SAILOR
KDU1805
Operator’s Manual
Introduction

Congratulations on your new Automatic Identification System control unit, fulfilling the highest international standards for vessel traffic services, ship-to-ship identification and safety procedures.

SAILOR® marine equipment is specially designed for the extremely rugged conditions on board a ship, based on more than 50 years' experience with all kinds of boats, from small pleasure crafts, over fishing boats working under all climatic conditions, to the largest vessels.

SAILOR® is one of Europe’s leading manufacturers of maritime equipment – a position which has been maintained by means of constant and extensive product development. We have a worldwide network of dealers with general agencies in more than 80 countries. All our dealers are specially trained to service all your SAILOR® products.

Abbreviations Used in this Manual

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACK</td>
<td>Acknowledge</td>
</tr>
<tr>
<td>AIMS</td>
<td>Automatic Identification and Data Management System</td>
</tr>
<tr>
<td>AIS</td>
<td>Automatic Identification System</td>
</tr>
<tr>
<td>AMDT</td>
<td>AIS Mobile Data Terminal</td>
</tr>
<tr>
<td>CH</td>
<td>Channel</td>
</tr>
<tr>
<td>COG</td>
<td>Course over Ground</td>
</tr>
<tr>
<td>CONFIG</td>
<td>Configuration</td>
</tr>
<tr>
<td>EPFS</td>
<td>Electronic Positional Fixing System</td>
</tr>
<tr>
<td>HDG</td>
<td>Heading in Degrees Relative to True North (0-359 degree)</td>
</tr>
<tr>
<td>IMO</td>
<td>International Maritime Organization</td>
</tr>
<tr>
<td>KDU</td>
<td>Keyboard and Display Unit</td>
</tr>
<tr>
<td>MDS</td>
<td>Marine Data Systems</td>
</tr>
<tr>
<td>MMSI</td>
<td>Maritime Mobile Service Identity</td>
</tr>
<tr>
<td>MSG</td>
<td>Message</td>
</tr>
<tr>
<td>NACK</td>
<td>Negative Acknowledgement</td>
</tr>
<tr>
<td>PA</td>
<td>Positional Accuracy</td>
</tr>
<tr>
<td>PC</td>
<td>Personal Computer</td>
</tr>
<tr>
<td>PWR</td>
<td>Power</td>
</tr>
<tr>
<td>RAIM</td>
<td>Receiver autonomous integrity monitoring of the Electronic Positional Fixing System (EPFS) device</td>
</tr>
<tr>
<td>ROT</td>
<td>Rate of Turn</td>
</tr>
<tr>
<td>Rx</td>
<td>Receive</td>
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<tr>
<td>SOG</td>
<td>Speed over Ground</td>
</tr>
<tr>
<td>SSD</td>
<td>Ship's Static Data</td>
</tr>
<tr>
<td>Tx</td>
<td>Transmit</td>
</tr>
<tr>
<td>VDL</td>
<td>VHF Data Link</td>
</tr>
<tr>
<td>VDM</td>
<td>VHF Data message</td>
</tr>
<tr>
<td>VSD</td>
<td>Voyage Static Data</td>
</tr>
<tr>
<td>VSL</td>
<td>Vessel</td>
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</table>
What is what?

1. LCD Display.
2. Soft Buttons: The function of each key is described in its respective line at the right edge of the display screen.
3. Function Button: View Data. Press button to go to View Data screen.
6. Function Button: Acknowledgement. Press button to acknowledge alarms. (See section Description of Alarms for a description of the different alarms.)
7. Scroll Knob. Used to scroll between different options or settings.
8. ON / OFF Button: Press button once to switch on. Press and hold button down for 5 seconds, and then release to switch off.
9. Keypad Buttons: with the keypad buttons alphanumerical characters can be written on the screen.
10. LED’s: Indicator lamps:
    - AIS LED illuminates when the KDU receives regular messages from the AIS.
    - MSG LED illuminates when there have been messages received that have not yet been read.
    - ALARM LED illuminates when alarms are present that have not yet been acknowledged.
About this Manual

This manual is for the daily user of the system. **We highly recommend you to read the manual before you start using the equipment.**

Notice: There may be some minor differences in the graphic layout of the manual compared to the physical device.

Please note

Any responsibility or liability for loss or damage in connection with the use of this product and the accompanying documentation is disclaimed. The information in this manual is furnished for informational use only, is subject to change without notice, may contain errors or inaccuracies, and represents no commitment whatsoever.

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Using the KDU Keypad

**The On/Off Key**

The On/Off Key shall be used to switch the system on and off:

To switch the system on, press the On/Off Key once.

To switch the system off, press and hold the On/Off Key in for five seconds, and then release the key. The system will switch off.

Momentarily pressing the On/Off key places the KDU in Standby Mode. The KDU will have the ability to receive and transmit messages on the data link between the transponder and KDU whilst in standby mode. This includes the KDU present message that indicates whether Data Terminal Equipment (DTE) is connected to the transponder. The transponder will report on air that Data Terminal Equipment is connected when the KDU is On or in Standby Mode.

**Shift Key**

The Shift key is used to access functions on the alphanumeric keypad that are written at the top of a key. For instance, to use the DIM function, press and hold the Shift key, and then press the alphanumeric key 7.

```
+ + DIM
```

**Using the Alphanumeric Keypad**

To display an alphanumeric character do the following:

- Pressing a key once shall display the alphanumeric value on the key.
- Pressing the key a second time, within two seconds of the last press, shall display the first alphabetical value of the key.
- Pressing the key a third time, within two seconds of the last press, shall display the second alphabetical value of the key.
- Pressing the key a fourth time, within two seconds of the last press, shall display the third alphabetical value of the key.
- Pressing the key a fifth time, within two seconds of the last press, shall display the numeric value on the key and so on.
- When the key is not pressed again for a period of two seconds the cursor will move to the next position.

For example, to display “11”, do the following:

Press the alphanumeric key ‘1’ four times, wait approximately two seconds, then press the alphanumeric key ‘1’ again four times.
Operating the KDU

Press the ON/OFF button once on the KDU to switch the system on.

The screen that will be displayed might not have any vessels listed immediately, but as soon as the system receives info from a vessel, it will appear on the screen (as shown below.)

