

Smart AIS Display SAS-300

Operation Manual

- Easy-To-Operation
- Wide 7 inch LED backlight
- Various AIS information
- Easy-to-use alarms
- Full/split screen
- Sort different types of vessels
- Track AIS targets

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Pictorials

This manual uses the following symbols for easy understanding safety instructions. Always follow these instructions carefully.

 WARNING	Always follow this safety instruction to prevent death or injury.
 CAUTION	Follow this safety instruction to avoid possible injury or damage to your property. Symbol “△” is a CAUTION or WARNING label indicating the safety instruction.
 WARNING	This symbol is an Electrical Shock WARNING label.
	Symbol is an instruction that you must not violate. (This symbol instructs NOT to disassemble the system components)
	Symbol is an operation instruction that you must follow. (This symbol shows the main power OFF instruction.)



WARNING <For System Operators>

Always follow this instruction to prevent death or personal injury.

	Turn power off During abnormality.	If smoke or a small of burning occurs, a fire or an electrical short circuit may result. Turn the power switch OFF and shut down the power supply immediately. Never try to repair the system yourself. Call for service.
	Do not open Cabinet.	High voltage exists in the instrument. Contact with voltage may cause possible injury or death.
	Do not touch back side of the equipment.	Harmful line voltage is present on back side of the equipment. Never try to touch back side while power is turned on.
	Avoid excessive shock to display unit.	The LCD display module contains a liquid. Do not apply any mechanical shock to the display. If the display broken, liquid may leak and injure your skin and eyes.
	Do not use with poor ventilation.	If you cover this unit or use in an enclosed place, it may malfunction or become damaged as a result of overheating. Use only where there is sufficient ventilation.



Installation Cautions <For service Personnel>

Follow installation instructions to avoid personal injury and system malfunction.

Installation in rigid location.	Mount your SAS-300 on a rigid frame or base to prevent your unit from working loose.
Use correct Installation materials.	Use the installation materials provided in the standard accessory pack only. If you use hardware of insufficient strength, your system may loosen causing damaged.
Keep away from direct sunlight.	Keep your system out of direct sunlight as it may become damaged by overheating.
Keep away from water.	Take care not to get water on or in your unit as it may be damaged and/or cause an electrical shock.
Keep away from heat source.	Keep your system away from other heat source as it may malfunction, be damaged, or burn.
Use correct power source.	Operate your system within the specified power voltage. An incorrect power supply may cause



Maintenance Cautions<For Maintenance Personnel>

Use the following safety precaution internal inspection.

Discharge capacitors.	High voltage may be retained in the capacitors if the high-tension circuit several minutes after you have turned the power switch off.
Check that power is OFF	To prevent an electrical injury due to erroneous power switching, make sure that the main power supply and the system power switch are both in the off position. Additionally, attach a safety label showing that service is in progress.
Avoid EMI.	Take care not to damage the ESDs (Electrostatic Sensitive Devices) by static electricity from carpet and cloths.
Avoid dust.	Wear a safety mask so as not to breath in dust during inspection or cleaning inside your system instruments.

Operation Notes <For operators>

Observe the following operation notes, otherwise the system failure or deterioration can result. And periodical inspection and maintenance are required for keeping the system in an optimum condition.

Backup important data.	The waypoint and other registered data may become unreadable by unexpected failure. We recommend recording this data separately.
Use correct transducer only.	If you use incorrect transducer, the transmitter circuit may be damaged due to a matching error. Consult us for system information.
Check transducer Connection before power on	Do not turn the power switch ON if the transducer is disconnected or if it is not inserted into the water. If done, the transducer or transmitter circuit may be damaged.
Always clean the transducer	Since transducer performance can drop due to accumulated bottom growth, keep the transducer clean. Never paint transducer surface.
Transducer must be installed by authorized personnel.	Consult us for transducer installation by authorized personnel.

 WARNING	This product is designed to assist a navigation. When you are sailing, use the certified chart from the Government or IMO.
----------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------

SAS-300 System

CAUTION

The **SAS-300** Color LCD Chartplotter & Fishfinder Systems employs the latest in proven technology to provide accurate fish & bottom information. The Plotter functions of SAS-300 are totally dependent upon the capability of the navigation source to provide accurate position information. This device is only an aid to navigation. It should be used in conjunction with all other navigation accuracy. For safety, always resolve any uncertainty before continuing navigation.

There is no direct relationship between the color of water areas and their depth. The navigator shall always query the area for depth information and use the official paper chart.

CAUTION

The performance of LCD displays are degraded by continuous direct exposure to ultraviolet rays. Locate your SAS-300 Display away from direct sunlight. When not in use. Keep the display covered.

DISPLAY BREAKAGE WARNING

The LCD display module contains a liquid. If the display is broken and the liquid contacts your skin, wash it off immediately in running water for 15 minutes. If the liquid contacts your eyes, immediately flush your eyes with running water for 15 minutes. Contact a physician if any abnormal symptom is experienced.

Welcome

Thank you for purchasing the SAS-300 from Si-Tex.

The SAS-300 is a premium multifunction Chartplotter & Fish Finder System. SAS-300 front panel keyboard and its wide screen viewing area make placement easy. Although SAS-300 offers many advanced features, operation is simplified through the use of popup menus similar to those found on personal computers. The **SI-TEX SAS-300** Color LCD System opens a new chapter of performance and integration in AIS system display and management. Whether you are a Cruiser or Sport fisherman or both, SAS-300 gives you the information you need.

Features of the SAS-300

Comprised of a display unit and a dual frequency transducer.

The main features of the SAS-300 are

- ▶ A large 7" Direct Sunlight Viewable High Definition LCD Display, in a vertical format to provide maximum sonar resolution! 480 x 800 pixels.
- ▶ Waterproof to IPX6 International Standard
- ▶ Track AIS targets on standard "radar" display, over included worldwide base charts or (with optional SD Card) overlaid onto full C-MAP MAX cartography
- ▶ Track up to five vessels with track history and optional live details on individual vessels
- ▶ Large display allows easy viewing of all vessels with name, MMSI, range/bearing and full details on each vessel
- ▶ Easy-to-use alarms for Closest Point of Approach (CPA) , Time to Closest Point of Approach (TCPA) and Radius Alarm.
- ▶ Sort different types of vessels by color and different types of transmission by on-screen icon
- ▶ Full control pad with dedicated function keys for easy operation

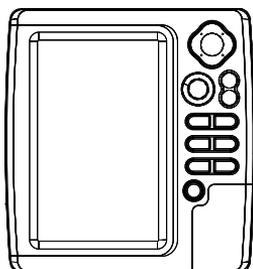
SAS-300 System

Introduction

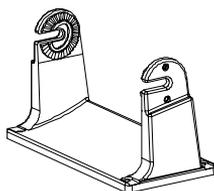
Thank you for purchasing the SAS-300 from Si-Tex.

The SAS-300 is a premium multifunction AIS ClassB. SAS-300 front panel keyboard and its wide screen viewing area make placement easy. Although SAS-300 offers many advanced features, operation is simplified through the use of popup menus similar to those found on personal computers. The **SI-TEX SAS-300** Color LCD System opens a new chapter of performance and integration in system display and management. Whether you are a Cruiser or Sport fisherman or both, SAS-300 gives you the information you need.

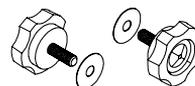
Standard Equipment Configuration List



Display unit



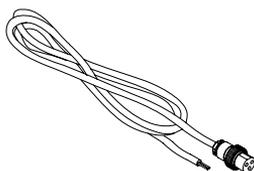
Mounting Bracket



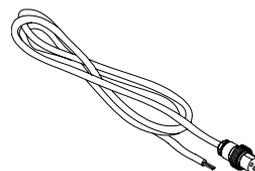
Knobs



Protector



Power cable



AIS cable



Manual

|| SAS-300 System

GETTING STARTED

This getting Started section will help you become acquainted with the displays and the front panel keyboard functions of your SAS-300 System. This section is intended to demonstrate the main functions and basic operation of your SAS-300 System. More detailed procedures may be found in the Operation section.

SAS-300 has built-in simulators which present realistic displays of cartography, GPS and AIS.

SAS-300 System

SPECIFICATION

GENERAL SPECIFICATION

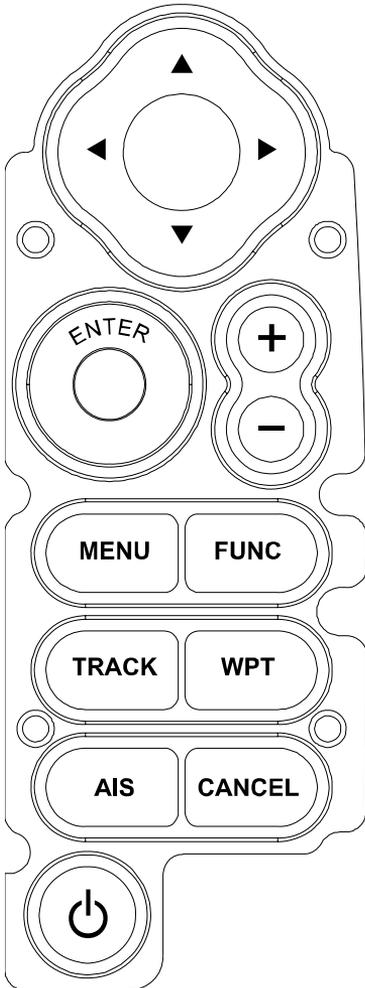
1. Display Screen
wide 7 inch color TFT LCD(480 X 800 pixels)
2. Operating Temperature
Display Unit: -15°C ~ 50°C
Antenna Unit: -25°C ~ 70°C
3. Performance Standard
IMO Resolution MSC.112(73)
4. Back-up
SD Card (Optional)

CHARTPLOTTER SPECIFICATION

1. Display Method
Mercator Projection
2. Display Mode
True motion / North up / Course up / Head up
3. Latitude Limits
Between 85° N to 85° S
4. Map Scale
0.05nm to 1000nm
5. Map Datum
WGS-84(Standard), 270 different Datums
6. Chart Data
C-MAP
7. Input/Output Data
NMEA-0183

SAS-300 System

Keypad



KEY	Description
[Cursor Key]	With MENU: Choosing the menu. Without MENU: Cursor on.
[ENTER]	Button: Enter when menu table on the screen.
[+] & [-]	Change the chart of scale.
[MENU]	Menu is displayed.
[FUNC]	Setting up Using Frequently key function.
[TRACK]	Start and stop AIS tracks & Vessel tracks .
[WPT]	Places a WPT on the plotter main screen
[AIS]	Selects AIS menus
[CANCEL]	Return to the previous display, or canceled the set-up.

How to use [Power/Brightness]

► Press [PWR/BRT]

1. Use PWR:

To turn off the power, keep pressing the [BRT/PWR] until the end of counting.

2. Use BRT:

Press [BRT/PWR] shortly and the brightness can be controlled. Use the arrow keys [←][→] of the cursor to control the brightness and the contrast.

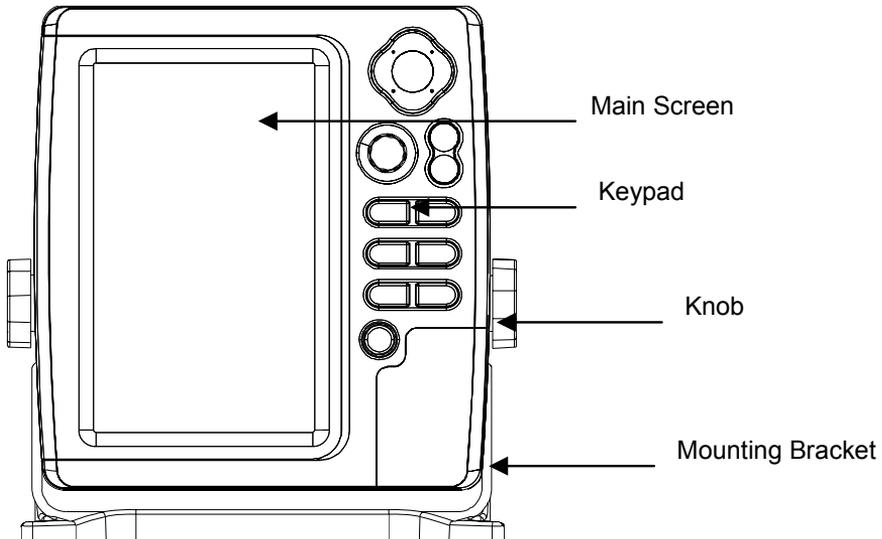
3. Use day/night mode

Press [BRT/PWR] shortly and change mode. Use the arrow keys [↓][↑] of the cursor to change mode.

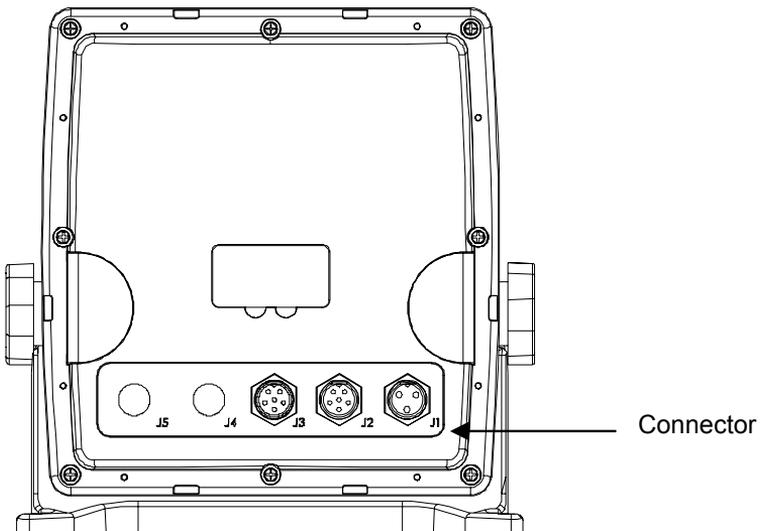
SAS-300 System

SAS-300

<Front>



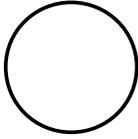
<Rear>



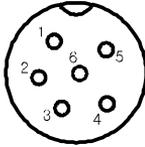
SAS-300 System

SPEC of the connectors

J4



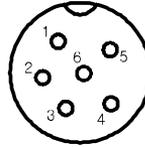
J3



AIS

NO	NAME
1	GND
2	AIS TX+
3	GND
4	AIS RX +
5	GND
6	DC 12V

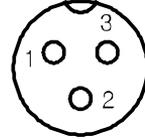
J2



TX/RX

NO	NAME
1	GND
2	TX +
3	GND
4	RX +
5	RX -
6	NC

J1



DC POWER

NO	NAME
1	DC +(12V~36V)
2	DC -
3	NC

Introduction

How AIS Works

The marine Automatic Identification System (AIS) is a location and vessel information reporting system. It allows vessels equipped with AIS to automatically and dynamically share and regularly update their position, speed, course and other information such as vessel identity with similarly equipped craft. Position is derived from a Global Navigation Satellite System (GNSS) network and communication between vessels is by Very High Frequency (VHF) digital transmissions. A sophisticated and automatic method of time sharing the radio channel is used to ensure that even where a large number of vessels are in one location, blocking of individual transmissions is minimised, any degradation of the expected position reporting interval is indicated to the user and even if the unit suffers extreme channel overload conditions it will always recover to normal operation.

AIS Class

There are two classes of AIS unit fitted to vessels, Class A and Class B. In addition AIS base stations may be employed by the Coastguard, port authorities and other authorised bodies. AIS units acting as aids to navigation (A to Ns) can also be fitted to fixed and floating navigation markers such as channel markers and buoys.

Class A units are a mandatory fit under the safety of life at sea (SOLAS) convention to vessels above 300 gross tons or which carry more than 11 passengers in International waters. Many other commercial vessels and some leisure craft also fit Class A units.

Class B units are currently not a mandatory fit but authorities in several parts of the world are considering this. Class B units are designed for fitting in vessels which do not fall into the mandatory Class A fit category.

Introduction

Class A ship borne reporting intervals

Ships dynamic conditions	Rate
Ship at anchor or moored	3 min
Ship 0-14 Knots	10 sec
Ship 0-14 Knots and changing course	3.3 sec
Ship 14-23 Knots	6 sec
Ship 14-23 Knots and changing course	2 sec
Ship > 23 Knots	2 sec
Ship > 23 Knots and changing course	2 sec
Ships Static Information	6 min

A Class B unit will transmit its MMSI, Call Sign and Name, length and beam, ship type, time, course over ground (COG), speed over ground (SOG).

Class B ship borne reporting intervals

Ships dynamic conditions	Rate
Ship with Speed Over the Ground < 2 Knots	3 min
Ship with Speed Over the Ground > 2 Knots	30 sec
Ships Static Information	6 min

|| NMEA 0183 Messages

Receipt of a VHF transmission on either AIS radio channel causes a VDM message to be output via the data port.

VDM Message Format

!--VDM,x1,x2,x3,a,s--s,x*hh<CR><LF>

x1 = Total number of sentences needed to transfer the message , 1 to 9

x2 = Sentence number, 1 to 9

x3 = Sequential message identifier, 0 to 9

a = AIS Channel, "A" or "B"

s - s = Encapsulated ITU-R M.1371 radio message

x = Number of fill-bits, 0 to 5

VDM Message Types

For example, the information contained in the s - s portion of the VDM = Encapsulated ITU-R M.1371 radio message. Note that messages 5 and 19 may be sent as multi part messages using the x1, x2 and x3 parameters for message sequence control

VDO Message Format

This sentence sends the own vessels details.

Message Format

!--VDO,x1,x2,x3,a,s--s,x*hh<CR><LF>

x1 = Total number of sentences needed to transfer the message , 1 to 9

x2 = Sentence number, 1 to 9

x3 = Sequential message identifier, 0 to 9

a = AIS Channel, "A" or "B"

s - s = Encapsulated ITU-R M.1371 radio message 4

x = Number of fill-bits , 0 to 5

ACA Message Format

The SAS SERIES unit can receive regional channel management information (ACA) in two ways: ITU-R M.1371 message 22 or a DSC telecommand received on channel 70,

Message Format

\$--ACA,x,IIII,II,a,yyyyy.yy,a,IIII,II,a1,y1y1y1y1y.y1y1,a2,x1,x2x2x2x2,
x3,x4x4x4x4, x5,x6,x7,a3,x8,hhmmss.ss*hh <CR><LF>

x = Sequence Number , 0 to 9

IIII, II, a = Region Northeast corner latitude – N/S

|| NMEA 0183 Messages

yyyyy.yy,a1 = Region Northeast corner longitude – E/W

lll.ll,a = Region Southwest corner latitude – N/S

y1y1y1y1y1.y1y1,a2 = Region Southwest corner longitude – E/W

x1 = Transition Zone Size

x2x2x2x2 = Channel A

x3 = Channel A bandwidth

x4x4x4x4 = Channel B

x5 = Channel B bandwidth

x6 = Tx/Rx mode control

x7 = Power level control

a3 = Information source

x8 = In-Use Flag

hhmmss.ss = Time of "in-use" change

ACS Message Format

This sentence is used in conjunction with the ACA sentence and identifies the originator of an ACA message.

