Tron AIS TR-8000 MkII

AIS Class A / Inland AIS Transponder

Inland User Manual

JOTRON

Performance for Life

1 Manual Revision History

Revision no.	By	Date	Reason for change
A	AD/ØB	07.09.21	Initial version

2 Software revisions

The installed SW version can be viewed in the "System" menu on the Display.

Please refer to change log in the "Tron AIS TR-8000 MkII Quick Reference Guide", for latest version and to see the update record.

The sub menu that shows SW versions

can be found selecting:

(Configuration)

↓

Advanced

↓
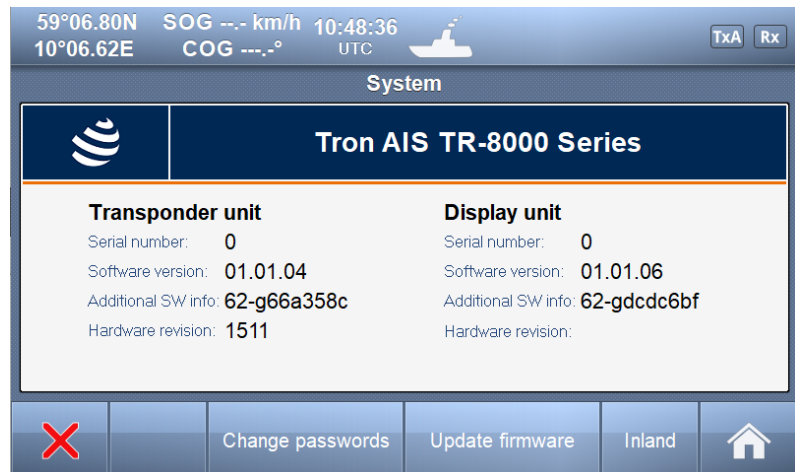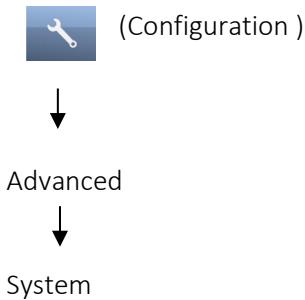
System

3 Introduction

This manual describes the operation of the Inland version of the TR-8000 MkII AIS system. For installation of the system, see the separate "**Tron AIS TR-8000 MkII - Operator and installation manual**".

3.1 Safety Instructions

- This equipment should be installed according to the instructions found in the installation part of this manual.
- The equipment should not be mounted in a way that exposes it for excessive heat from the sun or other sources.
- The equipment should not be mounted in a flammable environment.
- The equipment should not be mounted in a way that exposes it to direct rain or water.

> **CAUTION**
>
> This equipment contains CMOS integrated circuits. Observe handling precautions to avoid static discharges which may damage these devices.

ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE
DEVICES

- Do not open equipment. Only qualified personell should service the equipment.

3.2 Compass Safe Distance

Transponder unit:

- Standard compass: 95cm
- Steering compass: 65cm

Display unit:

- Standard compass: 30cm
- Steering compass : 14cm

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3.5   Disposal Instructions

The Transponder and Display shall be disposed according to local regulations regarding Electronic Waste Recycling in the country the equipment is taken ashore.

At time of writing this manual (2012), there are some common regulations which allies:

Europe: Directive 2002/96/EC (WEEE) Waste Electrical and Equipment Directive

Equipment is labeled with this symbol:

USA: Most states have implemented some kind of recycling act, but there is not yet a federal law about this issue.

Elsewhere: Follow local regulations regarding disposal of electronic equipment

3.6   Ingress protection

Transponder unit:

- IP56
- IPx6
- IEC 60945, Exposed

Display unit:

- IP54
- IEC 60945, Protected

4   Operation General Introduction

Thank you for purchasing this Jotron AIS Class A transceiver.

The Jotron AIS Class A transceiver has been developed to offer you the highest level of performance and durability and we hope that it will provide many years of reliable service. This product has been designed to meet the highest possible quality standards and should you encounter any problems with this product, please contact your local dealer who will be pleased to offer any assistance.

4.1   About AIS in general

The system is based on the IMO regulation for AIS using Self Organized Time Division Multiple Access (SOTDMA) technology based on a VHF Data Link (VDL).

- The system operates in the following modes:
  - Autonomous (continuous operation in all areas)
  - Assigned (data transmission interval remotely controlled by authority in traffic monitoring service)
  - Polled (in response to interrogation from a ship or authority)
  - Silent (listening only, use with caution)
- The system is synchronized with GNSS time (UTC) to avoid conflict among multiple users. If GNSS data is not available, the system is self synchronized using the VDL.
- The VHF channels 2087 and 2088 are the main AIS channels in addition to local AIS frequencies.
- AIS transponders onboard ships exchange various data as specified by IMO and ITU on either frequency set up by :
  - The frequency management telecommand (DSC)
  - Special AIS messages sent from a AIS Base station.
  - Manual input of special region
- The normal transmit power is 12.5W, but under certain conditions, as during tanker loading (according to ISGOTT regulation), or the use of regional settings, a low power option (1W) is automatically selected.

5   Description

The AIS system consists of two separate units interconnected by Ethernet. The Transponder is the main unit, handling the basic AIS functionality, including sensors and RF functions, while the Display unit is used for setup and display of the AIS data.

Standard Antenna configuration

VHF antenna

GPS antenna

TR-8000 Display Unit

TR-8000 MkII Transponder

VHF GPS

Power (Backup), 12-24 v

Power (Backup), 12-24 v

Junction box *

Sensors
(Heading, GPS,Speedlog, ROT)
External display(s)
Pilot port/Aux.display
Alarm Relay
Blue sign

Power (Main), 12-24 v

* Not Jotron supply
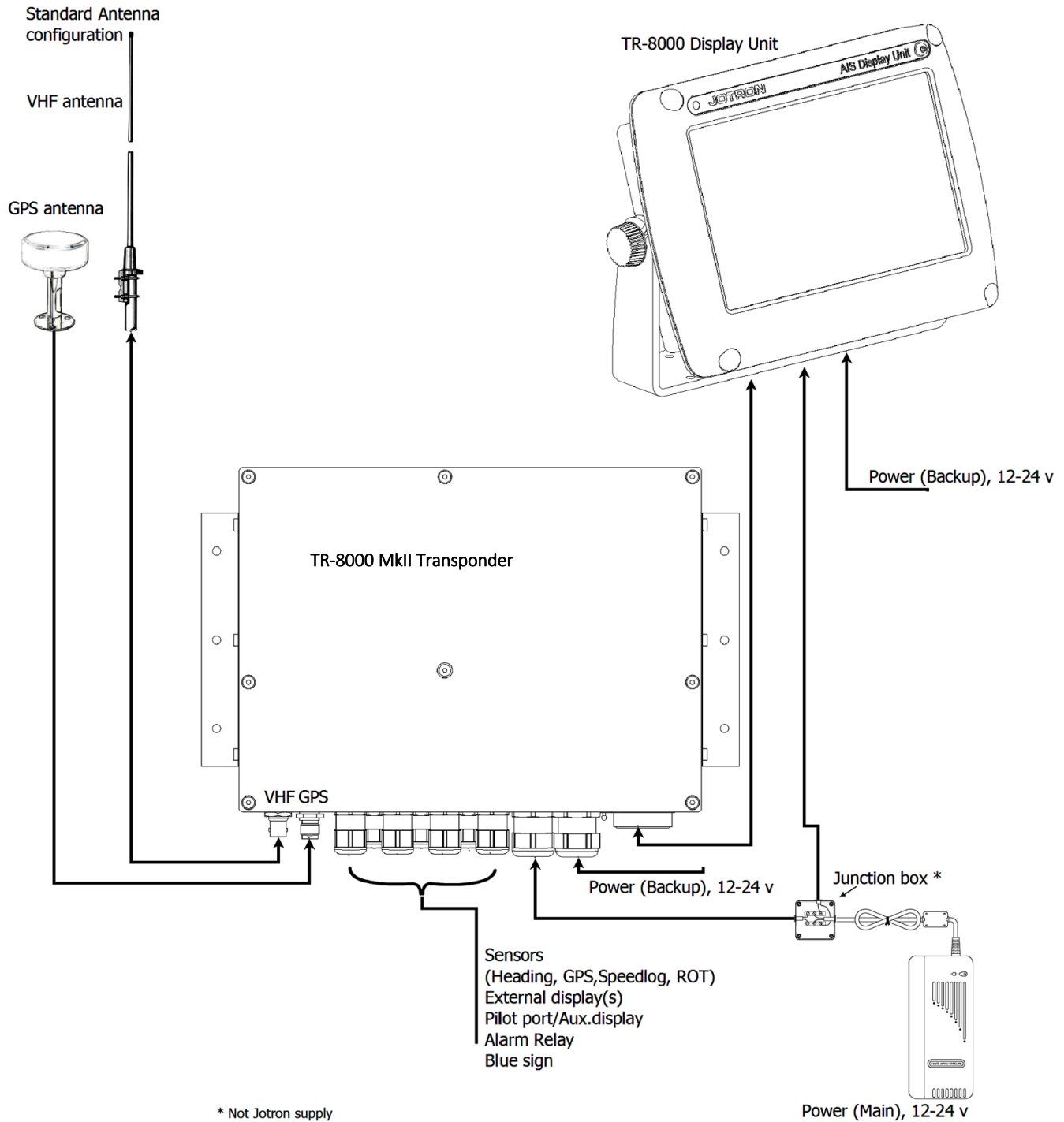
5.1 Functionality

The main features are:

Safety of navigation by automatically exchanging navigational data between ships (Class A transponders), coast stations, Class B transponders and receiving positional data from emergency equipment (AIS-SART, EPIRB, MOB) and AtoNs (Aids to Navigation).

- Inland AIS
- Class A AIS transmitter and receiver (transponder)
- Class B compatible (receives all Class B messages)
- Short safety related messages and other short messages.
- 7" color LCD panel with LED backlight connects to transponder unit using Ethernet.
- Interfaces for AIS compatible radar, ECDIS/ECS/Chart plotter and/or PC selectable through RS422 (IEC 61162-2), RS232 (non MkII) or Ethernet (UDP).
- GNSS and VHF antenna separate
- Built-in GNSS receiver for time synchronization and backup position.
- SD-Card slot for future upgrades.

The information exchanged between ships using AIS transponders are:

Static data:

- MMSI (Maritime Mobile Service Identity).
- ENI number
- Call sign and name.
- Length and beam.
- Type of ship.
- Location of position-fixing antenna on the ship.
- Quality of external sensors
- Hazardous cargo
- Draught

Dynamic data:

- Ships position with accuracy indication and integrity status.
- UTC.
- Course over ground (COG).
- Speed over ground (SOG).
- Heading.
- Navigation status (manual input).
- Rate of turn (where available).

Voyage related data:

- Destination and ETA (at masters discretion).

5.2 Transponder Unit

5.2.1 LED Indicators:

- Transmission
- Reception
- Alarm
- Status

5.3 Display Unit

Front View

The Display unit is the user interface for the AIS system on the bridge. It is used to configure the AIS system and to present AIS data about own and other ships, both graphically and in list form. The Display Unit consists of a splash proof housing with a 7 inch LCD colour display with touch screen. Splash proof connections for Main and Backup power, Pilot plug and Transponder (Ethernet) are present on the back side of the unit. The internal power supply is switched in order to obtain a high efficiency over the whole voltage input range from 10.8V – 31.2V. A Backup power source can be connected if available. This will be automatically switched in if the main source of power is lost.

The main features of the Tron AIS Display Unit are:

- Give the user information about other ships with AIS in the vicinity.
- Enable the user to obtain information about other ships and send and receive safety messages to other ships with AIS Transponders.
- CPA/TCPA
- Enable the user to configure the AIS System.
- Alert the user about alarms from the AIS system.
- Pilot Port connection directly to the Display Unit.

Certified to IP54 and IEC 60945 Ed.4 "Protected".

Operating temperature from -25°C to +55°C and storage temperature from -30°C to +70°C

6   Operational Description

The operational description chapter assumes that the AIS System is fully installed using the instructions found in the "Tron AIS TR-8000 MkII – Operator and Installation Manual". This manual also contain the configurations for the installation.

6.1   On/Off button

ON/OFF button handles 3 different options
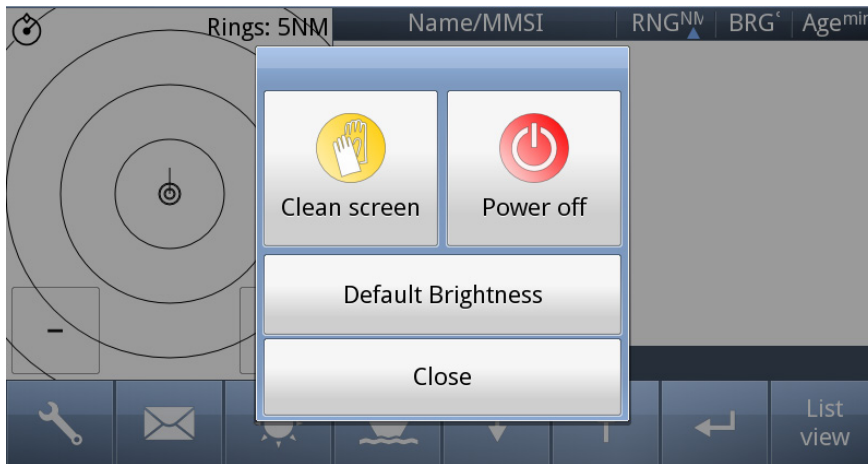
When the ON/OFF is pushed and released, a popup menu is displayed with some display options. Additionally, if the brightness is low, it will automatically be increased. This feature can be used if the user by some reason has too low visibility to adjust the brightness the regular way. If the Default Brightness button is pressed, the brightness will be set to a 50% value. Otherwise the current brightness level will be restored when the dialog is closed.

6.1.1 Clean Screen

Clean Screen is a function which turns off all touch sensitivity, enabeling the user to clean the screen without pushing buttons unintentionally.
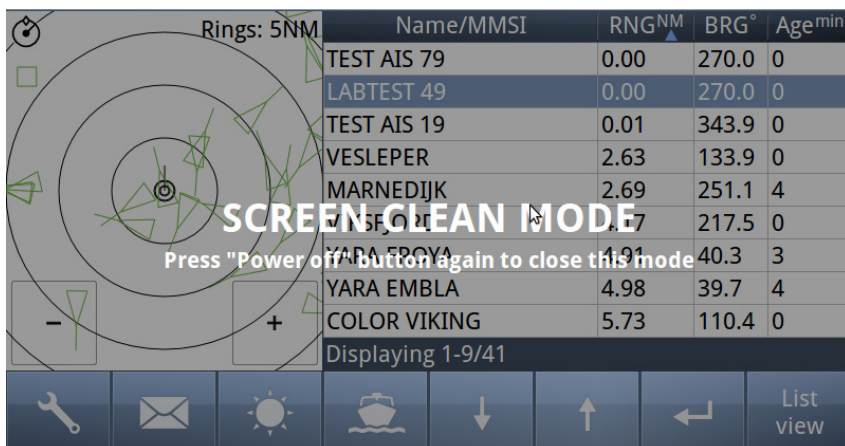
6.1.2 Deafult Brightness

The Default Brightness function sets the Brightness to a preset value in case the user has some visibility issues with the current setting.