1. Range and Bearing: It shall be possible to view the range or true bearing via the Vessels screen.

2. Vessels Name: Names of vessels received by the KDU shall be displayed.

3. Soft Buttons:
   - VESSELS soft button: used to navigate to the Vessels screen.
   - SSD/VSD soft button: used to navigate to the Ship Static Data / Voyage Ship Data screens.
   - CONFIG soft button: used to navigate to the Configuration screen.
   STATUS: used to navigate to the Status Log screen (Alarm and Text messages).

4. Speaker: indicates that the buzzer is turned on, a cross over the speaker will indicate that the speaker is muted.

5. Msg, LR Man, LR Auto: (information received from other vessels)
   - Msg: indicates numbers of safety / text telegram messages that been received.
   - LR Man: indicates number of Long Range (LR) Interrogations that need response from the user.
   - LR Auto: indicates number of automatically replied Long Range (LR) interrogations.

6. ALR, TXT:
   - ALR: indicates the number of unacknowledged and acknowledged alarms in the system.
   - TXT: indicates the number of text messages in the system. The View Data Screen is the Main Screen of the keyboard and display unit. The View Data screen displays the
3 highest priority vessels (determined by the range and true bearing selection) that the AIS is currently receiving. The View Data Screen in addition displays the current position of the vessel as well as the positional source. The number of alarms and warnings received by the AIS is indicated alongside the “ALR, TXT:” indication. The number of safety/text telegrams, messages, long range manual and long range automatic messages received are indicated alongside the “Msg, LR Man, LR Auto:” indication. The speaker graphic indicates that the buzzer of the KDU is not muted. A cross through the speaker indicates that the speaker has been muted.

7. Positional Source: shall indicate the positional source of the own vessel.
   - Ext. GNSS: Global Navigational Satellite System.
   - Int. GNSS: Global Navigational Satellite System.
   - Ext. EPFS: Electronic Position Fixing System.
   - No Sensor: No valid sensor position.

Viewing the Vessels Screen
The vessels screen can be viewed by pressing the “VESSELS” (first) soft button of the VIEW DATA screen.

In the VESSELS screen a ship’s range, true bearing and MMSI can be viewed. A specific vessel can be selected by using the scroll knob, and will be indicated by inversed text. As shown above the first vessel is white on black, indicating the selected vessel, while the other vessels listed are black on white.

Vessels that have not been received for 6 minutes shall be marked as a lost target on the display (lost next to bearing).

An exclamation sign (!) before the MMSI shall indicate that the vessel has no sensor position information available. The vessel’s position is thus either being entered manually or calculated by dead reckoning.

The Scroll Knob can be used to scroll through the listed vessels, and to select a specific vessel.
By pressing the “VIEW DETAIL” soft button the selected vessel’s detail can be viewed.

ROT: rate of turn in degrees per minute (positive is clockwise, negative is counter clockwise)
SOG: speed over ground in knots
COG: course over ground in degrees relative to True North (0-359 degrees)
HDG: heading in degrees relative to True North (0-359 degrees)
NAV STAT: navigation status – can be one of the following:
- Underway using engine
- At anchor
- Not under command
- Restricted manoeuvrability
- Constraint by draught
- Moored
- Aground
- Fishing
- Under way sailing
- Not defined

POSITION: present position of vessel
KDU: present or not
PA: Positional accuracy
RAIM: Receiver autonomous integrity monitoring of the Electronic Positional Fixing System (EPFS) device
SHIP TYPE: i.e. 30 = Fishing vessel, 60 = Passenger ship (see table on page 12).

By pressing the “BACK” soft, it shall be possible to return to the previous screen.

By pressing the “OWN INFO” soft button the ships own detail can be viewed.
By pressing the “BACK” soft, it shall be possible to return to the previous screen.

The KDU can display the following types of vessels. The type of vessel is indicated by the call sign:

- SAR: Search and Rescue Aircraft
- BASE: Base station
- B-STD: Standard Class B
- B-EXT: Extended Class B
- A-T-N: Aids to Navigation
- Other Class A
In the VESSELS screen a ship’s range and true bearing will be viewed as "--- ---", if the information received was invalid.

Positional Source of "NO SENSOR" indicates that there was no sensor source available.
Viewing the SSD/VSD Screen

The SHIP’S STATIC DATA (SSD) and the VOYAGE SHIP DATA (VSD) screen can be viewed by pressing the “SSD/VSD” (second) soft button of the VIEW DATA screen.

By using the scroll knob on the KDU it is possible to scan through the SHIP STATIC DATA screen and the VOYAGE SHIP DATA screen.

By turning the scroll knob on the KDU clockwise or counter clockwise, the screen will scrolls down or up respectively.

As illustrated below, the screens change from the SHIP STATIC DATA to the VOYAGE STATIC DATA by turning the scroll knob clockwise.

Clockwise:
As illustrated below, the screens change from the VOYAGE STATIC DATA to the SHIP STATIC DATA by turning the scroll knob counter clockwise.

**Counter clockwise:**

By pressing the “BACK” soft button, it shall be possible to return to the previous screen.
Identifiers to be used by ships to report their type:

