-0	ERROR	Demodulator load	The second receiver demodulator cannot be initialised and loaded correctly.
0A029-0	ERROR	XIM PLL lock	The PLL on the VIM/TIM does not lock.
0A02B-0	ERROR	ABS software version	The ABS software version in the antenna is too old to match the hardware requirements. Upload new software via the web interface.
0A034-0	WARNING	ACU communication	The communication link between ACU and antenna is not working.
0A035-0	WARNING	ISM data valid	Sensor measurements from the ISM are invalid. This indicates a malfunctioning ISM.
0A036-0	WARNING	ISM data range	Sensor measurements from the ISM are out of range.
0A037-0	WARNING	GNSS communication	Lost connection to the GNSS device.
0A038-0	WARNING	GNSS data range	Received information from the GNSS device which is out of range.

Table D-2: Event messages for antenna (Continued)

Event ID	Severity	Description	Explanation
0A039-0	WARNING	GNSS device warning	Local GNSS device warning.
0A03A-0	WARNING	GNSS device error	Local GNSS device error.
0A03B-0	ERROR	Azi DDM shutdown	The azimuth motor control has detected one of the following situations: Extreme temperature, voltage, current or velocity. The motor was then shut down. This is usually a temporary situation and is probably fixed by a restart of the system.
0A03C-0	ERROR	Xel DDM shutdown	As Azi DDM shutdown but detected by the cross-elevation motor control.
0A03D-0	ERROR	Ele DDM shutdown	As Azi DDM shutdown but detected by the elevation motor control.
0A03E-0	ERROR	PMM shutdown	As Azi DDM shutdown but detected by the polarisation motor control.
0A03F-0	WARNING	AMB timing	This indicates a busy situation. It may occur during installation procedures. No user interaction is required unless it occurs repeatedly.
0A040-0	WARNING	VIM cable attn	The output power cannot be controlled correctly. Check the Tx chain.
0A041-0	WARNING	BUC voltage low	The voltage for the BUC is too low, probably caused by a malfunctioning VIM or BUC.
0A042-0	WARNING	BUC voltage high	The voltage for the BUC is too high probably caused by a malfunctioning VIM.
0A043-0	WARNING	LNB voltage low	The voltage for the LNB is too low probably caused by a malfunctioning VIM/TIM or LNB.
0A044-0	WARNING	LNB voltage high	The voltage for the LNB is too high probably caused by a malfunctioning VIM/TIM.
0A045-0	WARNING	PMM fan	The fan is not working or the tacho input from the fan is not connected. Check fan cable and fan.
0A046-0	WARNING	Antenna temperature	The temperature of the antenna is too high. Check if the fan is working.
0A047-0	ERROR	VIM PLL lock	The PLL of the VIM/TIM is out of lock. Check the 10 MHz reference signal.
0A048-0	WARNING	VIM tuner lock	The PLL of the second receiver (DVB) is out of lock. Check the 10 MHz reference signal.

Table D-2: Event messages for antenna (Continued)

Event ID	Severity	Description	Explanation
0A049-0	WARNING	Azi encoder slip	A slip of the azimuth encoder has been detected. If this event is not resolved by itself after some time, check the belt and encoder of the azimuth axis.
0A04A-0	WARNING	Xel encoder slip	A slip of the cross-elevation encoder has been detected. If this event is not resolved by itself after some time, check the belt and encoder of the cross-elevation axis.
0A04B-0	WARNING	Ele encoder slip	A slip of the elevation encoder has been detected. If this event is not resolved by itself after some time, check the belt and encoder of the elevation axis.
0A04C-0	WARNING	Pol encoder slip	A slip of the polarisation encoder has been detected. If this event is not resolved by itself after some time, check the belt and encoder of the polarisation axis.
0A04D-0	WARNING	GNSS position	No position available from the GNSS device or position too old.
0A04E-0	WARNING	GNSS velocity	No velocity available from the GNSS device.
0A04F-0	WARNING	Heading data	Heading information is missing in the antenna.
0A050-0	ERROR	Azi DDM communication	Communication error between PCM and azimuth DDM. Check SUB-D connectors and cables.
0A051-0	ERROR	Xel DDM communication	Communication error between PCM and cross-elevation DDM. Check SUB-D connectors and cables.
0A052-0	ERROR	Ele DDM communication	Communication error between PCM and elevation DDM. Check SUB-D connectors and cables
0A053-0	ERROR	ISM communication	Communication error between PCM and ISM. Check SUB-D connectors and cables.
0A054-0	ERROR	PMM communication	Communication error between PCM and PMM. Check SUB-D connectors and cables.
0A055-0	WARNING	Azi DDM warning	The azimuth motor controller has temporarily observed an unusual situation for temperature, voltage, current or velocity. No user interaction required.
0A056-0	WARNING	Xel DDM warning	The cross-elevation motor controller has temporarily observed an unusual situation for temperature, voltage, current or velocity. No user interaction required.
0A057-0	WARNING	Ele DDM warning	The elevation motor controller has temporarily observed an unusual situation for temperature, voltage, current or velocity. No user interaction required.