6.1.3 Power off

If the **Power off** is selected, only the Display Unit is turned OFF and the AIS functionality of the Transponder will still be active. Note that the ship list will need some time to recover when turning the Display unit on again. This is dependent on when the messages from the different vessels are received.

The message logs for sent and received messages will also be lost.

Note that the Transponder unit will issue an alarm when the display is shut down, and there may be no means to acknowledge this alarm if the display is turned off!

6.2 Display Unit menu system.

The main window contains three main sections.

6.2.1 Status Bar

The *Status bar* is visible in all the sub menus. Note that the status bar is mostly left out from the screenshots in this manual.
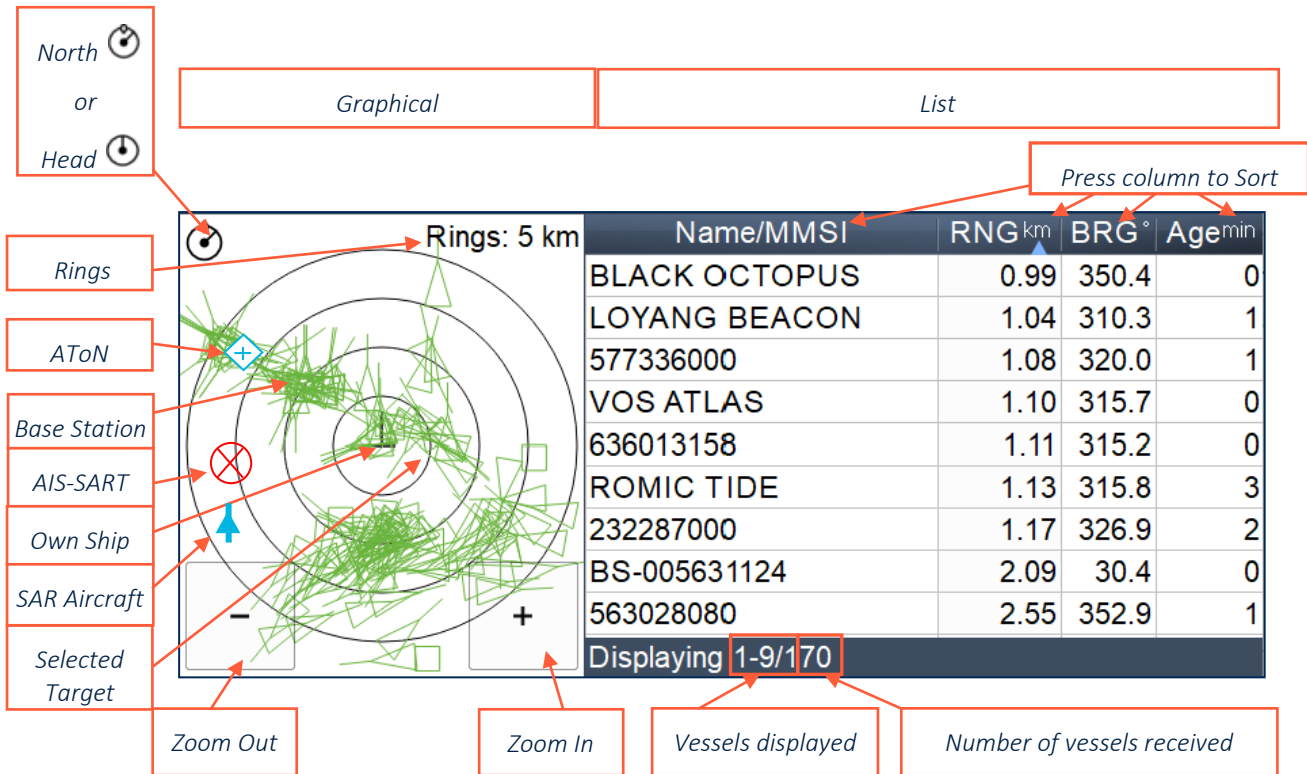
6.2.2 Content Section

Displays the current selected window and the corresponding data

Example below shows **Main View**:

Main View is a combination of **Graphical** and **List view**:

All menus, menu buttons and settings are displayed in this section.

6.2.3 Button Bar

Contains all the functional buttons for above window:

| Config | Messages | Display | Voyage | Down | Up | Enter | List |
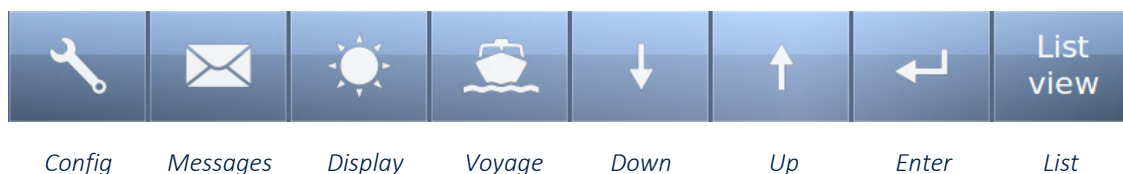
The functionality of the buttons on the **Button Bar** is dependent on the content of the **Content Section**.

6.2.4 Important Buttons shown in different Views:

Return to last menu **without saving**.

Confirm, **save data** and return to last menu.

If the Icon is not highlighted, indicates no data has changed

The **Home button** will take you to **Main view** without saving.

Enter – Show detailed information ("Page 1") on selected item

More info
Will be shown when vessel is selected with **Enter** button. Click to show "More info" about vessel

Inland info
Will be shown in "More Info" if vessel is broadcasting Inland information.

Basic info
Switch back to "Basic Info"

Arrow Down – Select next item on a list

Arrow Up – Select previous item on a list

Arrow Right – Select item to the right

Arrow Left – Select item to the left

Configuration – of Own ship, Display, Regions, Alarms, Indicators and Advanced

Messages – See **Received** and **Sent** messages, **Reply** to received and send **New**

Display setting – Adjust **Brightness** or select **Day/Night** mode

Voyage settings – Nav. Status, Destination, ETA, Draught, Cargo, Persons aboard

Some of the functions cannot be altered without entering a password. There are two levels of passwords, a user password and an administrator password. The default user passwords is "OP". Contact your administrator to do other changes.

6.2.5 Indicating ICONS

Rx Receive data on either of the two AIS channels. If **Inactive**, shown as   **Rx**

TxB Transmit on either channel A or B shown as **TxA** or **TxB.** Icon shown is **Inactive**.
Active is shown with Green color as the Rx icon above.

INLAND Indicates that the unit is operating in Inland mode

        Indicates that your vessel is signaling Blue Sign active. Replaces inland mode icon in the menu bar.

Alarm Status:

        No alarms

        Unacknowledged warning(s) caused by one or more incidents from Table 2.

        Acknowledged warnings(s) or active caution(s) caused by one or more incidents from Table 2.

Navigation Status:

        Under way using Engine

        At Anchor

NUC Not Under Command

RIM Restricted Manoeuvrability

VCD Constrained by her draught

Moored Moored

GRND Aground

Fishing Fishing

        Sailing

Transmission Modes :

Silent Mode - Transmission is turned OFF (ch 8.5.2.3)

Normal transmission mode (12.5W)

Low Power (1 W) if
- Vessel type = "Tanker"
  and
- Speed is below 3 knots
  and
- Navigation Status = "Moored"

6.2.6 Ship List

List view

The display unit receives data about all the ships with an active AIS transmitter in the area and presents this data in a list in the main window. The list displays the name or MMSI, range to own ship, bearing and age of presented data. When the graphical view is off, course and speed are also displayed.

Name/MMSI	RNG^{km}	BRG$^{°}$	SOG$^{km/t}$	COG$^{°}$	Age^{min}
353009876	0.99	350.0	0.0	0.0	0
LOYANG BEACON	1.05	310.3	---	---	0
BS-005631124	2.09	30.2	---	---	0
563694000	2.25	12.9	10.6	81.2	0
000000070	2.48	23.3	43.0	87.1	0
563504000	3.34	61.9	0.0	173.3	0
CHEK JAWA REAR BEACO	4.10	31.3	---	---	0
PENGUIN TRANSPORTER	4.76	62.1	9.6	213.3	0
677025900	6.66	84.9	0.0	---	0

Displaying 1-9/70

Graphical view

The list can be sorted on any of these criteria, but an AIS Locating Device will always be presented at the top of the list. If the list is scrolled down, or other sorting criteria than "range in ascending order" is selected, the display will revert to a "range in ascending order" sorted list after approx. 3 minutes of user inactivity.

The columns "Name/MMSI", "RNG","BRG" and "Age" are always present, but "SOG" and "COG" may be replaced by "CPA" and "TCPA" or added in addition (See paragraph 8.5.3)

Note that in areas with heavy traffic, the number of received Vessels can be large. In cases where more than 200 vessels are received, the display unit will at any time display the 200 nearest vessels. Display of other types of objects (base stations atons etc.) will not be restricted in any way. This restriction also affects the graphical view described in the next section. The output to external devices (ECDIS,Pilot) is not affected by this filtering.

6.2.6.1 Column description

- Name/MMSI :
  Shows the MMSI (**Maritime Mobile Service Identity)** of the ship until its Name is received. Name is transmitted more seldom than MMSI numbers

- RNG^{km}:
  Is the Range to the Vessel in kilometres

- BRG$^{°}$:
  Bearing to the Vessel in degrees from your position

- SOG$^{km/h}$:
  Speed Over Ground in km/h

- COG$^{°}$:
  Course Over Ground in degrees

- CPA^{km}:
  Closest Point of Approach : An estimated point in which the distance between you and the other vessel are at its minimum value

- TCPA^{min}:
  Time To Closest Point of Approach : The time (in Minutes) until you reach the **CPA**

- Age^{min}:
  Shows how many minutes since last reception from this vessel

6.2.7 Graphical View

The *graphical display* of the ship list plots the positions of other AIS targets relative to your own position in a frame on the left side.

A vessel with neither a reported heading nor COG will be oriented toward the top of display area. The restiction of number of vessels described in the above Ship list section, also apply to the graphic display.

The user may switch between North Up and Head Up, but if no heading or COG is available, or if the ship is anchored/moored, the North Up configuration will automatically be chosen. If a valid heading is received from external heading sensor (Gyro, Satellite compass or similar), own ship will be oriented according to this. If heading is lost, Course Over Ground (COG) will be second choice for own ships orientation on the display.

Name/MMSI	RNG km	BRG°	Age min
353009876	0.99	349.8	0
LOYANG BEACON	1.05	310.3	1
566681000	1.11	315.7	0
BS-005631124	2.09	30.2	0
563694000	2.33	17.7	0
563028080	2.56	352.8	1
SRI PERKASA 70	2.93	38.4	0
563504000	3.34	61.9	0
525020120	3.57	55.1	1

Displaying 1-9/112

The setup is done in the *Display Settings* menu. In this menu, it is also possible to toggle between Graphical and List view as default.

In the display menu, the user can choose not to return to the graphical view when exiting menus.
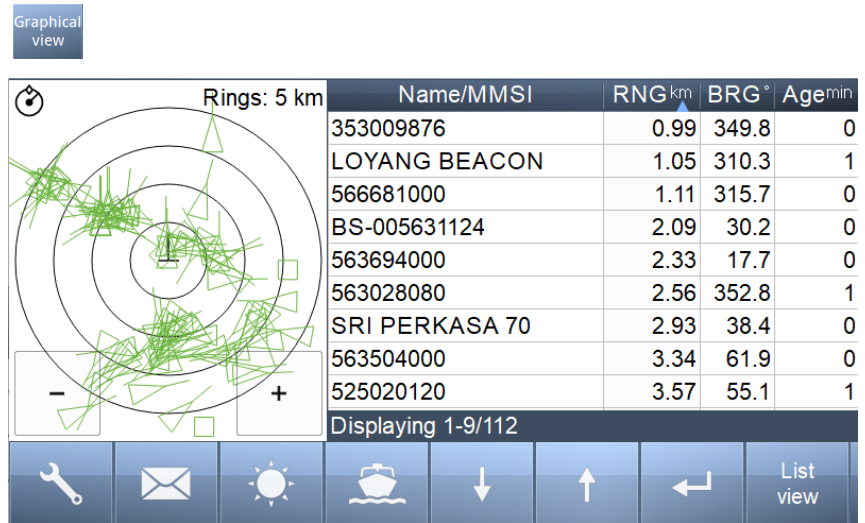
Different types of targets are displayed with different icons.

Active Vessel

If the CPA/TCPA system is activated, ships on collision course are displayed with a red color and double thickness of the lines.

Own ship is indicated in the same way as other ships, but is always in center.

Vessels with active Blue Sign will be colored blue, and include a filled circle.

Sleeping target

Smaller symbol than "Active Vessel" without a beam line

Sleeping targets are defined based on either:

- Range more than X Nautical miles
- Class B

Activation can be either of the definitions above and can be visible or not

AIS base station

Physical Aton

An Aids to navigation buoy indicating that it is off position is indicated with a red color.

Virtual Aton

A symbol provided from typically a base station, to indicate fixed objects important to navigation.

AIS SART. Will be displayed with a red color.

AIS TEST will be displayed with normal color.
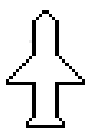
SAR Aircraft

6.3   Voyage Settings

Red square shows
button selected to get to this menu

The **Voyage Settings** contains all the information to be entered or changed for a voyage. This information will be available for other AIS stations, both vessels and base stations, so it is important to keep these parameters up to date. This page is divded into two sub-sections.

Common parameters:

- Navigational Status
- Destination
- ETA (Estimated Time of Arrival)

Inland specific parameters:

- Number of blue cones
- Loaded/Unloaded
- Assisting tugs
- Number of crew
- Number of personnel
- Number of passenger
- Draught
- Air draught
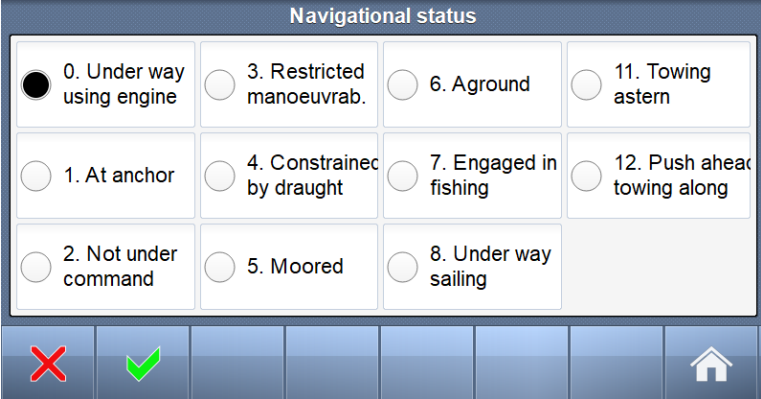
6.3.1 Navigational Status

The options available for the navigational status are as follows:

- Under way using engine,
- At anchor,
- Not under command [1],
- Restricted manoeuvrability [2],
- Constrained by her draught [3],
- Moored,
- Aground,
- Engaged in fishing [4]
- Under way sailing [5]
- Not Defined (Default) [6]
- Power driven vessel towing astern (regional use)
- Power-driven vessel pushing ahead or towing astern (regional use)

Navigational status

● 0. Under way using engine	○ 3. Restricted manoeuvrab.	○ 6. Aground	○ 11. Towing astern
○ 1. At anchor	○ 4. Constrained by draught	○ 7. Engaged in fishing	○ 12. Push ahead towing along
○ 2. Not under command	○ 5. Moored	○ 8. Under way sailing	

[1] **Vessel not under command** means a vessel which through some exceptional circumstance is unable to maneuver as required by these Rules and is therefore unable to keep out of the way of another vessel.