<table>
<thead>
<tr>
<th>Identifier No.</th>
<th>Special craft</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>Pilot vessel</td>
</tr>
<tr>
<td>51</td>
<td>Search and rescue vessels</td>
</tr>
<tr>
<td>52</td>
<td>Tugs</td>
</tr>
<tr>
<td>53</td>
<td>Port tenders</td>
</tr>
<tr>
<td>54</td>
<td>Vessels with anti-pollution facilities or equipment</td>
</tr>
<tr>
<td>55</td>
<td>Law enforcement vessels</td>
</tr>
<tr>
<td>56</td>
<td>Spare – for assignments to local vessels</td>
</tr>
<tr>
<td>57</td>
<td>Spare – for assignments to local vessels</td>
</tr>
<tr>
<td>58</td>
<td>Medical transports (as defined in the 1949 Geneva Conventions and Additional Protocols)</td>
</tr>
<tr>
<td>59</td>
<td>Ships according to Resolution No 18 (Mob-83)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other ships</th>
<th>First digit (*)</th>
<th>Second digit (*)</th>
<th>First digit (*)</th>
<th>Second digit (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – reserved for future use</td>
<td>0 - All ships of this type</td>
<td>-</td>
<td>0 – Fishing</td>
<td></td>
</tr>
<tr>
<td>2 – WIG</td>
<td>1 - Carrying DG, HS, or MP IMO hazard or pollutant category A</td>
<td>-</td>
<td>1 – Towing</td>
<td></td>
</tr>
<tr>
<td>3 - see right column</td>
<td>2 - Carrying DG, HS, or MP IMO hazard or pollutant category B</td>
<td>3 - Vessel</td>
<td>2 - Towing and length of the tow exceeds 200 m or breadth exceeds 25 m</td>
<td></td>
</tr>
<tr>
<td>4 – HSC</td>
<td>3 - Carrying DG, HS, or MP IMO hazard or pollutant category C</td>
<td>-</td>
<td>3 - Engaged in dredging or underwater operations</td>
<td></td>
</tr>
<tr>
<td>5 - see above</td>
<td>4 - Carrying DG, HS, or MP IMO hazard or pollutant category D</td>
<td>-</td>
<td>4 - Engaged in diving operations</td>
<td></td>
</tr>
<tr>
<td>6 - Passenger ships</td>
<td>5 - reserved for future use</td>
<td>-</td>
<td>5 - Engaged in military operations</td>
<td></td>
</tr>
<tr>
<td>7 - Cargo ships</td>
<td>6 - reserved for future use</td>
<td>-</td>
<td>6 - Sailing</td>
<td></td>
</tr>
<tr>
<td>8 - Tanker(s)</td>
<td>7 - reserved for future use</td>
<td>-</td>
<td>7 - Pleasure Craft</td>
<td></td>
</tr>
<tr>
<td>9 - Other types of ship</td>
<td>8 - reserved for future use</td>
<td>-</td>
<td>8 - reserved for future use</td>
<td></td>
</tr>
</tbody>
</table>

Below are a few examples of ship type:

30 = Fishing vessel
34 = Vessel engaged in diving operations
37 = Vessel engaged in military operations
60 = Passenger ship
80 = Tanker
Viewing the System Configuration Screen

The SYSTEM CONFIGURATION screen can be viewed by pressing the “CONFIG” (third) soft button of the VIEW DATA screen.

From the CONFIGURATION screen it is possible to change the configuration of the KDU and AIS.

KDU configurations:
1. Buzzer Level – Change volume of buzzer.
3. Transponder’s brightness controlled by KDU – Ability to control the brightness of the AIS status LEDs for when an AIS.
4. IBIT – Perform interruptive built in tests on core functions of the KDU.
5. Version information of the KDU and AIS.
6. Change Passwords

AIS configurations:
1. Channel Profile – Ability to change the channel number and power level of both AIS channels.
2. Long Range Mode – Ability to change the AIS to respond to Long Range Interrogations automatically or manually.
3. Current Regional Settings – Ability to change the current regional setting stored in the AIS.
4. Own MMSI – Ability to view the MMSI of the vessel.
5. Version Information of the AIS.
6. IMO –

By using the scroll knob on the KDU the SYSTEM CONFIGURATION screen can be viewed, and a sub-configuration from the sub-configuration menu can be selected by pressing the “ENTER” key on the keypad.

Turn the scroll knob on the KDU clockwise or counter-clockwise, the screen scrolls down when scroll knob is turned clockwise and the screen scrolls up when scroll knob is turned counter-clockwise.
The configuration screen exists of eleven sub-configurations:

1. AIS CHANNEL PROFILE
2. LONG RANGE MODE
3. CURRENT REGIONAL SETTINGS
4. MMSI
5. IMO
6. AMDT LED’s BRIGHTNESS CONTROLLED
7. BUZZER LEVEL
8. ALARM SETTINGS
9. IBIT
10. VERSION
11. CHANGE PASSWORDS

**AIS channel profile**

From the SYSTEM CONFIGURATION Screen:
Select the AIS CHANNEL PROFILE Sub-configuration by scrolling with the Scroll knob until the AIS CHANNEL PROFILE is highlighted in black, then press the “ENTER” button on the KDU.

The following screen shall be displayed:

By pressing the “BACK” soft button on the AIS CHANNEL PROFILE screen you will go back to the previous screen (main System Configuration Screen).

By pressing the “CHANGE” soft button on the AIS CHANNEL PROFILE screen, the following screen shall be displayed where it shall be possible to scroll between the AIS CHANNELS, and change the VHF Channel.
By pressing the “BACK” soft button, it shall be possible to return to the previous screen.

By pressing the “CH1«2” soft button, it shall be possible to edit a specific AIS CHANNEL as described below.

By using the Scroll knob, it shall be possible to increment and decrement the selected VHF channel.

By pressing the “ENTER” key on the keypad the changes shall be stored after entering the required password, as seen in the screen below.

Use the KDU Keypad to type in the password, and press the “ENTER” key on the keypad to confirm. If the incorrect password was entered, the password screen shall be displayed again, and the password can be re-entered.

By pressing the “BACK” soft button, it shall be possible to return to the previous screen.

To override the password, type in the override password, and press the “SEND OVR” soft button.

**N.B.**
Any changes made on any screen, or any info entered **MUST ALWAYS** be confirmed by **USING THE KEYPAD “ENTER”** button on the KDU. If the “ENTER” button is not pressed no changes will be stored, and all data will be lost.

If changes have been made and the “BACK” soft button is pressed (the top/first soft button) it shall be possible to go to the previous screen, without accepting the new AIS CHANNEL PROFILE settings.
Long Range Mode

From the SYSTEM CONFIGURATION Screen:
Select the LONG RANGE MODE Sub-configuration by scrolling with the Scroll knob until the LONG RANGE MODE is highlighted in black, and then press the “ENTER” button on the KDU.

The Long Range Mode can be changed between Manual and Automatic. When set to manual the user is required to reply to Long Range interrogation. When set to automatic the AIS will automatically reply to Long Range interrogation.

By pressing the “BACK” soft button it shall be possible to go to the previous screen.

By pressing the “CHANGE” button, it shall be possible to go to the AIS CHANNEL CHANGE screen.

Pressing the “AUTO ↔” soft button of the LONG RANGE MODE shall change the AIS between manual and automatic.

By pressing the “BACK” soft button it shall be possible to go to the previous screen, without accepting the new long-range mode settings.
Current Regional Settings

From the SYSTEM CONFIGURATION Screen:
Select the CURRENT REGIONAL SETTINGS Sub-configuration by scrolling with the Scroll knob until the CURRENT REGIONAL SETTINGS is highlighted in black, then press the “ENTER” button on the KDU.

