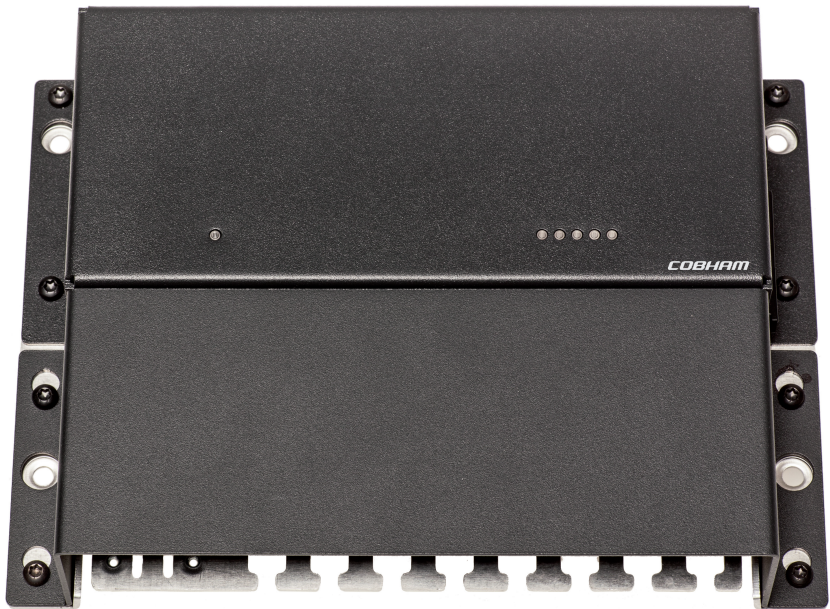


COBHAM

SAILOR 500 Fleetbroadband Dual Antenna Solution

Installation and user manual



SAILOR 500 FleetBroadband Dual Antenna Solution

Installation and user 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. Cobham SATCOM assumes no liability for the customer's failure to comply with these requirements.

GROUND THE EQUIPMENT

To minimise shock hazard, the equipment chassis and cabinet must be connected to an electrical ground and the cable instructions must be followed.

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 service the unit with the power cable connected. Always disconnect and discharge circuits before touching them.

DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT

Because of the danger of introducing additional hazards, do not substitute parts or perform any unauthorised modification to the equipment.

COMPASS SAFE DISTANCE

For Dual Antenna Control Unit: 20 cm

About the manual

Intended readers

This manual is primarily an installation manual for the SAILOR 500 FleetBroadband Dual Antenna Solution. The manual is intended for installers of the system and service personnel. Personnel installing or servicing the system must be properly trained and authorised by Cobham SATCOM. It is important that you observe all safety requirements listed in the beginning of this manual, and install the system according to the guidelines in this manual.

See also the user manual and installation manual for the SAILOR 500 FleetBroadband system. Related manuals are listed on the next page under *Related documents*.

Related documents

The below list shows the documents related to this manual and to this product.

The manuals can be found in the Self Service Center at cobham.com/satcom under Service and Support.

Ref.	Title and description	Document number
[1]	SAILOR 500/250 FleetBroadband, User manual	98-125645
[2]	SAILOR 500/250 FleetBroadband, Installation manual	98-125646
[3]	Thrane IP Handset, User manual	98-126059

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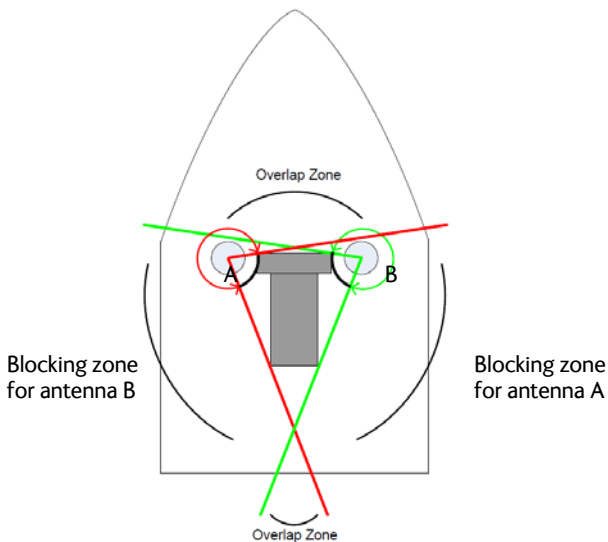
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Introduction

Purpose of the SAILOR 500 FleetBroadband Dual Antenna Solution

When your SAILOR 500 FleetBroadband antenna cannot obtain full line of sight to the satellite, e.g. because of blocking objects on board the ship, you can use a dual antenna solution. The purpose of the dual antenna solution is to obtain full line of sight with a combination of two SAILOR 500 FleetBroadband systems.

The system works as **one** system, where the master terminal is the main unit containing the SIM card, controlling the system and connecting to user equipment.

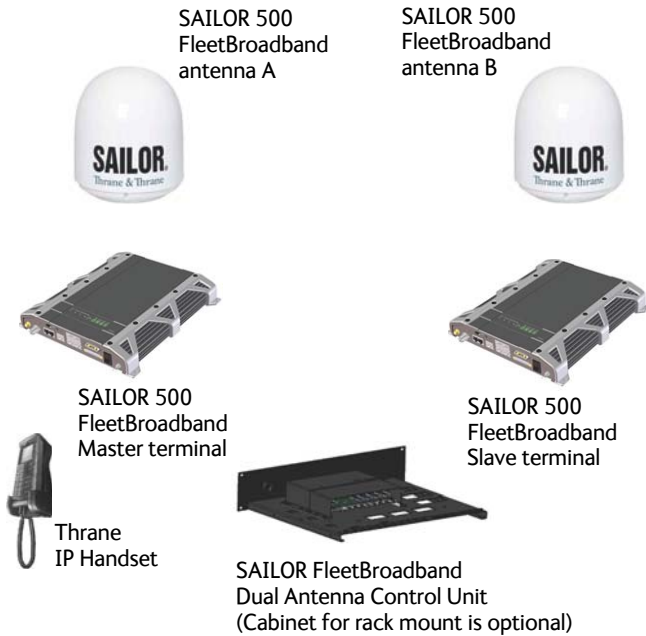


The two antennas in the system must be placed so that they cover as much as possible of each other's blocking zones. The SAILOR 500 FleetBroadband Dual Antenna Solution offers automatic switch-over between the two antennas in order to obtain the best possible coverage.

Units in the dual antenna solution

A dual antenna solution consists of the following units:

- Two SAILOR 500 FleetBroadband terminals (master and slave)
- Two SAILOR 500 FleetBroadband antennas (A and B)
- A Thrane IP Handset (optional - included with the SAILOR 500 FleetBroadband terminals)
- One SAILOR FleetBroadband Dual Antenna Control Unit (DACU)



Minimum software versions

The units in the dual antenna solution must have the following software version in order to support the dual antenna functions:

Unit	Minimum software version
SAILOR 500 FleetBroadband terminal	1.18 Master and slave must have the same version.
Thrane IP Handset (master handset, no. 0501)	1.16
Thrane IP Handset (other handsets)	Any version

SAILOR 500 FleetBroadband terminals

For details on the SAILOR 500 FleetBroadband terminals, see the SAILOR FleetBroadband manuals [1] and [2].

Master/slave configuration

The **master** terminal controls the system and connects to user equipment. The master terminal must have a SIM card installed.

The **slave** terminal receives and transfers the signal from antenna B when ordered by the master terminal. No SIM card should be present when the terminal is operating as a slave terminal, but during configuration a SIM card is needed.