[2] **Vessel restricted in her ability to manoeuver** means a vessel which from the nature of her work is restricted in her ability to manouvre as required by these Rules and is therefore unable to keep out of the way of another vessel. The term "vessels restricted in their ability to manoeuvre" shall include but not be limited to:

- A vessel engaged in laying, servicing or picking up a navigation mark, submarine cable or pipeline;
- A vessel engaged in dredging, surveying or underwater operations;
- A vessel engaged in replenishment or transferring persons, provisions or cargo while underway;
- A vessel engaged in the launching or recovery of aircraft;
- A vessel engaged in mine clearance operations;
- A vessel engaged in a towing operation such as severely restricts the towing vessel and her tow in their ability to deviate from their course.

[3] **Vessel constrained by her draught** means a power-driven vessel which, because of her draught in relation to the available depth and width of navigable water, is severely restricted in her ability to deviate from the course she is following.
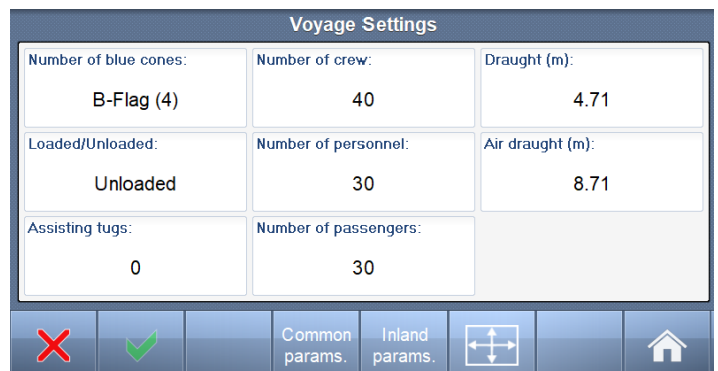
[4] **Engaged in fishing** means any vessel fishing with nets, lines, trawls or other fishing apparatus which restrict manoeuvrability, but does not include a vessel fishing with trolling lines or other fishing apparatus which do not restrict manoeuvrability.

[5] **Under ways sailing** means any vessel under sail provided that propelling machinery, if fitted, is not being used.

[6] **Not Defined (Default)** is used when unit is delivered from factory. Then none of above selections are made

6.3.2 Destination

The destination of the voyage is to be entered here using a maximum of 20 characters.

NOTE Many countries require destination input is according to GUIDANCE ON THE USE OF THE UN/LOCODE IN THE DESTINATION FIELD IN AIS MESSAGES from IMO SN/Circ.244
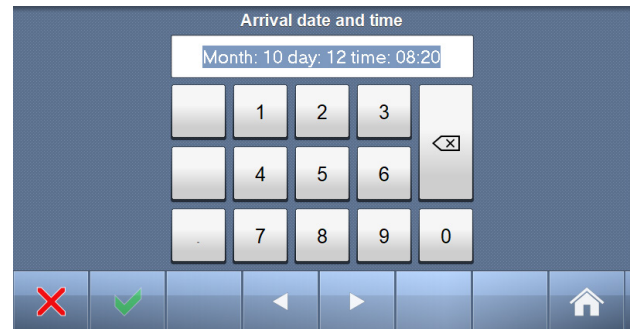
Text from the Guidance:

Recommended use of the UN/LOCODE

6.   *The recommended format is to indicate the port of departure at the first six positions of the data field followed by a separator and then the code for the next port of call.*

7.   *In order to identify that it is a LOCODE, to separate the locations and to indicate the 'from' and 'to' ports, a '>'. symbol should be used as a separator. See example below.*

   A ship is leaving Dubai bound for Rotterdam. Use of the UN/LOCODE would represent this voyage as below:
   "AE DXB>NL RTM"

8.   *If the next port of call is unknown, "?? ???" should be entered instead of the UN/LOCODE in the corresponding place in the data field. See example below:*

   "AE DXB>?? ???"

9.   *If the port of departure does not have a designated UN/LOCODE then "XX XXX" should be entered instead of the UN/LOCODE in the corresponding place in the data field. See example below:*

   "XX XXX>US PBI"

10.   *If the next port of call does not have a designated UN/LOCODE the commonly accepted English name of the destination port should be entered, preceded by "===" (3 "equals signs"). If no such name is known, the locally used name should be entered. In this case, there may not be enough space available to indicate the port of departure. See example below:*

   "===Orrviken"

11.   *If only the general area of destination is known the name or accepted abbreviation of the area preceded by "===" ("three equals signs") should be entered. See example below:*

   "NL RMT> === US WC"
   Indicating a destination on the United States West Coast.

6.3.3 ETA

The Estimated Time of Arrival is displayed to other AIS units and should be updated if the expected arrival time is changed.
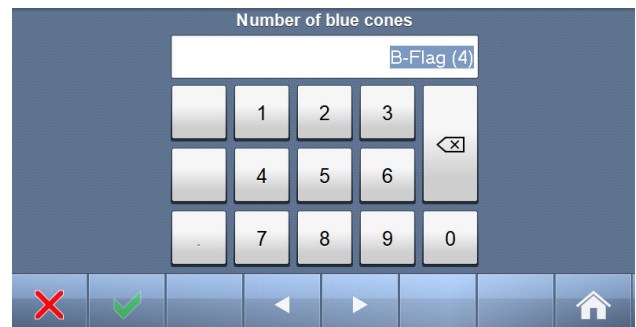
6.3.4 Number of blue cones

This field is used to indicate hazardous cargo. Input one of the following numbers.

0-3: Number of blue cones

4: B-Flag

5: Unknown (default)

6.3.5 Loaded/Unloaded

Toggle button to indicate if vessel is loaded or not.

6.3.6 Assisting tugs

Input number of assisting tugs. Valid values are 0-6.

Use 7 if unknown.

6.3.7 Number of crew/personnel/passengers
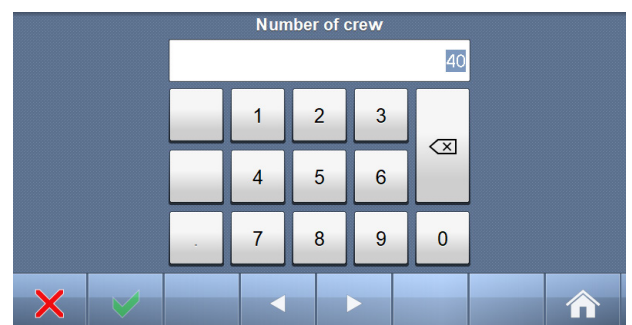
Input the number of crew, personnel or passengers. These values are not regularly broadcasted, but other AIS devices may query them.

Valid values:

Crew: 0-254, 255=unknown

Personnel: 0-254, 255=unknown

Passengers: 0-8190, 8191=unknown

6.3.8 Draught

The draught parameter specifies the maximum depth of the ship in meters and centimetres.

Valid values: 0,00-20,00 metres

6.3.9 Air draught

The air draught parameter specifies the maximum heigth above the surface of the ship in meters and centimetres.

Valid values: 0,00-40,00 metres

6.3.10   Convoy extension

If you are towing barges or similar you must indicate this using the Convoy Extension. Input how much your vessel increases in each direction. Other vessels will see you as a single larger vessel. You can also change the Vessel type for a convoy, see chapter 8.1.
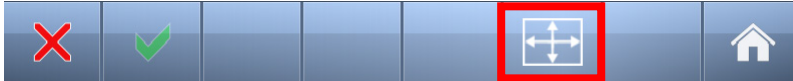
Clicking the icon brings you to a new configuration page.
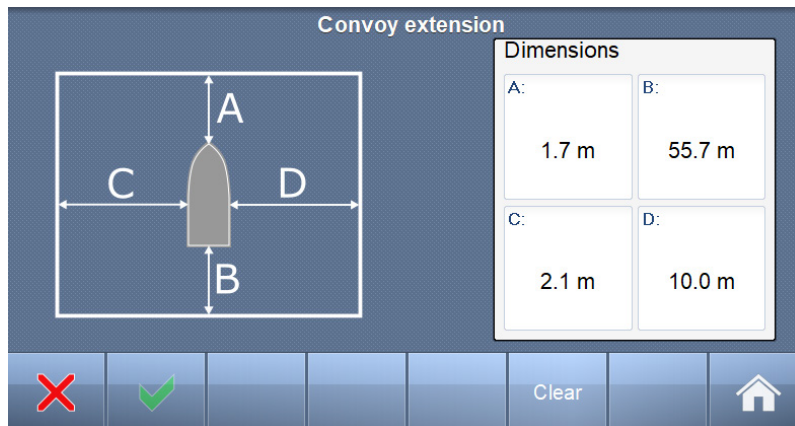
Remember to clear vessel size and reset Vessel type when not towing anymore.

6.4   Messages

WARNING	Use of AIS text messages between ships must not be used to avoid collisions when time is critical. AIS systems are not required to have an audible alarm to indicate the arrival of all text messages. The use of AIS text messaging does not relieve the vessel of other requirements, such as the Vessel Bridge-to-Bridge Radiotelephone regulations or of the requirements to sound whistle signals and display lights or shapes in accordance with the International or Inland Navigation Rules.

Usage During Emergencies - With respect to using AIS safety related text messages in emergency situations, users must be aware that they may not be received, recognized or acted upon as Global Maritime Distress Safety Systems (GMDSS) messages would be by the Coast Guard, other competent authorities or maritime first responders. Thus AIS must not be relied upon as the primary means for broadcasting distress or urgent communications, nor used in lieu of GMDSS such as Digital Selective Calling radios which are designed to process distress messaging. Nonetheless, AIS remains an effective means to augment GMDSS and provides the added benefit of being 'seen' (on radar or chart displays), in addition to being 'heard' (via text messaging) by other AIS users within VHF radio range (Ref: USCG Safety Alert 05-10).
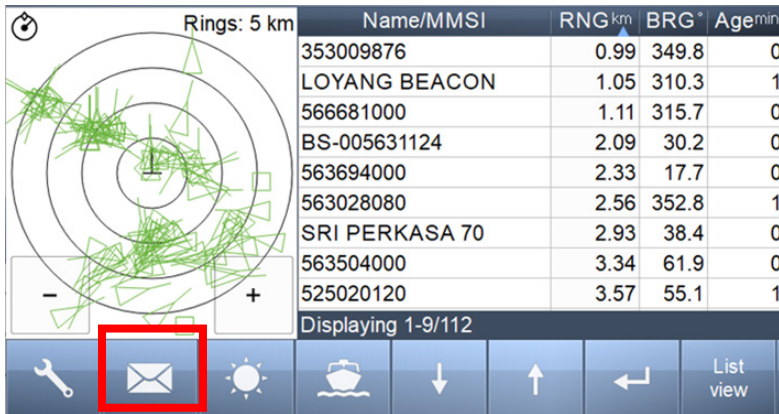
The messages Icon opens the messages menu.

6.4.1 Received messages

By pushing the buttons on the bottom bar, you can switch to:

- Sent messages
- Write New
- Reply
- Scroll up or down through received messages

When you select one of the messages in the list, you will see the content in the right window
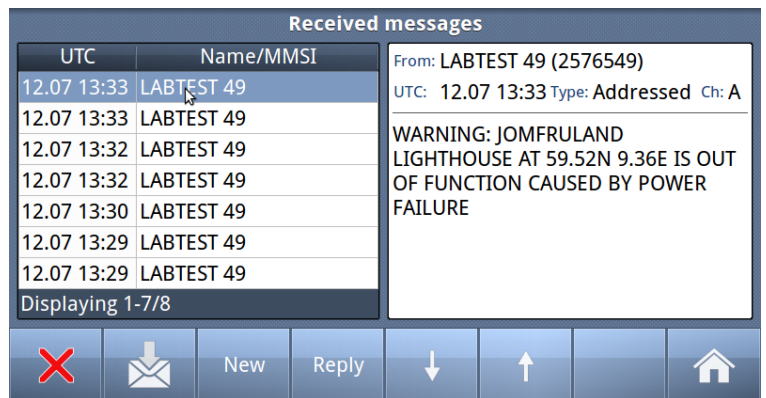
If you press the button, the display will swap to:

6.4.2 Popup when received message

Example showing "Popup" of received "Safety message" from AIS SART

The message must be acknowledged by pressing "Close" button
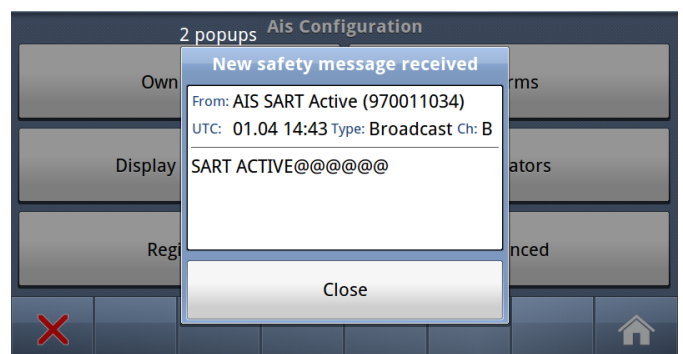
6.4.3 Sent messages

By pushing the buttons on the bottom bar, you can switch to:

- Received messages
- Write New
- Resend
- Scroll up or down through sent messages

When you select one of the messages in the list, you will see the content in the right window

There is also a "Status" field on each line showing:

🟢   Message SENT OK

🟡   Message transmission in PROGRESS

🔴   Message transmission FAILED
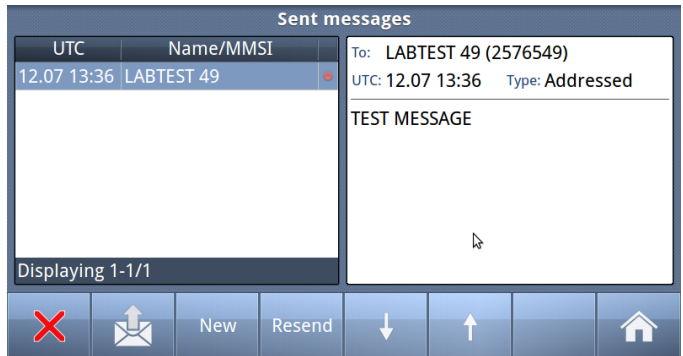
6.4.4 Write New message

Be advised, text messages in this context are SAFETY RELATED and should not be used for other purposes.