\$--ACS,x,xxxxxxxx, hhmmss.ss,xx,xx,xxx*hh <CR><LF>

x = Sequence Number , 0 to 9

xxxxxxxx = MMSI of originator

hhmmss.ss = UTC of receipt of channel management information

xx = UTC Day, 01 -31

xx = UTC Month, 01 -12

xxxx = UTC Year

ALR Message Format

Alarm message

\$--ALR,hhmmss.ss,xxx,A,A,c--c*hh<CR><LF>

hhmmss.ss = Time of alarm (UTC)

xxx = Unique alarm number

A = Alarm condition

A = Alarm acknowledge state

c--c = Alarm description, text

Alarms descriptions presented are:

|| NMEA 0183 Messages

AIS: TX malfunction

AIS: Antenna VSWR exceeds limit

AIS: Rx channel 1 malfunction

AIS: Rx channel 2 malfunction

AIS: general failure

AIS: no sensor position in use

AIS: no valid SOG information

AIS: no valid COG information

AIS: 12V alarm

AIS: 5V alarm

AIS: Loss of serial interface integrity

AIS: Background noise above -77dBm

ACK Message Format

Can be generated by a minimum keypad and display (MKD) unit, chart plotter or other display device connected to the SAS-300 to acknowledge an alarm condition reported by the SAS SERIES.

`$--ACK,xxx*hh <CR><LF>`

xxx = Unique alarm number

|| Installation

GPS Antenna

The GPS antenna used must be of the active type (i.e. it should incorporate an LNA) and must be suitable for marine shipboard applications (index of protection, ruggedness, means of mounting, etc.). An antenna should be selected with a gain (in dB) depending on the length of cable between the antenna and the AIS unit; after subtraction of cable and connector losses, a minimum total gain of 25 dB should be available at the SAS SERIES unit GPS antenna connector.

The GPS antenna to be used for AIS use must be a dedicated antenna, i.e. not shared with any other

GPS receiver.

Installation of the GPS antenna is critical for the performance of the built in GPS receiver which is used for timing of the transmitted time slots and for the supply of navigational information should the main navigational GPS fail. We strongly recommend that:

The GPS antenna is mounted in an elevated position and free of shadow effect from the ship's superstructure

The GPS antenna has a free view through 360 degrees with a vertical angle of 5 to 90 degrees above the horizon.

As the received GPS signal is very sensitive to noise and interference generated by other onboard transmitters, ensure that the GNSS antenna is placed as far away as possible from radar, Inmarsat and Iridium transmitters and ensure the GPS antenna is free from direct view of the radar and the Inmarsat beam.

It is also important that the MF/HF and other VHF transmitter antennas are kept as far away as possible from the GNSS antenna. It is good practice never to install a GNSS antenna within a radius of 5 meters from these antennas.

Installation

VHF antenna

The VHF antenna employed for AIS use:

Must be a dedicated antenna, i.e. not shared with any other VHF transmitter/receiver.

Must be suitable for marine shipboard applications (index of protection, ruggedness, means of mounting, etc.)

Should be omni-directional and vertically polarised with unity gain (0 dB) with a bandwidth sufficient to maintain VSWR <1.5 over the frequency range 156 – 163 MHz. As a minimum the 3dB bandwidth must cover the two AIS channels and the DSC Channel.

Should be mounted with at least a two metre vertical separation distance from any other VHF antenna used for speech or DSC communication.

VHF Antenna Connection

Connecting a badly mismatched VHF antenna, leaving the VHF antenna port disconnected, or shorting the VHF antenna port will activate the VSWR alarm, cause the unit to stop sending position reports or cause damage to the transponder.

Radio Frequency Exposure

To meet the requirements for Radio Frequency Exposure it is necessary to install the VHF antenna correctly and operate the AIS equipment according to the instructions.

The VHF antenna must be mounted at a minimum distance (vertical separation) of 3 metres from the head of any person standing on deck in order to meet international safety directives on Maximum Permissible Exposure (MPE) / Specific Absorption Rate (SAR).

Where no suitable structure exists to achieve a 3 metre vertical separation then the antenna base must be mounted at least 1 metre above the head of any person within range, all persons should stay outside the 3-metre safety radius and if practical a grounded RF shield should be interposed between people and the antenna.

Failure to adhere to these limits could expose persons within the 3 metre radius to RF radiation in excess of the MPE / SAR limits.

Installation

SAS-300 brings expandable display technology to your bridge or navigation station. A careful installation will assure maximum benefit from SAS-300 integrated features.

Display Unit Location

Select a location for your SAS-300 display unit that provides easy viewing from all likely operator's positions. The display unit is designed to be mounted on either a console or from an overhead surface. The SAS-300 display is also designed for flush mounting using six threaded holes on the rear panel. Locate the display in an area with protection from the elements and avoid direct sunlight on the viewing window. Also, consider access to the rear panel of the unit for connecting power and cables to the various remote sensors. The mounting surface must be flat and solid to support the unit and prevent vibration. There should be access to the inside of the surface to permit through bolt fastening for the mounting bracket.

Display Unit Installation

Temporarily install the mounting bracket on the Genesis display unit and place the unit at the selected location.

CAUTION

The SAS-300 display unit is unstable when the mounting bracket is not secured. Hold the unit in place at all times.

Check the suitability of the location and make any adjustments. When all is satisfactory, use the holes in the mounting bracket as a guide and mark the holes locations on the mounting surface.

Installation

Drill a 1/4 in. diameter hole at each marked location. Mount the SAS-300 display bracket using bolts through the mounting surface. Place large flat washers on the opposite side of the mounting surface from the bracket and then install lock washers and nuts. Tighten securely.

Install the display unit into the mounting bracket. Check alignment and operation of the pivots and security of the mounting. Make any adjustments necessary to prevent binding and assure even meshing of the pivot locking washers. It is advised to remove the display unit and store it in a safe place to prevent damage during the rest of the installation process.

- Power Connection

Power is supplied to the SAS-300 System through a connector on the rear panel of the display unit.

Route the power cable from the SAS-300 location to the ship's power distribution panel.

Connect the black wire to a battery negative (-) terminal of the power panel.

Connect the white wire to a fused battery positive (+) terminal of the power panel (12 to 24 Vdc nominal). If a fused terminal is not available, install an in-line fuse holder.

Reference

- Care and Cleaning

Your SAS-300 is made to withstand marine elements but a little care ensures a trouble free life. Accumulations of salt and sand, if not removed, will eventually mar the finish. No solvents or harsh cleaners should be used. The display unit may be wiped down with a damp cloth while avoiding the display window. Be careful not to scratch the display window surface. Gently remove any sand or other grit particles before cleaning the display window. The display window should be cleaned only with water and a clean soft cloth using very light pressure.

- NMEA

A standard developed by the National Marine Electronics Association and used by most marine equipment manufacturers for data communication is known as NMEA 0183 version 1.5 and version 2.0. NMEA0183 specifications offer many recognized sentences for exchanging data between many types of marine equipment.

The following technical information is provided for reference and is accurate to the best of our knowledge at the time of printing. Please refer to the appropriate NMEA specifications for details and the latest information.

The data sentences used by the HGP-660 are as follows.

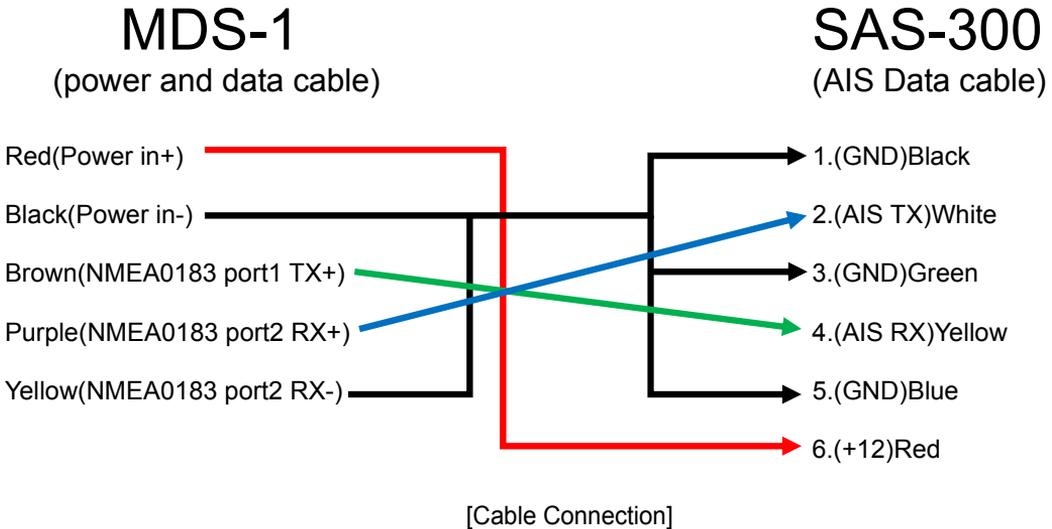
Output sentences:

DESCRIPTIONS	CONTENTS OF DATA FIELD
\$GPGGA	Global Positioning System Fix Data
\$GPGLL	Geographic Position, Latitude/Longitude
\$GPGSA	GPS DOP and active satellites
\$GPGSV	GPS Satellites in View
\$GPVTG	Course and Ground Speed
\$GPZDA	Time & Date
\$GPRMC	Recommended Minimum Specific GPS/TRANSIT DATA
\$GPAPB	Heading/track controller (Autopilot) sentence B
\$GPXTE	Cross-track error, measured
\$GPBOD	Bearing, origin to destination
\$GPRMB	Recommended minimum navigation information

MDS-1

Connecting SAS-300 and MDS-1, setting Name of Vessel, MMSI, Call Sign, type of Vessel, Dimensions of MDS-1 is available directly through SAS-300 as below.

(*Please, see Page.39 12.Program Transponder of MDS-1)



(*For more information about MDS-1, PLS see page.63 the manual of MDS-1)

Page

Select Page

Enter [Page] menu and then go to "Pages" screen

Selectable Pages by red box and then press [ENTER] key.

Pages [1/2]

The screenshot displays a 3x3 grid of page thumbnails. The top row shows three identical depth profile screens with a reading of 23.9 m. The middle row shows three identical screens with a reading of 20.4 m and 24.6 °C. The bottom row shows three screens: the left one is highlighted with a red box and shows 20.4 m and 24.6 °C; the middle one shows a yellow depth profile; the right one shows a compass rose and coordinates. A callout box labeled 'red box' points to the bottom-left thumbnail.

[PAGE] : Modify SCR [ENT] : Select SCR [CANCEL] : Exit

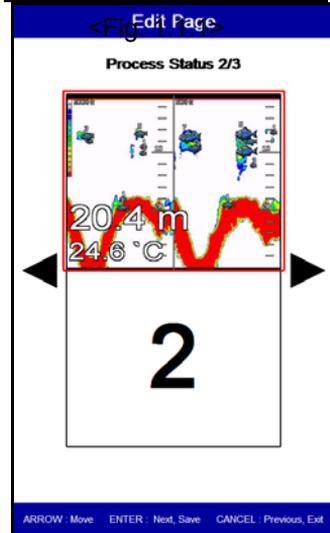
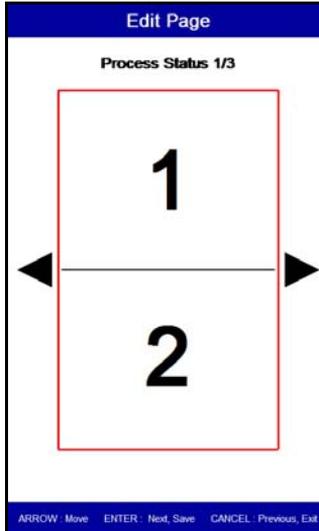
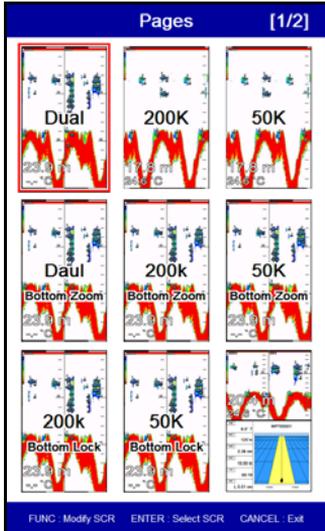
Customize

Customize of screen

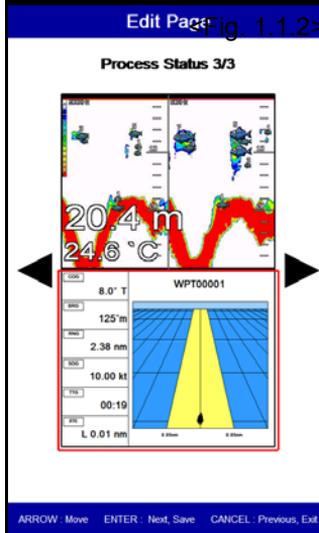
Enter Page menu on the Pages which selected red box. (*Refer Fig. 1.1.1 as below)

Select the layout of the formation of screen. (*Refer Fig. 1.1.2 as below)

Select displays. (*Refer Fig. 1.1.3 & 1.1.4 as below)



<Fig. 1.1.3>



<Fig. 1.1.4>

Customize

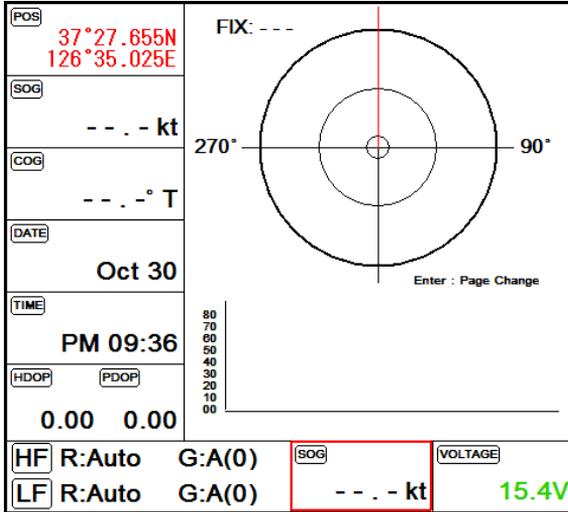
Customize of data bar

► [MENU]->Advance->Setup->Customizing->Data bar-> Edit

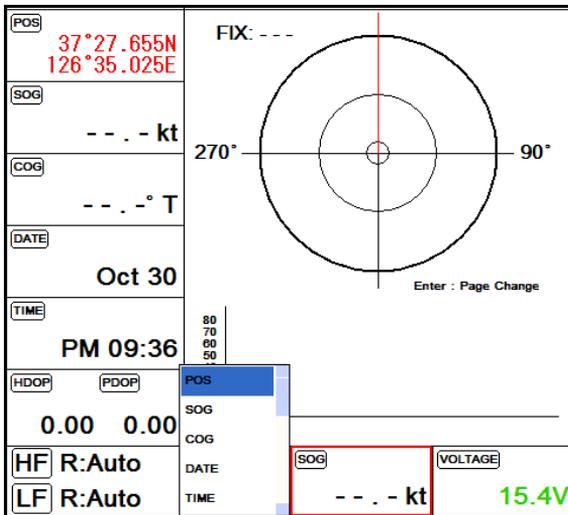
Select the section to edit by red box. (*Refer Fig. 1.2.1 as below)

Press [ENTER] key and select the data as a user want. (*Refer Fig. 1.2.2 as below)

Finish the formation of data bar, press [CANCEL] key to complete.



<Fig. 1.2.1>



<Fig. 1.2.2>

II Customize

Navigation data edit

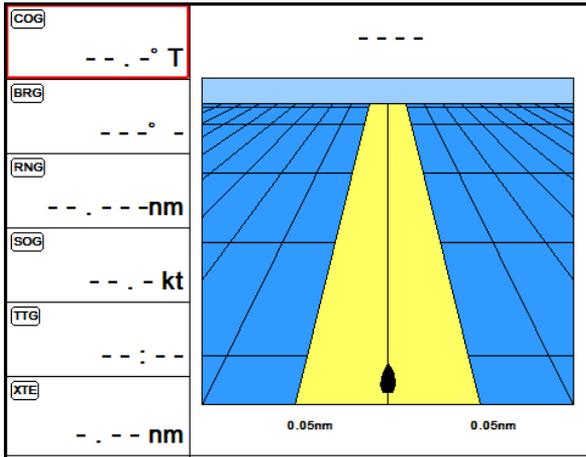
► [MENU]->Advance->Setup->Customizing->Navigation Data-> Edit

Select the section to edit .(*Refer Fig. 1.3.1 as below)

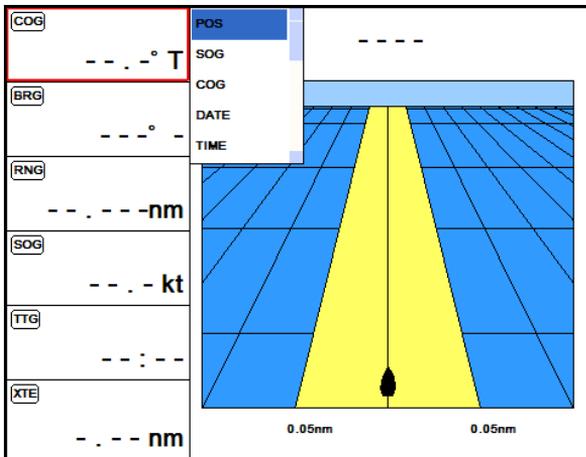
Press [ENTER] key and select the data as a user want. (*Refer Fig. 1.3.2 as below)

Finish the formation of data bar, press [CANCEL] key to complete

(* If no navigation data on present activated display, it is not available to edit)