In the dual antenna solution, you must configure one FleetBroadband terminal to be master and the other to be slave. For details, see *Configuration* on page 17.

Connection to the Dual Antenna Control Unit

One of the FleetBroadband terminals must be connected to the Dual Antenna Control Unit. If you connect the slave terminal you will have more user interfaces (LAN) available on the master terminal.

SAILOR 500 FleetBroadband antennas

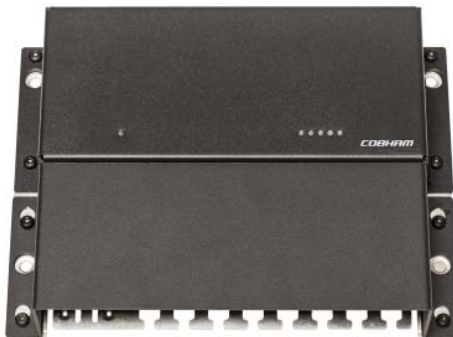
For details on the SAILOR 500 FleetBroadband antennas, see the SAILOR FleetBroadband manuals [1] and [2].

Minimum antenna version

The FleetBroadband antennas used in the dual antenna solution must have part number 403052C and minimum revision B.03 (see the serial number label on the antenna).

FleetBroadband Dual Antenna Control Unit (DACU)

The FleetBroadband Dual Antenna Control Unit receives NMEA0183 Ship Heading True (HDT) information from the ship and passes it on to the FleetBroadband system for antenna pointing and blocking zone calculation.



The Dual Antenna Control Unit is supported by the ThraneLINK Management Application, a Windows program that provides easy monitoring and software update of connected Cobham SATCOM devices with ThraneLINK support.

Thrane IP Handset

Functions of the Thrane IP Handset

In addition to the general functions of the Thrane IP Handset, the master handset (with local number 0501) can be used to check the status of the dual antenna system. If manual switchover is selected in the web interface, you can also select which antenna is to be active. For details see *Thrane IP Handset* on page 23.

See also *Thrane IP Handset, User manual* [3].

Installation

This chapter describes how to unpack, store and install the Dual Antenna Control Unit and how to install the SAILOR 500 FleetBroadband Dual Antenna Solution. It contains the following sections:

- *Unpacking the Dual Antenna Control Unit*
- *What's in the delivery*
- *Installing the Dual Antenna Control Unit*
- *Outline drawing, DACU*
- *Outline drawing, cabinet for rack mount*
- *Installing the SAILOR 500 FleetBroadband systems*

For information on cable connections, see *Connecting cables* on page 31.

Important

Do not connect the units to each other before the two FleetBroadband terminals are configured as master and slave.

For information on how to install the FleetBroadband systems, see *SAILOR 500/250 FleetBroadband, Installation manual, [2]*.

Unpacking the Dual Antenna Control Unit

Initial inspection

Inspect the shipping carton immediately upon receipt for evidence of damage during transport. If the shipping carton is severely damaged or water stained, request that the carrier's agent be present when opening the carton. Save the carton 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, 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.

What's in the delivery

The following items are included in the delivery of the Dual Antenna Control Unit:

- FleetBroadband Dual Antenna Control Unit
- Mounting tool for spring-loaded terminals
- Installation and user manual (this manual)

Installing the Dual Antenna Control Unit

General installation requirements

The Dual Antenna Control Unit must be installed in a location which is

- indoors
- not exposed to water
- close to a ship ground connection point.

Make sure the Compass Safe Distance is maintained. See *General specifications for the DACU* on page 51.

Mounting the Dual Antenna Control Unit

The Dual Antenna Control Unit can be mounted on a flat surface, e.g. on a bulkhead, or in a cabinet for rack-mounting.

Distance between units: When installing the DACU, keep in mind that the DACU and the FleetBroadband terminals must be placed close enough to each other to comply with the maximum cable lengths (100 m for Ethernet).

To mount the unit on a bulkhead

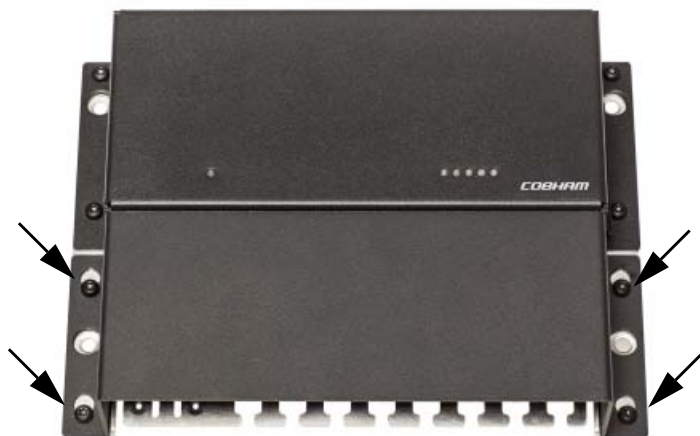
Important | If the Dual Antenna Control Unit is not mounted on a surface with a good connection to ship ground, you must connect a separate cable for this purpose. See *Grounding the Dual Antenna Control Unit* on page 40.

To mount the Dual Antenna Control Unit, do as follows:

1. Using four screws, mount the Dual Antenna Control Unit on the mounting surface. The mounting holes are Ø6. If you mount the Dual Antenna Control Unit on a vertical surface, make sure the cable relief is facing down as shown in the picture below.

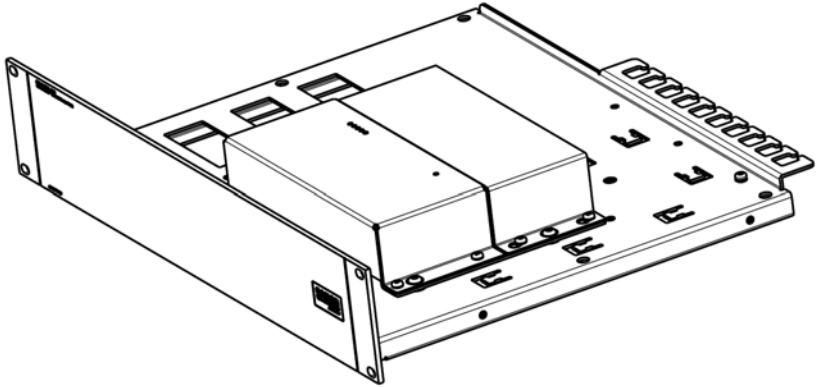


2. Tighten the screws.
3. Connect all cables as described in *Connecting cables* on page 31 and fasten the cables to the cable relief with cable strips.
4. When all cables are installed, mount the cover for the spring-loaded terminals. Tighten the screws to 1.5 Nm.