For this reason, this functionality is protected by a user password.

Default Password = OP

Select here message recipients:

- From list (Of received ships)
- Enter MMSI (directly)
- Broadcast (to all)
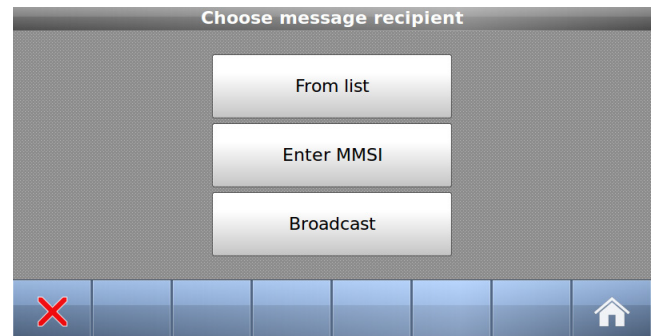
6.4.4.1   Message recipients "From list"

1. Select ship
2. Confirm with [✓]

Select message recipient			
Name	MMSI	RNG^{NM}	BRG°
PACHUCA	304824000	2.68	250.9
RESCUE STORMBULL	258258500	2.94	264.6
SOUTHERN ACTOR	257015900	5.43	37.0
LITEN	257143720	5.50	37.5
M/S BOHUS	259153000	8.00	105.9
LOS 112	257075500	10.29	80.6
	257137700	11.35	265.2
Displaying 1-7/30			

SELECT MESSAGE TYPE

Select Text if you wish to write a custom safety message, or select Number of persons RFM55 to send this Inland specific message containing the number of crew, personnel and passenger abord your vessel.

If selecting Number of persons RFM55, you will jump directly to the Choose channel and send menu.

Selecting Text opens the Enter message text menu.

WRITE TEXT

When a target is selected, the keyboard window opens, and allows the user to write a message. The total allowed length is 156 characters.

Confirm with [✓]

CHOOSE CHANNELS AND SEND

1. Select preference
2. Press send buton   Send

6.4.4.2 Message recipients "Enter MMSI"

1. Enter MMSI
2. Confirm with ✓
3. Write Text (as described above)
4. Select Channel and Send (-""-)
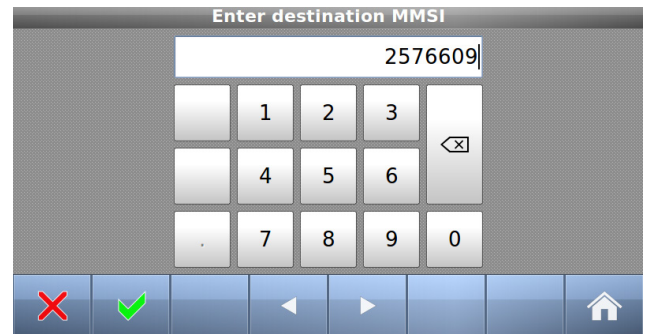
6.4.4.3 Message recipients "Broadcast"

1. Write Text (as described above)
2. Select Channel and Send
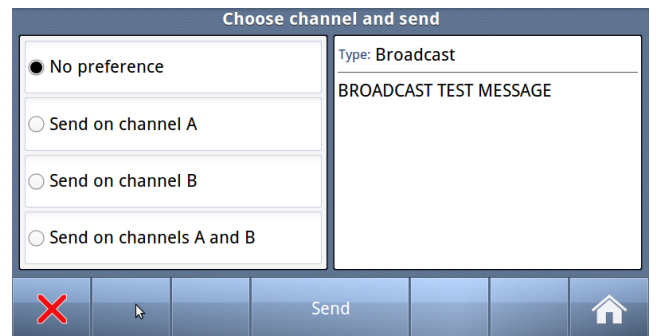
6.5   Display Settings
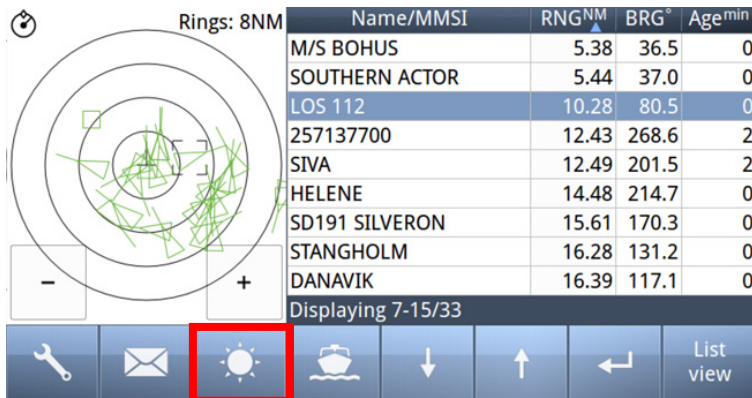
In the **Display settings** menu, you can adjust Brightness level and switch between night and day mode. Each mode has its own brightnesslevel.
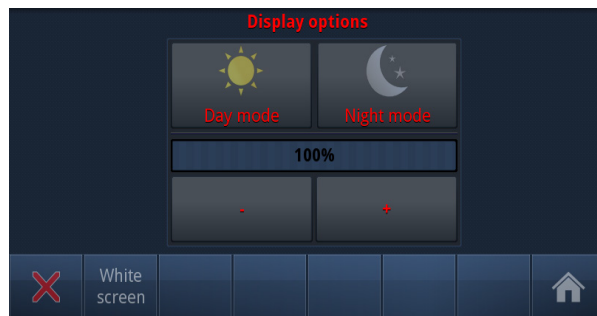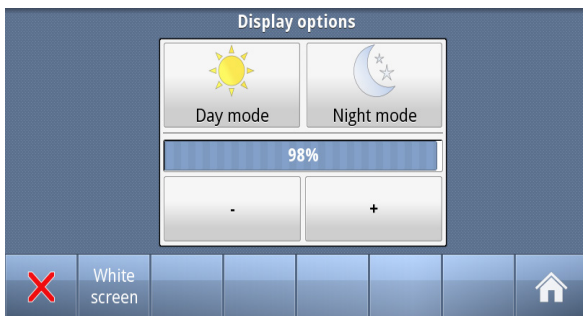
In the low brightness end of the scale, the steps are more accurate to adapt to very low intensity levels.
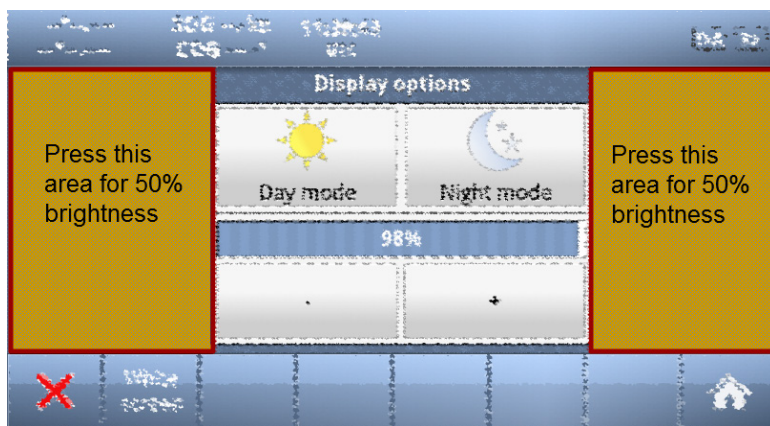
Touching the empty area at the left or right side of the display restores a 50% brightness level if the display gets too dark to see the actual buttons for this purpose.

Restoring of 50% brightness level is also accessable by pressing the on/off button (see chapter **6.1**)

Press "Home"   to return to Main Window again

7 Initial Configuration

7.1 Short reference for initial configuration

Reference to the main manual: "Tron AIS TR-8000 MkII - Operator and installation manual".

1. Fill in **Own ship** (Ch. **8.1**)
   - Ship Name
   - MMSI number
   - IMO number
   - Call Sign
   - GNSS antenna positions (Internal & external)
   - Type of Vessel
2. Configure Blue Sign
   - ECDIS or electrical connection (ref ch. **8.5.7.3**)
3. Check GNSS and position:
   - Internal GNSS signal strength (ref ch. **8.5.4**)
   - Transmitted data: (Ref ch.**8.5.8**)
4. Configure **External Display Interface**(ch. **8.5.1.2**)
   - Ethernet
5. Configure **Display port interface**(ch. **8.5.1.2**)
6. Check External Sensor communication
   - Indicators (ch.**8.4**) - shows Sensors detected
   - Port Monitor (ch. **8.5.1.7**) – shows RAW data from Sensor 1 to Sensor 3
7. Check **External Display** communication
8. Check **Communication test** (ch.**8.5.2**)
9. Fill in **Voyage Settings** (Ch. **6.3**)
   - Navigational status
   - Destination
   - ETA
   - Draught, air draught
   - Blue-cones
   - Persons abord
10. Check **reception of ship in ship list** – normal operation (ch. **6.2.6**)

7.2 Not all ships carry AIS

It is important to remember that not all ships carry AIS, in particular leisure crafts, fishing boats, warships and some coastal shore stations including Vessel Traffic Service Centers.

7.3 Use of AIS in collision avoidance

As an anti-collision aid the AIS has some advantages over radar:
- Capable of instant presentation of target course alternations.
- Not subject to target swap.
- Not subject to target loss in clutter.
- Not subject to target loss due to fast manoeuvres.
- Able to detect ships within VHF/FM coverage.

> **IMPORTANT**
>
> When using the AIS for anti-collision purposes it is important to remember that the AIS is an additional source of navigation information. It does not replace other navigational systems. The AIS may not always give the right picture of the traffic in your area separately.

7.4   Erroneous information

Erroneous information implies a risk to other ships as well as your own. Incorrectly configured or calibrated sensors might lead to transmission of incorrect information. It is the user's responsibility to ensure that all information entered into the system is correct and up to date.

8 Operation Instructions
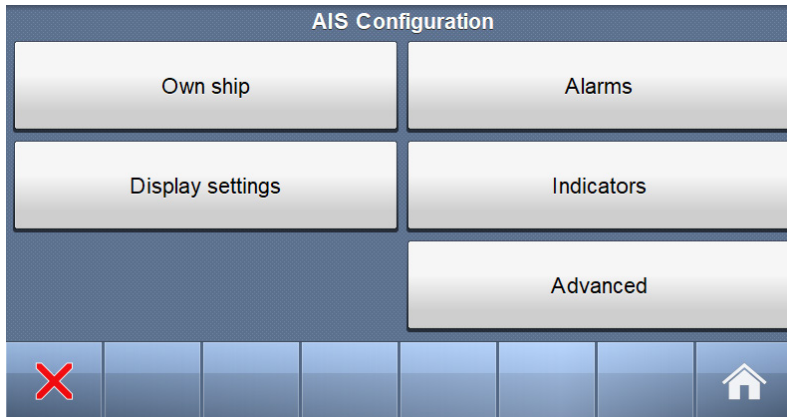
The AIS configuration menu consists of five menus, containing the settings and configurations most applicable to the user. Some settings are write-protected by administrator password, but the user is always allowed to view the current settings.

8.1 Own Ship

The own ship configuration is for setting the static data of the ship and is primarily only used during setup/installation but should also be checked regularly (at least once a month).

See the common parameters as shown here.

To be able to change values, the **Admin pswrd** button must be pressed and the administration password must be entered

Vessel name, Call sign and MMSI are all text or numbers and may be entered easily

Click the Inland Params. button too see more configuration options:
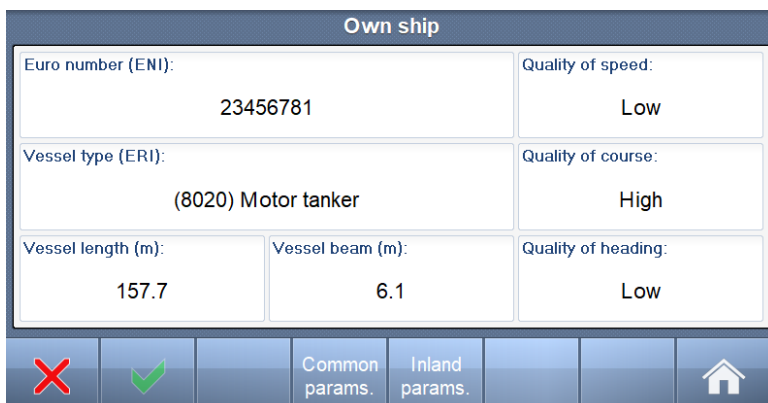
Click on each option to configure Euro Number, vessel type, vessel length, vessel beam, and quality of sensors.

For a list of vessel types, see chapter 12.

Set Quality of speed/course/heading to high only if type approved sensor connected.

Note that Vessel type and Quality of speed/course/heading does not require password.

8.1.1 Ship Dimension and Antenna Position

In order to calculate the correct location of own ship relative to other ships, the exact position of the GNSS antennas need to be specified.

The setting of the Ship Dimensions and the Antenna positions are combined as follows:
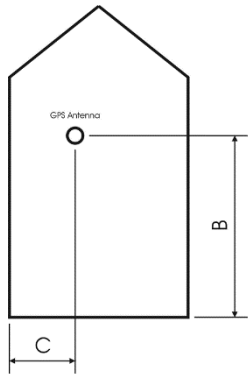
B: Distance from stern to GNSS antenna position in meters.

C: Distance from port to GNSS antenna position in meters.

Figure 8-1: Ship Dimension and GNSS antenna position.

Both the position of the internal and the external GNSS antenna need to be set. To configure "GNSS Antenna position", select directly on the Touch screen:
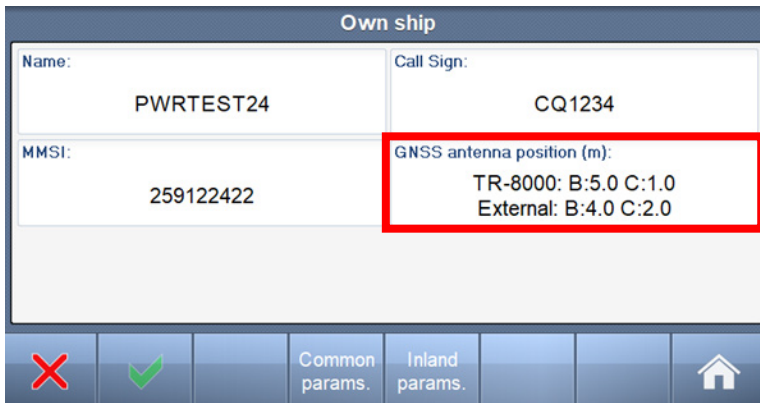
TR-8000 -> means position of the antenna connected directly to the transponder.