The current regional settings screen makes it possible to edit the channel parameters for a specific region.

By using the scroll knob the “CURRENT REGIONAL SETTINGS” can be changed between 1 and 8.

If a “CURRENT REGIONAL SETTINGS” screen indicates “CURRENT REGIONAL SETTINGS (IN USE)” as shown below, it means that that specific channel is in use at present.

By pressing the “BACK” soft button it shall be possible to go to the previous screen.

By pressing the “CHANGE” soft button it shall be possible to go to the CURRENT REGIONAL SETTINGS edit screen.

In the CURRENT REGIONAL SETTINGS edit screen, it shall be possible to change the CURRENT REGIONAL SETTINGS of the AIS such as the region boundaries, the transitional zone size and the AIS channel configuration for the region.

Traditional Zone Size can be changed between 1 and 8.
By pressing the “BACK” soft button it shall be possible to go to the previous screen.

To enter a coordinate, turn the scroll knob until the specific coordinate is highlighted. Use the alphanumeric keypad to set the degrees, minutes and parts of minutes. To select between North (N), East (E), South (S) or West (W), use the alphanumeric key with the respective letter, i.e. for North use alphanumeric key “5”.

To edit the AIS channel configuration, turn the scroll knob until one of the channels is highlighted. The screen will change as follows, and the “RxTx/Rx”, “PWR LVL” and “BW” options will become available. A channel can now be selected for editing.

To edit the AIS CHANNEL (1 or 2), select the specific channel by pressing keypad number 1, for channel one.

or keypad number 2, for channel 2.

After selecting the channel using the keypad, the VHF channel can be incremented or decremented by turning the scroll knob. The channel will only increment and decrement to the next valid channel value. When satisfied with the channel, press “ENTER” to confirm the channel setting.

The scroll knob can now be used to scroll between the different options.

By pressing the “RxTx/Rx” soft button it shall be possible to change the settings of the RxTx mode, to either RxTx, None or Rx.
By pressing the “PWR LVL” soft button it shall be possible to change the power level.

By pressing the “BW” soft button it shall be possible to change the bandwidth. BW = 0 use the bandwidth as specified in channel, or 1 = bandwidth of 12,5 kHz.

When all the changes have been made the operator can confirm these changes by pressing the “ENTER” button once. By pressing the “ENTER” button a second time a confirmation screen shall be displayed where the user shall be able to confirm or decline the changes made in the current regional settings screen by pressing the “YES” / “NO” soft button.

![ENTER button](image)

<table>
<thead>
<tr>
<th>CHANGE CURRENT REGIONAL SETTINGS</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confirm ch. inquirer</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

After pressing any one of these soft buttons (YES/NO), the Current Regional Settings screen shall be displayed.

If the “YES” soft button was pressed, the data will be sent to the radio, and an indication will be presented to the user by means of the following screens. When the new regional settings are accepted the following screen will be displayed.

![New Region Accepted](image)

When the settings were not updated as requested then the following screen will be displayed. This condition will also occur when two or more overlapping regions were combined into one region, the operator can then check the regional setting list to confirm the new settings are contained within another region.

![New Region Not Accepted](image)

By pressing the “NO” soft button the original CURRENT REGIONAL SETTINGS (as shown below) shall be displayed and changes can be done again or left as it was.
N.B.
The different fields can only be selected and changed AFTER the AIS CHANNEL (1 or 2) has been selected.

**MMSI**

From the SYSTEM CONFIGURATION Screen:
Select the MMSI Sub-configuration by scrolling with the Scroll knob until the MMSI is highlighted in black, and then press the “ENTER” button on the KDU.

By pressing the “BACK” (first) soft button, it shall be possible to go to the previous screen.

Enter a number with the KDU keypad, and press the "ENTER" soft button to confirm. The password screen will be displayed.

Use the KDU Keypad to type in the password, and press the “ENTER” key on the keypad to confirm. If the incorrect password was entered, the password screen shall be displayed again, and the password can be re-entered.

By pressing the “BACK” soft button, it shall be possible to return to the previous screen.
By pressing the “Send OVR” soft button, it shall be possible to send the new password to the KDU, and overwrite the previous password.

If the incorrect password was typed in, a pop-up screen “incorrect password” shall be displayed, press the “BACK” soft button to go to the previous screen and re-type the password.

If the correct password was typed in one of 2 pop-up screens shall be displayed (see screens below)

IMO

From the SYSTEM CONFIGURATION Screen:
Select the IMO Sub-configuration by scrolling with the Scroll knob until the IMO is highlighted in black, and then press the “ENTER” button on the KDU.

By pressing the “BACK” soft button, it shall be possible to go to the previous screen.
The IMO number is password protected, by using the KDU Keypad to type in the password, and press the “ENTER” key on the keypad to confirm. If the correct password was entered, the password screen shall be displayed.

By pressing the “BACK” soft button, it shall be possible to return to the previous screen.

Use the KDU Keypad to type in the password, then by pressing the “ENTER” key on the keypad the password shall be entered. If the incorrect password was typed in, the password screen shall be displayed again, re-type the password, or overwrite the password with the selected overwrite password.

By pressing the “Send OVR” soft button, it shall be possible to send the new password to the KDU, and overwrite the previous password.

**AMDT LED’s BRIGHTNESS CONTROLLED**

From the SYSTEM CONFIGURATION Screen:
Select the AMDT LED’s BRIGHTNESS CONTROLLED Sub-configuration by scrolling with the Scroll knob until the AMDT LED’s BRIGHTNESS CONTROLLED is highlighted in black, and then press the “ENTER” button on the KDU.

The purpose of this configuration is to select whether the KDU controls the brightness of the transponder LED’s (i.e. when an transponder is installed on the bridge, the KDU can control the transponder LED’s brightness).
By pressing the “BACK” (first) soft button, it shall be possible to go to the previous screen, without accepting the new transponder LED’s brightness controlled by the KDU setting.

It shall be possible to change the coupling between the transponder LED’s and the KDU brightness setting.

Selection of YES or NO is done by the turning the scroll knob and the selection is confirmed with the “ENTER” button. The screen shall close when the “ENTER” button is pressed.

**Buzzer Level**

From the SYSTEM CONFIGURATION Screen:
Select the BUZZER LEVEL Sub-configuration by scrolling with the Scroll knob until the BUZZER LEVEL is highlighted in black, and then press the “ENTER” button on the KDU.