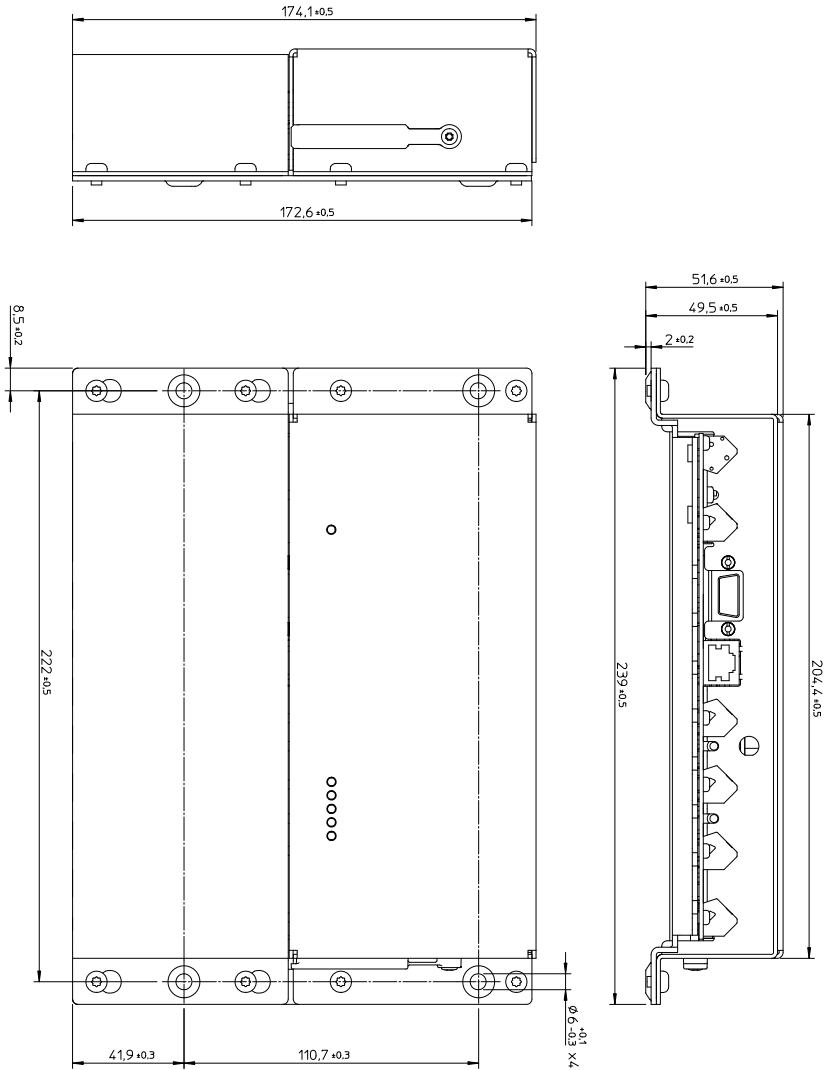
To mount the unit in a rack

The Dual Antenna Control Unit is available in a cabinet for rack-mounting.



1. Slide the DACU with cabinet into a 2U space in a 19" rack.
2. Mount two screws in each side through the holes in the front and fasten the screws to the rack.
3. Connect all cables as described in *Connecting cables* on page 31
4. Secure the cables to the cable relief at the back of the rack unit.

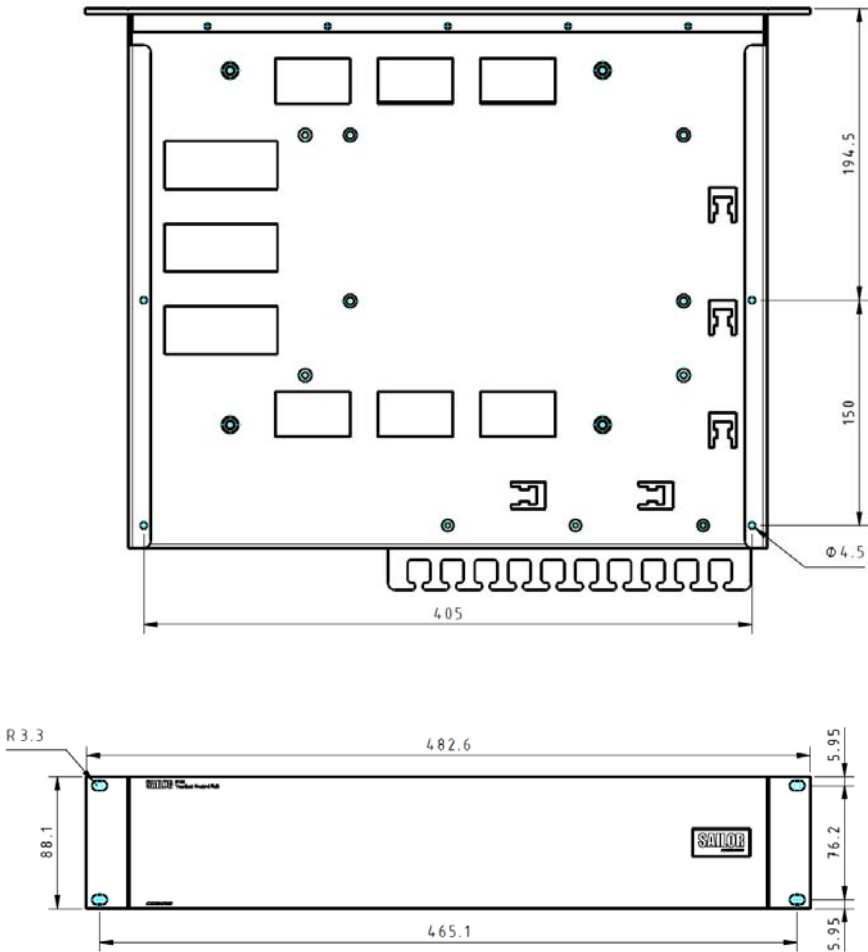
Outline drawing, DACU



Dimensions are in mm.

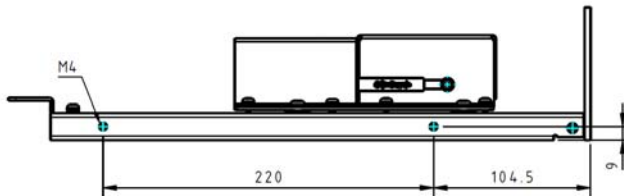
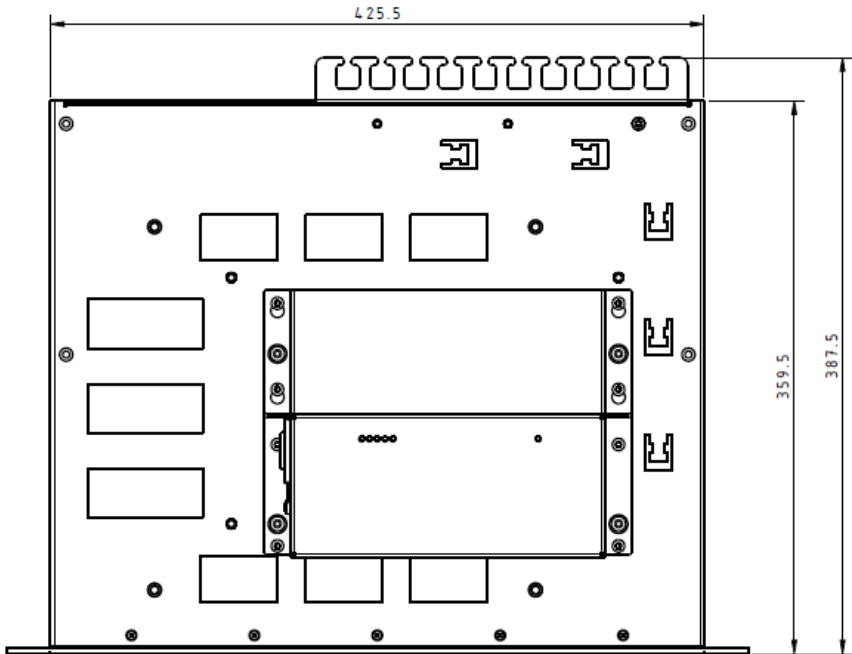
Outline drawing, cabinet for rack mount

Bottom and front view



Dimensions are in mm.

Top and side view



Dimensions are in mm.

Installing the SAILOR 500 FleetBroadband systems

For details on installation of the FleetBroadband systems, see the installation manual for the FleetBroadband system [2].