External -> means the position of the GNSS antenna which is connected to an external GNSS which feeds IEC 61162-1 messages to the transponder.
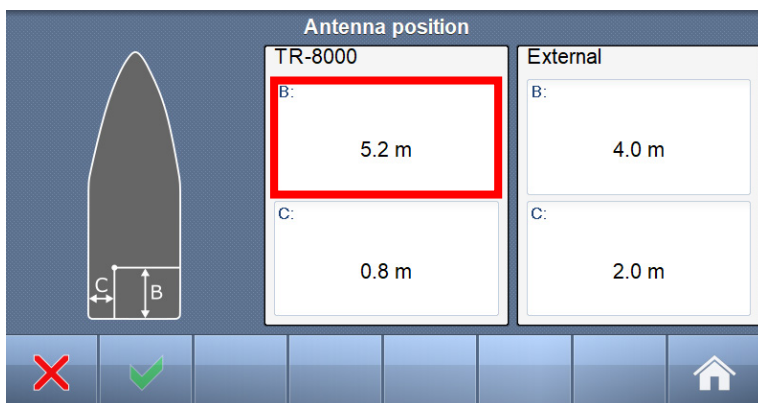
Click on "B"or "C" for "TR-8000" and "External" and input correct values.

B may be maximum 511 metres, while C may be maximum 63 metres each.

The resolution is decimetres.

8.2   Display settings

8.2.1   Sleeping Targets
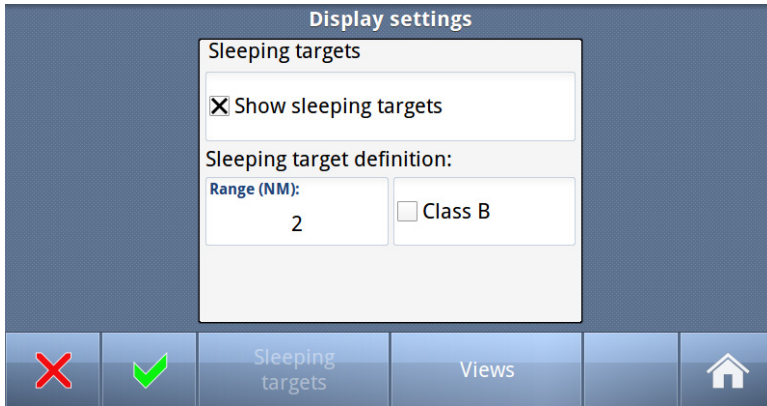
The first "Display settings" menu configures "Sleeping targets". Sleeping target has a smaller shape and no vector in order to display a less cluttered graphic view. Sleeping targets can be defined to be all vessels outside a defined range, and/or all class B stations.

8.2.2   Views
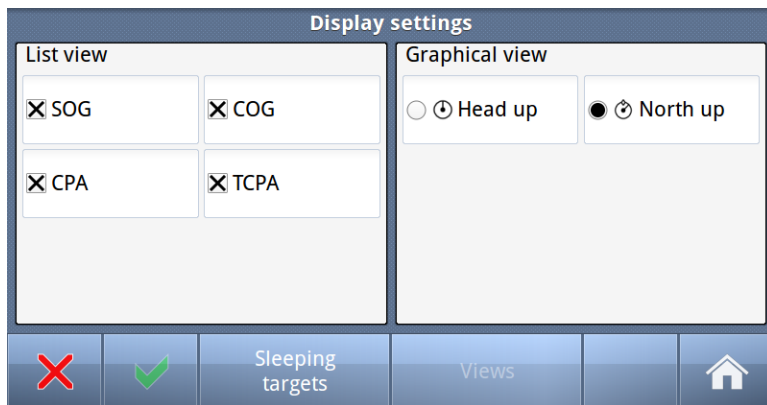
Press the View button on the button bar in order to configure how the ship list and the graphic view should be displayed.

Here we can configure which columns shall be shown in "Ships List" (chapter 6.2.6) and if we want "Head up" or "North up" in "Graphical view"(chapter 6.2.7).

8.3 Alarms

8.3.1 Alarm config

Pressing the Config button opens the Alarm Configuration page:

During installation it is possible to disable some specific alarms. Disabling alarms is done by selecting one alarm and clicking the Toggle button.

8.3.2 Alarm popup

Alarms in the transponder is divided into two categories: warnings and cautions.

When a warning alert occurs, a popup will be shown with status of Warnings:

And the "Warning" popup must be acknowledged by pressing the button below Alarm window

When a caution alert occurs, a separate popup will be shown with the status of Cautions. Cautions, however, may not be acknowledged.

The internal Alarm is triggered if a failure is detected in one or more of the AIS functions or data. The corresponding message is given as defined in chapter 9. The most probable source of error and corresponding system behavior is described together with some notes on troubleshooting the error.
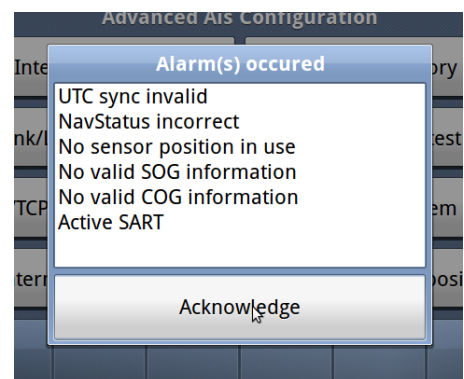
8.4   Indicators
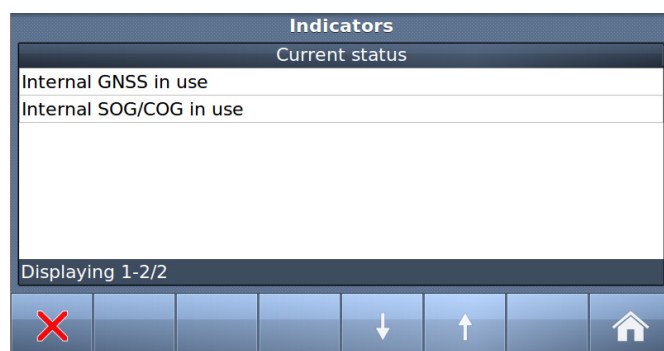
The *indicators* show information about where sensor data are collected, valid Heading etc.

This list may be used if troubleshooting of the sensors is needed. The available messages are as given in .

Identifier	Text message	Description
021	External DGNSS in use	DGNSS is normally the same as DGPS, which indicates external type of such sensor is in use
022	External GNSS in use	GNSS is normally the same as GPS, which indicates external type of such sensor is in use
023	Internal DGNSS in use (beacon)	Internal DGNSS (DGPS) (beacon) in use indicates a DGNSS beacon receiver is connected and transmit valid data to Transponder
024	Internal DGNSS in use (Message 17)	Internal DGNSS (DGPS) (Message 17) in use indicates Differential correction data is sent from an AIS Base Station Transponder
025	Internal GNSS in use	The built-in GNSS (GPS) receiver is in use
027	External SOG/ COG in use	SOG (Speed Over Ground)/ COG (Course Over Ground) from external GNSS(GPS) device is in use
028	Internal SOG/ COG in use	SOG (Speed Over Ground)/ COG (Course Over Ground) from internal GNSS(GPS) device is in use
031	Heading valid	True Heading is received from either an external Gyro or Satelitte compass
033	(ROT) Rate of Turn Indicator in use	ROT received from external sensor: TI (Turn Indicator)
034	Other ROT source in use	No TI(Turn Indicator) from external sensor, ROT(Rate of Turn) value is calculated from HDT internally
036	Channel management parameters changed	If either "Region setting" is applied manually or from msg received from AIS Base Station, this indicator will be shown.
037	Low power tanker mode active	Entering low power mode, when ship is tanker, NavStatus is moored and SOG is less than 3 kn.
038	Low power tanker mode inactive	Leaving low power tanker mode active
040	Operating in assigned mode by Message 16	
041	Operating in channel management mode by Message 20	
042	Operating in channel management mode by Message 22	
043	Operating in group assignment mode by Message 23	
044	Returned to default operations	No longer assigned by base station
057	MMSI not defined	MMSI set to 0. Confgiure MMSI on Own Ship page. Jotron custom

Table 1: Indicators

8.5 Advanced

Advanced AIS Configuration	
Interface	History
VHF link/Long Range	Self test
CPA/TCPA settings	System
Internal GNSS	Transmitted data
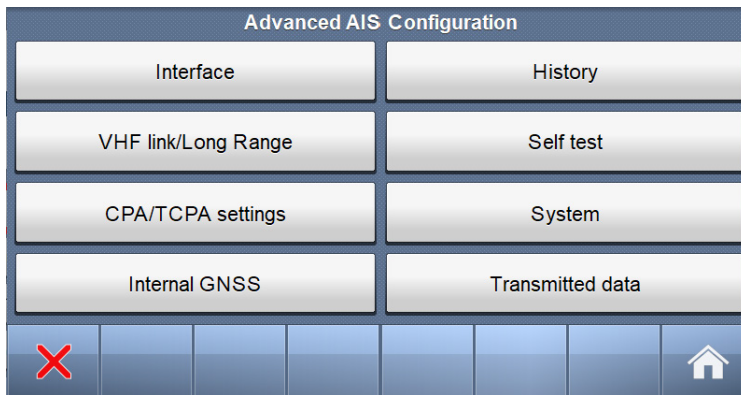
The **Advanced Menu** is intended for use during setup and maintenance of the AIS system. Some of the menus are write protected by password, but all parameters are readable to all users for inspection.

8.5.1 Interface

For installation and connection of the system, see the separate "**Tron AIS TR-8000 MkII - Operator and installation manual**"

Interface	
Display/Transponder IP	Baud rate
External display	Priorities
Display pilot port	Port monitor
Long Range/ECDIS	
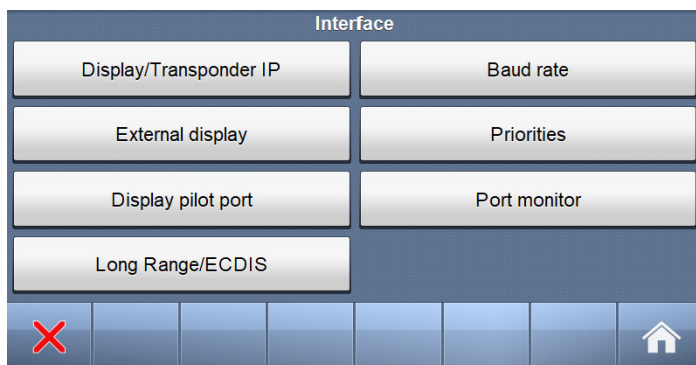
In the "Interface" menu, the parameters shown on the left picture can be configured.

8.5.1.1 Display/ Transponder IP

NOTE	Because Ethernet is used between transponder unit and display, an IP addresses must be correctly configured

Display and transponder IP	
Display IP settings	**Transponder IP settings**
Address: 000.000.000.000	Address: 10.0.11.45
Netmask: 000.000.000.000	Netmask: 255.255.0.0
	Gateway: 0.0.0.0
Admin pswrd.	
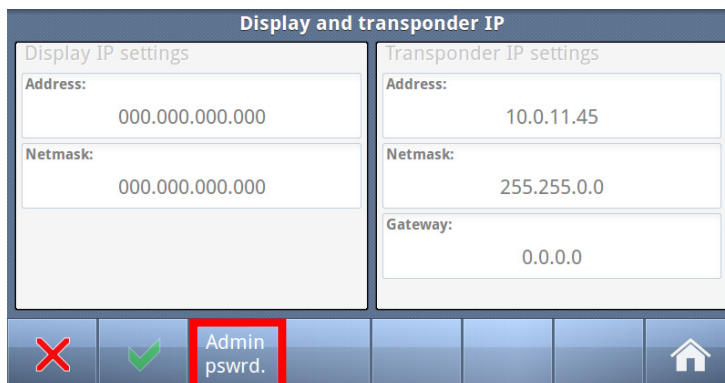
All parameters /buttons are "grayed out" as they are not accessible without "Admin Pswrd". Contact your administrator to do the following changes.

When "Admin pswrd" button is selected, the following window appear:

Input the "Admin Password" into the field and press the "Confirm" button:

Then it is possible to access all fields and configure IP settings:
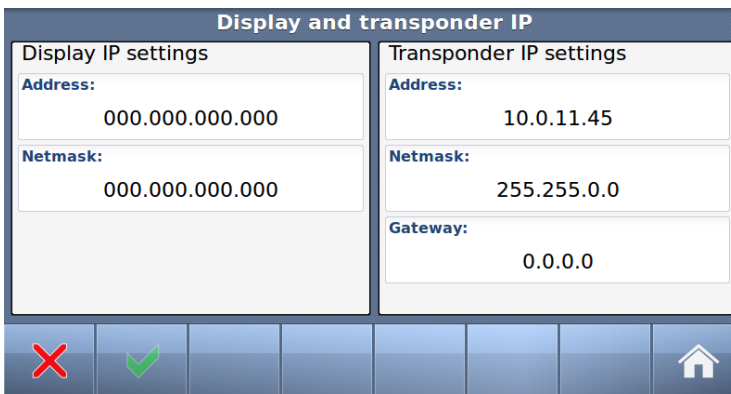
Default values are:

Display:

Adress: 10.0.0.11

Mask: 255.255.0.0

Transponder:

Adress: 10.0.0.10

Mask: 255.255.0.0

Gateway: 0.0.0.0

(Gateway is only used if Transponder and display are on different subnets)

And when configuration is finished either of "Return" or "Confirm" buttons will bring you back to last menu.

8.5.1.2 External display

The Transponder supports multiple ports for external display, see installation chapter. Note that previous software images had an option to enable RS232.

In addition there is an ethernet UDP port, which may be enabled and work at the same time.

When using UDP, the datagram is transmitted to the IP address shown in the dialog. The address may be in another subnet if a gateway is programmed in the interface settings.
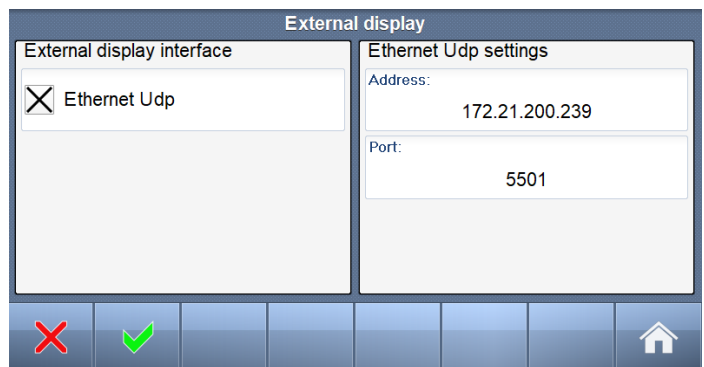
If Ethernet is used, an external Ethernet switch is required for simultaneously connection of the display unit and a remote computer, see also installation chapter of SOLAS manual, which describes the External Display physical connections.

8.5.1.3 Pilot port

The AIS system has the flexibility of either connecting the Pilot port outlet to the Transponder unit or the Display unit. The Transponder units pilot port is always enabled, but the Display units pilot port must be explicitly enabled.

By enabling the restricted mode both pilot ports are restricted to read-only mode, and thus not permitted to change settings.