By pressing the “BACK” soft button, it shall be possible to go to the previous screen WITHOUT accepting the new BUZZER LEVEL setting.

It shall be possible to adjust the volume of the buzzer by turning the scroll knob clockwise or counter clockwise. The new setting shall be confirmed with the “ENTER” button and the screen shall close.
Alarm Settings

From the SYSTEM CONFIGURATION Screen:
Select the ALARM SETTINGS Sub-configuration by scrolling with the Scroll knob until ALARM SETTINGS is highlighted in black, and then press the “ENTER” button on the KDU.

In this screen it shall be possible to select the alarms that cannot be acknowledged in the alarm screen.

See section Description of Alarms for a description of the different alarms.

By pressing the “BACK” soft button, it shall be possible to go to the previous screen.

By pressing the “DELETE” soft button, it shall be possible to delete the previously entered alarm number.

Alarm numbers can be added with the “ADD” soft button, by pressing the “ADD” soft button. Once the “ADD” soft button has been pressed a black rectangle with a 0 in the centre shall indicate that an alarm number can be entered.

This rectangle is two digits wide; the highest alarm number that can be entered is 99.

Once an alarm number has been entered it shall be possible to add another alarm number by pressing the “ADD” soft button again, the black rectangle shall then appear again, but in the next available field.
The alarm list is confirmed only when the “ENTER” button on the KDU is pressed. When the “ENTER” button is pressed the KDU shall return to the previous screen.

If only one digit has been entered, and the “ADD” or “ENTER” buttons have been pressed on the KDU, then the KDU will add a leading zero.

The KDU will reject duplicate alarm numbers.

**Interruptive Built In Test (IBIT)**

From the SYSTEM CONFIGURATION Screen:
Select the IBIT Sub-configuration by scrolling with the Scroll knob until IBIT is highlighted in black, and then press the “ENTER” button on the KDU.

By pressing the “BACK” soft button, it shall be possible to go to the previous screen.

This screen displays all the IBIT tests.

With the scroll knob a specific IBIT test can be selected.
IBIT DISPLAY Test

The DISPLAY function tests the contrast and brightness of the display.

Select “DISPLAY” by scrolling with the Scroll knob until DISPLAY is highlighted in black, then press the “ENTER” button on the KDU.

By pressing the “CHANGE” soft button the brightness and contrast can be tested.

In these two screens it shall be possible to test the brightness and contrast of the KDU screen.

By using the keypad the level of the brightness can be viewed by selecting numbers 0-4 on the keypad, and pressing the “ENTER” button on the KDU to confirm the selection.

The LED’s brightness on the KDU shall also become brighter when the brightness is set higher.

By using the keypad the level of the contrast can be viewed by selecting numbers 0-7 on the keypad, and pressing the “ENTER” button on the KDU to confirm the selection.

With the “BACK” soft button the system shall return to the IBIT screen.
IBIT LED Test

Select “LED” by scrolling with the Scroll knob until LED is highlighted in black, then press the “ENTER” button on the KDU.

The LED function tests the three LED’s of the KDU.

By pressing the “BACK” soft button, it shall be possible to go to the previous screen.

The three LED’s on the left side of the KDU shall illuminate when the “ENTER” button is held down. (LED continues to indicate functional status when “ENTER” button is released.

IBIT KEYPAD Test

Select “KEYPAD” by scrolling with the Scroll knob until KEYPAD is highlighted in black, then press the “ENTER” button on the KDU.

The KEYPAD function tests every button on the KDU.

In this screen all the buttons can be tested. Each button that is pressed shall be inversed text.

By holding in the “BACK” soft button for 3 seconds, you will be able to go to the previous screen.

All the buttons can be tested in the above screen. Each button that is pressed shall be inversed text i.e. Soft Button 2 on the screen below has been tested (pressed on the KDU).
To test a specific button, select the button on the KDU, press it, and see whether it is displayed in inversed text on the screen.

**IBIT SCROLL KNOB Test**

Select “SCROLL KNOB” by scrolling with the Scroll knob until SCROLL KNOB is highlighted in black, then press the “ENTER” button on the KDU.

The SCROLL KNOB function tests the scroll knob.

By pressing the “BACK” soft button, it shall be possible to go to the previous screen.

By turning the scroll knob clockwise the number shall increment and by turning the scroll knob counter-clockwise the number shall decrement. The default number is 50.

**IBIT PRESENTATION INTERFACE Test**

Select “PRESENTATION INTERFACE” by scrolling with the Scroll knob until PRESENTATION INTERFACE is highlighted in black, then press the “ENTER” button on the KDU.

In this screen the messages sent via the PRESENTATION INTERFACE can be viewed.

By pressing the “BACK” soft button, you will be able to go to the previous screen.
The arrow in front of the message shows whether the message is incoming or outgoing.

An arrow to the right indicates an incoming message and an arrow to the left indicates an outgoing message.

**IBIT BUZZER Test**

Select “BUZZER” by scrolling with the Scroll knob until BUZZER is highlighted in black, then press the “ENTER” button on the KDU.

Hold in the “ENTER” key to test the buzzer. Release the “ENTER” key to end the test.

**IBIT SENSORS Test**

Select “SENSORS” by scrolling with the Scroll knob until SENSORS is highlighted in black, and then press the “ENTER” button on the KDU.

In this screen it shall be possible to view which sensors are connected to the AIS.

By pressing the “BACK” soft button, you will be able to go to the previous screen.

With the scroll knob it shall be possible to scroll through the entire list of connected devices.
In this screen all the devices that are connected to the AIS will be shown. With the scroll knob it shall be possible to scroll through the entire list of connected devices.