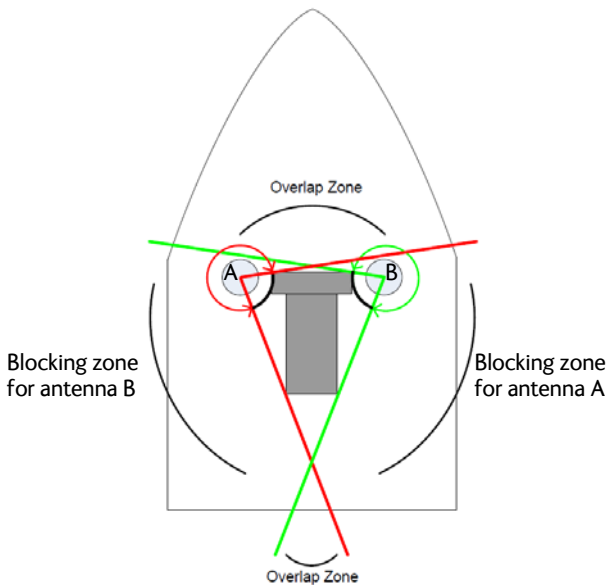
This section only gives installation guidelines specific for the dual antenna solution.

Antennas

Note | The antennas must have part number 403052C and minimum Rev. B.03 (see serial number label on the antenna).

When installing the two FleetBroadband antennas, place the antennas so that they cover as much as possible of each other's blocking zones.

Below is an example of how the two antennas can complement each other.



Terminals

Install the FleetBroadband terminals close to each other and close to the Dual Antenna Control Unit.

SIM card

The SAILOR 500 FleetBroadband Dual Antenna Solution is **one** system that uses **one** SIM card, installed in the master terminal.

If a SIM card is installed in the slave terminal, it is not used as long as the system is configured to be a dual antenna solution.

Configuration

Configuring the dual antenna solution

To use your SAILOR 500 FleetBroadband Dual Antenna Solution you must go through the following configuration steps with the built-in web interface of the SAILOR 500 FleetBroadband terminals:

- *Configuring the slave terminal*
- *Configuring the master terminal*
- *Configuring blocking zones*

For details on how to use the web interface, see the user manual for your SAILOR 500 FleetBroadband system [1].

Important

Do not connect the two FleetBroadband terminals to each other nor to the DACU before they are configured.

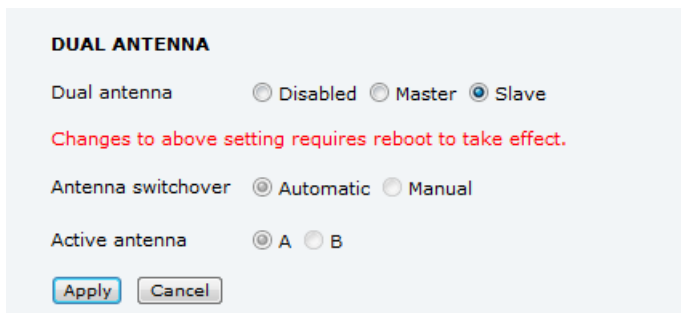
Configuring the slave terminal

To prepare the FleetBroadband slave terminal for communication with the other units in the dual antenna system, you must configure the terminal to be slave and give it a local IP address different from that of the master terminal.

Setting the terminal to be slave

Configure the slave terminal as follows:

1. Start the FleetBroadband terminal that is to be the **slave**.
2. Connect your computer to **LAN port 3 or 4** on the **slave** terminal.
3. To access the web interface of the terminal, open a browser and type the IP address of the slave terminal in the address bar (default: 192.168.0.1).
4. From the left navigation pane, select **ADMINISTRATION**.
5. Enter the administrator user name and password (default: user name: **admin** and default password: **1234**).
6. From the left navigation pane, select **Dual antenna**.
7. Select **Slave**.



The screenshot shows a configuration window titled "DUAL ANTENNA". It contains three radio button options: "Dual antenna" with sub-options "Disabled", "Master", and "Slave" (selected). Below this is a red warning message: "Changes to above setting requires reboot to take effect." The next section is "Antenna switchover" with "Automatic" (selected) and "Manual" options. The final section is "Active antenna" with "A" (selected) and "B" options. At the bottom are "Apply" and "Cancel" buttons.

8. Click **Apply**.
9. Restart the slave terminal.

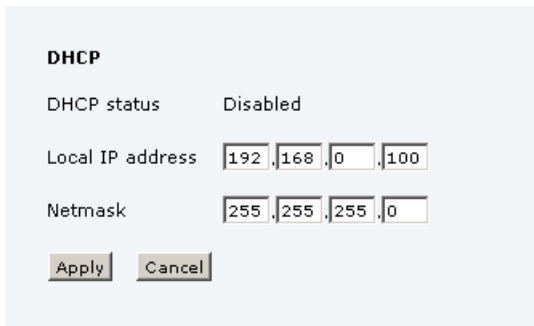
DHCP is now automatically disabled in the terminal. You can only enable it again by disabling the dual antenna function. For the terminal to work as a slave terminal, you still have to change the local IP address of the slave terminal, as described in the next section.

Changing the local IP address

Note A SIM card must be present in the slave terminal when setting the IP address. For details on how to insert the SIM card, see the SAILOR 500 FleetBroadband Installation manual [2]. You may temporarily use the SIM card from the master terminal.

1. Access the web interface of the slave terminal as described in the previous section.
2. From the left navigation pane, select **SETTINGS > LAN**.
3. At **Local IP address**, type in a new IP address different from the master, but in the same range (192.168.0.---), e.g. 192.168.0.100.

Note The IP address must be outside DHCP range (that is ≥ 100 in the last field).



The screenshot shows a configuration window titled "DHCP". It contains the following fields and values:

DHCP status	Disabled
Local IP address	192 . 168 . 0 . 100
Netmask	255 . 255 . 255 . 0

At the bottom of the window, there are two buttons: "Apply" and "Cancel".

4. Click **Apply**.

Note Next time you access the web interface of the slave terminal, you have to use the new IP address (192.168.0.100 in the example above)

Configuring the master terminal

Setting the terminal to be master

Note

The SIM card must be present in the master terminal.

For details on how to insert the SIM card, see the SAILOR 500 FleetBroadband Installation manual [2].

1. On the terminal that is to be master, connect your computer to **LAN port 3** or **4**.
2. Open a browser and type the IP address of the master terminal in the address bar to access the web interface of the terminal (default: 192.168.0.1).
3. From the left navigation pane, select **ADMINISTRATION**.
4. Enter the administrator user name and password (default: user name: **admin** and default password: **1234**)
5. Select **Dual antenna**.
6. Select **Master**.
7. Click **Apply**.
8. Restart the master terminal.

This FleetBroadband terminal is now ready to function as a master terminal in the dual antenna system.

Verifying the dual antenna function

Connect all units in the system as described in *Connecting cables* on page 31.

Note | If the DACU with the ship heading input is not connected or not functioning, the dual antenna function will not work properly.

1. Power the system.
2. Check the light indicators on the two FleetBroadband terminals. The Power and Antenna indicators must be green. The Terminal indicator must be green or flashing green. For details, see the SAILOR 500 FleetBroadband User manual [1].
3. If possible, check the light indicators on the DACU. They must both be green.

Note | The light indicators on the DACU are not visible when the DACU is installed in a rack.

Apart from the indicators, there are two methods for viewing status:

- Web interface
- Thrane IP Handset

These are described in the next sections.