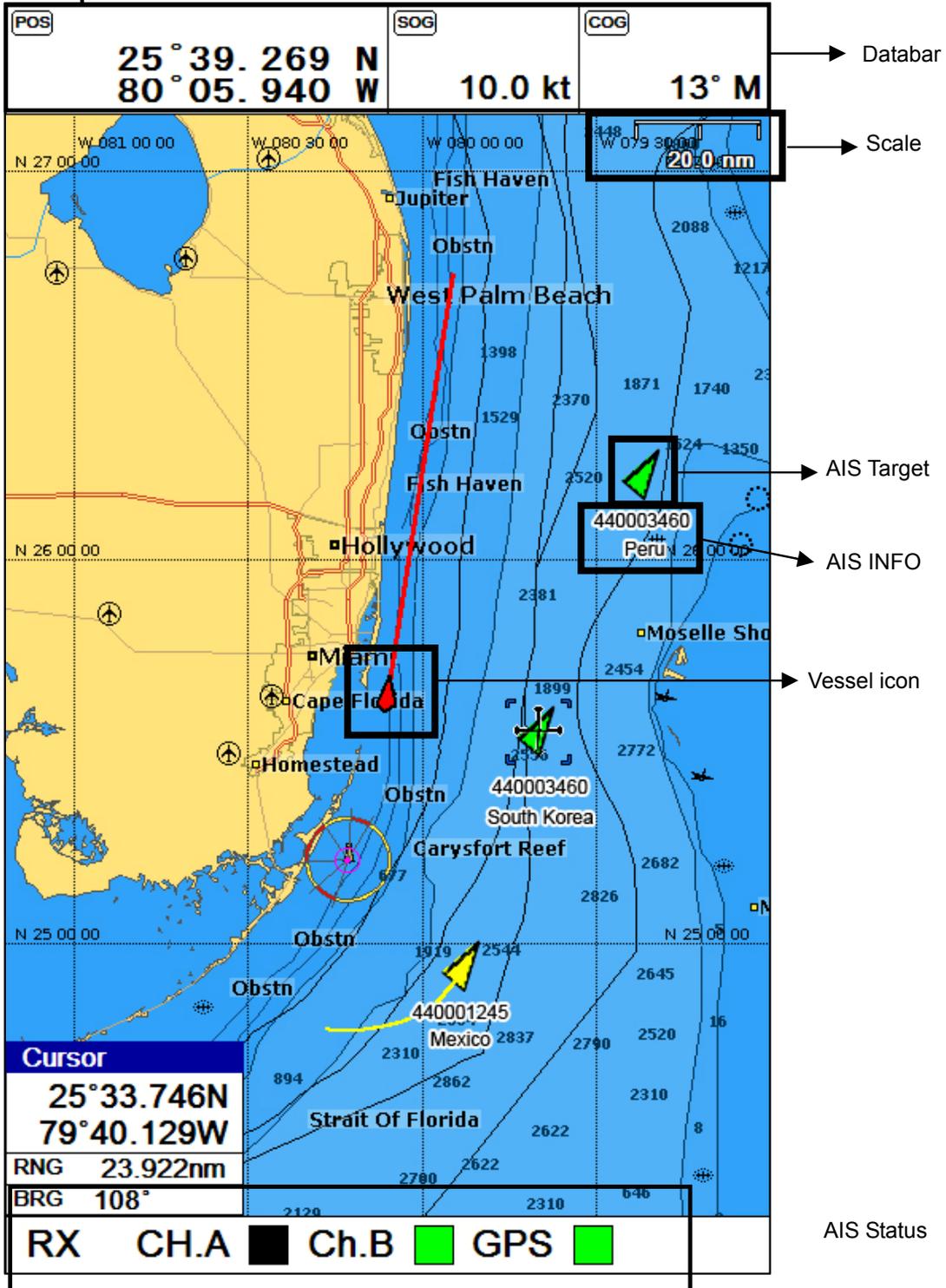
<Fig. 1.3.1>



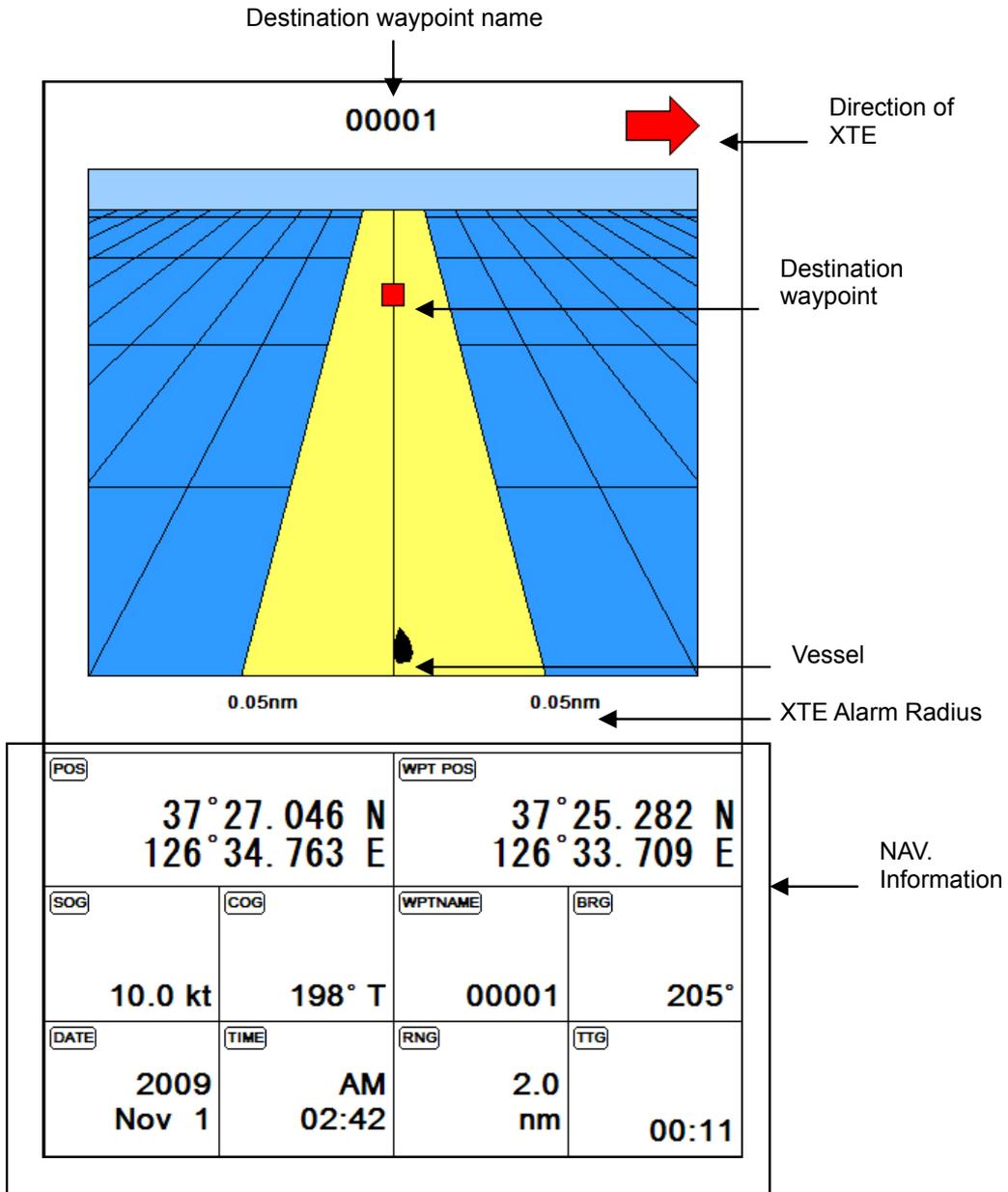
<Fig. 1.3.2>

Display

Chartplotter



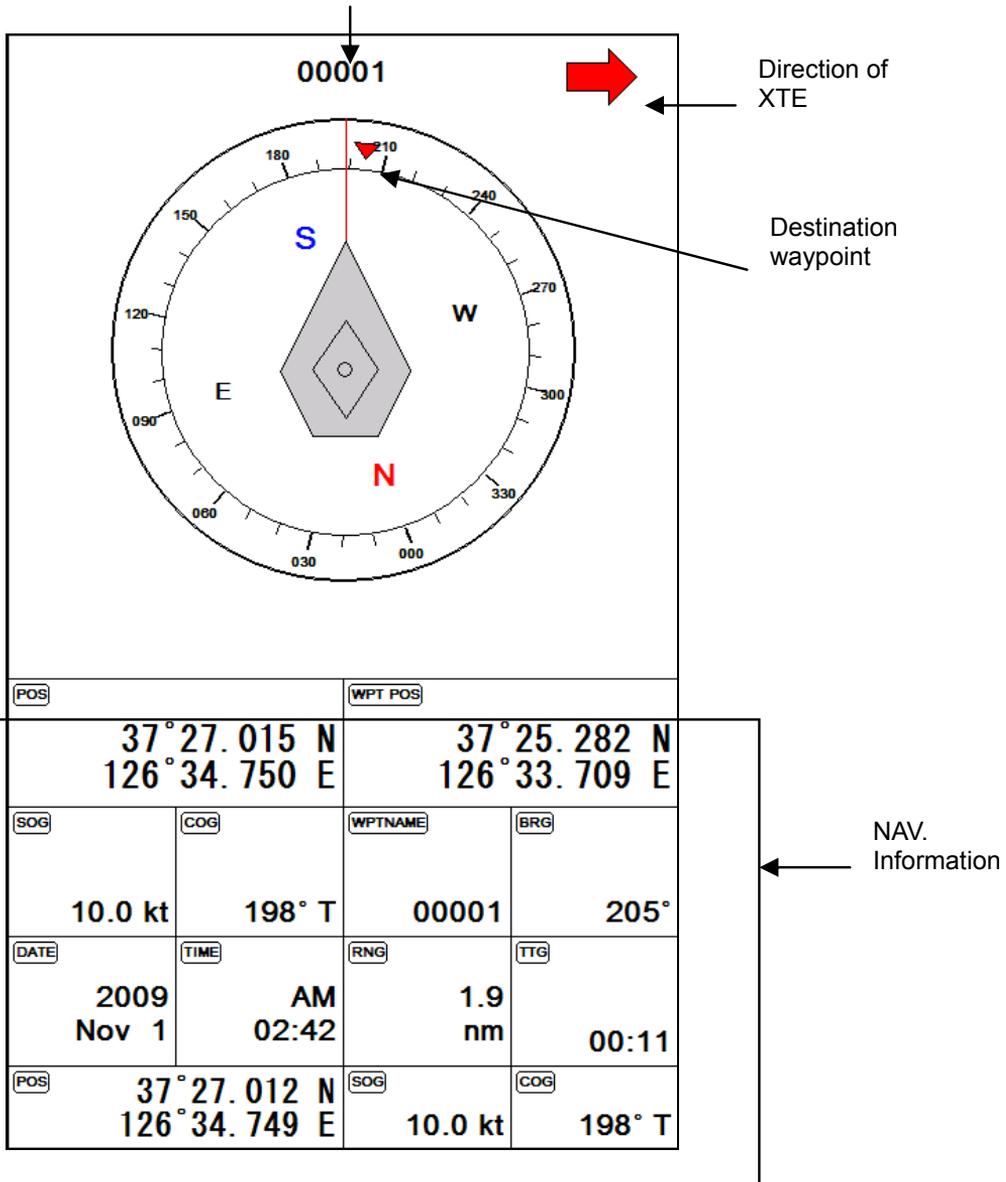
Highway



Display

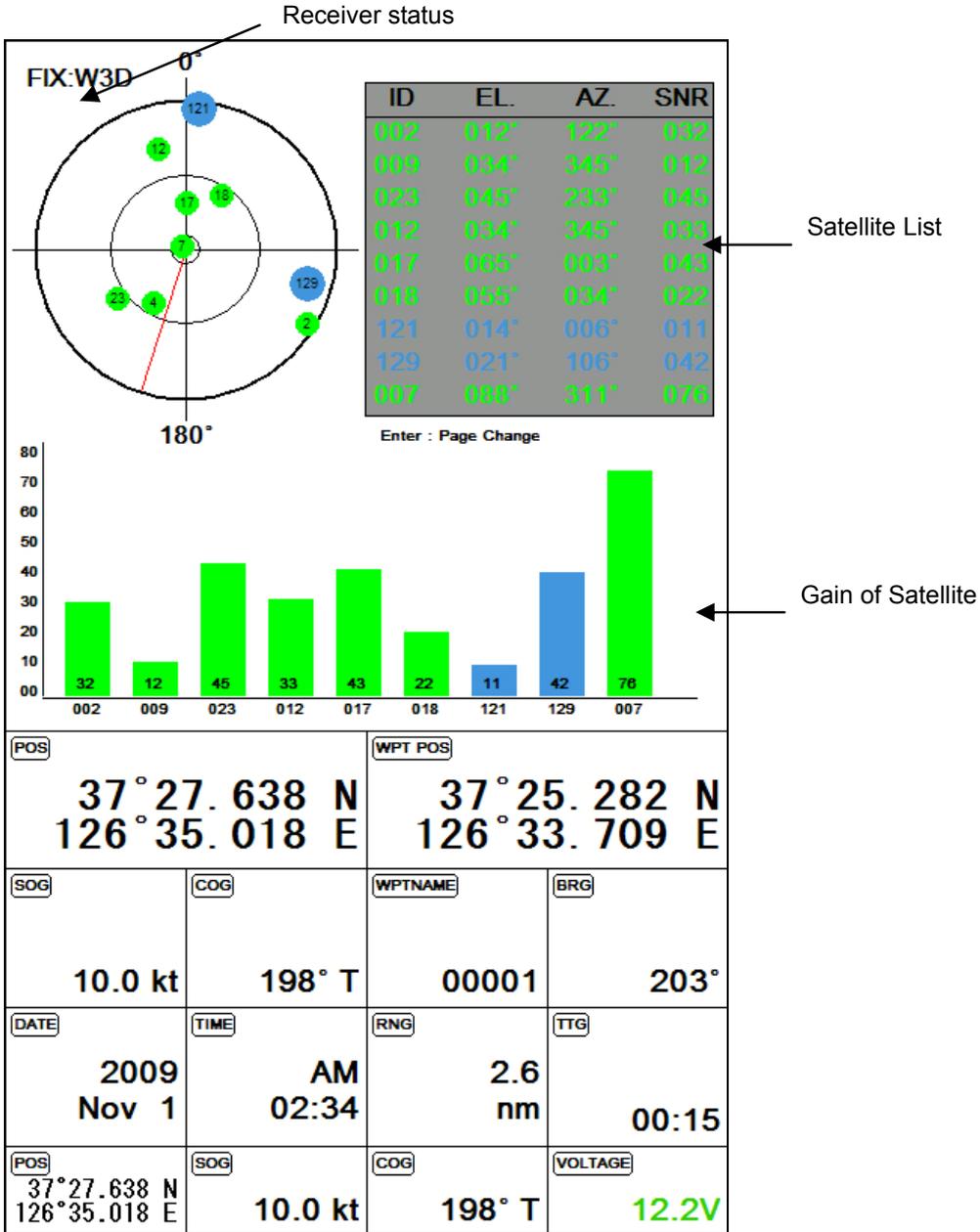
Steering

Destination waypoint name



Display

GPS Information



|| AIS System

AIS is an Automatic Identification System. It has been introduced to improve the safety of navigation by assisting in the efficient operation of ship to ship, ship reporting and VTS applications. The system should enable operators to obtain information from the ship automatically, requiring a minimum of involvement of ship's personnel, and should have a high level of availability.

Connecting to the chart plotter an AIS receiver, vessels with AIS transponder within VHF range are displayed on screen giving the skipper or navigator a visual interpretation of the data of nearby vessels. This improves safety, and specifically for collision avoidance reasons.

|| AIS System

1. AIS system definitions

CPA	Closest Point of Approach is the closest distance that will be achieved between your vessel and the tracked target, based on your vessel's speed and direction and the target's speed and direction.
CPA Alarm	Occurs if CPA is less or equal to CPA Radius. This test is done for active targets only.
CPA Limit	This is the distance from your vessel that a target may reach before a target is deemed a threat.
TCPA	Time to Closest Point of Approach is the time remaining until the CPA will occur.
TCPA Alarm	Occurs if TCPA is less or equal to TCPA Radius. This test is done for active targets only and if CPA value is less or equal to CPA Radius.
TCPA Limit	This is the time remaining before the CPA is reached.
Name	Name of ship, 20 characters.
MMSI	Maritime Mobile Service Identity.
MMSI number	A unique 9 digit number that is assigned to DSC radio station. It primarily registers the boat information in the U.S. Coast Guard's national distress database for use in emergency situations.
Target	It is a vessel equipped with AIS. Information about the targets is being received by AIS Receiver and displayed on the screen.
Active Target	Target located within the Activation Range. Active target is represented by oriented triangle with COG and Heading vectors. Rate of turn may also be displayed.
Dangerous Target	Target detected by CPA or TCPA Alarm. Dangerous target is Active Target by definition. For better visibility Dangerous Target symbol is charged from basic color to red color.
Sleeping Target	Target located outside the Activation Range. Sleeping target is represented by a small oriented triangle.
Lost Target	When the AIS info is not received from that vessel for 3.5minutes. The presentation will be marked X on the target.

|| AIS System

2. Quick info on AIS target

Press [ENTER] key on Target which wants to see. It shows Information of "AIS INFO" window.

AIS INFO window

1. Name
2. MMSI number
3. National
4. Navigation Status
5. Heading
6. COG
7. SOG
8. CPA
9. TCPA
10. Latitude
11. Longitude

※Press [ENTER] key on Target which wants to see. It shows Information of "AIS INFO" window.

3. AIS target tracking

In the targets on the screen, choose the target and put the cursor on it. Press "TRACK" and the track turns to yellow and tracking begins.

(※The maximum is five tracks. This tracking is unavailable to store so that it will be gone after power off.)

AIS MENU

To obtain more information on AIS vessels or to configure the AIS

► Press [AIS]

1. AIS On/Off

Turns the display of AIS targets overlay on the screen On or Off.

(☞ The default setting is On.)

2. List of Vessels.

Pressing the [ENTER] key will display a list of current AIS vessels in view. Initially these are sorted by showing the nearest first, additional pages of vessels can be displayed by pressing the [►] arrow key. The vessels Name, MMSI, Range and Bearing are shown.

To sort alphabetically by Name press [MENU]->[MENU], alternate pressing of this button will toggle between A to Z and Z to A order.

To sort numerically by MMSI press [MENU]->[GOTO], alternate pressing of this button will toggle between 0-9 and 9-0 order.

To sort by Range press [MENU]->[PAGE], alternate pressing of this button will toggle between nearest and furthest.

Pressing the [▲] or [▼] arrow keys will move the highlight blue bar over different vessels. Pressing [ENTER] when a vessel is highlighted will display another page showing all the details so far received from this vessel. Details of other vessels in the list can be accessed directly by scrolling through with the [◀] and [▶] arrow keys. To return to the main list press the [CANCEL] button.

To GOTO a vessels position directly, scroll through the list to highlight the vessel you wish to go to and press the [GOTO] key. The screen will now return to the main chart display and be centred on the vessel you have selected.

3. Display radius

Displays range rings centred on your current position.

(☞ The default setting is OFF.)

Different types of AIS transmissions can be selected to display different colors of icons on the chart display.

4. Display vessels by Type

Different types of AIS transmissions can be selected to display different color of icons on the chart display.

|| AIS

5. Display vessels by Type

Different types of AIS transmissions can be selected to display different types of icons on the chart display.

6. Filter AIS types

This function allows you to turn on or off reception from different types of AIS transmissions, for instance if you only wanted to view Class B vessels on the chart display then select Class B On and all the others Off.

7. Alarm

7.1. CPA Alarm

The CPA alarm is the closest approach alarm, this allows you to set a distance when the alarm will sound if a vessel comes within that distance .

(☞ The default setting is OFF.)

7.2. CPA Radius

The values allowed are from 0.1nm to 10nm.

(☞ The default setting is OFF.)

7.3. TCPA Alarm

The TCPA alarm is the time that a vessel will take to be in the same position as you currently are.

(☞ The default setting is OFF.)

7.4. TCPA Limit

The values allowed are from 1 to 50 min.

(☞ The default setting is 1 min.)

7.5 Radius Alarm

When approaching to the setting range, alarm activates.