Table D-2: Event messages for antenna (Continued)

Event ID	Severity	Description	Explanation
0A058-0	WARNING	PMM warning	The polarisation motor controller has temporarily observed an unusual situation with regards to temperature, voltage, current or velocity. No user interaction required.
0A059-0	WARNING	Azi cal. limits	Check limits of the calibration result for the azimuth axis are exceeded. Pointing performance may be degraded. Info: 0x00000040: End stop detected before expected limit 0x00000100: Zero width is low 0x00000200: Zero width is high 0x00000400: Zero slack is high 0x00001000: Friction average is high 0x00002000: Friction peak is high 0x00004000: Friction asymmetry is high Zero width low/high: Zero reference module placement may be incorrect. Zero slack high: Mechanical slack may be too high. Friction average/peak high: Mechanical friction is higher than expected. Friction asymmetry high: Mechanical imbalance may be too high.
0A05A-0	WARNING	Xel cal. limits	Check limits of the calibration result for the cross-elevation axis are exceeded. Pointing performance may be degraded. Info: See 0A059-0.
0A05B-0	WARNING	Ele cal. limits	Check limits of the calibration result for the elevation axis are exceeded. Pointing performance may be degraded. Info: See 0A059-0.
0A05C-0	WARNING	Pol cal. limits	Check limits of the calibration result for the polarisation axis are exceeded. Pointing performance may be degraded. Info: See 0A059-0.
0A05D-0	WARNING	ISM warning	The ISM has temporarily observed an unusual situation for temperature or voltage. No user interaction required. If repeated after cooldown and reboot, check if the ISM or cables around it are defective.
0A05E-0	WARNING	Low elevation	The antenna is not allowed to transmit because the elevation is too low.
0A05F-0	WARNING	Heading range	Heading data range error. External heading unit supplies unreliable data.
0A062-0	WARNING	High elevation	The antenna cannot perform acquisition in gyro-free mode because the elevation is too high.
0A065-0	ERROR	Deploy/Stow	Deploy/stow error. The antenna did not properly unlock (deploy), or the stow switch never closed (stow).

Table D-2: Event messages for antenna (Continued)

# DVB-S/DVB-S2 satellites for Ku-Band

This appendix contains examples of DVB-S/DVB-S2 satellite data for the Ku-version of EXPLORER 8100.

**Note** The information in this list is temporary and may have changed since the writing of this manual.

VSAT coverage	Satellite name	Satellite position	RX polarization	RX frequency	Symbol rate	NID
Americas	SatMex6 Transponder Backup	113°W	Horizontal —	12.080 GHz —	25.635 MS/s —	0 —
Americas	Hispasat1D/1E Transponder Back-up	30°W	Vertical Horizontal	12.052 GHz 12.092 GHz	27.500MS/s 27.500MS/s	(51) (4001)
USA	Echostar9 Transponder Backup	121°W	Horizontal Vertical	11.943 GHz 12.016 GHz	20.000 MS/s 20.000 MS/s	(4106) (4106)
South East Asia	NSS6 Transponder Backup	95°E	Horizontal Horizontal	11.676 GHz 12.729 GHz	28.800 MS/s 26.400 MS/s	(65535) (100)
Europe	Thor 5 T2 Transponder Backup	0.8°W	Horizontal Vertical	11.785 GHz 12.418 GHz	30.000 MS/s 28.000 MS/s	70 70
Europe	Astra2 Transponder Backup	28.2°E	Horizontal Horizontal	11.623 GHz 12.032 GHz	27.500 MS/s 27.500 MS/s	32 2
Europe	Hotbird Transponder Back-up	13°E	Vertical Vertical	11.034 GHz 11.662 GHz	27.500 MS/s 27.500 MS/s	318 318