Web interface

To verify that the system works as a dual antenna solution, do as follows:

1. On the **master** terminal, access the web interface and select **HELPDESK > Extended status**.

The screenshot displays the 'Extended status' page of the web interface. It is organized into several sections:

- ANTENNA**: Shows 'Antenna' as 'TT-3052C'.
- STATUS**: Shows 'IAI-2 status' as 'Registered'.
- Dual antenna**: Shows 'Dual antenna' as 'Master', 'Status' as 'Operational', 'Active antenna' as 'A', 'Antennas in blocking zone' as 'B', 'Elevation' as '25°', and 'Azimuth' as '30° relative to ships heading'.
- Ongoing data sessions**: Shows '(No active data sessions)'.
- Ongoing calls**: Shows '(No active calls)'.

At the bottom of the interface is a 'Refresh' button.

2. Under **Dual antenna** check that the **Status** field shows **Operational**.

Note | If Manual switchover is selected, the Status field shows Manual instead of Operational.

3. Under **Dual antenna** check that the **Dual antenna** field shows **Master**.

Thrane IP Handset

Only the master handset (Thrane IP Handset with number 0501) can be used to access the dual antenna status and settings.

For general information on the Thrane IP Handset, see the user manual [3].


Note

The IP handset can only show dual antenna status and settings if connected to a functional dual antenna solution.

To access dual antenna status

To access the dual antenna status from the IP handset, do as follows:

1. Connect your Thrane IP Handset (no. 0501) to LAN 3 or 4 on the master FleetBroadband terminal in the dual antenna solution.

The handset starts up automatically. When the handset is ready for use, the top right corner shows this symbol .

2. To access the menu system from the main screen, press the centre select key.
3. Select **BGAN**.
4. Select **Dual antenna**.

The screen shows status, such as:

- Automatic/Manual switchover
- Master/Slave
- Operational status of the dual antenna functionality, e.g. Operational, Manual B, Limited
- Antenna used (A or B)
- Blocking status for each antenna (blocked yes/no)

Selecting antenna switchover

By default, the system automatically switches antenna if the active antenna moves into a blocking zone. However, you can choose to manually select one of the antennas.

- The antenna connected to the master terminal is called **A**.
- The antenna connected to the slave terminal is called **B**.

To select the active antenna from the web interface

To select the antenna manually, do as follows:

1. In the web interface of the master terminal, select **ADMINISTRATION** and enter the user name and password.
2. Select **Dual antenna**.
3. At **Antenna switchover**, select **Manual**.

DUAL ANTENNA

Dual antenna Disabled Master Slave

Changes to above setting requires reboot to take effect.

Antenna switchover Automatic Manual

Active antenna A B

4. Select the antenna you want to be active.
You can also change this setting with the Thrane IP Handset. See the next section.
5. Click **Apply**.

The system will now only use the selected antenna. In the web interface under **HELPDESK > Extended status** you can check that the correct antenna is active.

To select the active antenna from the Thrane IP Handset

If Antenna switchover is set to Manual in the web interface, you can use the master Thrane IP Handset (no.0501) to change which antenna is to be active. Do as follows:

1. In the Thrane IP Handset no. 0501, select the **BGAN** menu.
2. Select **Antenna select**.
This setting is only available when Manual switchover is selected in the web interface.
3. Select **Edit**.
4. Select **A** or **B**.

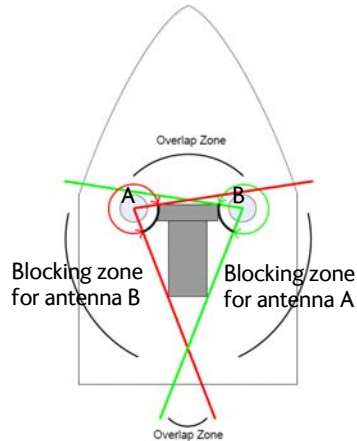
The system will now only use the selected antenna. In the IP Handset menu under **BGAN > Dual antenna** you can check that the correct antenna is active.

Configuring blocking zones

Overview

Blocking zones are sections in which the signal is blocked between the antenna and the satellite because of the ship's superstructure. These blocking zones must be configured in the two terminals, using the built-in web interface of each terminal.

The ship's visibility to a satellite is determined by the combination of blocking zones for the two antennas. Visibility affects the Quality of Service during the antenna switch.



The SAILOR 500 FleetBroadband Dual Antenna Solution can automatically switch to the other antenna if the active antenna moves into a blocking zone.

Important

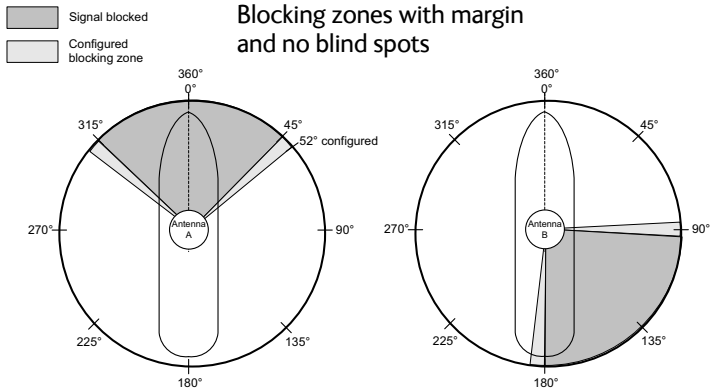
For the system to work properly, it is important that you identify and configure the blocking zones for the ship.

To define the blocking zones

If you define the blocking zones a bit larger than they actually are, the system will have time to detect the blocking zone and switch over to the other antenna before the signal is actually lost. On the other hand, if you add too much margin there is a risk that two blocking zones will cross each other, creating an imaginary blind spot where both antennas are configured to be blocked.

Margin for blocking zones

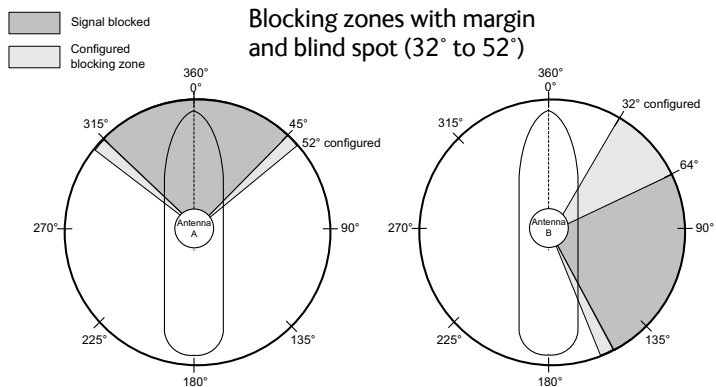
In the example below, extra margin is added to the blocking zones for the two antennas. When the Antenna A passes from free line of sight to e.g. the 52° limit configured in the system, the system switches to Antenna B before the actual blocking (at 45°) occurs.



Blind spots

Blind spots are areas where both antennas are in blocking, i.e. they have no line of sight to the satellite.

In the example below, the configured margin results in an imaginary blind spot where both antennas are configured to be in blocking.



When the active Antenna A enters the configured blocking zone at 52°, it will **not** switch over to Antenna B, because B is also configured to be in a blocking zone, though it actually has line of sight to the satellite.

Important | Always avoid blind spots if possible!

To configure blocking zones

You must configure both horizontal (Azimuth) and vertical (Elevation) blocking zones to cover the areas where the antenna signal is blocked.