(☞ The default setting is OFF)

7.6. Radius

The setting range is between 0.1nm and 10nm.

7.7. Ignore Vessels if Speed Less

If you want the alarms to ignore vessels that are travelling at less than a particular speed then switch ON.

7.8. Speed Less Than

The values allowed are from 0.1kt to 9.9kt.

8. Set up AIS time outs etc.

1. Mark vessels as lost after

If repeat transmissions are not received from a vessel after 7 minutes then the target is marked with a "X".

2. Remove lost vessels after

If repeat transmissions are not received from a vessel after 10 minutes then the target is removed from the chart display.

3. AIS Status Bar

Setting up the AIS Status Bar on the display.

(☞ The default setting is On.)

4. Vessel target

It is available to setup the own vessel's AIS target display on the screen.

(☞ The default setting is On.)

9. Labels on vessels.

This menu controls what details are displayed alongside the vessels icons on the chart display.

10. Cursor Box info.

When you move the cursor in chart mode over an AIS target a box appears showing details of that vessel.

11. Messages List.

This window displays lists of specific AIS messages, such as Safety Messages that the unit has received. Scrolling down the list and highlighting a message allows you to see the contents by pressing the [ENTER] key. Whilst in the main list pressing the [MENU] key when a message is highlighted will erase that message, pressing the [▶] [◀] keys will allow you to view any other pages of messages.

★ AIS SART Messages

If an AIS SART message is received it will immediately be displayed on whatever screen you are viewing. If the "Status" shows "Test" then no further action is required as it is just a test transmission. If the "Status" shows "Active" it will also show the MMSI, Name and position, the SART icon should now be displayed on your chart screen at that location. Monitor your VHF radio on Channel 16 and establish whether any other station has received this SART message, if not take the appropriate action.

12. Program transponder

This facility is currently only setup to allow programming of AIS Class B transponder. To enter the name of your vessel press the [ENTER] key, a keyboard will be displayed in the lower half of the screen, move around the keyboard with the [▲] [▼] [◀] [▶] until the character you require is highlighted, pressing the [ENTER] key places the character in the window above the keyboard. When you have completed the name pressing [CLEAR] exits the editing screen and places the name into the name data field. Repeat this operation for the MMSI and Callsign, Note the MMSI can only be entered once so ensure the number is correct. To select the Type of Vessel choose the corresponding number from the type of vessels listed below:

- 30: Fishing vessel
- 31: Vessels engaged in towing
- 32: Vessel engaged in towing, tow exceeds 250m
- 33: Vessel engaged in dredging or underwater operations
- 34: Vessel engaged in diving operations
- 35 : Vessel engaged in military operations
- 36 : Sailing
- 37 : Pleasure craft
- 50 : Pilot vessel
- 51 : Search and Rescue vessel
- 52 : Tugs
- 53 : Port Tenders
- 54 : Anti pollution vessel
- 55 : Law enforcement vessel
- 58 : Medical transport
- 60 : Passenger ship
- 70 : Cargo ship
- 80 : Tanker ship

Continue to enter your vessels total length and breadth in the same manner. When all the details are correct press the [AIS] key, this will send the data to the MDS-1.

13. Fishing net

13.1. Fishing net

Display the programmed Fishing net AIS target.

( The default setting is Off.)

13.2. Select name

Program the name of Fishing Net

13.3. Alarm

The alarm goes off when no Fishing net AIS target is in setting range.

(☞ The default setting is Off.)

13.4. Alarm Radius

Setup the Fishing net alarm range.

(☞ The default setting is 0.05nm.)

14. When the cursor is on the AIS target, showing the popup window or not.

(☞ The default setting is OFF)

|| Map Orientation

1. True Motion

The True Motion is in the way the vessel position is presented. In True Motion mode, the vessel position symbol moves over the map while the map remains stationary.

Select True motion.

(* It is not available to operate on Course up and Head up.)

2. North Up/South Up/East Up/West Up

They setting the vessel present position remains fixed in the center of the Main Screen while the map moves under it.

3. Course Up

The Course Up mode screen orientation is determined by whether or not navigation is in progress.

During navigation vessel present position is in the center of the Screen and the course line to the destination is straight up. As your present position changes, the map moves under the stationary vessel symbol.

(*If navigation is stopped, the Main Screen appears as Head up.)

4. Head Up

For Head Up mode, vessel present position is fixed in the center of the Main Screen and vessel heading is upward. As your present position changes, the map moves under the vessel symbol.

It is to be used for Object information or Find function of C-MAP.

► Press [ENTER]

1. Information

It is possible to see map information at the Vessel Position.

(*Information is Port Services, Tides, Lights, Wrecks, Rocks, Buoys, Beacon, Obstructions, Land markers, etc.)

2. Find

The charplotter allows finding Nearest Services, Port By name, Port by distance, Tide Stations, Wrecks, Obstructions.

2.1. Port Services

To locate and display the nearest available facilities of a particular type.

The icons of the available services are shown. Use the cursor key to select any facility and press [ENTER]. The list of the ports containing the facility will be shown on the screen. Then choose the port you want and press [ENTER]

2.2. Port by names

To select the Ports by name function following the procedure.

Shows the list of all ports stored on the C-CARD in alphabetical order and allows to search ports by name to locate the ports on the map.

2.3. Port by distance

To select the ports by distance function following the procedure.

Shows the list of all ports stored on the C-CARD in closest distance order and allows to locate the ports on the map

2.4. Tide stations

Finds the nearest Tide stations on the map, from the boat position –if a valid fix is received- or from the cursor position-if the received fix position is not good.

A new window will appear in few seconds. Choose the tide stations you want and press [ENTER] to display the tide graph page.

2.5. Wrecks

Searches for nearest Wrecks.

Use the cursor key to select the port. Press [ENTER] to locate the selected Wreck on the map.

Menu

It is available to load the window of the Menu on the activated chartplotter display in red box

► Press [MENU]

1. Userdata

1.1. WPT

Waypoints may be entered and stored in the waypoint library by any of two different methods. You may use the cursor to select locations from a chart, or store vessel present position as a waypoint

1.1.1. List

Verification of saved WPT information and edit, delete, navigation.

(*Refer the menu from bottom list on the list window)

1.1.2. Symbol size

You can select the size of "WPT symbol"

(☞ The default setting is Auto.)

1.2. Route

Use waypoints to create a instant route for your sailing. The capacity of waypoints are 20 point.

Every time you put waypoints on the screen, the temporary route is drawn on the screen.

1.2.1. List

Verification of saved "Route" information and edit, delete, navigation.

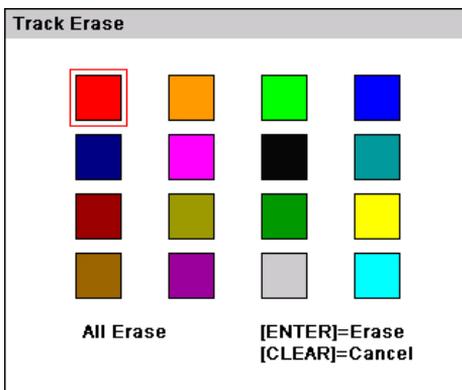
(*Refer the menu from bottom list on the list window)

1.3-1. Track(type 1)

1.3-1.1. Erase

You can erase all tracts by the selected color.

(* If you want to delete to be being used the track , choose "All Erase")



Menu

1.3-1.2. Setup

1.3-1.2.1. Thickness

The size of a track is selectable between thin and pan.

(☞ The default setting is Thin.)

1.3-1.2.2. Record setup

Track display interval is adjustable by distance or time.

(☞ The default setting is Time.)

1.3-1.2.3. Time interval

If track interval is set in time, a track displays by track time interval. The track time interval and the maximum capacity is 50,000 points.

(☞ The default setting is 10 seconds.)

1.3-1.2.4. DIST interval

If track interval is set in distance, a track displays by track distance interval. The track distance interval and the maximum capacity is 50,000 points.

(☞ The default setting is 0.03nm.)

1.3-1.2.4. Track Type

Setting up track type for type1 or type2.

(☞ The default setting is type1 .)

1.3-2. Track(type 2)

1.3-2.1. Select Index

Select the number of the active track.

1.3-2.2. Setup

1.3-2.2.1. Thickness

The size of a track is selectable between thin and pan.

(☞ The default setting is Thin.)

1.3-2.2.2. Record setup

Track display interval is adjustable by distance or time.

(☞ The default setting is Time.)

1.3-2.2.3. Time interval

If track interval is set in time, a track displays by track time interval. The track time interval and the maximum capacity is 10,000 points.

(☞ The default setting is 10 seconds.)

|| Menu

1.3.2-2.4. DIST interval

If track interval is set in distance, a track displays by track distance interval. The track distance interval and the maximum capacity is 10,000 points.

(☞ The default setting is 0.03nm.)

1.3.2-2.4. Track Type

Setting up track type for type1 or type2.

(☞ The default setting is type2 .)

1.3-2.3. List

Verification of saved Track information and edit, delete, display.

(*Refer the menu from bottom list on the list window)

1.4. User Line

This function is used to create new line or plane at specific area on chart manually.

1.5. User Name .

This function is used to put a name on the specific area by user.

1.6. Save Userdata

You can save the "User data" in SD card

1.7. Load UserData

You can load the "User data" from SDcard.

2. Vessel offset

It is possible to be set up positions of 0, 1/3, and 2/3 by the standard of the center of Main Screen.

(☞ The Vessel offset does not work on True Motion.)

3. Track

The Track function provides a record of the path over which your vessel has traveled. A track is a series of lines connecting points of vessel present position which are plotted at wither time or distance intervals. Tracks are recorded and stored one at a time. HD-70 series supports 50,000 points of track history.

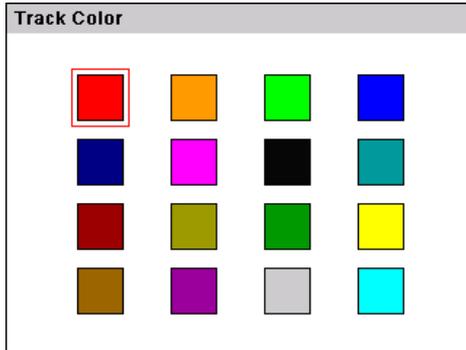
(☞ The default setting is OFF.)

Menu

4. Track color

You can select the color of "Track"

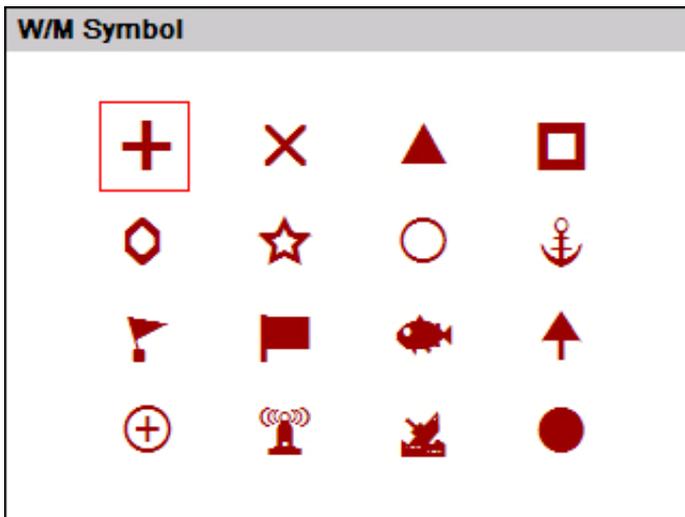
(There are 16 sort of * Track as picture)



5. WPT symbol

You can select shape of WPT.

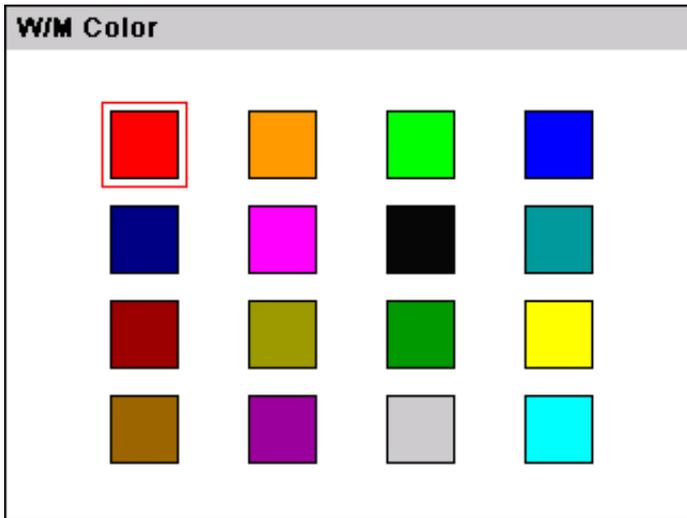
(There are 16 sort of * WPT symbols as picture)



6. WPT color

You can select the color of WPT symbol

(There are 16 sort of * WPT symbols as picture)



7. Navigation

7.1. Previous WPT

It is available to set up a previous WPT in the Present preferred route.

7.2. Next WPT

It is available to set up a next WPT in the Present preferred route.

7.3. Route order

It is available to set up the route forward and reverse in the Present preferred route.

7.4. Navigation Time

Setting up navigation time for TTG or ETA during navigating.

7.5. Goto Type

Setting up goto type for type1 or type2.

8. Calendar

It is available to check the solar/moon calendar and tide.

9. Page

Select the configuration & modification you wish.

10. Active

Select the activated section.

11. Advance

Load the additional advanced menu on the Menu.

|| Advanced Menu

Chartplotter

It is available to load the window of the Advanced Menu on the activated chartplotter display in red box

► Press [MENU] -> Advance

1. Map setting

1.1. Map orientation

1.1.1. True motion

You can select “True motion”

(☞ The default setting is OFF.)

1.1.2. Up mode

You can select “Map Orientation”

(☞ The default setting is North Up.)

1.2. UserData Display

Setting up shown/hide the user data on the display.

1.3. INFO Display

Setting up shown/hide common item between the HY-MAP and the C-MAP on the display.

1.4. Map scale

Setting up the map scale on the display.

1.5. Palette

It is possible to the palette used to enhance the visibility of the screen depending on the surround light condition. The possible choices are listed in the table below:

1.5.1. Normal

It set the maps are displayed in ordered to use colors as similar as possible to the ones used in the original paper charts.

1.5.2. Sunlight

It is designed to enhance the visibility of the screen when HD-70 series is exposed to the sunlight.

The maps are much brighter than in the other displays.

1.5.3. NOAA

Allows setting NOAA paper chart colors presentation.

(*It is available NOAA menu on C_MAP mode.)

Advanced Menu

1.6. LAT. Modification

Though GPS information is accurate, there could be an error in the chart at latitude. The error can be modified in the chart latitude modification.

1.7. LOT. Modification

Though GPS information is accurate, there could be an error in the chart at longitude. The error can be modified in the chart longitude modification.

1.7. Map

Select the chart among HY-MAP,C-MAP and External map.

1.8-2. C-Map

1.8-2. 1. SAT.Image

Setting up the overlay Satellite Image on the C-MAP.

(☞ The default setting is shown.)

1.8-2. 2. Font&Symbols

On charts it is possible to set the size of all names and symbols drawn on the charts, selecting between Normal size and Large size.

(☞ The default setting is normal.)

1.8-2. 3. Mixing Level

When the map coverage at the current zoom level does not fill the entire screen, the chartplotter draws the rest of the map expanding the cartographic information read from, at most, two zoom levels above the current zoom level. For this reason the map is drawn three times; firstly it draws the two levels before the current level and then the current level. The area covered by the cartographic data read from the previous levels is identified by a dotted pattern. When the cursor is moved area not covered by data of the currents level the chartplotter zooms out to the first level covered by cartographic data. The default setting is ON.

(☞ The default setting is on.)

1.8-2. 4. Perspective View

Chart data may be projected in perspective mode during navigation. This function allows setting the panoramic View of the chart.

As the upper side of the map is more compressed than the lower side, a wider map area is visible. The perspective view allows showing more chart information immediately ahead and around the cursor.

(☞ The default setting is off.)

|| Advanced Menu

1.8-2. 5. Chart Boundaries

Sets ON/OFF the displaying of the chart boundaries, which represents the boundaries of the charts available on the chartplotter. Selecting Auto instead, if we are in background charts only the first chart levels contained in the memory card are displayed, if we are in a charts level contained in the C-CARD the next four charts level are displayed.

( The default setting is auto.)

1.8-2. 6. Multi Language

Select language for name of the place, lighthouse or buoy.

( The default setting is English.)

1.8-2. 7. Quick View

It is available to set up. Place the cursor on buoys or icons on the C-MAP, the information window is shown up automatically.

( The default setting is hidden.)

|| Advanced Menu

2. Vessel

2.1. Vessel Icon Size

The size of the present position is adjustable from 0 to 9. The biggest size is '0'.

(☞ The default setting is 9.)

2.2. Heading Line

The length of the heading line is adjustable from 50 until 300. The bigger number, the longer line. The heading line is used in modes of the true motion and the north up.

(☞ The default setting is 270.)

2.3. Vessel Style (Circle/Arrow/Vessel)

Select the vessel symbol among Circle, Arrow and vessel.

(☞ The default setting is circle.)

2.4. Orient. Resolution

Sets you preferred Rolling Road Scale.

(☞ The default setting is 0.)

3. Cursor Icon

Select the cursor icon between Cross to Arrow.

(☞ The default setting is Cross.)

3. Alarm

3.1. Navigation

3.1. 1. Arrival Alarm:

When you approach into the waypoint range, it gives you a notice with alarm.

(☞ The default setting is OFF.)

3.1.2. Arrival Radius:

It is to adjust the range of arrival from your waypoint. If you have a route, it changes to the next waypoint automatically.

(☞ The default setting is 0.05nm.)

3.1.3. XTE Alarm:

If you are out of the course, it gives you a notice with alarm.

(☞ The default setting is OFF.)

|| Advanced Menu

3.2. Anchor

3.2.1. Anchor Alarm:

It is necessary when your vessel anchors.

(☞ The default setting is OFF.)

3.2.2. Anchor Radius:

If your vessel is out of the range of the anchor, it gives you notice with alarm.

(☞ The default setting is 0.05nm.)

3.3. Interval

3.3.1. Interval Alarm:

It alarms every time you set.

(☞ The default setting is OFF.)

3.3.2. Interval Time

The time is available from one minute until sixty minutes.

(☞ The default setting is 3 min.)

3.1.4. XTE Radius:

It is to adjust the range of the off course.

(☞ The default setting is 0.25nm.)

3.4 User Line

3.4.1. User Line Alarm

It alarms if it breaks into the setting area.

(☞ The default setting is OFF.)

3.4.2. User Line Radius

It sets the range of the course alarm.

(☞ The default setting is 0.05nm.)

|| Advanced Menu

General

1. GPS

It is available to control and confirm information in GPS receiver.

1.1. Coordinate System

It sets coordinate system of GPS or Loran.

(☞ The default setting is GPS.)

1.2. Datum

It shows GPS Datum. WGS-84, which is the worldwide standard is only available.

1.3. LAT. Modification

There could be a receiving signal error from satellites. If it is on the latitude, modify in the latitude modification.