Table E-1: Examples of DVB-S/DVB-S2 satellites for azimuth calibration



VSAT coverage	Satellite name	Satellite position	RX polarization	RX frequency	Symbol rate	NID
China	Apstar6 Transponder Backup	134°E	Vertical	12.435 GHz	27.500 MS/s	65
			Vertical	12.675 GHz	27.500 MS/s	65
Australia	Optus D1 Transponder Backup	160°E -45°skew	Horizontal	12.391 GHz	12.600 MS/s	0
			Horizontal	12.407 GHz	12.600 MS/s	0
Singapore	Thaicom 5	78.5°E	Horizontal	12.272 GHz	30.000 MS/s	88
			Vertical	12.313 GHz	30.000 MS/s	1
Singapore	Apstar 2R (Telstar 10) / Apstar 7	76.5°E	Vertical	11.167 GHz	45.000 MS/s	0
Osaka, Japan	KT 5	113°E	Vertical	12.430 GHz	25.6 Ms/s	0

Table E-1: Examples of DVB-S/DVB-S2 satellites for azimuth calibration (Continued)

For satellite data of other regions or transponders see [www.lyngsat.com](http://www.lyngsat.com).

Example:



Freq. Tp	Provider Name Channel Name	System Encryption	SR-FEC SID-VPID	ONID-TID APID Lang.	Beam EIRP (dBW) C/N lock	Source Updated
11038 V tp 38	 Canal +	 DVB-S Mediaguard 2 Nagravision 3	22000-5/6	1-1038	Europe 51 6.5	D Shimoni 111119

Figure E-1: Satellite data, example from [www.lyngsat.com](http://www.lyngsat.com)

The above transponder has the following parameters:

- Frequency: 11.038 GHz
- Polarization: V-Vertical
- Symbol Rate: 22.000 MS/s
- NID: 1
- Coverage: Europe.

# Approvals

This appendix lists the approvals for EXPLORER 8100.

- *Eutelsat*
- *CE*
- *FCC*
- *IC*

## F.1 Eutelsat

The EXPLORER 8100 is approved by Eutelsat. The certificate is added to this appendix in electronic copy.

## F.2 CE

The EXPLORER 8100 is in the process of being CE certified. The Declaration of Conformity will be added to this appendix in electronic copy when ready.

The requirement with respect to LVD directive 2006/95/EC is met by conforming to harmonized EU standard EN 60950.

The protection requirement with respect to EMC directive 2004/108/EC is met by conforming to harmonized EU standard EN 61000.

Effective use of frequency spectrum is met by conforming to harmonized standard EN 301 489.

## F.3 FCC

**Note:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

**NOTICE:**

This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

**NOTICE:**

Changes or modifications made to this equipment not expressly approved by Cobham SATCOM may void the FCC authorization to operate this equipment.

FCC id : ROJ-7157A

## **F.4 IC**

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This Class [B] digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe [B] est conforme à la norme NMB-003 du Canada.

IC id : 6200B-7157A

# Eutelsat s.A. Type Approval Summary Sheet

**Applicant:**

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**Antenna model:**

EXPLORER 8100 Ka  
With Viasat E TRIA

**Diameter:**

1 m

**Standard:**

M

**Type Approval (Ref. EB-028) date:**

21-08-2015

**Most recent test data received on:**

13-08-2015

**System Description:**

Vehicular mounted auto-deploy system with Cobham ACU using Viasat E TRIA for KA-SAT operation. Single piece 1.00 m Carbon fiber reflector for long focal length. Motorized auto-deploy AZ/EL mount, heavy and stable antenna back structure and feed boom. Single optic front fed offset.

**Configurations:** Antenna presented and tested works Viasat network on KA-SAT using the Viasat E TRIA. Antenna is designed for an exchange of the RF front end and for operation in Ku band. Antenna need an additional approval for operation in Ku band.

