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. Thrane & Thrane A/S 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 below.

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 www.cobham.com/communications-and-connectivity/satcom under Service and Support.

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Title and description</th>
<th>Document number</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1]</td>
<td>SAILOR 500/250 FleetBroadband, User manual</td>
<td>98-125645</td>
</tr>
</tbody>
</table>
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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.
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)
- An 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:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Minimum software version</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAILOR 500 FleetBroadband terminal</td>
<td>1.18 Master and slave must have the same version.</td>
</tr>
<tr>
<td>IP Handset (master handset, no. 0501)</td>
<td>1.16</td>
</tr>
<tr>
<td>IP Handset (other local numbers)</td>
<td>Any version</td>
</tr>
</tbody>
</table>

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.

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

Important Early versions of the FleetBroadband antennas will not work with the dual antenna solution. Check the serial number label on your antennas for the information below.

The following antennas can be used with the dual antenna solution:

P/N 403052C-THR-001 or 403052C-NEU-001, all revisions.

P/N 403052C: Antennas with
- minimum Rev. B.03 and
- minimum S/N 80519208

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.
IP Handset

Functions of the IP Handset

In addition to the general functions of the 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 Check with IP Handset on page 22. See also 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:

- To unpack the Dual Antenna Control Unit
- What’s in the delivery
- To install the Dual Antenna Control Unit
- Outline drawing, DACU
- Outline drawing, cabinet for rack mount
- To install 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].

To unpack 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.
To install 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 49.
To mount 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

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 To ground 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.
Chapter 2: Installation

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.
Chapter 2: Installation

Top and side view

Dimensions are in mm.
To install 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

Minimum antenna version

Important Early versions of the FleetBroadband antennas will not work with the dual antenna solution. Check the serial number label on your antennas for the information below.

The following antennas can be used with the dual antenna solution:

P/N 403052C-THR-001 or 403052C-NEU-001, all revisions.

P/N 403052C: Antennas with

- minimum Rev. B.03 and
- minimum S/N 80519208
Chapter 2: Installation

Antenna installation guidelines

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.
Chapter 3

Configuration

To configure 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:

- To configure the slave terminal
- To configure the master terminal
- To configure 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.

To configure 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.

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**.

8. 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 $\geq 100$ in the last field).

9. Click **Apply**.

10. Restart the slave terminal.

    DHCP is now automatically disabled in the terminal. You can only enable it again by disabling the dual antenna function.

    **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)
To configure the master terminal

To set the terminal to be master

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.
To check the dual antenna function

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

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

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
- IP Handset

These are described in the next sections.
Check with 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`.

   ![Antenna Configuration](image)

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

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**.

To check the dual antenna function
Chapter 3: Configuration

Check with IP Handset

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

For general information on the 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 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 center 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)
To select 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](image)

4. Select the antenna you want to be active.
   You can also change this setting with the 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 IP Handset

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

1. In the 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.
To configure 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.
Chapter 3: Configuration

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 Configuration Interface](image-url)
Chapter 3: Configuration

To configure blocking zones

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**.

If you have blind spots, check your blocking zone configuration in both terminals to see if you have configured the blocking zones correctly.
Chapter 3: Configuration

To configure blocking zones
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:

- To connect the SAILOR 500 FleetBroadband Dual Antenna Solution
- DACU Connector overview
- Power (X2)
- NMEA0183 input (X3)
- LAN interface (X6)
- To ground the Dual Antenna Control Unit
- Cable requirements
To connect 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:

<table>
<thead>
<tr>
<th>Master terminal</th>
<th>Slave terminal</th>
<th>Signals</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAN 1 connects to LAN 1</td>
<td>High-priority, time critical traffic (Forward frames and return bursts)</td>
<td></td>
</tr>
<tr>
<td>LAN 2 connects to LAN 2</td>
<td>Lower priority signalling and ship heading information</td>
<td></td>
</tr>
</tbody>
</table>

The picture below shows the location of the LAN connectors in the connector panel of a SAILOR 500 FleetBroadband terminal.
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 To check the dual antenna function on page 20.
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.
Chapter 4: Connecting cables

Power (X2)

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

For specifications for the power input, see Specifications on page 49.

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

The table below shows the pin assignment of X2.

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Pin function on X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do not connect</td>
</tr>
<tr>
<td>2</td>
<td>Do not connect</td>
</tr>
<tr>
<td>3</td>
<td>PWR+</td>
</tr>
<tr>
<td>4</td>
<td>PWR-</td>
</tr>
</tbody>
</table>

[Diagram of X2 pinout]
Chapter 4: Connecting cables

NMEA0183 input (X3)

Overview

There is one NMEA0183/IEC 61162-1 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 49.

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*. 
Chapter 4: Connecting cables

Pin-out

The table below shows the pin assignment of X3.

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Pin function on X3</th>
<th>Differential connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NMEA0183- (A)</td>
<td>NMEA0183- (A)</td>
</tr>
<tr>
<td>2</td>
<td>NMEA0183+ (B)</td>
<td>NMEA0183+ (B)</td>
</tr>
<tr>
<td>3</td>
<td>Field Signal GND (C)</td>
<td>GND (C)</td>
</tr>
<tr>
<td>4</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>5</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>6</td>
<td>Digital GND</td>
<td>Do not connect</td>
</tr>
</tbody>
</table>
Chapter 4: Connecting cables

Single-ended connection

Note This connection type is not recommended, use only in installations with short cabling.