Position sensor in use can be one of the following.
- .1 = External DGNSS in use (corrected)
- .2 = Internal DGNSS in use (corrected; msg 17)
- .3 = Internal DGNSS in use (corrected; beacon)
- .4 = External GNSS in use (GPS source, uncorrected)
- .5 = Internal GNSS in use (uncorrected)
- .6 = Internal GNSS in use (uncorrected)
- .7 = No Position sensor in use -using manual position input
- .8 = No Position sensor in use- dead reckoning position
- .9 = No Position sensor in use -no position

SOG sources can be.
- .1 = External (non-GNSS) source providing VBW or OSD sentence
- .2 = External GNSS source providing VTG or RMC sentence
- .3 = Internal GNSS source providing VTG or RMC sentence
- .4 = No valid SOG source in use
Will generally follow the position sensor in use if GNSS source used

COG source can be.
- .1 = External (non-GNSS) source providing RMC or OSD sentence
- .2 = External GNSS source providing VTG or RMC sentence
- .3 = Internal GNSS source providing VTG or RMC sentence
- .4 = No valid COG source in use
Will generally follow the position sensor in use if GNSS source used

ROT source can be.
- .1 = ROT from TI sensor in use
- .2 = External ROT, other sensor in use
- .3 = ROT derived from heading information (HDT sentence)
- .4 = No valid ROT information
State 3 shall not be derived from COG information

UTC time source can be.
- .1 = Time source is internal GNSS
- .2 = Time source is external GNSS
- .3 = Internal RTC is time source
- .4 = No time source available

Reference datum in use can be.
- .1 = Datum is WGS84
- .2 = Datum is non-WGS84
IBIT DSI SENTENCE Test
Select “DSI SENTENCE” by scrolling with the Scroll knob until DSI SENTENCE is highlighted in black, then press the “ENTER” button on the KDU.

In this screen a DSI test will be done.

By pressing the “BACK” soft button, you will be able to go to the previous screen.

When DSI SENTENCE is selected and confirmed with “ENTER”, a DSI sentence shall be sent to the AIS.

IBIT Version Test

From the SYSTEM CONFIGURATION Screen:
Select the VERSION Sub-configuration by scrolling with the Scroll knob until the VERSION is highlighted in black, and then press the “ENTER” button on the KDU.

On this screen the serial and version numbers of the installed modules can be seen.

By pressing the “BACK” soft button, you will be able to go to the previous screen.

With the scroll knob it shall be possible to scroll through the serial and version numbers of all the installed modules.
IBIT CHANGE PASSWORDS Test

From the SYSTEM CONFIGURATION Screen:
Select the CHANGE PASSWORDS Sub-configuration by scrolling with the Scroll knob until the CHANGE PASSWORDS is highlighted in black, and then press the “ENTER” button on the KDU.

By pressing the “BACK” soft button, you will be able to go to the previous screen.

On this screen different passwords can be changed and/or overwritten.

It shall never be possible to totally delete the master password; the master password shall always be embedded in the KDU’s software.

Use the scroll knob, to select “IMO” and press the “ENTER” button on the KDU keypad to change the IMO password.

By using the keypad the password can be typed in. Confirm the password by pressing the “ENTER” button on the keypad.
If the password is correct, another password screen shall be displayed, where the password must be retyped to confirm.

By pressing the “BACK” soft button, you will be able to go to the previous screen.

By pressing the “Send OVR” soft button, you will be able to override the previous password.

A pop-up screen shall be displayed “Password has been changed” when the password has been changed successfully.

A pop-up screen shall be displayed “New password confirmation error” when prompted to retype password to confirm, and password was retyped incorrectly.

A pop-up screen shall be displayed “Incorrect password” when wrong password has been entered.
Viewing the Status Screen

The STATUS screen can be viewed by pressing the STATUS soft button of the VIEW DATA screen.

See section Description of Alarms for a description of the different alarms.

By using the scroll knob on the KDU it shall be possible to scan through the list of alarms.

By pressing the “BACK” soft button, you will be able to go to the previous screen.

By pressing the “ALARMS” soft button, you will be able to go to the Alarms screen. Alarms shall be sent every 30 seconds.

By pressing the “TEXT” soft button, you will be able to view text messages. The text screen shall be able to take 48 characters. The “TEXT” log shall be able to display 10 messages at a time, if more than 10 message are received, the newest 10 shall be listed, and available to be viewed in the “TEXT” screen.

The selected alarm is indicated by inverted text of the entire alarm (as shown below, the first alarm is highlighted in black).

It shall be possible to indicate acknowledged or unacknowledged alarms. Unacknowledged alarms shall be indicated with an “x” on the screen. An acknowledged alarm shall be indicated with a tick (✓), and the “A” shall change to a “V”, indicating a warning and no longer an alarm.

This screen displays the list of alarms.
It shall be possible to indicate acknowledged or unacknowledged alarms (indicated with a X on the screen) by selecting the alarm with the scroll knob and acknowledging the alarm with the “ACK” button (Acknowledge button) on the KDU, as shown below. An acknowledged alarm shall be indicated by a tick (✓).

To view all the detail of the selected line, press the “ENTER” button on the KDU.

By pressing the “DELETE” soft button it shall be possible to delete test that was send manually.
Using the Function Buttons

View Data

The VIEW DATA screen is the default screen of the KDU.

By pressing the VIEW DATA Function Key from any screen it shall be possible to return to the default screen, as shown above.

Input Data

With the INPUT DATA function button it shall be possible to go to the SHIPS/VOYAGE DATA, MESSAGES and MAN. POSITION screen.
Ship/Voyage Data Input Screen

From the Input Data Screen, press the “SHIPS/VOYAGE DATA” soft button. The SHIP/VOYAGE DATA Input screen shall be displayed.

By using the scroll knob on the KDU it is possible to scroll through the SHIP STATIC DATA screen and the VOYAGE STATIC DATA screen.

By turning the scroll knob on the KDU clockwise or counter clockwise, the screen will scroll down or up respectively.

As illustrated below, the screens change from the SHIP STATIC DATA to the VOYAGE STATIC DATA by turning the scroll knob clockwise.

By pressing the “BACK” soft, it shall be possible to return to the previous screen.

By pressing the “DELETE” soft, it shall be possible to delete the “CALL SIGN” and the “NAME”, and retype the information by using the keypad on the KDU, then pressing the “ENTER” button to confirm.

By using the keypad on the KDU all information can be typed in, deleted and confirmed by pressing, “ENTER”.

With the keypad buttons the inversed field (highlighted text) can be changed.
With the scroll button, it shall be possible to scroll between the SHIP STATIC DATA screen and the VOYAGE STATIC DATA Screen.

The ship and voyage data is confirmed with the “ENTER” button and then sent to the AIS.

One of 2 pop-up screens shall be displayed:

VSD information updated.

or

The new VSD information has not been updated successfully by the AIS.

If one selects to go to a new menu without confirming the data with the keypad “ENTER” button the data shall be discarded.
Messages Input Screen

From the Input Data screen, press the “MESSAGES” soft button. The Messages screen shall be displayed.