**Maximum Allowed EIRP** for digital carriers transmitted at the 18 dB/K satellite receive contour of KA-SAT (EESS 502 refers):

20.2 dBW / 4 KHz (equivalent to 30.2 dBW / 40 kHz) for an orbital separation of the adjacent satellite  $\geq 1.5^\circ$

**Tx Frequency:**

29.50-30.00 GHz

**Rx Frequency:**

19.70-20.20 GHz

**Tx Gain:**

47.7 dBi (average at 29.75 GHz)

**Rx Gain:**

44.1 dBi (average at 19.95 GHz)

**Tx XPD:**

$\geq 20.5$  dB within -1 dB contour

**Rx XPD:**

$\geq 20.4$  dB within -1 dB contour

**Pointing Error:**

$\leq 0.2^\circ$  @ 72 Km/h

**G/T:**

22.2 dB/K, assuming the Viasat E TRIA with 1.5 dB NF

**Restrictions and remarks:**

- 1) The terminal shall be used solely in VSAT Networks which are conformed with the EU regulations for blanket license agreement. Otherwise the operator has to be in possession of an operating license for above mentioned terminal from its local regulatory office.
- 2) The authorization to operate the terminal is conditioned to the approval to access the Eutelsat S.A. Space Segment (ref. <http://www.eutelsat.com/files/contributed/satellites/pdf/esog110.pdf> ESOG110).
- 3) This type approval has been performed at the outdoor test range of Politecnico di Torino on three units of the same model, in the month of August 2015.
- 4) The type approval's validity is subject to regular submission of patterns to confirm that the system remains compliant with the Eutelsat standard at the inspection date.
- 5) Any change to the type approved configuration needs to be notified to Eutelsat and may be subject to further tests.
- 6) This approval allows only operation in Viasat technology networks on KA-SAT.
- 7) The antenna system can only be operated for maximum wind speeds of up to 72 Km/h (45mph).

## A

ABS	ADU Bus Slave
ACU	Antenna Control Unit
ADM	ACU Digital Module. A main processor board in the ACU.
AMB	Antenna Module Bus

## B

BUC	Block Up Converter. The BUC can be thought of as the “transmitter”, and its actions are effectively the opposite to the LNB. The BUC consists of the Up Converter and HPA.
-----	--

## C

CE	Conformité Européenne. This term signifies that a CE certified product conforms to European health, environmental, and safety regulations. In short, it makes the product legal to be sold in the European Union.
CM	Continuous Monitoring

## D

DHCP	Dynamic Host Configuration Protocol. A protocol for assigning dynamic IP addresses to devices on a network. With dynamic addressing, a device can have a different IP address every time it connects to the network.
DVB	Digital Video Broadcasting, a set of standards relating to digital television.

## E

eTRIA	Transmit and Receive Integrated Assembly
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## F

FPGA	Field Programmable Gate Array
FWG	Flexible Wave Guide

## G

GNSS	Global Navigation Satellite System, e.g. GPS.
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**GPS** Global Positioning System. A system of satellites, computers, and receivers that is able to determine the latitude and longitude of a receiver on Earth by calculating the time difference for signals from different satellites to reach the receiver.

## K

**KDM** Keyboard and Display Module of the ACU

## L

**LAN** Local Area Network. A computer network covering a small physical area, like a home, office, school or airport. The defining characteristics of LANs, in contrast to wide-area networks (WANs), include their usually higher data-transfer rates, smaller geographic area, and lack of a need for leased telecommunication lines.

**LED** Light Emitting Diode

**LNB** Low Noise Blockdown converter. A device used to amplify or boost the weak received signal without amplifying the noise signals (hence the “low noise” part of LNB) and to convert the high frequencies of the signal into lower frequencies, a process called down converting, for conveyance to the indoor equipment (demodulator) for processing.

## M

**MIB** Management Information Base

## O

**ODU** OutDoor Unit. The part of the system that is placed outdoors, e.g. the antenna.

**OMT** Ortho Mode Transducer

## P

**PAST** Person Activated Self Test

**POST** Power On Self Test. A system test that is activated each time the system is powered on.

## R

**RF** Radio Frequency. Electromagnetic wave frequencies between about 3 kHz and about 300 GHz including the frequencies used for communications signals (radio, television, cell-phone and satellite transmissions) or radar signals.

**S**

**SMA** SubMiniature version A. A coaxial RF connector developed as a minimal connector interface for coaxial cable with a screw type coupling mechanism. The connector has a 50 Ohm impedance.

**SSID** Service Set IDentifier. An SSID is the name of a wireless local area network (WLAN). All wireless devices on a WLAN must use the same SSID in order to communicate with each other.

**V**

**VSAT** Very Small Aperture Terminal. An earthbound station used in satellite communications of data, voice and video signals, excluding broadcast television. A VSAT system consists of a two-way satellite ground station and a stabilized VSAT antenna with a dish antenna that is smaller than 3 metres.

**W**

**WLAN** Wireless LAN, wireless network

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