See installation chapter of SOLAS manual for information regarding connecting to the pilot port.
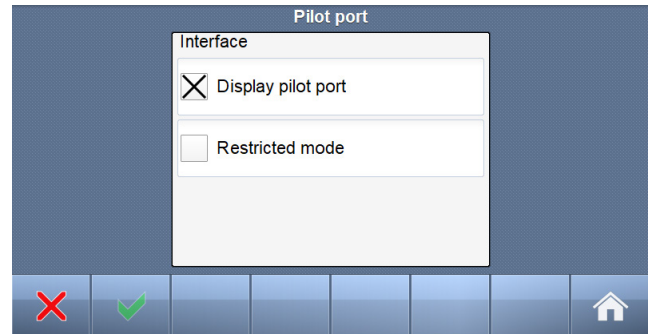
8.5.1.4 Long-Range/ECDIS

The Transponder has the flexibility of using the Long-Range port as an External Display (ECDIS) port if the Long-Range functionality is not needed.

Changing this option requires a reboot of the Transponder.
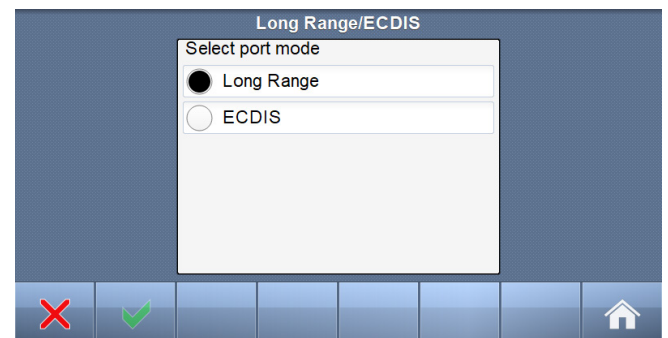
8.5.1.5 Baud rate

Press one of the 5 Port buttons to change the baud rate of that port.

It will then jump between the legal options:

- 4800 (default: Sensor)
- 9600
- 19200
- 38400 (default: Long-Range)
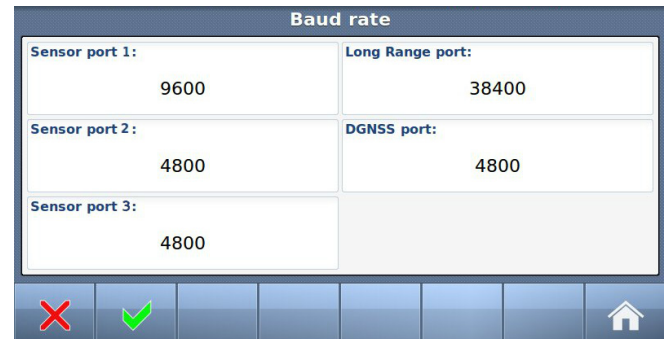
8.5.1.6 Priorities

From this menu the priorities for the different sensor measurements can be set individually.

I.e if the unit receives Heading data from two different sources, the settings here specify what data source to be used.

In order to navigate through the different sensors, administrator password is required.

Priorities of Position, Heading and Rate Of Turn can be configured in this window. SOG and COG follows the position priority setting.

Select which " Port" will have lower or higher priority.

	Position	Heading	Rate of Turn
HIGH	Sensor Port : 1	Sensor Port : 1	Sensor Port : 1
	Sensor Port : 2	Sensor Port : 2	Sensor Port : 2
	Sensor Port : 3	Sensor Port : 3	Sensor Port : 3
	External display Port	External display Port	External display Port
	Pilot Port	Pilot Port	Pilot Port
LOW	Longrange Port	Longrange Port	Longrange Port

Priorities

Buttons: ✗ ✓ Lower Priority Higher Priority ↓ ↑ → 🏠
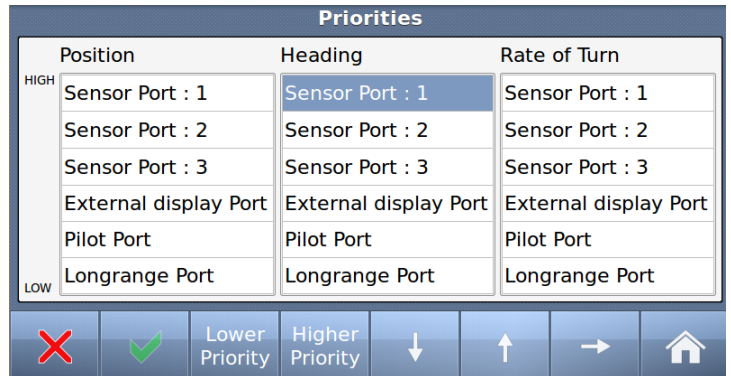
8.5.1.7 Port monitor

The Port monitor is an important feature in the AIS system which can help troubleshooting connection issues with different sensors. The "Port monitor" acts as a Terminal window, showing raw data received on a sensor, similar to Windows "Hyperterminal"

First select which "Sensor port" you want to "listen" to

Port monitor

Sensor port 1 / Sensor port 2 / Sensor port 3

Buttons: ✗ Start Clear ↓ ↑ 🏠

And if a Sensor is connected it could look similar to these:

Port monitor: monitoring port 1

```
$TIROT,0.4,A*3F
$TIRMC,111527.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*2D
$TIROT,0.7,A*3C
$TIRMC,111528.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*22
$TIROT,0.8,A*33
$TIRMC,111529.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*23
$TIROT,0.8,A*33
$TIRMC
```

Sensor port 1 / Sensor port 2 / Sensor port 3

Buttons: ✗ Stop Clear ↓ ↑ 🏠

Port monitor: monitoring port 1

```
$GPRMC,111629.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*2A
$GPRMC,111630.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*22
$GPRMC,111632.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*20
$GPRMC,111633.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*21
$GPRMC,111634.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*26
$GPRMC,111634.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*26
$GPRMC,111636.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A*24
$GPRMC,111637.00,A,5904.00,N,01107.00,E,0.0,0.0,231211,0,E,A
```

Sensor port 1 / Sensor port 2 / Sensor port 3

Buttons: ✗ Stop Clear ↓ ↑ 🏠

Port monitor: monitoring port 1

Sensor port 1

Sensor port 2

Sensor port 3

ÿÿÿø`U+ÿÿÿÿÿÿÿëÿÿÿëÿÿÿÕÿÿÿÿöÿÿÿïÿÿÿÿÕïÿÿÿïÿÿÿöÿÿÿ-
ÿÿÿÿÿÿÿ«kÿÿÿÿöv6ÿÿÿÿÿÿÿövmÿÿÿëÿÿÿÿÕÿÿÿÕÿÿÿÕÿÿÿÿ6ÿÿÿïÿÿÿövÿÿÿ-
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| X | Stop | Clear | ↓ | ↑ | ⌂ |

The two screenshots above shows Sensor data which are most probably OK, while left screenshot shows corrupt data from incorrectly connected sensor (Polarity of signals are incorrect)

8.5.2 VHF link/Long-Range

In this menu, configuration of

- Long-Range
- VHF Link (Silent ON/OFF)

can be done, in addition to:

- Test VHF link communication
- Display locating devices when such equipment are tested

VHF link/Long Range

Autonomous Long Range

☐ Enable Ch. A   Channel A: 0

☐ Enable Ch. B   Channel B: 0

Polled Long Range

Response mode:

Manual

VHF link

☒ Silent mode

☐ Display devices in TEST mode

Test communication

| X | ✓ | | | | | | ⌂ |
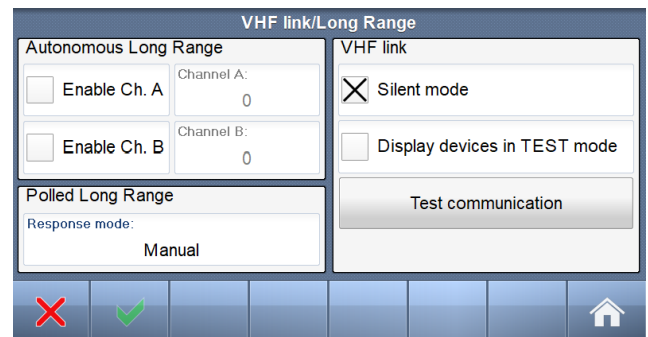
8.5.2.1 Autonomous Long-Range

Long-Range Broadcast Channel A and B are used for broadcasting positions and ship data to a satellite system. Base Stations are able to temporarily disable the Long-Range broadcast functionality of the AIS. The Long-Range Broadcast may also be disabled manually by administrator.

8.5.2.2 Polled Long-Range

The Polled Long-Range system can be configured to reply automatically or wait for acknowledgement from the user. An indication of received LR messages is displayed for the user in either case.

8.5.2.3   VHF Link: Silent mode

The silent mode is a special mode for travelling in areas where the transmission of own position impose risk to the user. When active, no signals are sent from the Transponder unit, but the user is still able to receive information from other vessels.

If the *Silent Mode* is active for more than 15 minutes, the event is logged in the *History Log.*

⚠ CAUTION	The Silent Mode disables the AIS Transmitter functionality and will make the Vessel invisible on the AIS system and impose a risk to other and own vessels.

8.5.2.4   VHF Link: Display devices in TEST mode

When AIS-SART was introduced as alternative to traditional Radar SART in 2011, it was obvious that testing such equipment could lead to much "noise" on nearby ships AIS Transponders and ECS/ECDIS as this AIS-SART icon/text message would pop up on all nearby vessels within VHF range (5-40 nautical miles). Therefore, revisions in the AIS standards were made so the person who wants to test the AIS on-board the ship, must first activate this menu item before it will be shown on the vessels AIS and ECS/ECDIS or Chart Plotter.

This options also applies to EPIRB and MOB (Man Over Board) devices in test mode.

Example showing "*Display devices in TEST mode*" and Popup received to be acknowledged by pressing "Close" button
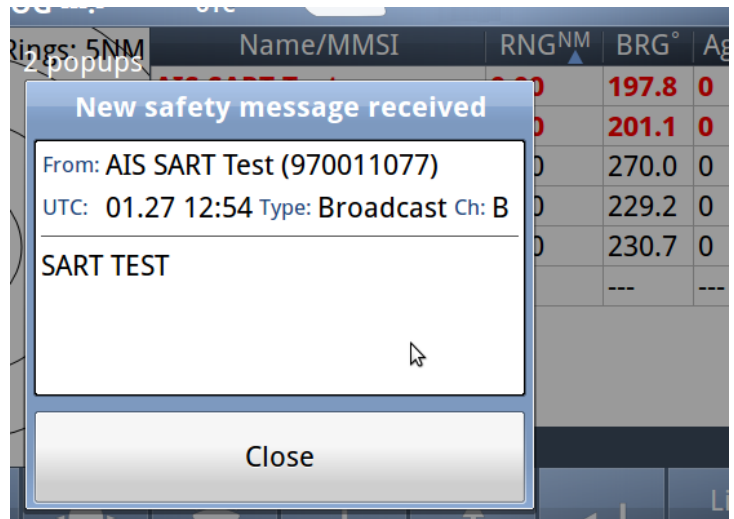
ⓘ IMPORTANT	Observe that here are "2 popups" received from 2 different AIS-SARTs and each "popup" must be acknowledged. Also observe that locating devices are displayed in top of the list in the background, and with RED color.

8.5.2.5 VHF Link: Test Communication

The Communications Test is used to test the VHF communication by transmitting a request for an acknowledgement to another ship. The target is automatically selected by the Display Unit, but the user can choose to select another target as long as the target is a Class A AIS transponder. If the Acknowledgment is not received within 10 seconds, the Communications Test has failed and the user should optionally retry with another target.

If the Transponder is in "Silent mode", it is not possible to perform this test:
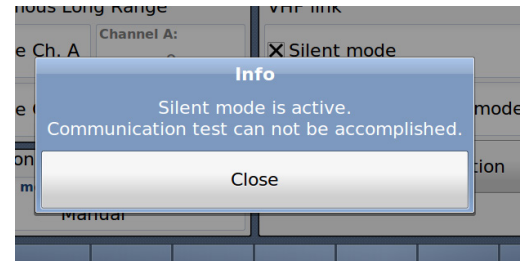
If not, we can continue with the test:

11. Select Target
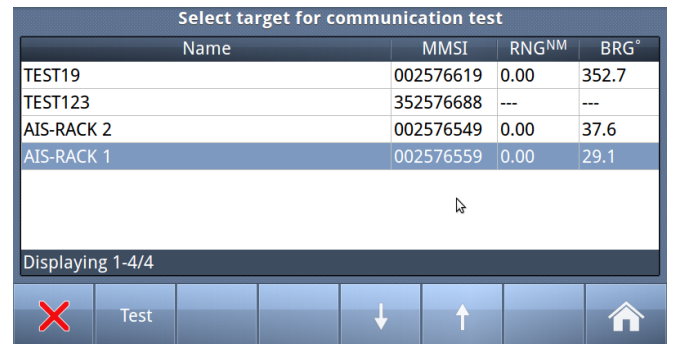
12. Press "Test"
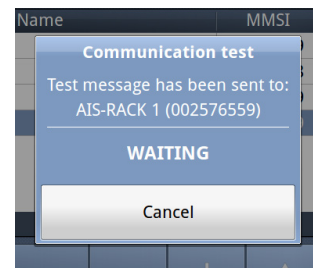
13. Wait until test finished
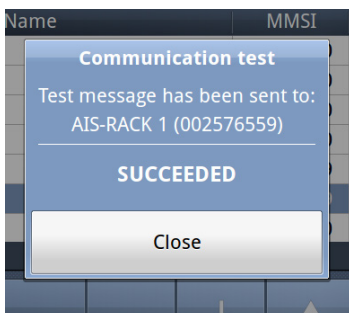
Success: or   Failure:
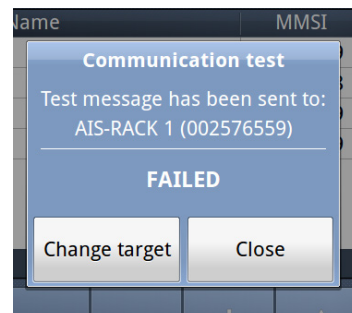
If the TEST fails, we can select another target and redo the test

8.5.3 CPA/TCPA settings

The CPA (Closest Point of Approach) and TCPA (Time to Closest Point of approach) range for which you want to be alerted of AIS targets on a possible collision course with you needs to be set here. You may also disable the CPA/TCPA functionality manually. How the user is alerted is also specified in this menu.

CPA/TCPA Settings

- ☒ Enable CPA/TCPA

CPA (NM):	TCPA (min):
1	1

- ☒ Enable CPA/TCPA indication
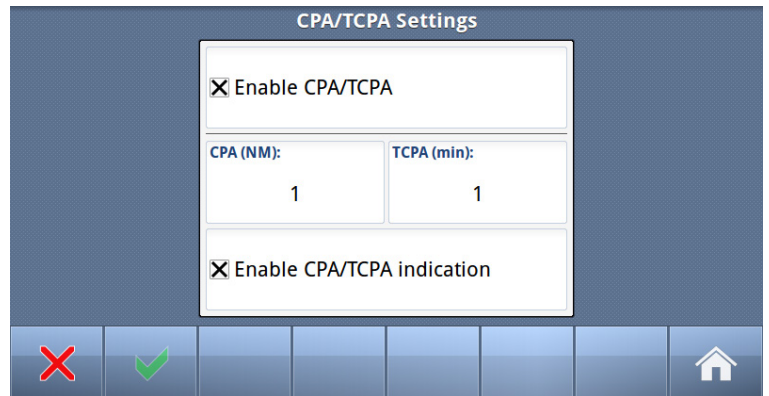
> **NOTE**
> The CPA/TCPA is calculated in the display only. No alarm will be generated to any external equipment. If the AIS is connected to remote systems that will calculate CPA/TCPA based on the real time information from the AIS, the CPA/TCPA calculations in the display should be turned off.