You can define up to 5 blocking zones for each antenna. To configure the blocking zones, do as follows:

1. Enter the web interface of the **master** terminal.
2. Select **SETTINGS > Blocking zones**.

BLOCKING ZONES		
Active	Azimuth	Elevation
<input checked="" type="checkbox"/>	40° - 50°	0° - 45°
<input type="checkbox"/>	0° - 0°	0° - 0°
<input type="checkbox"/>	0° - 0°	0° - 0°
<input type="checkbox"/>	0° - 0°	0° - 0°
<input type="checkbox"/>	0° - 0°	0° - 0°

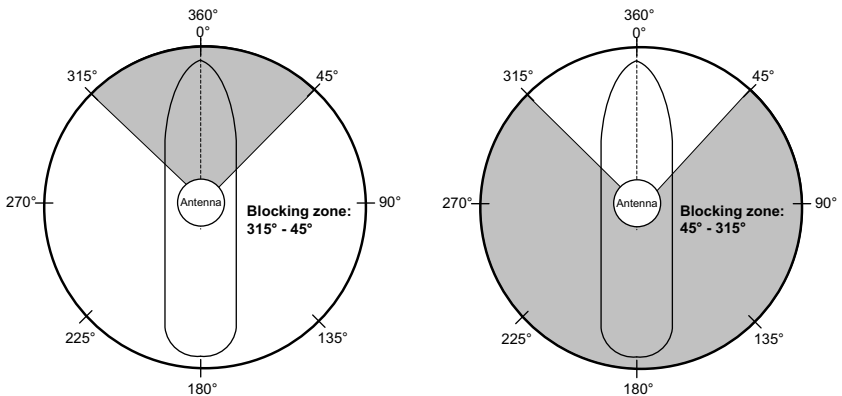
Diagram: A circular field of view with a central 'Antenna' label. A vertical oval-shaped blocking zone is centered on the antenna. Azimuth angles are marked around the circle: 0°, 45°, 90°, 135°, 180°, 225°, 270°, 315°, and 360°.

Note | These blocking zones are for the antenna connected to the terminal, i.e. if you are configuring the master terminal, the blocking zones are for the antenna connected to the master terminal (called antenna **A**).

3. Select **Active** to enable the blocking zone.
4. Under **Azimuth**, enter start and stop Azimuth value in degrees for the blocking zone (0 to 360 degrees).

Note | Configure the blocking zones a bit larger than they actually are, in order to ensure a smooth switchover with optimum coverage.

In the image below, the dark areas are the blocking zones.



5. Under **Elevation**, enter the start and stop Elevation angle for the blocking zone (0° to 90°).
6. If you have more than one blocking zone, repeat step 3 to step 5.
7. Click **Apply** when all blocking zones are configured.
8. Access the web interface of the **Slave** terminal and repeat the procedure from step 2.

When blocking zones are defined for both terminals, the zones are used by the master terminal to switch between the two antennas in order to keep the connection.

To see information on blind spots

When both terminals are configured and the system is operational, the master terminal can show whether or not there are configured blind spots (areas where both antennas are configured to be blocked).

To check for blind spots, access the web interface of the **master** terminal and select **Blocking zones**. The bottom of the Blocking zones page shows whether or not there are configured blind spots.

Note The information is not automatically updated on the **Blocking zones** page. To refresh the information, press **F5** or click **Apply**.

BLOCKING ZONES

Active	Azimuth	Elevation
<input checked="" type="checkbox"/>	40° - 60°	0° - 45°
<input type="checkbox"/>	0° - 0°	0° - 0°
<input type="checkbox"/>	0° - 0°	0° - 0°
<input type="checkbox"/>	0° - 0°	0° - 0°
<input type="checkbox"/>	0° - 0°	0° - 0°

Apply Cancel

360°
0°
315° 45°
270° 90°
225° 135°
180°
Antenna

Blind spots No

If you have blind spots, check your blocking zone configuration in both terminals to see if you have configured the blocking zones correctly.

Connecting cables

This chapter provides a description of the connectors on the Dual Antenna Control Unit and gives guidelines to cabling of the SAILOR 500 FleetBroadband Dual Antenna Solution. It has the following sections:

- *Connecting the SAILOR 500 FleetBroadband Dual Antenna Solution*
- *DACU Connector overview*
- *Power (X2)*
- *NMEA0183 input (X3)*
- *LAN interface (X6)*
- *Grounding the Dual Antenna Control Unit*
- *Cable requirements*

Connecting the SAILOR 500 FleetBroadband Dual Antenna Solution

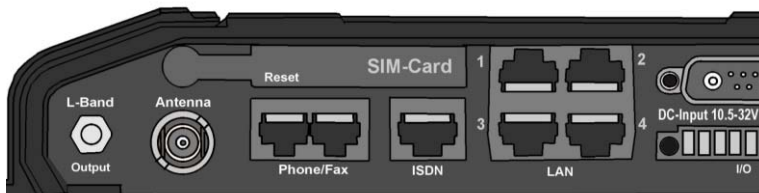
Important Do not connect the units to each other before the two FleetBroadband terminals are configured as master and slave.

After configuring the two FleetBroadband terminals, connect the system units as follows:

1. Connect the two FleetBroadband systems according to the SAILOR 500/250 Fleetbroadband installation manual [2].
2. Connect two Ethernet cables between the two FleetBroadband terminals as follows:

Master terminal		Slave terminal	Signals
LAN 1	connects to	LAN 1	High-priority, time critical traffic (Forward frames and return bursts)
LAN 2	connects to	LAN 2	Lower priority signalling and ship heading information

The picture below shows the location of the LAN connectors in the connector panel of a SAILOR 500 FleetBroadband terminal.



LAN interface

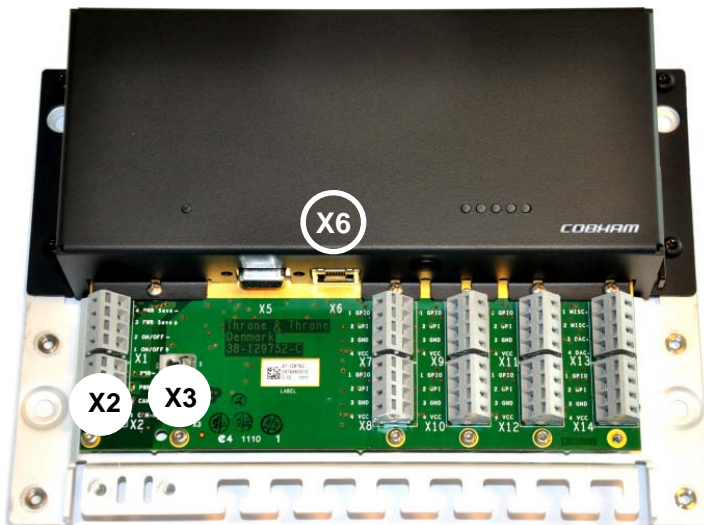
3. Connect the NMEA 0183 input (X3) on the Dual Antenna Control Unit to the ship's NMEA0183 Ship Heading True output. See *NMEA0183 input (X3)* on page 36.
4. Connect an Ethernet cable between the Ethernet connector on the DACU (X6) and LAN 3 or LAN 4 on one of the FleetBroadband terminals. We recommend connecting to the slave terminal. See *LAN interface (X6)* on page 39.
5. Connect Ship power (12 - 24 VDC) to the Power input on the DACU. See *Power (X2)* on page 35.
6. When all units in the system are connected, verify the function of the system as described in *Verifying the dual antenna function* on page 21.

DACU Connector overview

The drawing below shows the connectors on the Dual Antenna Control Unit.

X6 is a standard Ethernet connector (RJ-45), X2 and X3 are spring-loaded terminals.