1.4. LOT. Modification

There could be a receiving signal error from satellites. If it is on the longitude, modify in the longitude modification.

1.5. POG filter

Step 1(OFF)~59(MAX) the POG Filter. When it is On(over step 1), you can filter the POG of the vessel, to optimize it.

(☞ The default setting is incorrect every the country.)

1.6. COG filter

Step 1(OFF)~119(MAX) the COG Filter. When it is On(over step 1), you can filter the COG of the vessel, to optimize it.

(☞ The default setting is incorrect every the country.)

1.7. SOG filter

Step 1(OFF)~119(MAX) the SOG Filter. When it is On(over step 1), you can filter the SOG of the vessel, to optimize it.

(☞ The default setting is incorrect every the country.)

1.8. LAT/LON Unit

It is to select the number of the unit for Lat/Lon.

(☞ The default setting is 4 unit.)

1.9. Receiving Port

It is to select Inter receiver Internal, External and AIS.

(☞ The default setting is Internal.)

Advanced Menu

2.Setup

It is available to set the menu or units for user's visual confidence.

2.1. Unit

2.1.1. DIST/Speed

Select desired unit of measure for distance and speed. Choose from: nautical mile/knots (nm/kt), kilometer/kilometers per hour(km/kmh), yard/knot(yd/kt).

cf) 1nm = 1.852km, 1kt /h= 1.852km/h, less than 1nm display in yard and over 1nm display in mile
(☞ The default setting is Nm/Kt.)

2.1.2. Depth

Select desired unit of measure for depth of water. Choose from: meter(M), foot(ft), fathom(fm), Italian Fathom(lfm), Japanese fathom(Jfm).

cf) 1m = 3.281ft = 0.549fm = 0.609lfm = 0.660jfm
(☞ The default setting is Foot.)

2.1.3. TEMP

Select desired unit of measure for temperature of water. Choose from: Celsius(°C), or Fahrenheit(°F).

cf) 1°C = +32°F

2.2. Compass

2.2.1. BRG

There is a difference degree where you are in the earth. This function is to modify the error from true and Magnetic.

(☞ The default setting is Auto.)

2.2.2. Variation

There could be a difference between the magnetic compass and the GPS compass. An error depends upon your area.

2.3. Time & Date

2.3.1. Reference

Available to adjust the collect local time by the UTC time from the GPS.

(☞ The default setting is incorrect every the country.)

2.3.2. Time Format

Sets you preferred time between 12 hour or 24 hour.

(☞ The default setting is 12 hour.)

Advanced Menu

2.3.3. Date Format

Sets you preferred date among YY-MM-DD, MM-DD-YY or DD-MM-YY.

(☞ The default setting is MM-DD-YY.)

2.3.4. Month format

Sets you preferred date between Character or Number.

2.3.5. Calendar setup

2.3.5.1. Week starts on

You can select the first day of week.

(☞ The default setting is SUN.)

2.3.5.2. Color Saturday

You can setup the color of Saturday.

2.3.5.3. Color Sunday

You can setup the color of Sunday.

2.4 Input/Output

3.4.1. Output Sentences

The chartplotter allows customizing the NMEA-0183 sentence.

DESCRIPTIONS	CONTENTS OF DATA FIELD	DEFAULT
\$GPGGA	Global Positioning System Fix Data	ON
\$GPVTG	Course and Ground Speed	ON
\$GPZDA	Time and Date	OFF
\$GPRMB	Recommended minimum navigation information	OFF
\$GPRMC	Recommended Minimum Specific GPS/TRANSIT DATA	ON
\$GPAPB	Heading/track controller (Autopilot) sentence B	ON
\$GPXTE	Cross-track error, measured	OFF
\$GPBOD	Bearing, origin to destination	OFF
\$GPBWC	Bearing and distance to waypoint	ON
\$SYPLT	Samyoung autopilot	OFF

2.4.2. Transmit

Available to adjust transmit speed of input/output in each ports.

2.4.3. Buzzer

It is can be buzzer on/off.

(☞ The default setting is on.)

Advanced Menu

2.4.4. Backlight time out

It is the screen sets the time to sleep mode.

(☞ The default setting is off.)

2.4.5. Customizing

2.4.5.1. Databar

2.4.5.1.1. Display

Setting up shown/hidden the databar on the display.

(☞ The default setting is Shown.)

2.4.5.1.2. Position

Setting up up/down the position of databar on the display.

(☞ The default setting is Down.)

2.4.5.1.3. Edit

It customizes the data bar information.

2.4.5.1.4. Mode

It is available to set up the data bar.

- Customizing : It is selectable and modifiable the data bar by user.

- Fix mode : It is fixed data bar by default. It is not available selectable and modifiable the data bar by user.

(☞ The default is User mode.)

2.4.5.2. Navigation Data

2.4.5.2.1. Type

It is a select the navigation data type.

(☞ The default setting is Type1.)

2.4.5.2.2. Edit

It customizes the Navigation data section except activated the echo sounder section.

2.4.5.3. Page mode

It is a select the page mode.

- Standard: Choosing Page and customizing is available.

- Flip: Showing the chosen pages in order.

(☞ The default setting is Standard.)

2.4.6. TD Setup

It sets Chain, Pair, ASF

|| Advanced Menu

3. Maintenance

It is necessary to check the system or the version for maintenance and demonstrate HD-70 series with the simulators

3.1. Program VER.

It contains ID and the program version, and it has important information for maintenance and upgrade.

3.2. OS VER.

It contains the version of OS, which is necessary for maintenance and upgrade

3.3. MAP VER.

It contains the version of the chart, the datum and the number, which is necessary for maintenance and upgrade

3.4. Simulator

It is necessary for an indoor demonstration. The simulations of GPS, Fish finder or AIS in the memory..

3.5. Language

Select the language.

3.6. Initialization

3.6.1. Setup Initialization

reset without deleting user data.

3.6.1. Factory Initialization

returning to the initial system from the releasing of factory. (*All user data will be deleted)

Advanced Menu

4. Others

4.1. Recording

This is the function of recording current screen.

Marked [● REC] in red color on the upper right on the data bar during recording.

Note: The recording file is stored in SD card.

(*The storage location is "E9\Recording\" in SD card).

(* Recording time is different by the size of the memory card)

4.2. Recording List

Available to display and delete the recording file

4.3. Screen capture

This is the function of save the current screen

Note: The capture file is stored in external SD card.

(*The storage location is "E9\Capture\" in SD card).

(* Recording time is different by the size of the memory card)

4.4. Capture List

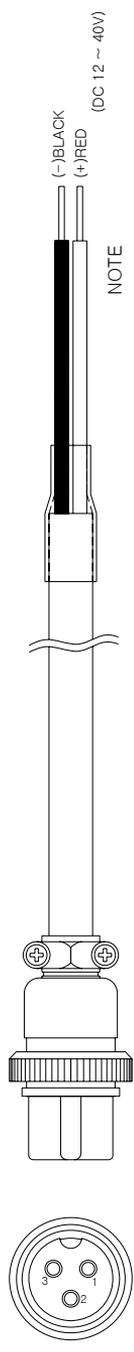
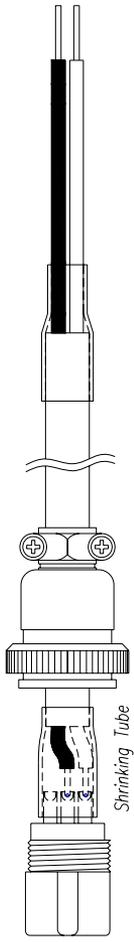
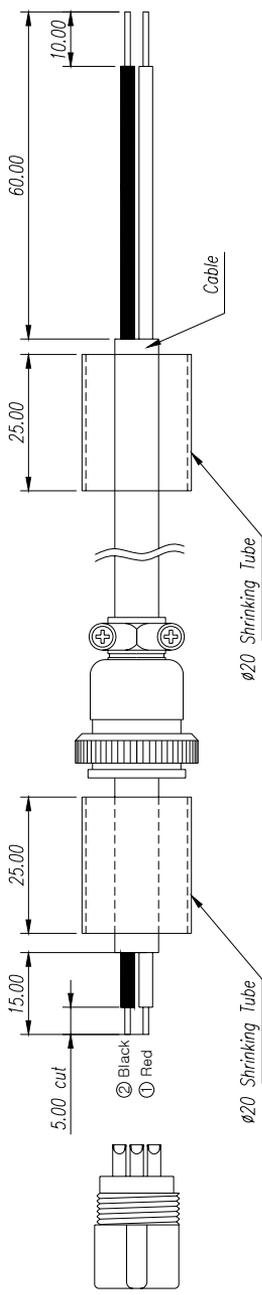
Available to display and delete the capture file

4.5. [FUNC] key:

Set the function frequently used for your convenience.

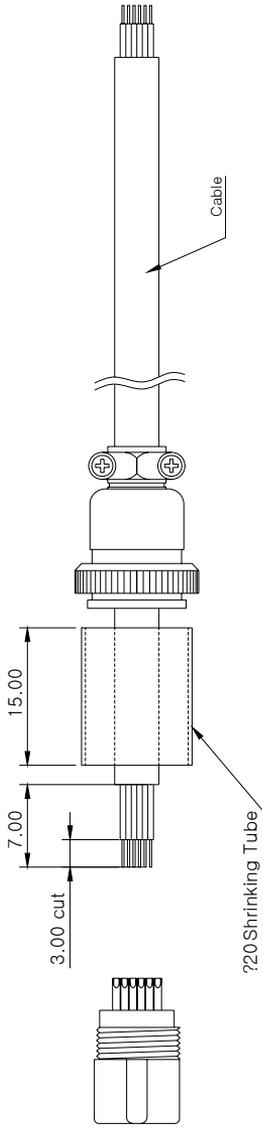
(☞ The default setting is Page.)

[FUNC]KEY SETUP
1.Page
2.Active
3.Recording
4.Capture
5. MOB
6. GOTO

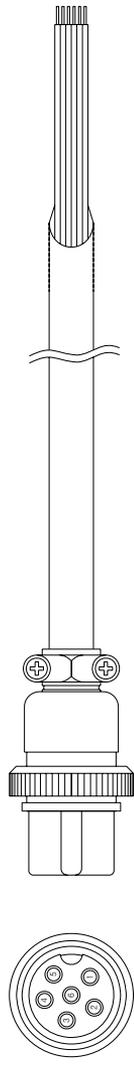
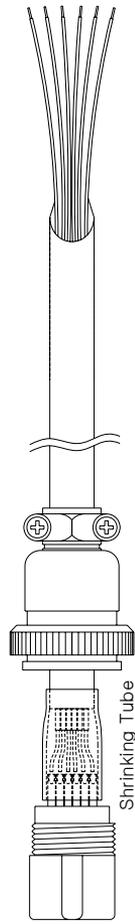


16-03P
To SAS-300 (J1)

MATERIAL MODEL		DESCRIPTION Power Cable	
SCALE NONE	SAS-300	DWG. NO.	
PERN Y.S.KIM	CHK. BY Y.S.KIM	DRA. BY Y.S.KIM	DATE 10.22.2013
			S7-DC10303M
SI-TEX MARINE ELECTRONICS			

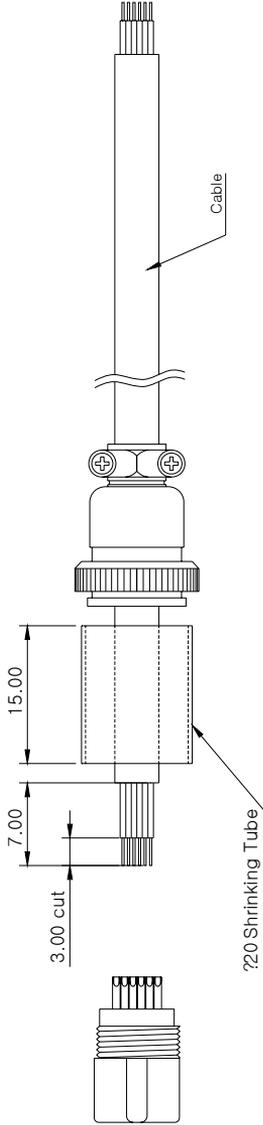


Data Cable	
PIN #	FUNCTION
1	GND
2	TX+
3	GND
4	RX+
5	RX-
6	NC

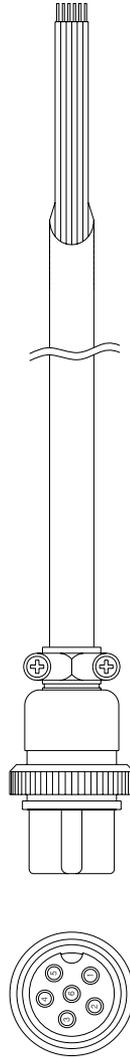
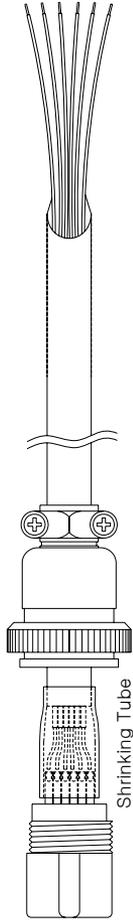


16-06P
To SAS-300 (J2)

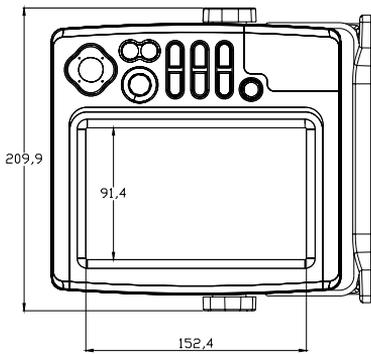
MATERIAL		DESCRIPTION	
SCALE	NONE	MODEL	SAS-300
PERN	Y.S.KIM	CHK. BY	DES. BY
Y.S.KIM	Y.S.KIM	Y.S.KIM	Y.S.KIM
		DATE	10.22.2013
		DWG. NO.	S7-DC10103M
		DESCRIPTION	Data Cable
			SI-TEX MARINE ELECTRONICS



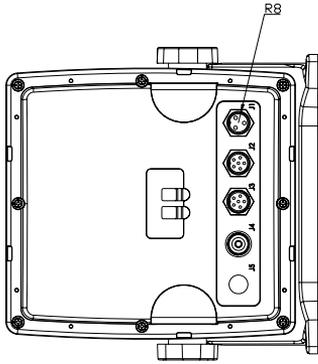
Data Cable		
PIN #	WIRE COLOR	FUNCTION
1	Black	GND
2	White	AIS TX
3	Green	GND
4	Yellow	AIS RX
5	Blue	GND
6	Red	+12



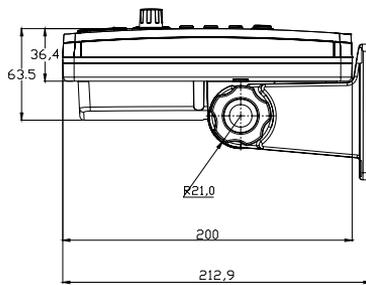
MATERIAL		DESCRIPTION	
SCALE	NONE	MODEL	SAS-300
PERN	Kim.Y.S	DES. BY	DRA. BY
Kim.Y.S	Kim.Y.S	DATE	2013.10.11
		DWG. NO.	SITEX-DC10103M
		SI-TEX MARINE ELECTRONICS	



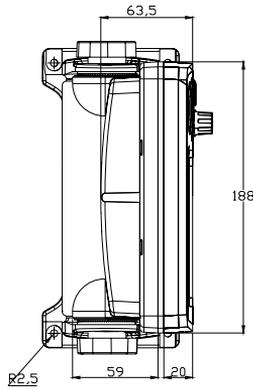
<FRONT>



<BACK>



<LEFT>



<TOP>

MATERIAL HIS-70A METAL		DESCRIPTION PLAN & DIMENSIONS	
SCALE 1:1	MODEL HIS-70A METAL	DWG. NO. S7-PL000DM_V	
PERIN Kim Y.S.	CHK. BY Kim Y.S.	DES. BY Park D.J.	DATE 10.22.2013
SI-TEX MARINE ELECTRONICS			



Metadata Class B AIS Transceiver Installation & Operation Manual

Thank you for buying this AIS Class B transceiver.

This product has been engineered to offer you the highest level of performance and durability and we hope that it will provide many years of reliable service. We constantly strive to achieve the highest possible quality standards, should you encounter any problems with this product, please contact your dealer who will be pleased to offer whatever assistance you require.

Notices

1 Notices



When reading this manual please pay attention to warnings marked with the warning triangle shown on the left.

These are important messages for safety, installation and usage of the product.

1.1 Safety warnings



This equipment must be installed in accordance with the instructions provided in this manual.



This AIS transceiver is an aid to navigation and must not be relied upon to provide accurate navigation information. AIS is not a replacement for vigilant human lookouts and other navigation aids such as RADAR. The performance of the transceiver may be seriously impaired if not installed as instructed in the user manual, or due to other factors such as weather and or nearby transmitting devices. Compatibility with other systems may vary and is reliant on the third party systems recognising the standard outputs from the transceiver. The manufacturer reserves the right to update and change these specifications at any time and without notice.



Do not install this equipment in a flammable atmosphere such as in an engine room or near to fuel tanks.

1.2 General notices

Position source

All marine Automatic Identification System (AIS) transceivers utilise a satellite based location system such as the Global Positioning Satellite (GPS) network.

The accuracy of a GPS position fix is variable and is affected by factors such as the antenna positioning, how many satellites are used to determine a position and how long satellite information has been received for.

Compass safe distance

The compass safe distance of this unit is 0.2m or greater for 0.3° deviation.

RF emissions notice

Caution: The AIS transceiver generates and radiates radio frequency electromagnetic energy. This equipment must be installed and operated according to the instructions contained in this manual. Failure to do so can result in personal injury and / or AIS transceiver malfunction.

Caution: Never operate the AIS transceiver unless it is connected to a VHF antenna.

Notices

To maximise performance and minimise human exposure to radio frequency electromagnetic energy you must make sure that the antenna is mounted at least 1.5 metres away from the AIS transceiver and is connected to the AIS transceiver before power is applied. The system has a Maximum Permissible Exposure (MPE) radius of 1.5m. This has been determined assuming the maximum power of the AIS transceiver and using antennas with a maximum gain of 3dBi. The antenna should be mounted 3.5m above the deck in order to meet RF exposure requirements. Higher gain antennas will require a greater MPE radius. Do not operate the unit when anyone is within the MPE radius of the antenna (unless they are shielded from the antenna field by a grounded metallic barrier). The antenna should not be co-located or operated in conjunction with any other transmitting antenna. The required antenna impedance is 50 Ohms.

Warranty

This product is supplied with standard warranty as defined in the accompanying warranty information.



Any attempt to tamper with or damage this product will invalidate the warranty.

Disposal of this product and packaging

Please dispose of the AIS transceiver in accordance with the European WEEE Directive or with the disposal of electrical equipment.

Every effort has been made to ensure the packaging for this product is recyclable. Please dispose environmentally friendly manner.