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8.5.4 Internal GNSS

It is possible to inspect the functionality of the internal GNSS receiver by the following parameters:

- Satellites in view
- Signal strength (SNR on Y-axis)
- Satellite ID (X-axis)
- Position
- Pos. accuracy
- Precision
- Differential mode

Showing internal GPS

Position:
59°06.81N   10°06.62E

Position accuracy:
FIX: 3D   VDOP: 0.8   HDOP: 0.56   PDOP: 0.98
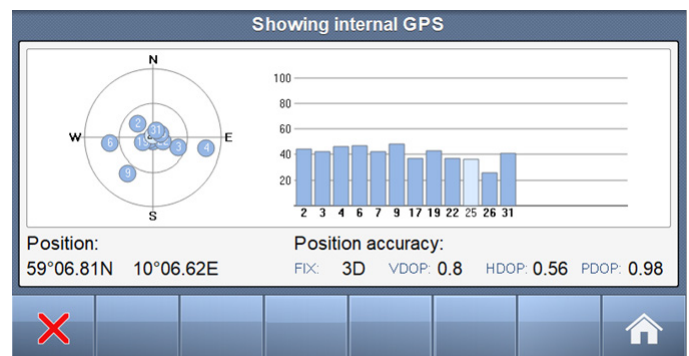
8.5.5 History

If the transmitter functionality of the transponder stops functioning for more than 15 minutes, this is logged as an event in the *History Log*.

Transmit malfunction log		
Turned Off	**Turned On**	**Reason**
25 Nov 2011 06:...	01 Dec 2011 07:...	Power Off
08 Nov 2011 11:...	22 Nov 2011 07:...	Power Off

Displaying 1-2/2

8.5.6 Self test

The "Self Test" consist of two different tests, a "Transponder self test" and a "Display self test":

"Transponder self test" measures values of:
Signal strength (RSSI.. 0-255)

- RF Power (Forward+ Reflected :0-512)
- Antenna matching (VSWR)
- Voltages (3, 5, 8 and 14v)
- Receivers status
- Transmitter status
- Power source (Main, Backup)

Transponder self test	
RSSI AIS 1 receiver: 201	Transponder Unit 14 V: 13.9 V
RSSI AIS 2 receiver: 200	Transponder Unit 8 V: 7.9 V
RSSI DSC receiver: 187	Transponder Unit tem... 42°C
Forward RF power: 342	AIS 1 receiver: passed
Reflected RF power: 114	AIS 2 receiver: passed
VSWR: 2.0	DSC receiver: passed
Transponder Unit 3 V: 3.0 V	Transmitter: passed
Transponder Unit 5 V: 5.0 V	Power Source: Main

When "Display test" is selected, this window is shown with measurement:

- Voltages
- Supply source (Power source)
- Light sensor reading (If automatic display adjustment are activated [option])

Display self test
Measured internal 3 V: 0.0V
Backlight voltage: 0.0V
Supply voltage: 0.0V
Supply source:
Light sensor reading: 0mV

8.5.7 System

In this window you can read information about :

- Serial number
- Software
- Hardware of both Display and Transponder unit

In addition you may select the buttons:

- Change password
- Update firmware
- Inland

System	
Tron AIS TR-8000 Series	
Transponder unit	**Display unit**
Serial number: 0	Serial number: 0
Software version: 01.01.04	Software version: 01.01.06
Additional SW info: 73-gbb39a86	Additional SW info: 92-g1f6825f
Hardware revision: 1511	Hardware revision:

Change passwords | Update firmware | Inland

8.5.7.1   Change password

If you select "Change password", you can select between

- Admin password
- User password
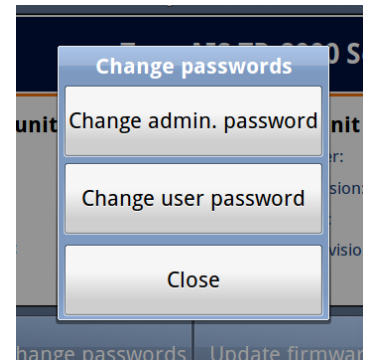
> **NOTE**
> "Admin password" is required to change the "User password"

8.5.7.2   Update Firmware

If you select "Update firmware", you can select between

- Display unit firmware
- Transponder unit firmware
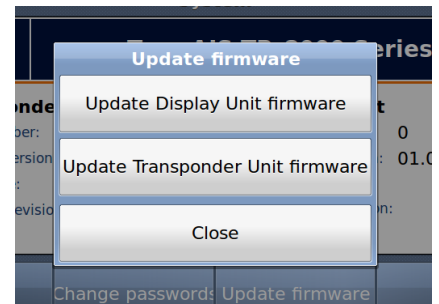
> **NOTE**
> Update of Firmware shall only be done by Jotron trained dealers, distributors & service agents.

8.5.7.3   Inland

If you select the "Inland", you can change the Transponder to operate in SOLAS mode.

See the separate SOLAS manual for details regarding the SOLAS mode.

When in Inland mode there are two ways to trigger signaling of Blue Sign information on air. Either electrical connection (see installation), or through VSD sentence via ECDIS interface.

If using electrical connection, you must *Enable blue switch input*.

If using ECDIS interface, you must *Disable blue switch input*.

If not using Blue Sign at all, you must *Disable blue switch input*. Vessel will then signal to other vessels that Blue Sign information is Not available.
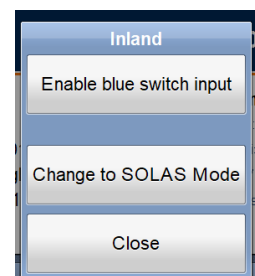
8.5.8 Transmitted data

This page shows a decoded version of the data fields included in the transmitted "position report" and "ship static and voyage related data" messages. Use the arrows to navigate between the 3 pages.

- Latitude
- Longitude
- Pos Accuracy (High/Low)
- Pos Source (Internal/External)
- Pos Device
- Time & Date
- SOG (Speed over Ground)
- COG (Course Over Ground))
- HDG (Heading)
- ROT (Rate Of Turn)

Transmitted data	
LAT: 59°06.81N	SOG: 0.0 kn
LON: 10°06.62E	COG: ---°
Pos. accuracy: Low	HDG: ---°
Pos. source: Internal	ROT: ---°/min
Pos. device: Internal GNSS	Time: 12:56:07 2020-11-06

- Navigational status
- Destination
- ETA

Transmitted data
Nav. status: Anchored
Destination: HOME
ETA: 24 des,13:37

- MMSI
- IMO number
- Call sign
- Ship name
- Ship type as integer
- Current GNSS antenna reference
- Max draguth
- DTE
- Special manoeuvre indicator

Transmitted data	
MMSI: 259122422	Antenna ref: A:9 B:6 C:4 D:2
IMO: 1345678	Max draught: 5 m
Call sign: TT	DTE: Yes
Ship name: TEST	Special manoeuvre N/A
Ship type: 99	

9   Alarms

The following table list all the alerts defined in IEC 61993-2:Ed3 in addition to some Jotron specific ones. The alerts are part of the Bridge Alert Management system. The legacy alarms are still triggered in parallel with the BAM alerts, but the display only shows the BAM alerts.

The category column indicates if alert is Warning (W) or Caution (C).

ID	Cat.	Description	Cause / Source of error	Reaction of the system and user advise
3108	W	Locating device	Check AIS targets	Nearby AIS SART, AIS MOB or AIS EPIRB. The Transponder continues operation. Contact local RCC (Rescue Coordination Centre). Be prepared to assist in search and rescue operation. Listen on VHF channel 16 for additional information.
3062	W	General fault	Check AIS equipment	The Transponder will never trigger this alarm
3008	W	Transceiver fail	Not transmitting, check AIS	The Transponder stops transmission. Check that the MMSI number is correct. Alternatively, service is required.
			Not receiving, check AIS	The Transponder stops transmission on the affected channel. Try rebooting the system. Alternatively, service is required
3015	W	Lost position	Own ship position not transmitted	The Transponder continues operation. Check cabling and antenna for the internal GNSS sensor. At start up the GNSS might need some time to receive almanac data. Up to 15 minutes might be required.
3116	C	Impaired radio	Reduced coverage (antenna VSWR)	The Transponder continues transmission. Check the VHF antenna and the cabling. Make sure the cables are 50 Ohm
			Ch1 inoperative, check AIS	The Transponder stops transmission on the affected channel. Try rebooting the system. Alternatively, service is required
			Ch2 inoperative, check AIS	The Transponder stops transmission on the affected channel. Try rebooting the system. Alternatively, service is required
			DSC inoperative	The Transponder continues normal transmission but is not able to receive DSC messages. Try rebooting the system. Alternatively, service is required.
3113	C	Sync in fallback	Check AIS for UTC time synchronisation	The Transponder continues operation using indirect or semaphore synchronisation with other AIS units. If the received GNSS signal strength is low, the GNSS might use some time to get the first fix. Consider waiting 15 minutes. Check the GNSS antenna and cabling. If the antenna is an active type, check that the phantom DC voltage is correct
3003	C	Lost ext EPFS	Check external position sensor	The Transponder continues operation with the internal GNSS receiver. If no valid position is present on the internal sensor, alert 3015 is also displayed. Check antenna and connections for EPFS, check sensor. Check baud rate settings.
3119	C	Missing COG	Not transmitting COG	The Transponder continues operation using default data. Check wiring and external sensor. Check baud rate settings.
		Missing SOG	Not transmissing SOG	The Transponder continues operation using default data. Check wiring and external sensor. Check baud rate settings.

		Missing Heading	Not transmitting Heading	The Transponder continues operation using default data. Check wiring and external sensor. Check baud rate settings.
		Missing ROT	Not transmitting Rate of Turn	The Transponder continues operation using default data. Check wiring and external sensor. Check baud rate settings.
3013	C	Doubtful GNSS	Int/Ext GNSS position mismatch	The Transponder continues operation, but as this might imply that wrong position is used. Care should be taken as this might impose a risk both for own and other ships. Check the positioning of the GNSS antennas. Disconnect the External GNSS and check if the internal GNSS provides the correct position.
		Doubtful heading	Difference with COG exceeds limit	The Transponder continues operation. Alarm indicates mismatch between Course over ground and True heading. Check sensors. If current speed is <5knots, check SOG
3019	C	Wrong NavStatus	Check NavStatus setting	The Transponder continues operation. Check that navigational status is not at anchor, moored or aground while SOG > 3knots. Check that navigational status is not under way while SOG = 0 knots. Check that SOG is correct.
3009	C	Lost MKD	Cannot display safety related messages	The Transponder continues operation, and alerts other AIS systems that no display is present. Check that the display is turned on. Check that the cable is correct connected in both ends. Check the IP address and corresponding communications IP address of both units if using the Ethernet connection. Check for firewall error or such if connected through a local network.
The following alarms are Jotron specific, and not part of IEC 61993-2:Ed3				
1051	W	EEProm error	Configuration reset	Validation of internal configuration failed on boot, and configuration has been reset. Attempt to re-configure unit and reboot to see if configuration is kept. If not, service is required.
1053	W	Invalid dimensions	Check antenna ref.	Antenna reference is either invalid, length or beam of ship is zero, or there is a mismatch in the length or beam of ship between the internal and external antenna reference. Check antenna reference page.

Table 2: Integrity alert conditions signaled using ALF sentence formatter.

10   Menu Tree

Configuration menu

- Own Ship data (Name, MMSI, Call Sign, Antenna Position, ENI, ERI, Length, Beam, Quality of speed/course/heading)
- Display Settings (Sleeping targets)
- Alarms
- Indicators
- Advanced
  - Interface
    - Display/Transponder IP
    - External Display
    - Display Pilot Port
    - Long-Range/ECDIS
    - Baud rate
    - Priorities
    - Port Monitor (monitor sensor connections)
  - VHF link / Long-Range
  - CPA/TCPA settings
  - Internal GNSS
  - History
  - Self Test
  - System (System information, serial no. and revisions)
    - Change Passwords
    - Update firmware
    - Inland / Solas settings
  - Transmitted data

Safety Message Menu

- Toggle between sent and received messages
- Write New message
- Select message in list (up and down arrows)
- Resend a selected Sent message (if any) or reply on a selected Received message (if any)

Display options

- Day / Night mode
- Dimming

Voyage Data

- Configuration of Navigation Status, Destination, ETA, Blue Cones, Loaded status, Assisting tugs, Crew, Personnel, Passengers, Draught and Air draught
- Convoy extension

11 List of VHF Channels

Channel no.	Frequency	Channel no.	Frequency	Channel no.	Frequency	Channel no.	Frequency
6	156.3000	1021	157.0500	1279	156.9775	2219	161.5625
8	156.4000	1022	157.1000	1280	157.0375	2220	161.6125
9	156.4500	1023	157.1500	1281	157.0875	2221	161.6625
10	156.5000	1024	157.2000	1282	157.1375	2222	161.7125
11	156.5500	1025	157.2500	1283	157.1875	2223	161.7625
12	156.6000	1026	157.3000	1284	157.2375	2224	161.8125
13	156.6500	1027	157.3500	1285	157.2875	2225	161.8625
14	156.7000	1028	157.4000	1286	157.3375	2226	161.9125
15	156.7500	1060	156.0250	1287	158.3875	2227	161.9625
16	156.8000	1061	156.0750	2001	160.6500	2228	162.0125
17	156.8500	1062	156.1250	2002	160.7000	2260	160.6375
67	156.3750	1063	156.1750	2003	160.7500	2261	160.6875
68	156.4250	1064	156.2250	2004	160.8000	2262	160.7375
69	156.4750	1065	156.2750	2005	160.8500	2263	160.7875
70	156.5250	1066	156.3250	2007	160.9500	2264	160.8375
71	156.5750	1078	156.9250	2018	161.5000	2265	160.8875
72	156.6250	1079	156.9750	2019	161.5500	2266	160.9375
73	156.6750	1080	157.0250	2020	161.6000	2278	161.5375
74	156.7250	1081	157.0750	2021	161.6500	2279	161.5775
75	156.7750	1082	157.1250	2022	161.7000	2280	161.6375
76	156.8250	1083	157.1750	2023	161.7500	2281	161.6875
77	156.8750	1084	157.2250	2024	161.8000	2282	161.7375
208	156.4125	1085	157.2750	2025	161.8500	2283	161.7875
209	156.4625	1086	157.3250	2026	161.9000	2284	161.8375
210	156.5125	1087	157.3750	2027	161.9500	2285	161.8875
211	156.5625	1088	157.4250	2028	162.0000	2286	161.9375
212	156.6125	1201	156.0625	2060	160.6250	2287	161.9875
213	156.6625	1202	156.1125	2061	160.6750		
214	156.7125	1203	156.1625	2062	160.7250		
215	156.7625	1204	156.2125	2063	160.7750		
216	156.8125	1205	156.2625	2064	160.8250		
217	156.8625	1206	156.3125	2065	160.8750		
267	156.3875	1207	156.3625	2066	160.9250		
268	156.4375	1218	156.9125	2078	161.5250		
269	156.4875	1219	156.9625	2079	161.5750		
270	156.5375	1220	157.0125	2080	161.6250		
271	156.5875	1221	157.0625	2081	161.6750		
272	156.6375	1222	157.1125	2082	161.7250		
273	156.6875	1223	157.1625	2083	161.7750		
274	156.7375	1224	157.2125	2084	161.8250		
275	156.7875	1225	157.2625	2085	161.8750		
276	156.8375	1226	157.3125	2086	161.9250		
277	156.8875	1227	157.3625	2087	161.9750		
1001	156.0500	1228	157.4125	2088	162.0250		
1002	156.1000	1260	156.0375	2201	160.6625		
1003	156.1500	1261	156.0875	2202	160.7125		
1004	156.2000	1262	156.1375	2203	160.7625		
1005	156.2500	1263	156.1875	2204	160.8125		
1007	156.3500	1264	156.2375	2205	160.8625		
1018	156.9000	1265	156.2875	2206	160.9125		
1019	156.9500	1266	156.3375	2207	160.9625		
1020	157.0000	1278	156.9375	2218	161.5125		