By pressing the “BACK” soft button it shall be possible to go to the previous screen whilst composing the message. If another menu is selected without confirming the data, the data will be saved in volatile memory.

By pressing the “DELETE” soft button it shall be possible to delete one character. By pressing the “DELETE” button and holding it down the whole message that has been typed in by using the keypad buttons on the KDU, shall be deleted.

In this screen it shall be possible to write safety related and text/telegram messages. The maximum number of characters that can be used is 155. Use the alphanumeric keypad to write a message. By pressing a keypad button four times, the corresponding number will be displayed. By pressing a keypad button once within 2 seconds, the alphabet character corresponding to the number of button presses will be displayed. See section using the Alphanumeric Keyboard.

Confirm the message by pressing the “ENTER” button on the KDU. When the “ENTER” button is pressed, the Message Confirmation screen shall be displayed.

In this screen it shall be possible to select and change the configuration settings of a message. The scroll button can be used to scroll between the MESSAGE TYPE, TRANSMISSION TYPE and CHANNEL.

The MESSAGE TYPE can be changed between “TXT No Reply Req” and “SAFETY”. To
change the MESSAGE TYPE, use the scroll button until the TXT No Reply Req or SAFETY text is inversed, and press the “CHANGE” soft button. The inversed text will change between TXT No Reply Req and SAFETY.

The TRANSMISSION TYPE can be changed between BROADCAST and ADDRESSED. To change the TRANSMISSION TYPE, use the scroll button until the BROADCAST or ADDRESSED text is inversed, and press the “CHANGE” soft button. The inversed text will change between BROADCAST and ADDRESSED.

The CHANNEL can be changed between NO PREFERENCE, CHANNEL A, CHANNEL B and CHANNEL A & B. To change the CHANNEL, use the scroll button until the NO PREFERENCE, CHANNEL A, CHANNEL B or CHANNEL A & B text is inversed, then press the “CHANGE” soft button. The inversed text will change between NO PREFERENCE, CHANNEL A, CHANNEL B and CHANNEL A & B.

To confirm the message settings, press the “ENTER” button.

If the TRANSMISSION TYPE selected is ADDRESSED, and the ENTER button is pressed, the VESSELS AND MMSI screen will be displayed.

On this screen KDU means any Data Terminal Equipment that enable the crew of the other ship to view and enter messages.
Using the scroll knob the desired vessel can be selected, and by pressing ENTER, the KDU shall display the MESSAGE CONFIGURATION screen. The name of the vessel shall be displayed next to the SEND text.

![MESSAGE CONFIGURATION Screen](image)

Reply required in “ADDRESSSED” mode, indicates reply required from addressed vessel in text/telegram message.

To send the message, press the “SEND” soft button. The KDU will return to the MESSAGES screen.

![MESSAGES Screen](image)

**Manual Position Input Screen**

From the Input Data screen, press the “MAN.POSITION” soft button. The MAN. POSITION screen shall be displayed.

![MAN. POSITION Screen](image)

In this screen it shall be possible to type in a lateral and longitudinal position in the case that positional source information is not available.

With the keypad buttons the lateral and longitudinal position can be filled in and confirmed with the “ENTER” button on the KDU.

![Keypad](image)

By pressing the “BACK” soft button the previous screen shall be displayed.
Message Log

In the “MSG LOG” (message log) screen all the safety related, text and long-range interrogation messages are displayed.

By pressing either “MESSAGE LOG” or “LR LOG” the different log screens shall be viewable.

In the “MESSAGE VIEW” screen it shall be possible to see whether the long-range messages have been replied to or not, whether a reply has been required or not. There also is the capability to reply to a message if the long-range mode is manual.

By pressing the “BACK” soft button the previous screen shall be displayed.
By pressing the “DELETE” soft button the replied message can be deleted.

In the MESSAGE VIEW screen (the above screen) the TEXT of the selected message as well as the CALL SIGN can be viewed.

By pressing the “VIEW” soft button the LR LOG (long range log) can be viewed.

By pressing the “BACK” button the previous screen shall be displayed.

By pressing the “REPLY” soft button it shall be possible to reply to a message if the long-range mode is manual.

By pressing the “DELETE” soft button it shall be possible to delete the replied message, and retype it, using the KDU keypad.
Different Pop-Up screens

MSG LOG screens:
The following pop-up screens be displayed when a message is received, saying whether a reply is required or not, or just what kind of message it is, i.e. safety message or long range message received and a response is required.

- **Message received but NO reply is required**
- **Message received AND reply IS required**
- **Safety message received**
- **Long range message received, NO response is required**

In the MMSI screen, type in the password, if the incorrect password was typed in, a pop-up screen “incorrect password” shall be displayed. If the correct password was typed in the screen ”configuration update” or “the new configuration has not been successfully updated by the AIS” will be displayed.

- **An incorrect password was typed in, press the “BACK” soft button and retype the password.**
- **Password was correct and configuration will now be updated.**
When a new password was typed in and the “ENTER” button on the KDU was pressed, then one of the following pop-ups shall be displayed.

The new password was typed in incorrectly when confirmed, press the “BACK” soft button and retype the confirmation password.

New password was typed in correctly, and accepted, and the old password was changed.

In the SSD/VSD screens vessels information can be updated i.e. ship at anchor, this information can be changed, by changing this information one of the following pop-up screens shall be displayed.

New Ship Static Data info was updated successfully.

New Ship Static Data info was not updated successfully, press the “BACK” soft button to go back and try again.

New Voyage Static Data info was not updated successfully, press the “BACK” soft button to go back and try again.

In the AIS CHANNEL PROFILE the channels can be changed, by pressing enter to confirm
the change, one of the following pop-screens shall be displayed.

The new AIS channel was not updated successfully, press the “BACK” soft button and try again.

The new AIS channel info was updated successfully.

In the INPUT DATA screen the option “MESSAGES” can be typed in, changed and then send, by pressing enter to confirm, one of the following pop-screens shall be displayed.

New message was typed in and confirmed by pressing the enter button, and transmitted successfully.

A broadcast/addressed transmission type was send but no acknowledgement was received from the addressed unit.

When connection between the radio and the KDU has been broken the following pop-up screen shall be displayed.

Connection between the radio and the KDU has been broken.