Accuracy of this manual

The AIS transceiver may be upgraded from time to time and future versions of the AIS transceiver may therefore with this manual. Information contained in this manual is liable to change without notice. The manufacturer liability for consequences arising from omissions or inaccuracies in this manual and any other documentation

Declaration of conformity

The manufacturer of this product declares that this product is in compliance with the essential requirements R&TTE directive. The declaration of conformity is provided with the product document pack. The product carries the CE mark, notified body number and alert symbol as required by the R&TTE directive. The product is intended for sale in the following member states: Great Britain, France, Spain, Sweden, Denmark, Norway, Belgium, Italy, Finland, Ireland, Luxembourg, Germany and Czech Republic.

CE0168ⓘ

Notices

FCC notice

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment



WARNING: It is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user, or to otherwise input any inaccurate data in this device.

Industry Canada notice

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

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

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

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

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

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

About your AIS class B transceiver

2 About your AIS class B transceiver

2.1 About AIS

The marine Automatic Identification System (AIS) is a location and vessel information reporting system. It allows vessels equipped with AIS to automatically and dynamically share and regularly update their position, speed, course and other information such as vessel identity with similarly equipped vessels. Position is derived from the Global Positioning System (GPS) and communication between vessels is by Very High Frequency (VHF) digital transmissions.

There are a number of types of AIS device as follows:

- **Class A transceivers.** These are similar to class B transceivers, but are designed to be fitted to large vessels such as cargo ships and large passenger vessels. Class A transceivers transmit at a higher VHF signal power than class B transceivers and therefore can be received by more distant vessels. They also transmit Class A transceivers are mandatory on all vessels over 300 gross tonnes on international voyages and certain types of passenger vessels under SOLAS regulations.
- **Class B transceivers.** Similar to class A transceivers in many ways, but are normally lower cost due to the less stringent performance requirements. Class B transceivers transmit at a lower power and at a lower reporting rate than class A transceivers.
- **AIS base stations.** AIS base stations are used by Vessel Traffic Systems to monitor and control the transmissions of AIS transceivers.
- **Aids to Navigation (AtoN) transceivers.** AtoNs are transceivers mounted on buoys or other hazards to shipping which transmit details of their location to the surrounding vessels.
- **AIS receivers.** AIS receivers will generally receive transmissions from class A transceivers, class B transceivers, AtoNs and AIS base stations but do not transmit any information about the vessel on which they are installed. This product is an AIS Class B transceiver.

2.2 Static and dynamic vessel data

There are two categories of information transmitted by an AIS transceiver: static and dynamic data.

The vessel's dynamic data, which includes location, speed over ground (SOG) and course over ground (COG), is calculated automatically using the internal GPS receiver.

Static data is information about the vessel which must be programmed into the AIS transceiver. This includes:

- Maritime Mobile Service Identity (MMSI)
- Vessel name
- Vessel call sign (if available)
- Vessel type
- Vessel dimensions

In most countries the operation of an AIS transceiver is included under the vessel's marine VHF licence provisions. The vessel on to which the AIS unit is to be installed must therefore possess a current VHF radiotelephone licence which lists the AIS system, vessel Call Sign and MMSI number.



An MMSI number is required in order for the AIS transceiver to operate. Please contact the relevant authority in your country for more information! .

About your AIS class B transceiver

2.3 Important information for US customers

There are specific laws in the USA regarding the configuration of AIS class B transceivers. If you are a US resident and intend to use your AIS class B transceiver in US waters, you should make sure that your retailer has configured your product prior to supplying it to you. If your AIS transceiver has not been pre-configured please contact your dealer for details of how to have it configured.



In the United States of America, the MMSI and static data must only be entered by a competent installer. The end user of the equipment is not authorised to enter their own vessel data.

2.4 What's in the box?

Figure 1 shows the items included with your AIS transceiver purchase. The following sections give a brief overview of each item. Please ensure all items are present and if any of the items are not present contact your dealer.

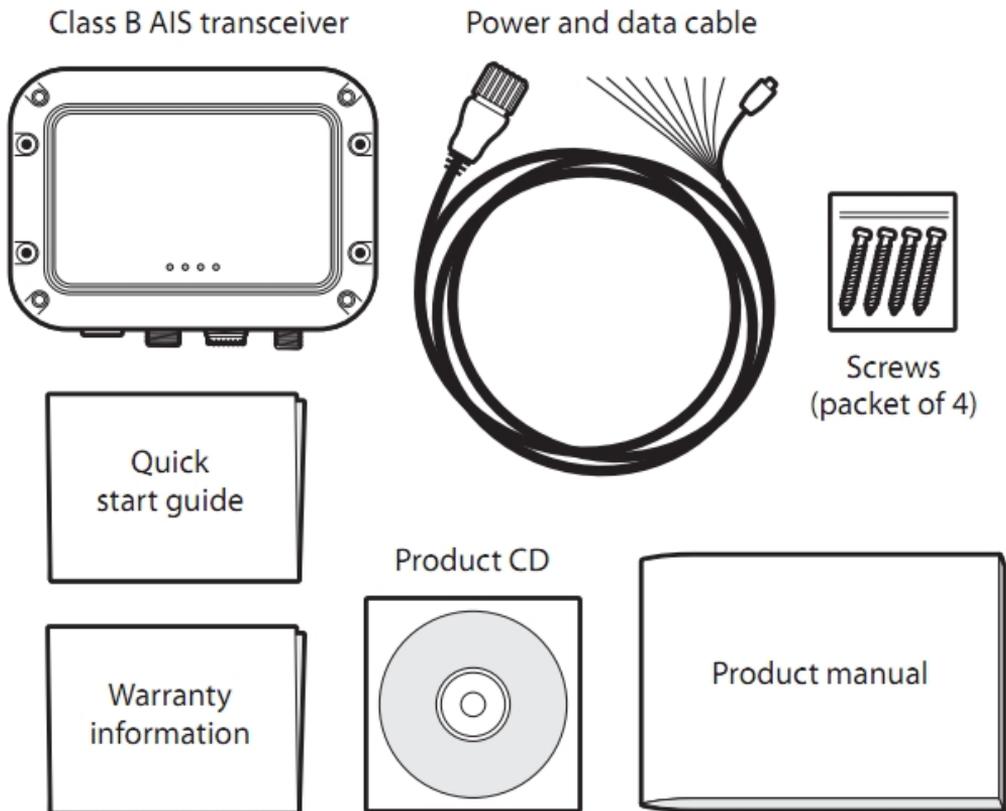


Figure 1 Items included with the product

About your AIS class B transceiver

Support tools CD

The CD supplied with the package contains the following:

- proAIS2 software tool necessary to configure the AIS transceiver. Please refer to section 4 for details of the configuration process and how to use the proAIS2 tool.
- USB drivers required to connect to the AIS transceiver via USB.
- Alternative language versions of this manual.

Quick start guide

The quick start guide gives a handy one page reference for the installation process.

Product manual

This document is the product manual and should be read thoroughly prior to any attempt to install or use the AIS transceiver.

Fixing screws

Four fixing screws are provided with the product for mounting of the AIS transceiver. Please refer to section 3.2 for details of how to mount the AIS transceiver.

AIS transceiver unit

Figure 2 shows an overview of the AIS transceiver unit.

The AIS transceiver has a number of indicators which provide information to the user about the status of the AIS transceiver.

Please refer to section 5.4 for more details of indicator functions.

The AIS transceiver has an internal GPS antenna. You should ensure that the transceiver is mounted where it has a clear view of the sky, or alternatively connect an external GPS antenna which is available from your dealer as an accessory.

Power, data and USB cable

The power and data cable connects to the AIS transceiver and enables connection to power, NMEA0183, external silent mode switch and USB.



Do not attempt to adjust or remove the fixings next to each of the four mounting holes. These fixings form part of the sealing of the AIS transceiver and any modification could affect the product's performance and will invalidate the product's warranty.

About your AIS class B transceiver

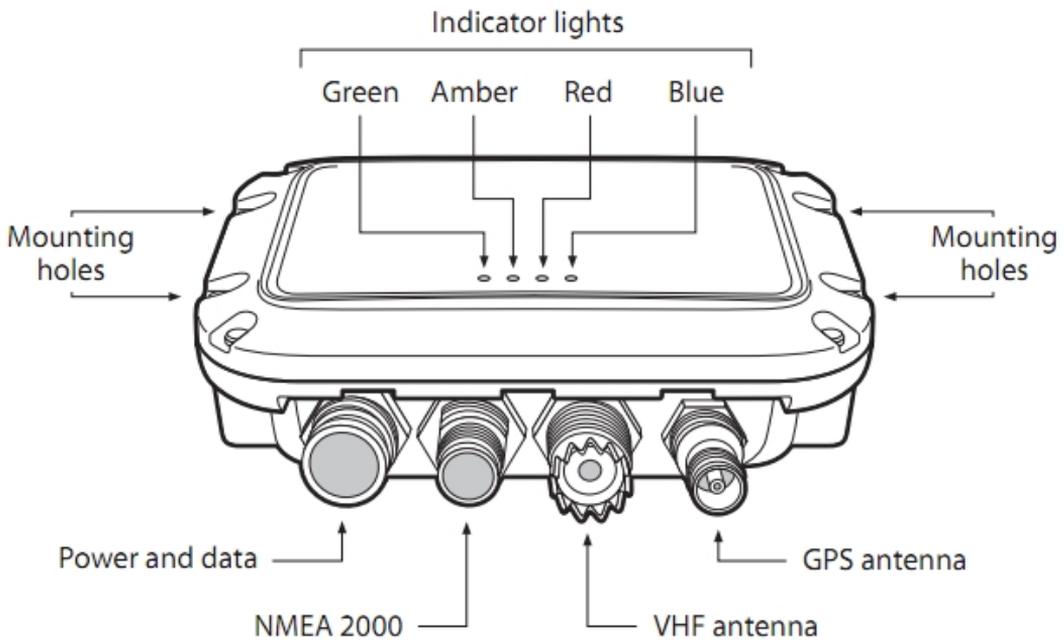


Figure 2 AIS transceiver overview

Electrical connections

The AIS transceiver has the following electrical connections:

- Power supply
- Two independent NMEA0183 data ports for connection to chart plotters and other NMEA0183 compatible equipment
- USB for connection to a PC or Mac
- External switch input for silent mode control
- NMEA2000 port for connection to NMEA2000 compatible equipment

About your AIS class B transceiver

In addition there are two other connections for the VHF antenna and an optional external GPS antenna. Figure 3 shows an overview of the electrical connections to the AIS transceiver.

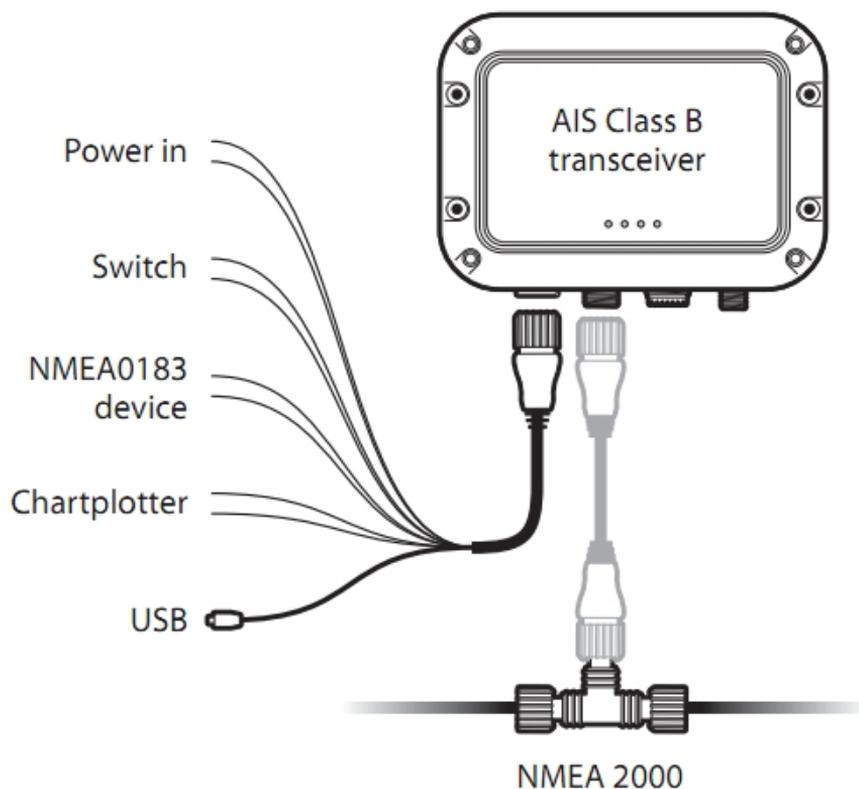


Figure 3 Electrical connections to the AIS transceiver

Installation

3 Installation

3.1 Preparing for Installation

Figure 4 shows a typical installation configuration for the AIS transceiver. Please take the time to familiarise yourself with the system elements and their connections prior to attempting installation.

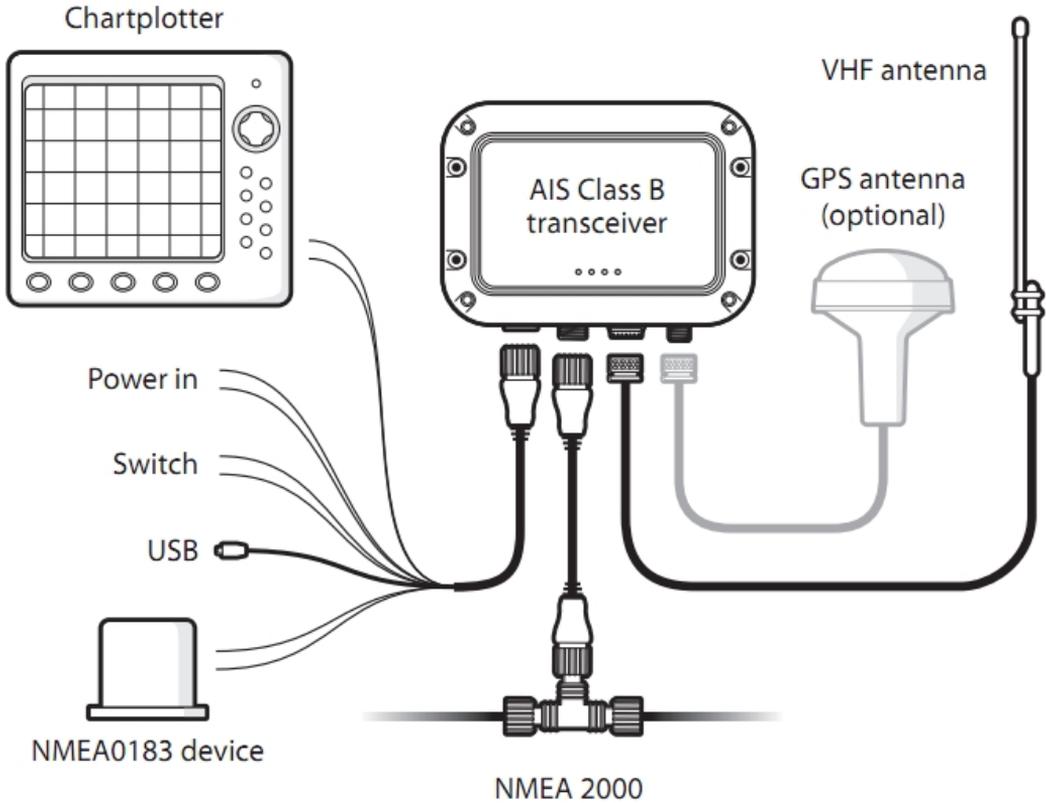


Figure 4 Typical installation configuration

Installation

In addition to the items provided with your AIS transceiver the following items will be required for installation:

VHF antenna

Connection to a suitable VHF antenna will be required for the AIS transceiver to operate. A standard marine band VHF antenna such as that used with VHF voice radios will be sufficient. Please take note of the warnings in section 1 regarding the use of antennas.

Alternatively, if you wish to use an existing VHF antenna, antenna splitter products are available which allow the existing antenna to be used with two radio devices, such as a VHF voice radio and the AIS transceiver.



When selecting an AIS antenna splitter make sure it is capable of operation with an AIS transceiver. Some AIS antenna splitters are designed to work only with AIS receivers. Please check with your dealer to ensure you purchase the correct type of antenna splitter.

Optional external GPS antenna

The transceiver has an internal GPS antenna. When the transceiver is mounted in a location with a clear sky view (for example, beneath a windshield or other non-metallic structure) an external GPS antenna is not required. Should it not be possible to mount the transceiver in a suitable location then an external GPS antenna can be connected. A compatible GPS antenna is available from your dealer as an accessory.

Optional switch

A switch can be connected to the transceiver to enable and disable 'silent mode' (see section 3.2). A latching toggle switch is required to use this feature.

VHF antenna cable

Please check that the VHF antenna you intend to use has sufficient cable to reach between the VHF antenna and the AIS transceiver unit. If it is not sufficient you will need an extension cable. Please contact your dealer for details of suitable products. For reference the VHF antenna connector type on the AIS transceiver unit is SO 239, and is intended to mate with a PL 259 connector.

Power and data cable

The AIS transceiver unit is supplied with a two metre long power and data cable as an accessory. If you require longer cables to reach your power supply, please ensure the cables are capable of carrying currents of up to 2A peak and 200mA on average. Means of connecting the cables together will also be required. The use of Scotchlok™ connectors is recommended for this purpose.

Chart plotter

To display received AIS messages as other vessels on your chart plotter, you will need to connect your AIS transceiver to your chart plotter. Please refer to the user manual supplied with your chart plotter for details of how to connect and configure your chart plotter for use with AIS devices. For general guidance your chart plotter should be configured to accept NMEA data at 38400 baud (sometimes referred to as 'NMEA HS' in the plotter configuration menu). You may also need to enable the display of AIS targets in the chart options. Alternatively if you use an NMEA2000 network on your vessel it is possible to connect the AIS transceiver to the NMEA2000 network via a suitable cable. Please refer to your dealer for details of NMEA2000 cables.

Installation

Connection to a PC or Mac

If you choose to use a PC or Mac with suitable charting software to display received AIS messages as other vessels, this can be accomplished by connecting the USB connector on the supplied power and data cable.

3.2 Installation procedures

Before beginning installation of your AIS transceiver, please ensure you have the necessary additional items as detailed in section 3.1. It is strongly recommended that you read all of the instructions in this manual prior to installation.

If after reading this manual you are unsure about any element of the installation process please contact your dealer for advice.

The following sections explain the installation process step by step for each of the main elements of the system.