Note Only X2, X3 and X6 are used.

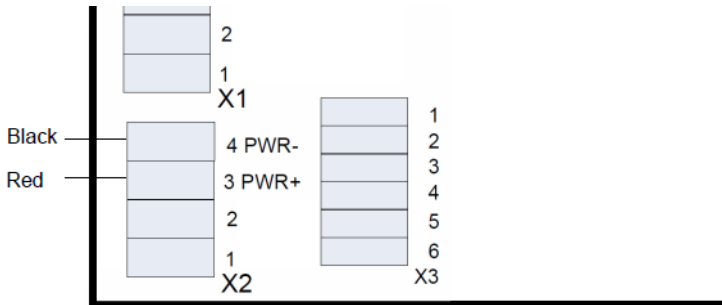


Power (X2)

X2 is used for connecting power (12-24 VDC) to the DACU.

For specifications for the power input, see *Specifications* on page 51.

Refer to the drawing and pinout table below for location and pin-out.



The table below shows the pin assignment of X2.

Pin no.	Pin function on X2
1	Do not connect
2	Do not connect
3	PWR+
4	PWR-

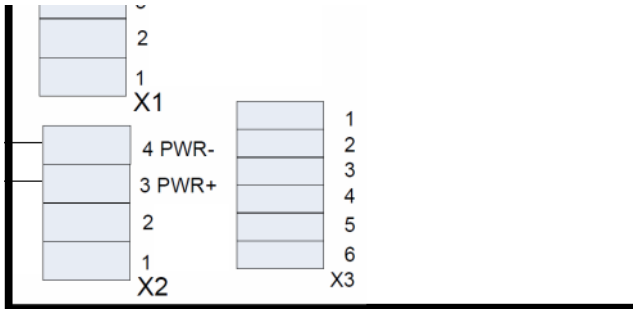
NMEA0183 input (X3)

Overview

There is one NMEA0183 input on the DACU. This input is used to connect the NMEA0183 ship heading true (HDT) information from the ship to the DACU. The baud rate must be **4800 Bd**.

For specifications on the NMEA0183 interface, see *NMEA input* on page 51.

X3 is located next to X2 (Power) on the DACU as shown below.



Connect your cable with the NMEA0183 ship heading true information to X3 according to the pin-out in the next section.

Note

You can use a **differential** connection (recommended) or a **single-ended** connection. The connections for each type are listed in the next sections, *Differential connection*, and *Single-ended connection*.

Pin-out

The table below shows the pin assignment of X3.

Pin no.	Pin function on X3
1	NMEA0183+
2	NMEA0183-
3	Field Signal GND
4	Do not connect
5	Do not connect
6	Digital GND

Differential connection

For a differential connection, connect your cable as follows:

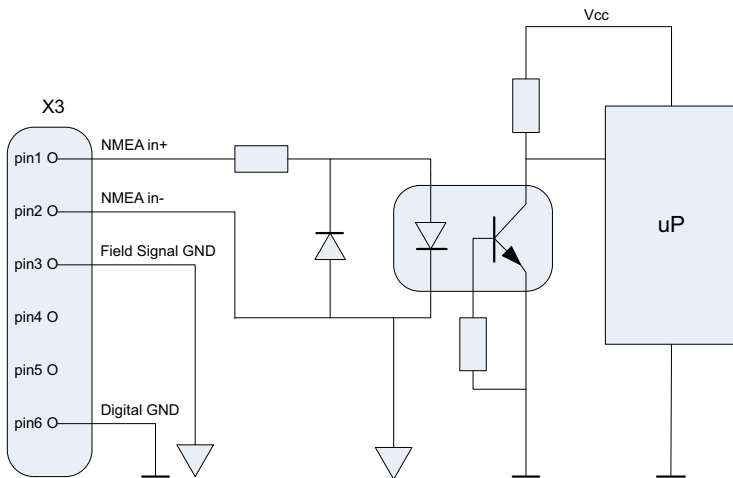
Pin no.	Pin function on X3	Differential connection
1	NMEA0183+	NMEA0183+
2	NMEA0183-	NMEA0183-
3	Field Signal GND	Field Signal GND
4	Do not connect	Do not connect
5	Do not connect	Do not connect
6	Digital GND	Do not connect

Single-ended connection

For a single-ended connection, connect your cable as follows:

Pin no.	Pin function on X3	Single-ended connection
1	NMEA0183+	NMEA0183+
2	NMEA0183-	Do not connect
3	Field Signal GND	GND, also connect pin 3 to pin 6
4	Do not connect	Do not connect
5	Do not connect	Do not connect
6	Digital GND	Connect to pin 3

The figure below shows the NMEA0183 interface in the DACU.



LAN interface (X6)

Overview

There is one Ethernet (10/100 MB) connector on the Dual Antenna Control Unit. This interface is used to connect the DACU to one of the FleetBroadband terminals in the dual antenna solution. We recommend connecting to the slave unit, in order to reserve the free LAN connectors for user interfaces on the master unit.

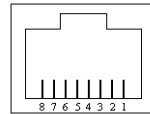
Connect a LAN cable between X6 on the DACU and LAN port 3 or 4 on the FleetBroadband terminal.

Pin-out

The figure and table below show the connector outline and pin assignments.

Pin number	Pin function
1	Rx+
2	Rx-
3	Tx+
4	Not connected
5	Not connected
6	Tx-
7	Not connected
8	Not connected

RJ-45 female



Grounding the Dual Antenna Control Unit

The base plate of the Dual Antenna Control Unit must be connected to ship ground in one of two ways:

- Mount the Dual Antenna Control Unit on a conducting surface connected to ship ground, or
- connect a ground wire between ship ground and the cable relief shown in the picture below.



Cable requirements

The following requirements apply to the cables used with the Dual Antenna Control Unit. Before using the Dual Antenna Control Unit for the first time, check that all cables are correctly wired and fastened.

Cable	Requirements
Ethernet	Category 5e or higher, shielded, max. length 100 m.
Power	2 leads, each with a cross-sectional area of 0.5 to 2.0 mm ² .
NMEA0183	2-wire screened cable

Service

This chapter has the following sections:

- *Updating software*
- *Status signalling*
- *Returning units for repair*
- *Repacking for shipment*
- *Part numbers*

Updating software

SAILOR 500 FleetBroadband terminals

The software for the SAILOR 500 FleetBroadband terminals can be updated using the ThraneLINK Management Application (TMA) described below, or using the built-in web interface of the terminals. See the user manual for the SAILOR 500 FleetBroadband terminals [1] for details.

SAILOR FleetBroadband Dual Antenna Control Unit

The software for the DACU can be updated using the ThraneLINK Management Application as described below.

Required tools and files

Before you can update the software for the Dual Antenna Control Unit you must get a download tool and the new software for the Dual Antenna Control Unit.

Do as follows:

1. Download the TMA from the Cobham eSupport web site (Self-Service Center, SSC. You find the SSC in the Service and Support section, 24-7 Service).
2. Install the ThraneLINK Management Application (TMA) on your PC.
3. Locate the new software image for the Dual Antenna Control Unit (.tiif file).
4. Download the .tiif file to a USB memory stick or to a folder on your PC.

