

I100X USER MANUAL
AIS Identifier



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1 Notices

1.1 Safety information

Various symbols are used in this manual, and on the product itself to ensure correct usage, to prevent danger to the user and others, and to prevent property damage. The meanings of these symbols are described below. It is important that you read these descriptions thoroughly and fully understand the contents.



WARNING

Indicates a situation where improper use may damage to the product and could put the user at risk.



CAUTION

Indicates a situation where improper use may cause important features of the product not working properly.



INFORMATION

Information, hints, and advice for better understanding of the instructions to be observed in the operation of the device.

1.2 Warnings



WARNING

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



WARNING

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



CAUTION

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



CAUTION

This product contains a Lithium-Ion battery. Never expose to fire or high temperatures. Do not attempt to disassemble the product. Do not short circuit the battery or attempt to charge with equipment other than the supplied charger.

1.3 General notices

1.3.1 | Position source

All marine Automatic Identification System (AIS) transceivers rely on satellite-based location systems, like the Global Positioning System (GPS) network, to operate effectively.

The accuracy of your GPS position fix can vary due to several factors. These include the placement of your GPS antenna, the number of satellites providing data, and the amount of time it takes to receive that data from the satellites.

1.3.2 | RF emissions notice



CAUTION

The AIS transceiver emits radio frequency electromagnetic energy, so it's essential to install and use it following the instructions in this manual. Ignoring these guidelines could lead to personal injury or cause the AIS transceiver to malfunction.

1.3.3 | Accuracy of this manual

The AIS transceiver may be updated over time, so future versions might not match this manual exactly. Keep in mind that the information in this manual is subject to change without notice. The manufacturer is not responsible for any consequences arising from omissions or inaccuracies in this manual or other provided documentation.

2 Before you begin

2.1 About AIS

AIS is primarily used for collision-risk management and navigation safety. It can automatically transmit and receive vessel information, such as the vessel name, MMSI (Maritime Mobile Service Identity) number, vessel code, vessel type position data, speed, course, destination and more information depending on the transceiver class. Information exchanged among vessels and base stations on the VHF maritime mobile band. This information helps to identify other nearby vessel stations.

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

- **Class A transceivers** - These 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 more frequently. 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** - These are 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** - AtoN's 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, AtoN's and AIS base stations but do not transmit any information about the vessel on which they are installed.

- **AIS Identifier** - The Identifier is a unique, self-contained AIS vessel tracking device. The key features of the AIS Identifier are as follows:
 - Self-contained VHF and GPS antennas
 - Internal rechargeable battery pack for up to 5 days of operation
 - Electronic security link to vessel mounting bracket
 - Simple installation