Step 1 - Installing the AIS transceiver

Please note the following guidelines when selecting a location for your AIS transceiver:

- The AIS transceiver must be fitted in a location where it is at least 0.2m from a compass or any magnetic device.
- There should be adequate space around the AIS transceiver for routing of cables. See Figure 5 for details of the AIS transceiver dimensions.
- The ambient temperature around the AIS transceiver should be maintained between -25°C and +55°C.
- The AIS transceiver should not be located in a flammable or hazardous atmosphere such as in an engine room or near to fuel tanks.
- The AIS transceiver is fully waterproof to ingress protection rating IPx7, however it is recommended that the AIS transceiver is not subjected to extended periods of exposure to spray or submersion.
- It is recommended that the AIS transceiver is installed in a 'below decks' environment.
- It is acceptable to mount the AIS transceiver either vertically or horizontally.
- The product is supplied with four self tapping screws for attachment of the AIS transceiver to a suitable surface. Please refer to Figure 6 for guidance.
- The AIS transceiver should be mounted in a location where the indicators are readily visible as these provide important information on the status of the AIS transceiver.
- If the internal GPS antenna is used the AIS transceiver should be mounted in a location with a clear sky view. The internal GPS antenna is mounted below the top surface of the transceiver enclosure.

Installation

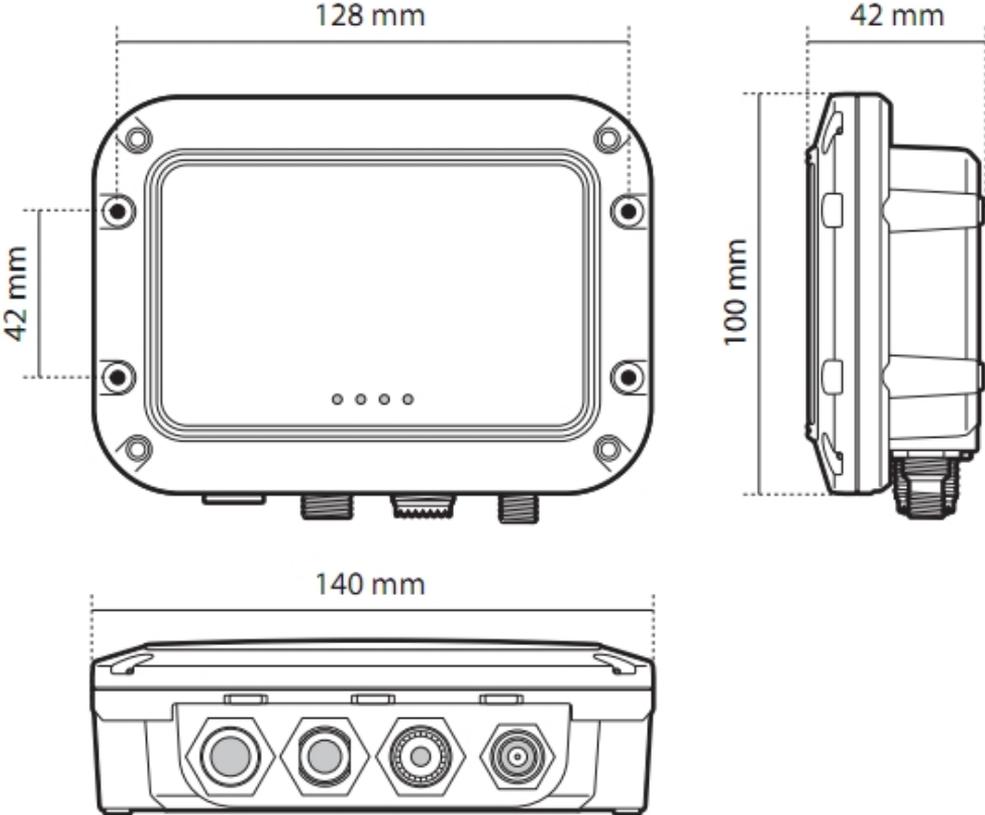


Figure 5 AIS transceiver dimensions

Installation

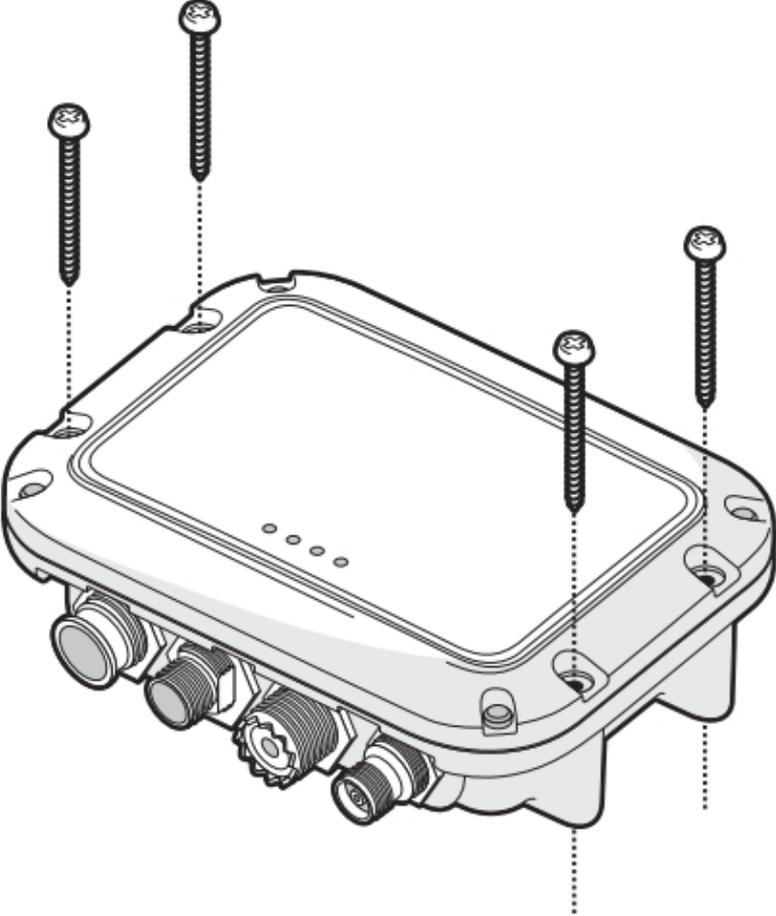


Figure 6 AIS transceiver mounting

Installation

Step 2 - Installing an optional external GPS antenna

For mounting of the optional external GPS antenna you will require a one inch 14 TPI thread pole.

You should ensure the GPS antenna has a good clear view of the entire sky.

It is not recommended that the GPS antenna is mounted up a mast where the motion of the vessel will cause the antenna to swing and potentially reduce the accuracy of the GPS position.

Do not mount your antenna in the direct path of a radar transmitter.

Feed the ten metre long cable attached to the GPS antenna cable through the pole and screw the antenna onto the pole mount as shown in Figure 7.

Route the cable to your AIS transceiver unit, adding any necessary extension cables.

Connect the cable from the GPS antenna to the GPS connector on the AIS transceiver as shown in Figure 8.

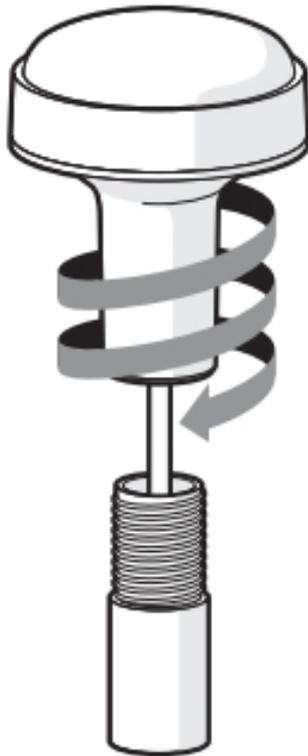


Figure 7 GPS antenna mounting

Installation

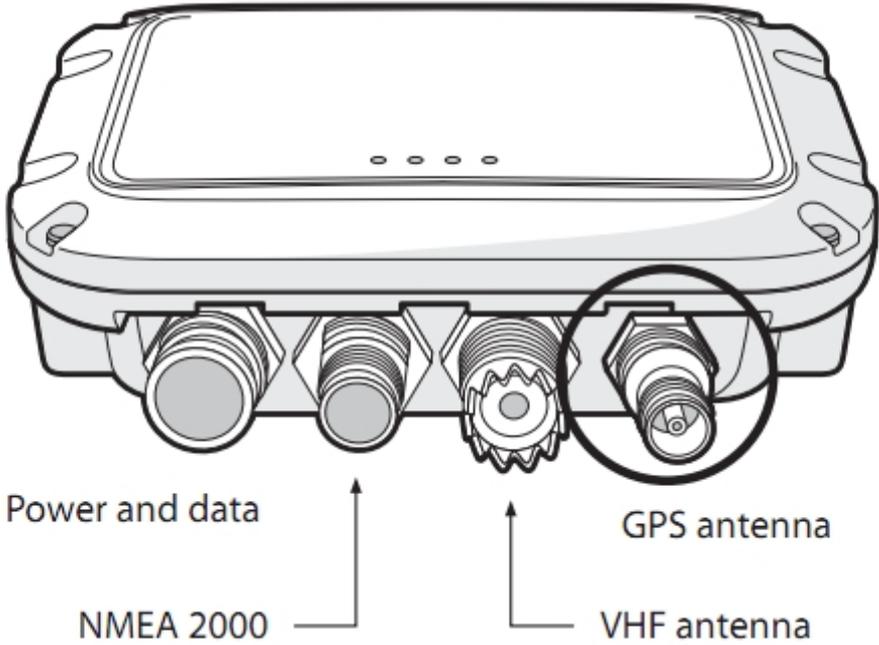


Figure 8 Position of the GPS antenna connector

Installation

Step 3 - Connecting the VHF antenna

Route the cable from the VHF antenna to the AIS transceiver and connect to the VHF connector on the AIS transceiver as shown in Figure 9.

A standard marine band VHF antenna or AIS antenna should be used with the AIS transceiver. The connector type on the AIS transceiver is SO239. Your chosen VHF antenna requires a PL259 connector to mate with this. If your VHF antenna does not use this type of connector please contact your dealer for details of available adaptors.

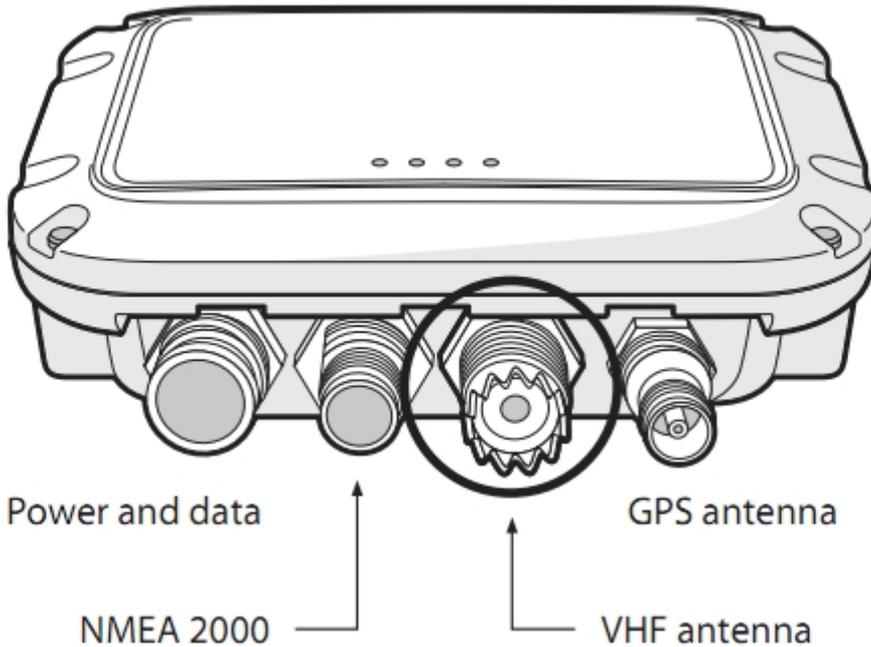


Figure 9 Position of the VHF antenna connector

Installation

Step 4 - Connecting the accessory cable

An accessory cable is supplied with the product to provide connections to power, the external switch, the NMEA0183 data ports and USB. The cable has a pre-moulded connector at one end which should be connected to the connector on the unit marked 'PWR/DATA'.

The other end of the cable has eight colour coded bare wires ready for connection and a USB connector for use with a PC or Mac. The table below in Figure 1 lists the function of each colour coded wire for reference.

Wire colour	Description	Function
Red	Power in +	Power supply connections
Black	Power in -	
Green	Switch input -	External switch connection for silent mode
Orange	Switch input +	
Brown	NMEA0183 port 1 TX+	High speed NMEA0183 output (38,400baud) intended for connection to chart plotters
Blue	NMEA0183 port 1 TX-	
Purple	N MEA0183 port 2 RX+	Low speed NMEA0183 input (4,800baud) intended for connection to other NMEA0183 compatible sensors for multiplexing of data to the chart plotter
Yellow	N MEA0183 port 2 RX-	

Table 1 Colour coding of wires in the accessory cable



Please check your wiring very carefully before applying power to the product. Failure to wire the product correctly could result in permanent damage.

Installation

Step 5 - Connecting an external switch

A toggle switch can be connected to the AIS transceiver to provide remote control of silent mode. Connect the toggle switch between the light green and orange wires as shown in Figure 10. Connection of an external switch to toggle silent mode is optional and not essential for normal operation of the product.



Do not connect a voltage source across the switch inputs as this may damage the transceiver

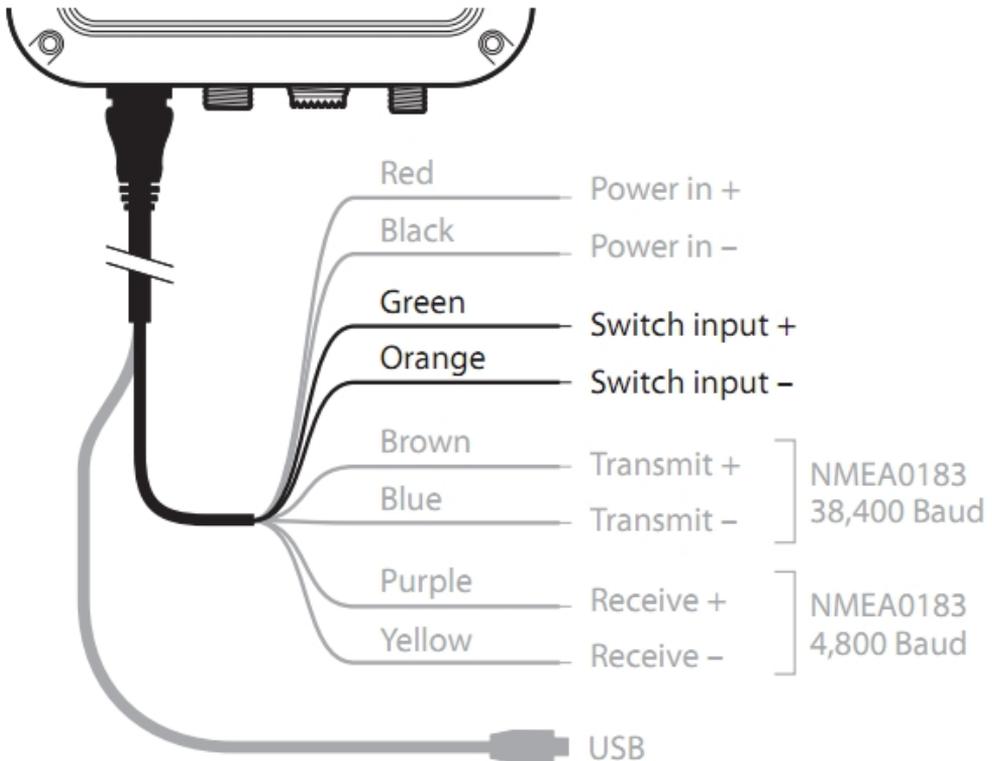


Figure 10 Connecting an external switch

Installation

Step 6 - Connecting to NMEA0183 compatible equipment

The two independent NMEA0183 data ports provide connection to your chart plotter and other NMEA0183 compatible equipment. Each port consists of two wires colour coded as shown in the table in Figure 11 and in the diagram in Figure 11. Connect the wires to the appropriate connections on your NMEA0183 compatible equipment. Please refer to your equipment manual for more information.

The AIS transceiver has a high speed output port which operates at 38,400baud and a low speed input port which operates at 4,800baud.

The high speed port is intended primarily to connect to a chart plotter, while the low speed port is intended to connect to other NMEA0183 devices. A multiplexing feature is provided, which means any messages which are received via the low speed port are automatically transmitted via the high speed port. This is particularly useful when using a chart plotter having only a single NMEA0183 port.

An additional sensor such as a gyro-compass can be connected to the AIS transceiver via the low speed port and the AIS transceiver can be connected via the high speed port to the chart plotter resulting in the chart plotter receiving both AIS information and heading information simultaneously. Please ensure your equipment is configured to use the correct baud rate for the port it is connected to.

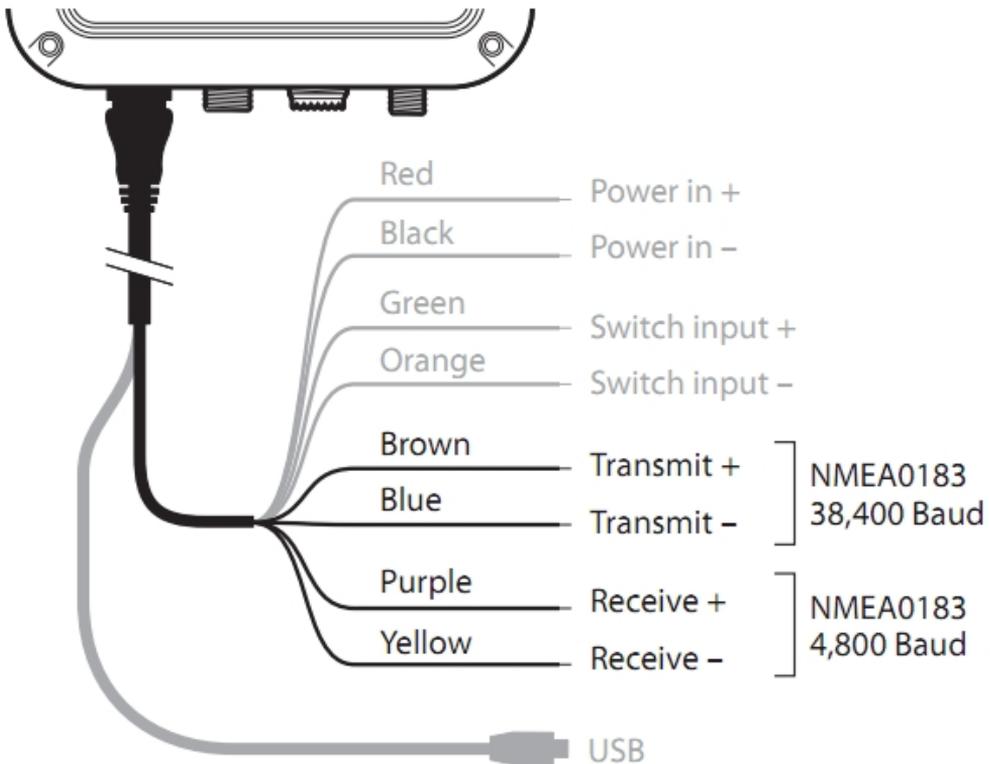


Figure 11 Connecting to the NMEA0183 data port

Installation

Step 7- Connection to an NMEA2000 network (optional)

The AIS transceiver can be connected to an NMEA2000 network by a suitable NMEA2000 network cable available from your local dealer. If your vessel has an NMEA2000 network please refer to the relevant documentation for your NMEA2000 equipment. Once connected, and with your chart plotter also connected to your NMEA2000 network you will be able to receive AIS targets on your chart plotter.