Channel 2087 = Channel 87B   Channel 2088 = Channel 88B

12   List of Inland vessel and convoy types

Code	Name	Code	Name	Code	Name
8000	Vessel, type unknown	8220	Pushtow, two cargo barges	8445	Day-trip high speed vessel
8010	Motor freighter	8230	Pushtow, three cargo barges	8446	Day-trip hydrofoil vessel
8020	Motor tanker	8240	Pushtow, four cargo barges	8447	Sailing cruise ship
8021	Motor tanker, liquid cargo, type N	8250	Pushtow, five cargo barges	8449	Sailing passenger ship without accommodation
8022	Motor tanker, liquid cargo, type C	8260	Pushtow, six cargo barges	8450	Service vessel, police patrol, port service
8023	Motor tanker, dry cargo as if liquid (e.g. cement)	8270	Pushtow, seven cargo barges	8451	Service vessel
8030	Container vessel	8280	Pushtow, eight cargo barges	8452	Police patrol vessel
8040	Gas tanker	8290	Pushtow, nine cargo barges	8453	Port service vessel
8050	Motor freighter, tug	8310	Pushtow, one tank/gas barge	8454	Navigation surveillance vessel
8060	Motor tanker, tug	8320	Pushtow, two barges at least one tanker or gas barge	8460	Vessel, work maintenance craft, floating derrick, cable-ship, buoy-ship, dredge
8070	Motor freighter with one or more ships alongside	8330	Pushtow, three barges at least one tanker or gas barge	8470	Object, towed, not otherwise specified
8080	Motor freighter with tanker	8340	Pushtow, four barges at least one tanker or gas barge	8480	Fishing boat
8090	Motor freighter pushing one or more freighters	8350	Pushtow, five barges at least one tanker or gas barge	8490	Bunkership
8100	Motor freighter pushing at least one tankbarge	8360	Pushtow, six barges at least one tanker or gas barge	8500	Barge, tanker, chemical
8110	Tug, freighter	8370	Pushtow, seven barges at least one tanker or gas barge	8510	Object, not otherwise specified
8120	Tug, tanker	8380	Pushtow, eight barges at least one tanker or gas barge	1500	General cargo Vessel maritime
8130	Tug, freighter, coupled	8390	Pushtow, nine barges at least one tanker or gas barge	1510	Unit carrier maritime
8140	Tug, freighter/tanker, coupled	8400	Tug, single	1520	Bulk carrier maritime
8150	Freightbarge	8410	Tug, one or more tows	1530	Tanker
8160	Tankbarge	8420	Tug, assisting a vessel or linked combination	1540	Liquefied gas tanker
8161	Tankbarge, liquid cargo, type N	8430	Pushboat, single	1850	Pleasure craft, longer than 20 metres
8162	Tankbarge, liquid cargo, type C	8440	Passenger ship, ferry, red cross ship, cruise ship	1900	Fast ship
8163	Tankbarge, dry cargo as if liquid (e.g. cement)	8441	Ferry	1910	Hydrofoil
8170	Freightbarge with containers	8442	Red cross ship	1920	Catamaran fast
8180	Tankbarge, gas	8443	Cruise ship		
8210	Pushtow, one cargo barge	8444	Passenger ship without accommodation		

Table from "COMMISSION IMPLEMENTING REGULATION (EU) 2019/838 of 20 February 2019 on technical specifications for vessel tracking and tracing systems and repealing Regulation (EC) No 415/2007" Appendix C

13   Complied Standards

The AIS system complies with the following standards:

IMO Resolution MSC.694(17) – *General Requirements for Shipborne Radio Equipment forming part of the Global Maritime Distress and Safety System (GMDSS) and for Electronic Navigational Aids*

IMO Resolution MSC.74(69) *Annex 3 Recommendation on performance standards for AIS*

IMO Resolution MSC.191(79) – *Performance standards for the presentation of navigation related information on shipborne navigational displays*

ITU-R M.1371-5 (Class A), 2014 – *Technical characteristics for an automatic identification system using time-division multiple access in the VHF maritime mobile band*

ITU-R M.825-3, 1998 - *Characteristics of a transponder system using digital selective calling techniques for use with vessel traffic services and ship-to-ship identification*

ITU-R M.1084-4 – *Interim solutions for improved efficiency in the use of the band 156-174 MHz by stations in the maritime band*

IEC 60945 Ed.4, 2002 incl. Corr.1, 2008 – *Maritime navigation and radio communication equipment and systems – General requirements – Method of testing and required test results*

IEC 61108-1 Ed.2, 2003 – *Maritime navigation and radio communication equipment and systems – Global navigation satellite systems (GNSS)*

IEC 61162-1 Ed.5, 2016 - *Maritime navigation and radio communication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners*

IEC 61162-2 Ed.1, 1998 - *Maritime navigation and radio communication equipment and systems – Digital interfaces – Part 2: Single talker and multiple listeners, high-speed transmission*

IEC 61993-2 Ed.3, 2018 - *Maritime navigation and radio communication equipment and systems – Automatic Identification Systems (AIS), Part 2: Class A ship borne equipment of the universal automatic identification system (AIS) – Operational and performance requirements, methods of test and required results*

IEC 62288 Ed.2, 2014 – *Maritime navigation and radio communication equipment and systems – Presentation of navigation-related information on shipborne navigational displays – General requirements, methods of testing and required test results*

IEC 62923-1, 2018 – *Bridge alert management: Operational and performance requirements, methods of testing and required test results*

IEC 62923-2, 2018 – *Bridge alert management: Alert and cluster identifiers and other additional features*

CESNI ES-TRIN Edition 2020/1 - European Standard laying down Technical Requirements for Inland Navigation vessels

Test Standard Inland AIS Edition 2021/3.0 - Inland AIS Shipborne Equipment according to the Vessel Tracking and Tracing Standard for Inland Navigation. Operational and performance requirements, methods of test and required test results

COMMISSION IMPLEMENTING REGULATION (EU) 2019/838 of 20 February 2019 on technical specifications for vessel tracking and tracing systems and repealing Regulation (EC) No 415/2007

14   Abbreviations and Definitions

ACK   Acknowledge

AIS   Automatic Identification System - A shipborne broadcast transponder system in which ships continually transmit their position, course, speed and other data to other nearby ships and shoreline authorities on a common VHF radio channel.

AIS-SART   Automatic Identification System-Search And Rescue Transponder

AtoN   Aid to Navigation

BAUD   Transmission rate unit of measurement for binary coded data (bit per second).

BNC   Bayonet Neill-Concelman connector – common type of RF connector used for coaxial cable

BRG   Bearing

CPA   Closest Point of Approach

COG   Course Over Ground – Course made good relative to the sea bed.

DSC   Digital Selective Calling

DGNSS   Differential GNSS

DGPS   Differential GPS – A method of refining GPS position solution accuracy by modifying the locally computed position solution with correction signals from an external reference GPS CDU (monitor).

ECDIS   Electronic Chart Display and Information System for navigation approved to be used without paper charts

ECS   Electronic Chart System

EPIRB   Emergency Position Indicating Radio Beacon

EOL   End of Life

EPFS   Electronic Position Fixing System (GPS is mostly used)

ETA   Estimated Time of Arrival. Calculated on basis of the distance to the destination and the current (or estimated) speed.

FM   Frequency Modulation - The method by which a signal offsets the frequency in order to modulate it on a data link.

GNSS   Global Navigation Satellite System – A common label for satellite navigation systems (such as GPS and GLONASS).

GPS   Global Positioning System – The NAVSTAR Global Positioning System, which consists of or-biting satellites, a network of ground control stations, and user positioning and navigation equipment. The system has 24 satellites plus 3 active spare satellites in six orbital planes about 20,200 kilometers above the earth.

GLONASS   A satellite navigation system developed and operated by Russia.

GMT   Greenwich Mean Time

GMDSS	Global Maritime Distress Safety System
HDG	Heading - The direction, in which the vessel is pointed, expressed as angular distance from north clockwise through 360 degrees. HEADING should not be confused with COURSE. The HEADING is constantly changing as the vessel yaws back and forth across the course due to the effects of sea, wind, and steering error.
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IEC	International Electro-technical Commission
IEC 61162-1	Maritime navigation and radio communication equipment and systems – Digital interfaces Single Talker- Multiple listeners: Closely related to NMEA0183 version 2.3, communication at 4800 baud. Definition of both electrical interface and protocol to be used.
IEC 61162-2	Maritime navigation and radio communication equipment and systems – Digital interfaces Single Talker- Multiple listeners, High speed transmission: Closely related to NMEA0183HS version 2.3, communication at 34800 baud. Definition of both electrical interface and protocol to be used.
IMO	International Maritime Organization
IP	Internet Protocol (**IP**) is the central, unifying protocol in the TCP/IP suite. It provides the basic delivery mechanism for packets of data sent between all systems on an internet, regardless of whether the systems are in the same room or on opposite sides of the world. All other protocols in the TCP/IP suite depend on IP to carry out the fundamental function of moving packets across the internet.
ISGOTT	International Safety Guide for Oil Tankers and Terminals
ITU	International Telecommunication Union
LAN	Local Area Network
LED	Light Emitting Diode
LCD	Liquid Crystal Display
LR	Long-Range
MOB	Man overboard
NMEA	National Marine Electronics Association – The NMEA electronics interface specifications have been developed under the auspices of the Association. The NMEA 0183 is an internationally recognized specification for interfacing marine electronics. NMEA 0183 version 2.3 is almost identical to IEC 61162-1.
MKD	Minimum Keyboard and Display
MMSI	Maritime Mobile Service Identity
RCC	Rescue Coordination Centre
RF	Radio Frequency
RMS	ROOT MEAN SQUARED – A statistical measure of probability stating that an expected event will happen 68% of the time. In terms of position update accuracy, 68 position updates out of 100 will be accurate to within specified system accuracy.
ROT	Rate Of Turn

RNG	Range
RX	RX is the telegraph and radio abbreviation for "receive"
SAR	Search And Rescue
S/N	Signal-to-Noise ratio (SIN). Quantitative relationship between the useful and non-useful part of the received satellite signal. A high SIN indicates a good receiving condition.
SOG	Speed Over Ground – Speed in relation to the seabed.
SOTMA	Self Organized Time Division Multiple Access -An access protocol, which allows autonomous operation on a data link while automatically resolving transmission conflicts.
TCP	Transmission Control Protocol – Provides a reliable byte-stream transfer service between two end points on an internet. TCP depends on IP to move packets around the network on its behalf.
TCP/IP	TCP/IP is a name given to the collection (or *suite*) of networking protocols that have been used to construct the global Internet. The protocols are also referred to as the **DoD** (*dee-oh-dee*) or **Arpanet** protocol suite because their early development was funded by the Advanced Research Projects Agency (**ARPA**) of the US Department of Defense (**DoD**).
TCPA	Time to Closest Point of Approach
TI	Turn Indicator
TNC	Threaded Neill-Concelman connector – common type of RF connector used for coaxial cable
TX	TX is the telegraph and radio abbreviation for "transmit"
UDP	User Datagram Protocol – Provides a packetized data transfer service between end points on an internet. UDP depends on IP to move packets around the network on its behalf.
UTC	Universal Time Coordinated – Greenwich mean time corrected for polar motion of the Earth and seasonal variation in the Earth's rotation.
VDC	Volt DC
VDL	VHF Data Link
VHF	Very High Frequency – A set of frequencies in the MHz region
VSWR	Voltage standing wave ratio

15   Optional Accessories

For an overview of the available optional accessories for the Tron TR30 radio, both the GMDSS and the Maritime VHF radio, refer to jotron.com.

16   Spare Parts

For an overview of the available spare parts for the Tron TR30 radio, both the GMDSS and the Maritime VHF radio, refer to jotron.com.

16.1 Counterfeit spare parts

Ensure that all spare parts being fitted to this product are only original spare parts manufactured or approved by Jotron.

Any use counterfeit parts will invalidate the product type-approval certificate.

17   Recycling and Disposal

The Tron TR30 radio is not to be disposed as normal waste and must be handled in accordance with the applicable federal, state and local waste disposal regulations in the country where the equipment is used.

18   Warranty

All Jotron products are warranted against factory defects in materials and/or workmanship during the warranty period.

Refer to the sales terms and conditions for specific warranty information regarding this product.

19   Service

All services such as testing, installation, programming, replacement, marking and battery exchange are provided by an authorized Jotron service agent.

Improper service or maintenance may destroy the functionality and/or performance of this product.

Jotron does not accept any responsibility for the dismantling or reassembling of any Jotron product that occurs externally from a Jotron authorized facility and/or is handled by someone other than an authorized, training and certified person.

19.1 Service agents

Refer to jotron.com for an overview of Jotron partners and distributors.

http://jotron.com/partners-and-distributors/

19.2 Trouble Description Form

For better to help you if your system fails, please give as much information as possible in the following tables:

Transponder Unit Information	Information from System Menu
Serial number	
Software version	
Model code	
Hardware revision	

Display Unit Information	Information from System Menu
Serial number	
Software version	
SVN revision	
Hardware revision	

Transponder Unit Connections:	Equipment:
Sensor 1	
Sensor 2	
Sensor 3	
Ext Display Port (RS-422/RS-232/LAN)?	
Pilot Port	
Long-Range Port	
DGNSS Data Port	

Display Unit Connections:	Equipment:
Pilot Port	

Trouble Description:

jotron.com