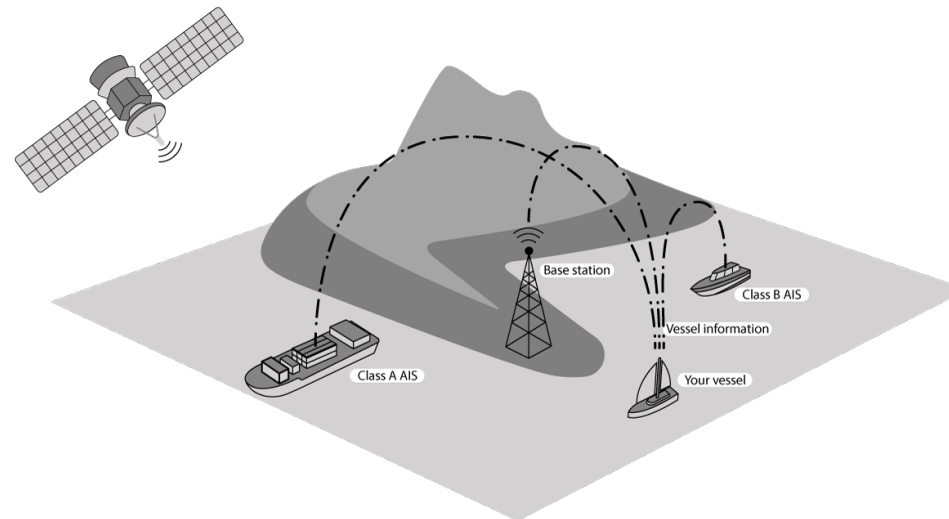


Figure 1 AIS network

2.2 Static and dynamic vessel data

The AIS transceiver transmits two types of information, static and dynamic data. The dynamic data includes your vessels location, the speed over ground (SOG), and course over ground (COG).

Your static data is the information programmed into your AIS transceiver. this data includes:

- your Maritime Mobile Service Identity (MMSI),
- your vessel's name,
- your call sign (if available),
- your vessel type, and
- the dimensions of your vessel.

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 radio-telephone licence which lists the AIS system, vessel Call Sign and MMSI number.

2.3 What's in the box?



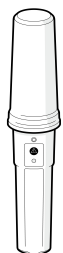
CAUTION

IMPORTANT PROGRAMMING REQUIRED - Before installation or use, the I100-X must be programmed using an I100 Programming Dock. One Programming Dock can be used to configure multiple I100-X transponders and can also be used as a charging dock. The Programming Dock is purchased separately.

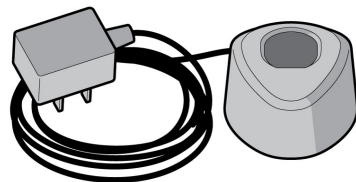


INFORMATION

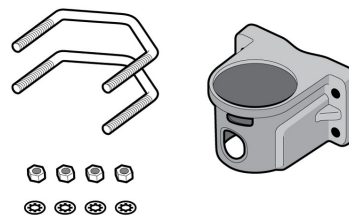
To purchase a programming dock or for further information, contact enquires@em-trak.com



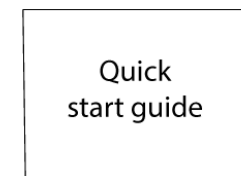
I100X



Charging dock



Bracket and fixings



Quick Start Guide

Figure 2 Package contents

I100X - The I100X AIS tracking device. The I100X is an all encompassing and includes a rechargeable battery pack, VHF antenna and GPS antenna.

Charging dock - The charging dock is used to charge the I100X. Plug the charging dock into a power supply and insert the I100X. A flashing green light indicates that it is charging.

Vessel bracket and fixings - The vessel bracket is used to attach the I100X to the vessel. It also automatically switches the I100X on when installed in the bracket.

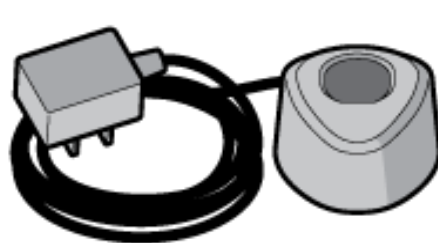
Quick Start Guide- This gives you a brief run down of how to install and use your I100X.

2.4 Programming dock



INFORMATION

The programming dock (417-0005) is required to program your I100X. A single programming dock can support multiple installations.

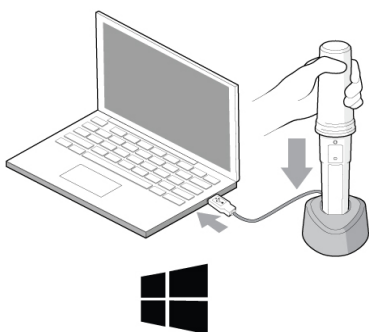


Programming dock

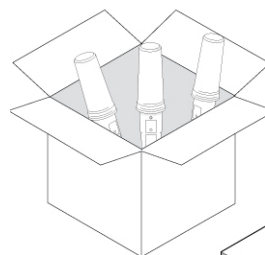


USB cable

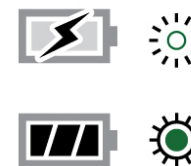
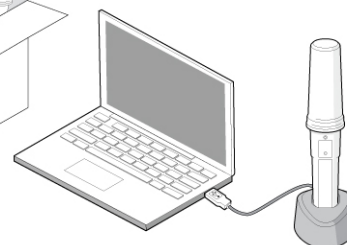
The dock:



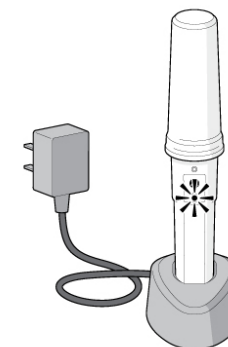
Is used to program / configure the I100X before use (works only on Windows)



Can program multiple I100Xs



Can charge the I100X



2.5 Choose your installation

The I100X is supplied with a charging dock. Additional accessories are available for programming and vessel installation. A programming dock is required to configure the I100X before use; one programming dock can be used to configure multiple I100Xs.

Select the appropriate vessel power option for your installation below.

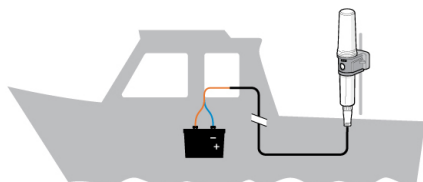
Internal battery



The I100X is operating normally from its internal battery.

No additional accessory is needed

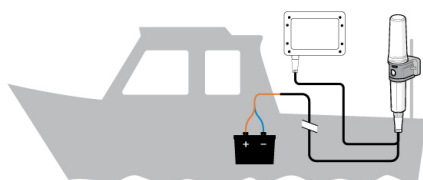
Direct vessel power



The I100X is connected directly to the vessel power (12-24V).

Power Cable – 301-0130

Vessel power & Status indication



The I100X is connected to vessel power with remote status indication.

The indicator Box is useful where the I100X itself is installed somewhere the LEDs cannot easily be seen, such as up a mast.

*LED Indicator Box & Power Cable –
417-0068*

2.5.1 | Optional installation accessories

Below are the optional extras you may choose to purchase. If you wish to purchase them contact your local dealer or em-trak directly at enquires@em-trak.com.

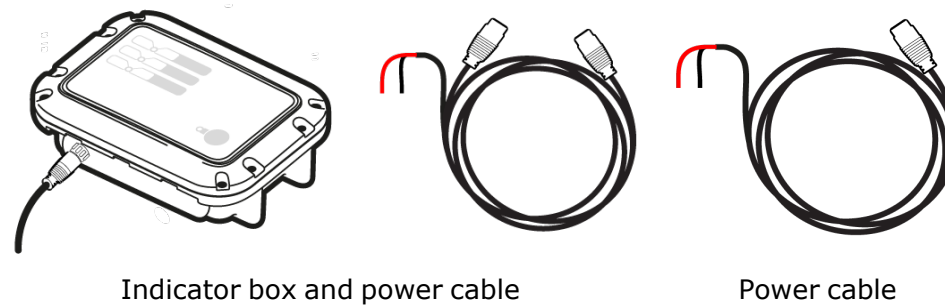


Figure 3 Accessories

3 Installing and charging the I100X

3.1 Installing the bracket and the I100X

The I100X needs to be placed in the supplied mounting bracket during use. Sliding it into the bracket activates the I100X, and removing it will turn it off.

Use a suitable tool and the supplied fixings to mount the bracket to a suitable mounting pole. It is best to mount the bracket on a vertical non metallic pole so that the indicator is easily visible. For best results, make sure that the I100X is installed at least 2m above sea level.

Keep the area around the I100X clear of any obstructions, as these can interfere with GPS reception or VHF transmission range.

Make sure to install the I100X bracket in the orientation shown in below. Try to avoid mounting the I100X horizontally, as this can reduce it's transmission range.