Updating the Dual Antenna Control Unit software

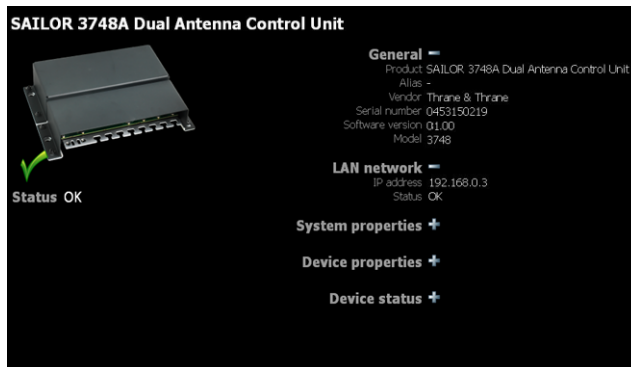
To update the Dual Antenna Control Unit software, do as follows:

1. Start the TMA.

- The TMA searches for units connected to the local network. All units found are shown on the screen.



- Click on the image of the Dual Antenna Control Unit to select it and to check the current software version. If there are more than one Dual Antenna Control Unit you can recognize your unit by the serial number.

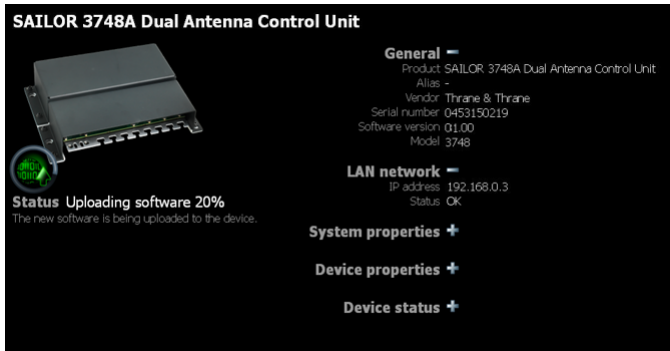


- Have the new software ready on the PC, for example on a USB memory stick. The TMA will automatically find the new software. If new software is available you can see a yellow circular image on the start screen and on the Dual Antenna Control Unit page at the bottom, where the icon for software update flashes.



- Click the icon **Software update**.

6. Click the button **Update** and wait for the update procedure to finish.



The software is now updated and the Dual Antenna Control Unit automatically restarts with the new software. You can use the ThraneLINK Management Application at any time to check the software version.

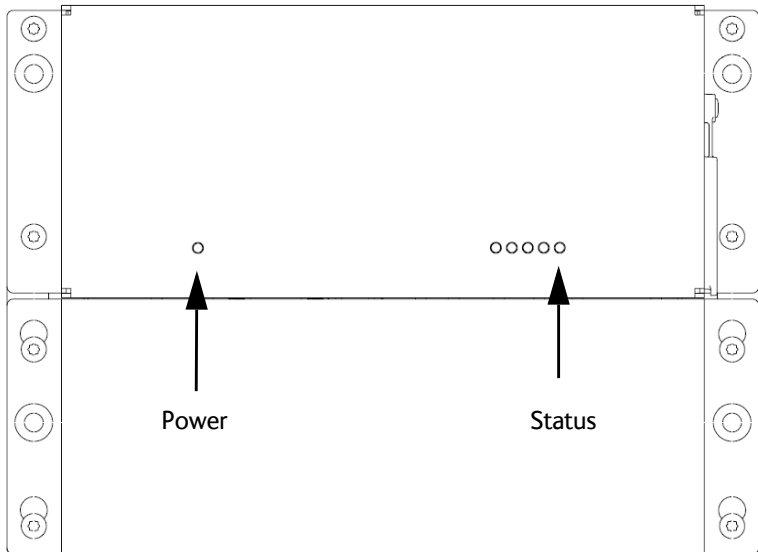
Status signalling

Light indicators

The Dual Antenna Control Unit has two light indicators for signalling status and errors/warnings.

Note

The indicators are not visible in the rack version.



The following sections show the function of each light indicator.

Light indicator functions

Power indicator

Behaviour	Meaning
Steady green	Dual Antenna Control Unit is on.
Off	Dual Antenna Control Unit is off.

Status indicator

Behaviour	Meaning
Steady green	Dual Antenna Control Unit is OK.
Steady red	Critical error.
Off	Dual Antenna Control Unit is off

Should the system fail, you may see a warning message in the web interface in the FleetBroadband terminals.

Returning 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 cobham.com/satcom where you also find the Cobham SATCOM Self Service Center web-portal, which may help you solving 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.

Repacking for shipment

The shipping carton has been carefully designed to protect the Dual Antenna Control Unit and its accessories during shipment. This carton and its associated packing material should be used when repacking for shipment. Attach a tag indicating the type of service required, return address, model number and full serial number. Mark the carton FRAGILE to ensure careful handling.

Note

Correct shipment is the customer's own responsibility.

Part numbers

SAILOR FleetBroadband Dual Antenna Control Unit

The SAILOR FleetBroadband Dual Antenna Control Unit is available as is or installed in a cabinet for rack mounting.

Item	Part number
SAILOR FleetBroadband Dual Antenna Control Unit	403748A-00500
SAILOR FleetBroadband Dual Antenna Control Unit in 19" Rack	403748A-00510

SAILOR 500 FleetBroadband system

For information on the SAILOR 500 FleetBroadband system, see the user manual for the SAILOR 500 FleetBroadband system [1].

Note

You need two SAILOR 500 FleetBroadband systems in the SAILOR 500 FleetBroadband Dual Antenna Solution.

The SAILOR 500 FleetBroadband system consists of the following units:

Item	Part number
SAILOR 500 FleetBroadband antenna	403052C
SAILOR FleetBroadband terminal or SAILOR FleetBroadband 19" Rack Terminal	403738A or 403738A-T19
Thrane IP Handset, Wired	403672A
Thrane IP Cradle, Wired	403674A

Specifications

This appendix only contains the specifications for the SAILOR FleetBroadband Dual Antenna Control Unit. For specifications for the SAILOR 500 FleetBroadband system, see the installation manual for the SAILOR 500/250 FleetBroadband system [2].

General specifications for the DACU

Item	Specifications
Power	10.5 to 32 VDC (nom. 12-24 VDC)
Power consumption	Typical 1 W, Maximum 3 W Standby power < 10 mW
Interfaces	Ethernet (10/100 Mbit), RJ45 connector (X6) Power for the Dual Antenna Control Unit, spring-loaded terminals (X2) NMEA0183 Ship Heading True (HDT) input from ship navigation system, spring loaded terminals (X3)
NMEA input	Impedance: 600 Ohm Max. 2 mA at min. level of 2 V Baud rate: 4800 Bd.
IP protection class	IP2X
Ambient temperature	-25°C to 55°C operating -40°C to 80°C storage.

Appendix A: Specifications

Item	Specifications
Compass safe distance	20 cm
Dimensions Stand-alone DACU	239 mm x 174 mm x 52 mm (9.4" x 6.9" x 2")
In 19" Rack cabinet (2U)	483 mm x 388 mm x 88 mm (19" x 15.3" x 3.5"), including cable relief
Weight	0.8 kg

D

DACU Dual Antenna Control Unit.

H

HDT Actual vessel Heading in Degrees True.

I

IMSO International Mobile Satellite Organisation. An intergovernmental organisation that oversees certain public satellite safety and security communication services provided via the Inmarsat satellites.

IP

Ingress Protection. An international classification system for the sealing effectiveness of enclosures of electrical equipment against the intrusion into the equipment of foreign bodies (i.e. tools, dust, fingers) and moisture. This classification system uses the letters "IP" followed by two or three digits. An "x" is used for one of the digits if there is only one class of protection; e.g. IPX4 which addresses moisture resistance only.

IP

Internet Protocol. The method or protocol by which data is sent from one computer to another on the Internet.

L**LAN**

Local Area Network. A computer network covering a limited 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.

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