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

<table>
<thead>
<tr>
<th>Pin no.</th>
<th>Pin function on X3</th>
<th>Single-ended connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NMEA0183- (A)</td>
<td>NMEA0183- (A)</td>
</tr>
<tr>
<td>2</td>
<td>NMEA0183+ (B)</td>
<td>GND (Connect to Pin 3)</td>
</tr>
<tr>
<td>3</td>
<td>Field Signal GND (C)</td>
<td>GND (C) (Connect to Pin 2)</td>
</tr>
<tr>
<td>4</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>5</td>
<td>Do not connect</td>
<td>Do not connect</td>
</tr>
<tr>
<td>6</td>
<td>Digital GND</td>
<td>Do not connect</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Pin number</th>
<th>Pin function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rx+</td>
</tr>
<tr>
<td>2</td>
<td>Rx-</td>
</tr>
<tr>
<td>3</td>
<td>Tx+</td>
</tr>
<tr>
<td>4</td>
<td>Not connected</td>
</tr>
<tr>
<td>5</td>
<td>Not connected</td>
</tr>
<tr>
<td>6</td>
<td>Tx-</td>
</tr>
<tr>
<td>7</td>
<td>Not connected</td>
</tr>
<tr>
<td>8</td>
<td>Not connected</td>
</tr>
</tbody>
</table>
To ground 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.

<table>
<thead>
<tr>
<th>Cable</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet</td>
<td>Category 5e or higher, shielded, max. length 100 m.</td>
</tr>
<tr>
<td>Power</td>
<td>2 leads, each with a cross-sectional area of 0.5 to 2.0 mm².</td>
</tr>
<tr>
<td>NMEA0183</td>
<td>2-wire screened cable</td>
</tr>
</tbody>
</table>
Service

This chapter has the following sections:

- To update software
- Status signalling
- To return units for repair
- To repack for shipment
- Part numbers

To update 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

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 SATCOM 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.

**To update the Dual Antenna Control Unit software**

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

1. Start the TMA.

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

3. 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.

4. Have the new software ready on the PC, for example on an 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.

5. 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.
Chapter 5: Service

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.
Chapter 5: Service

Light indicator functions

Power indicator

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady green</td>
<td>Dual Antenna Control Unit is on.</td>
</tr>
<tr>
<td>Off</td>
<td>Dual Antenna Control Unit is off.</td>
</tr>
</tbody>
</table>

Status indicator

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steady green</td>
<td>Dual Antenna Control Unit is OK.</td>
</tr>
<tr>
<td>Steady red</td>
<td>Critical error.</td>
</tr>
<tr>
<td>Off</td>
<td>Dual Antenna Control Unit is off.</td>
</tr>
</tbody>
</table>

Should the system fail, you may see a warning message in the web interface in the FleetBroadband terminals.
Chapter 5: Service

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/communications-and-connectivity/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.

To repack 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 (DACU) is available as is or installed in a cabinet for rack mounting.

<table>
<thead>
<tr>
<th>Item</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAILOR 500 FleetBroadband DACU</td>
<td>403748A-00500</td>
</tr>
<tr>
<td>SAILOR 500 FleetBroadband DACU in 19&quot; Rack</td>
<td>403748A-00510</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Item</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAILOR 500 FleetBroadband antenna</td>
<td>403052C</td>
</tr>
<tr>
<td>SAILOR FleetBroadband terminal or SAILOR FleetBroadband 19&quot; Rack Terminal</td>
<td>403738A or 403738A-T19</td>
</tr>
<tr>
<td>IP Handset, Wired</td>
<td>403672A</td>
</tr>
<tr>
<td>IP Cradle, Wired</td>
<td>403674A</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power</td>
<td>10.5 to 32 VDC (nom. 12-24 VDC)</td>
</tr>
<tr>
<td>Power consumption</td>
<td>Typical 1 W, Maximum 3 W</td>
</tr>
<tr>
<td></td>
<td>Standby power &lt; 10 mW</td>
</tr>
<tr>
<td>Interfaces</td>
<td>Ethernet (10/100 Mbit), RJ45 connector (X6)</td>
</tr>
<tr>
<td></td>
<td>Power for the Dual Antenna Control Unit, spring-loaded terminals (X2)</td>
</tr>
<tr>
<td></td>
<td>NMEA0183 Ship Heading True (HDT) input from ship navigation system, spring loaded terminals (X3)</td>
</tr>
<tr>
<td>NMEA input</td>
<td>NMEA input impedance: 600 Ohm</td>
</tr>
<tr>
<td></td>
<td>IEC 61162-1</td>
</tr>
<tr>
<td></td>
<td>Max. 2 mA at min. level of 2 V</td>
</tr>
<tr>
<td></td>
<td>Baud rate: 4800 Bd.</td>
</tr>
<tr>
<td>IP protection class</td>
<td>IP2X</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25°C to 55°C operating -40°C to 80°C storage.</td>
</tr>
</tbody>
</table>
### Appendix A: Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compass safe distance</td>
<td>20 cm</td>
</tr>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td>Stand-alone DACU</td>
<td>239 mm x 174 mm x 52 mm (9.4” x 6.9” x 2”)</td>
</tr>
<tr>
<td>In 19” Rack cabinet (2U)</td>
<td>483 mm x 388 mm x 88 mm (19” x 15.3” x 3.5”), including cable relief</td>
</tr>
<tr>
<td>Weight</td>
<td>0.8 kg</td>
</tr>
</tbody>
</table>
DACU  Dual Antenna Control Unit.

HDT  Actual vessel Heading in Degrees True.

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.

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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