Step 8 - USB Connection (optional)

The AIS transceiver is supplied with a USB port for connection to a PC or Mac. The USB connector can be connected directly to the USB port on the PC or Mac via the supplied USB cable. To enable connection of the AIS transceiver to a PC the USB drivers, supplied on the product CD, must first be installed. Driver installation is typically not required for use with a Mac.

To install the drivers please follow the steps below:

1. Insert the product CD into the PC and navigate to the USB drivers folder.
2. Double click on the setup.exe file to launch the installer.
3. Follow the on screen installation instructions to complete installation.
4. Once installed the AIS unit can be connected to the PC. The USB drivers will be installed automatically and the AIS will appear as a new COM port device.
5. Select the AIS COM port and a baud rate of 38,400 in PC based navigation software to make use of the AIS data.



If the USB connection is removed from the PC or Mac during use you must reset the connection before further use.

To reset the connection, disconnect then reapply power to the AIS before closing and relaunching any PC or Mac applications using the USB connection. Finally, reconnect the USB cable between the PC or Mac and the AIS transceiver.

Installation

Step 9 - Connecting to a power supply

The AIS transceiver requires a 12V or 24V power supply typically provided by the vessel's battery. It is recommended that crimped and soldered lugs are used to connect the AIS transceiver to the power source. It is recommended that the power supply is connected via a suitable circuit breaker and/or 3A fuse block.

1. Connect the red wire to a 12V or 24V power supply positive terminal.
2. Connect the black wire to the supply negative terminal.

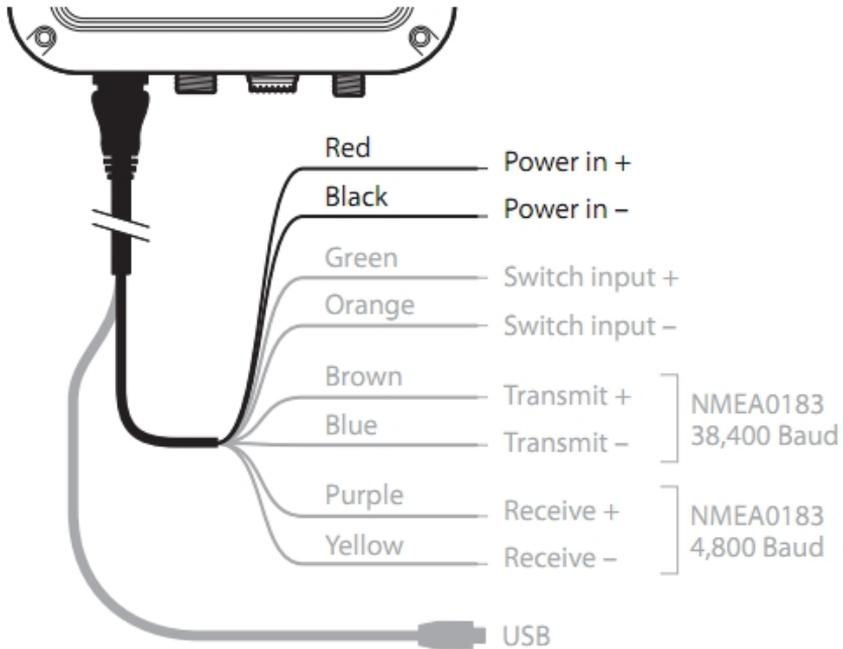


Figure 12 Connecting the power supply

Configuring your AIS transceiver

4 Configuring your AIS transceiver

Until correctly configured your AIS class B transceiver will only receive AIS messages and will not transmit AIS messages.

4.1 Switching on your AIS transceiver for the first time

A few seconds after power is applied to the AIS transceiver, the indicators on unit will illuminate in a pattern dependent on the configuration state of the unit. Figure 13 shows the functions of the four indicators.

Indicator	Function
Green	Unit is powered up and operating normally
Amber	Unit is in a 'transmit timeout' period
Red	Unit has experienced an error
Blue	Silent mode is activated

Figure 13 Indicator functions

If the AIS transceiver has been pre-configured the amber indicator will illuminate until a transmission has been sent by the unit. This may take several minutes as the transceiver must acquire a GPS position fix prior to transmitting its first message.

If the transceiver has not been pre-configured the amber and red indicators will be illuminated until the configuration process has been completed.

4.2 Configuring your AIS transceiver

There are two potential ways in which your AIS transceiver can be configured:

1. Configuration in advance by your dealer or installer.

If your AIS transceiver has been configured for you by your dealer or installer you can proceed to section 5.

2. Configuration using proAIS2

Providing it is acceptable to do so under your local legislation it is possible to configure your AIS transceiver yourself using the proAIS2 software provided with the product.



US Customers only: It is a violation of the rules of the Federal Communications Commission for the end user to programme the vessel data. The vessel data must only be programmed by a competent installer. If your AIS transceiver has not been pre-configured for you please refer to your dealer for advice on how to have the AIS transceiver configured by a competent installer.

Configuring your AIS transceiver

4.3 Introduction to proAIS2

Included in the CD supplied with your product is a software tool called 'proAIS2'. proAIS2 provides the facility to configure, monitor and diagnose issues with your AIS transceiver. proAIS2 can provide assistance when ensuring that a satisfactory GPS signal is being received. It can also display alarm messages generated by the transceiver regarding poor VHF antenna quality or that the power being supplied is outside the range specified for operation. proAIS2 can also be used to activate 'silent mode' which disables AIS transmissions.

Section 4.4 provides instructions on how to install proAIS2. Section 4.5 provides instructions on how to configure the AIS transceiver using proAIS2. Further help on how to use the features of proAIS2 can be found in the 'Help menu within the proAIS2 tool.

proAIS2 is designed to be installed and used with a PC or Mac connected to the AIS transceiver via USB using the supplied USB cable.

4.4 Installing proAIS2

1. Insert the CD into your PC or Mac then locate and run the setup.exe file on the CD and then follow the on-screen prompts.
2. If a security warning appears, click 'Install' to continue with the installation.
3. Once installation is complete, proAIS2 will launch automatically and a start menu folder and shortcut will be created for future use.

4.5 Configuration using proAIS2

For configuration purposes only, it is possible to power the AIS transceiver via its USB connection. This is useful if you wish to configure your AIS transceiver away from the vessel power supply. The AIS transceiver will not transmit any data or acquire a GPS position fix whilst powered by USB.

You will require the following information in order to configure your AIS transceiver:

- MMSI
- Vessel name
- Vessel type
- Call sign

Vessel dimensions and position of your GPS antenna installation.

For further assistance in configuring your AIS transceiver please refer to the Help menu within proAIS2.



Please ensure that you enter all vessel data accurately. Failure to do so could result in other vessels failing to identify your vessel correctly. The vessel MMSI can only be programmed once using proAIS2, please take care to programme your MMSI correctly. If you need to change the MMSI for any reason, please contact your dealer who will arrange to have the MMSI reset.

Operation

5 Operation

5.1 Using the AIS transceiver

Once the unit has been configured it is ready for use. Providing other vessels with AIS transceivers installed are within radio range of your vessel you should see their details appear on your chart plotter or PC. These vessels will also be able to see your vessel on their chart plotter or PC. It may take up to six minutes for your full vessel details to be visible to others.

Specific details of how to configure your chart plotter to make use of the AIS transceiver features will be given in your chart plotter manual. If you are using charting software running on a PC, please refer to the instructions provided with your chart plotting software for details of how to configure it to display AIS information.

5.2 Switch functions

When connected to the AIS transceiver following the instructions in section 3.2 an external switch provides the ability to set the AIS transceiver into 'silent mode'. In silent mode the transmission of your own vessel position ceases, whilst the reception of other vessel's AIS position continues. You should use silent mode if you do not wish your vessel data to be received by other AIS devices. When silent mode is active the blue indicator will be illuminated.



When silent mode is active other vessels will not be able to receive your vessel information on their AIS devices. Your navigational safety may be compromised as a result.

5.3 Using proAIS2 with your AIS transceiver

The proAIS2 tool has a range of features to help monitor the performance of your AIS transceiver. To use the full range of features your AIS transceiver must be installed as described in section 3 and connected to a PC running the proAIS2 application. Follow the instructions provided in the help menu within proAIS2.

Operation

5.4 Indicator functions

The AIS transceiver includes four coloured indicators as shown in Figure 14. The state of the indicators provides information regarding the status of the AIS transceiver.

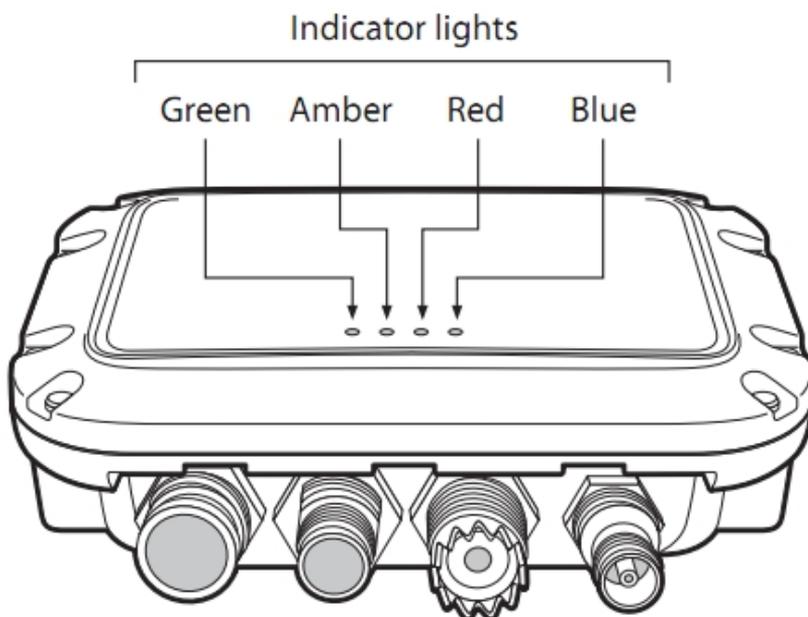
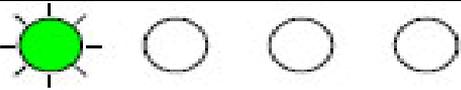
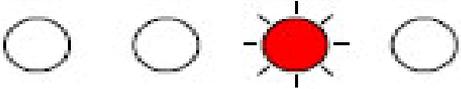
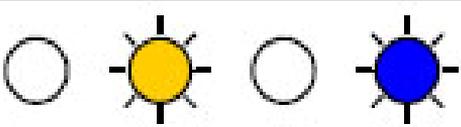
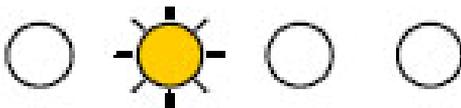


Figure 14 Indicator location on the AIS transceiver unit

Operation

The meaning of typical indicator configurations is shown in the table below and Figure 14 shows the orientation of the AIS transceiver.

	<p>Green indicator only The AIS transceiver is powered up, has a position fix and has transmitted at least one vessel information report.</p>
	<p>Red indicator only The AIS transceiver has detected a system error. The likely causes of this are detailed in the troubleshooting guide in section 6. Diagnostic messages displayed in proAIS2 may also help troubleshoot the cause of the error.</p>
	<p>Amber and blue indicators When silent mode is activated using the optional silent mode switch this combination of indicators is illuminated to show that the transmitter is disabled.</p>
	<p>Amber indicator only The AIS transceiver is in 'transmit timeout' mode. This can be for a number of reasons:</p> <ul style="list-style-type: none"> • The unit has only recently been powered on and is obtaining a position fix prior to transmitting its first vessel information report. (This process can take several minutes). • Position fix has been lost. The AIS transceiver will attempt to regain position fix for 30 minutes before entering an error state. • The AIS radio channels are exceptionally busy so there is currently no available timeslot for transmission. • The unit has been in silent mode and after deactivating silent mode this amber indicator will illuminate until the first AIS message has been sent • The AIS transceiver has been commanded by the local authority (via an AIS base station) to cease transmissions.

Troubleshooting

6 Troubleshooting

Issue	Possible cause and remedy
No data is being received by the chart plotter	<ul style="list-style-type: none"> • Check that the power supply is connected correctly. • Check that the power supply is a 12V or 24V supply. • Check that the connections to the chart plotter are correct.
No indicators are illuminated	<ul style="list-style-type: none"> • Check that the power supply is connected correctly. • Check that the power supply is a 12V or 24V supply.
The Red 'error' indicator is illuminated	<ul style="list-style-type: none"> • The unit may not have a valid MMSI. Check that the AIS transceiver is correctly configured with a valid MMSI. • The VHF antenna may be faulty. Please check the connection to the VHF antenna and that the VHF antenna is not damaged. The red indicator may illuminate briefly if the power supply is interrupted or the VHF antenna characteristics are briefly affected. • No GPS position fix can be obtained. Please check the transceiver is located where the internal GPS antenna has a clear sky view or that an external GPS antenna is properly connected and installed. Review the GPS signal strength graph available in proAIS2. • The power supply is outside the allowable range. Check that the power supply is within the range 9.6V to 31.2V. • If none of the above correct the error condition please contact your dealer for advice. • Check for error and alarm messages in proAIS2
My MMSI is being received by other vessels but my vessel name is not shown on their chart plotter or PC	<ul style="list-style-type: none"> • Some older AIS devices and chart plotters do not process the specific class B AIS message which provides the vessel name (message 24). This is not a fault of your AIS transceiver. Software upgrades are available for many older chart plotters which will correct this issue. The other vessel should update its AIS unit and/or chart plotting software to receive AIS message 24.

If the guidance given in the table above does not rectify the problem you are experiencing, please contact your dealer for further assistance.

Specifications

7 Specifications

Parameter	Value
Dimensions	140 x 100 x 42 mm (L x W x H)
Weight	250g
Power	DC (9.6V - 31.2V)
	Average power consumption 170mA at 12VDC
	Peak current rating 2A
GPS Receiver (AIS Internal)	50 channel IEC 61108-1 compliant
Electrical Interfaces	USB
	NMEA0183 38,400kBaud output
	NMEA0183 4,800kBaud input
	NMEA2000 LEN=1
Connectors	VHF antenna connector (SO-239)
	External GPS antenna connector (TNC)
	USB type A plug
	NMEA2000 standard connector
	12 way power input / NMEA0183/External switch

Specifications

VHF Transceiver	Transmitter x 1
	Receiver x 2 (One receiver time shared between AIS and DSC)
	Frequency: 156.025 to 162.025 MHz in 25 kHz steps
Output Power	33dBm \pm 1.5 dB
Channel Bandwidth	25kHz
Channel Step	25kHz
Modulation Modes	25kHz GMSK (AIS, TX and RX)
	25kHz AFSK (DSC, RX only)
Bit rate	9600 b/s \pm 50 ppm (GMSK)
	1200 b/s \pm 30 ppm (FSK)
RX Sensitivity	Less than -107dBm at 20% PER
	Co-channel 10dB
	Adjacent channel 70dB
	IMD 65dB
	Blocking 84dB
Environmental	Water resistant to IPx7
	Operating temperature: -25°C to +55°C
	Tested to IEC 60945 'Protected' category
Indicators	Power, TX timeout, error, silent mode status

CERTIFICATE OF LIMITED WARRANTY

Providing you present a valid proof of purchase, SI-TEX Marine Electronics Inc. warrants all parts of each new product against defects in material and workmanship under normal use and will repair or exchange any parts proven to be defective at no charge for a period of two years for parts and one year for labor from the date of purchase, except as provided below under Limited Warranty Exceptions. Defects will be corrected during normal working hours by an authorized SI-TEX Marine Electronics Inc. dealer, service center, or at the SI-TEX office in Riverhead, NY. There will be no charge for labor for a period of one year from the date of purchase, except as provided below under Limited Warranty Exceptions.

This Warranty and Proof of Purchase must be made available to the authorized SI-TEX Marine Electronics Inc. service location or dealer at the time of service.

LIMITED WARRANTY EXCEPTIONS

SI-TEX Marine Electronics Inc. will not be responsible for equipment which has been subjected to water or lightning damage, accident, abuse, or misuse, nor any equipment on which the serial number label has been removed, altered or mutilated.

SI-TEX Marine Electronics Inc. assumes no responsibility for damage incurred during installation.

This Limited Warranty is effective only with respect to the original purchaser.

Any cost associated with transducer replacement, other than the cost of the transducer itself, is specifically excluded from this Limited Warranty.

Travel costs incurred will not be accepted for SI-TEX Marine Electronics Inc. products.

THERE ARE NO WARRANTIES, WHICH EXTEND BEYOND THE DESCRIPTION OF THE FACE HEREOF.

SPECIFIC EXCLUSIONS

Charges for overtime, stand-by, holiday, and per diem are specifically excluded from the Limited Warranty. Installation workmanship or materials except as provided directly by SI-TEX Marine Electronics Inc. are not covered by this Limited Warranty. SI-TEX Marine Electronics Inc. equipment or parts thereof, which have been repaired or altered except by an authorized SI-TEX Marine Electronics Inc. dealer or service center, are not warranted in any respect. Transducer, software update, battery, microphone, magnetron, and microwave components and water damage on water resistant VHF radio are items excluded from the two-year warranty and are covered by warranty for a period of one year for both parts and labor. SI-TEX Marine Electronics Inc. will not, at any time, assume any costs or labor charges for checkout or external line fuse replacement or problems not found to be at fault in equipment itself.

THERE ARE NO WARRANTIES OR GUARANTEES EXPRESSED OR IMPLIED WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE AND MERCHANTABILITY. SI-TEX MARINE ELECTRONICS INC. HAS NO OTHER LIABILITY TO PURCHASE FOR DIRECT OR CONSEQUENTIAL DAMAGE OR ANY THEORY INCLUDING ABSOLUTE LIABILITY, TORT, OR CONTRACT. THIS LIMITED WARRANTY CANNOT BE ALTERED OR MODIFIED IN ANY WAY AND SHALL BE INTERPRETED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW YORK. THIS WARRANTY IS LIMITED TO THE CONTINENTAL U.S.A., ALASKA, HAWAII, AND CANADA.

HOW TO OBTAIN SERVICE UNDER THIS WARRANTY

If you encounter problems during the installation or operation of this product, or cannot find the information you need, please contact SI-TEX Customer Service.

The contact numbers and e-mail address for SI-TEX Customer Service are:

SI-TEX Main Office.....+1-631-996-2690

SI-TEX Fax.....+1-631-996-2693

SI-TEX Service E-mail address: service@si-tex.com

SI-TEX Customer Support E-mail address: custsvc@si-tex.com

SI-TEX Main Office Address:

25 Enterprise Zone Drive, Ste 2

Riverhead, NY 11901

Technical Support is available from 9:00 AM to 5:00 PM Eastern Standard Time, Monday through Friday.