The following alarm pop-up shall be displayed when late reception occurred.

Late reception of acknowledgement from the addressed unit.

When an Alarm is received the following pop-up screen shall be displayed telling the operator that an alarm was received and an acknowledgement is required. The reason for the alarm is also displayed.
### Description of Alarms

The following table gives a brief description of the alarms.

<table>
<thead>
<tr>
<th>Alarm's description text</th>
<th>Alarm condition threshold exceeded</th>
<th>Alarm condition not exceeded</th>
<th>Alarm ID or Text Identifier</th>
<th>Reaction of the system to the alarm condition threshold exceeded</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS: Tx malfunction</td>
<td>A V</td>
<td>001</td>
<td>Stop transmission</td>
<td></td>
</tr>
<tr>
<td>AIS: Antenna VSWR exceeds limit</td>
<td>A V</td>
<td>002</td>
<td>Continue operation</td>
<td></td>
</tr>
<tr>
<td>AIS: Rx channel 1 malfunction</td>
<td>A V</td>
<td>003</td>
<td>Stop transmission on affected channel</td>
<td></td>
</tr>
<tr>
<td>AIS: Rx channel 2 malfunction</td>
<td>A V</td>
<td>004</td>
<td>Stop transmission on affected channel</td>
<td></td>
</tr>
<tr>
<td>AIS: Rx channel 70 malfunction</td>
<td>A V</td>
<td>005</td>
<td>Stop transmission on affected channel</td>
<td></td>
</tr>
<tr>
<td>AIS: General failure</td>
<td>A V</td>
<td>006</td>
<td>Stop transmission</td>
<td></td>
</tr>
<tr>
<td>AIS: MKD connection lost</td>
<td>A V</td>
<td>008</td>
<td>Continue operation w ith &quot;DTE&quot; set to &quot;1&quot; 1</td>
<td></td>
</tr>
<tr>
<td>AIS: External EPFS lost</td>
<td>A V</td>
<td>025</td>
<td>Continue operation (refer to table 4)</td>
<td></td>
</tr>
<tr>
<td>AIS: No sensor position in use</td>
<td>A V</td>
<td>026</td>
<td>Continue operation (refer to table 4, priority 6)</td>
<td></td>
</tr>
<tr>
<td>AIS: No valid SOG information</td>
<td>A V</td>
<td>029</td>
<td>Continue operation using default data</td>
<td></td>
</tr>
<tr>
<td>AIS: No valid COG information</td>
<td>A V</td>
<td>030</td>
<td>Continue operation using default data</td>
<td></td>
</tr>
<tr>
<td>AIS: Heading lost/invalid</td>
<td>A V</td>
<td>032</td>
<td>Continue operation using default data 2</td>
<td></td>
</tr>
<tr>
<td>AIS: No valid ROT information</td>
<td>A V</td>
<td>035</td>
<td>Continue operation using default data 2</td>
<td></td>
</tr>
</tbody>
</table>

1 If applicable
2 When so configured

### Integrity alarm conditions signalled using ALR sentence formatter

<table>
<thead>
<tr>
<th>Text Message</th>
<th>Text Identifier</th>
<th>Reaction of the system</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS: UTC clock lost</td>
<td>007</td>
<td>Continue operation using indirect or semaphore synchronisation</td>
</tr>
<tr>
<td>AIS: external DGNSS in use</td>
<td>021</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: internal GNSS in use</td>
<td>022</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: internal DGNSS in use (beacon)</td>
<td>023</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: internal DGNSS in use (message 17)</td>
<td>024</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: internal GNSS in use</td>
<td>025</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: external SOOG/COG in use</td>
<td>027</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: internal SOOG/COG in use</td>
<td>028</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: Heading invalid</td>
<td>031</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: Rate of Turn Indicator in use</td>
<td>033</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: Other ROT source in use</td>
<td>034</td>
<td>Continue operation</td>
</tr>
<tr>
<td>AIS: Channel management parameters changed</td>
<td>036</td>
<td>Continue operation</td>
</tr>
</tbody>
</table>

### Sensor status indications signalled using TXT sentence formatter

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Installation

How to upload KDU SW:
1. Switch off the KDU at the power supply.
2. Plug in the serial cable between the PC serial port and the KDU service port. The KDU service port is located on the left hand side at the back of the KDU (when looking at the KDU from the back). The AIS port is located on the right.
3. Open the Hyper Terminal application.
4. Setup Hyper Terminal on the PC serial port for 38400 8N1 i.e. 38400 bits per second, 8 data bits, no parity and 1 stop bit as shown below.

5. Open the Hyper Terminal send file dialog by selecting ‘Transfer’ and then ‘Send File’ from the Menu. The following dialog should be displayed.
6. Select the appropriate filename (KDU_M4.bin or KDU_M3.bin).
7. Select Xmodem as the protocol.
8. Select Send.

9. Apply power to the KDU (24V) at the power supply. If the KDU does not come on press the On/Off button on the KDU.

10. On the ‘Xmodem file send’ dialog, the file should start to upload. Progress will be seen as the number of packets sent to the KDU increases.
11. When the download is complete the following message will be displayed – ‘Upload finished’ and ‘Checksum ok’ (as shown below).
12. Switch off the KDU.
13. Apply power to the KDU.

Compass safe distance
Compass safe distance in accordance with ISO/A 694 are given below in metres

<table>
<thead>
<tr>
<th>Unit</th>
<th>Standard</th>
<th>Steering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Unit</td>
<td>5.4°/H</td>
<td>18°/H</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Power
Power requirements: 24V DC +30% / -10%
Power consumption: 0.5W

Power cable
Cable: 2 x 1.5mm² / AWG15 screened.
Maximum cable length: 100 metres.
Cable connector: Sub-D power 3 poles.

Connections to the AIS Transponder
Cable: Multi-cable 5 x 2 x 0.5mm² screened.
Arrangement of twisted pairs in reference to KDU connector pin out as follows: pair 1 - pins 1 & 2, pair 2 - pins 3 & 9, pair 3 - pins 4 & 6, pair 4 - pins 5 & spare, pair 5 - pins 7 & 8.
Maximum cable length: 100 metres.
Cable connector: Sub-D 9 poles male (metal cover).
Dimensions and weights
Control Unit with Mounting Bracket

Mounting Option

Drilling Plan

Weight:
Control Unit 1 kg
Mounting Bracket 0.3 kg