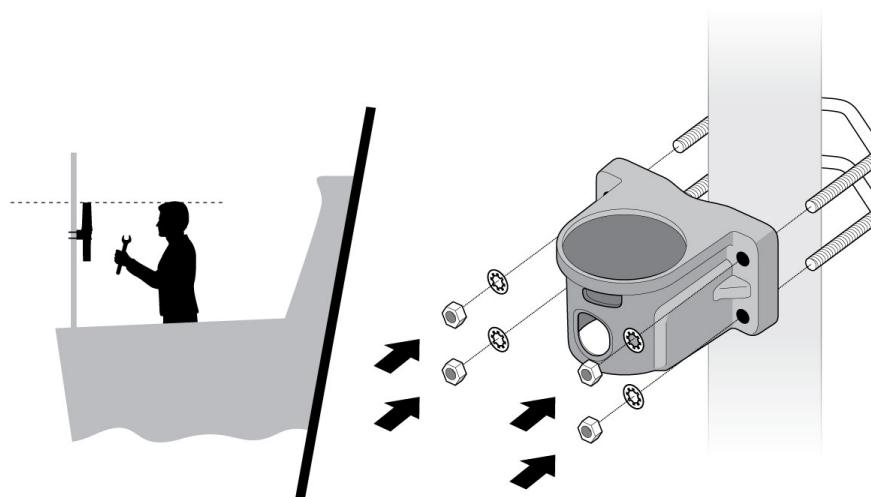


Figure 4 Installing the bracket and I100X

3.2 Installing the indicator box (optional)

You can connect the I100X to your vessel's power supply with the optional indicator box. Make sure your vessel can provide a 12V 1.6A or 24V 1A supply to the unit. Contact your local dealer for their help in sourcing the correct cable.

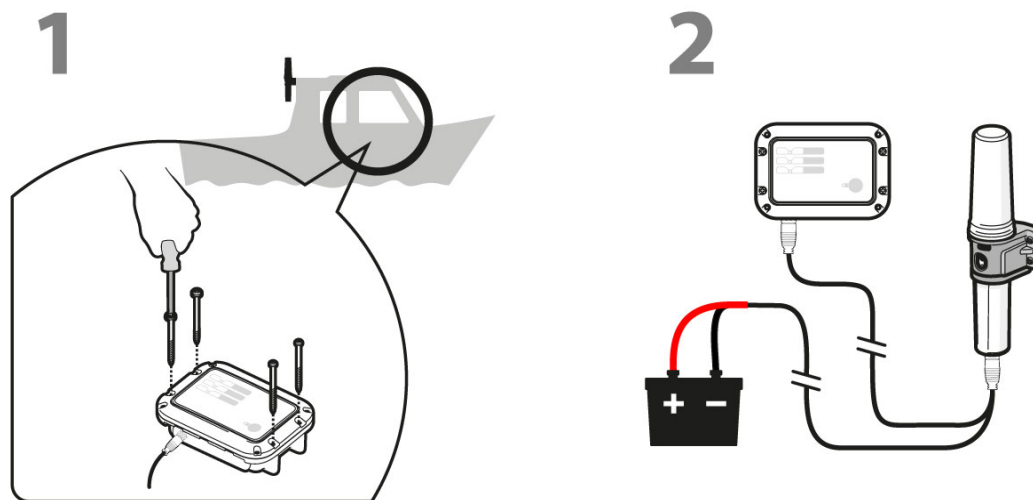


Figure 5 Installing the indicator box

Its best to install the indicator box in a location where the LED indicators are clearly visible. Use the power and the data accessory cable to connect the box to the vessels power supply.

3.3 Charging the I100X

The I100X comes with a partial charge. If it will be used without a connection to vessel power, ensure it is fully charged before installation on the vessel. You can charge the I100X by placing it into the charging dock as shown in Figure 6.

While charging, you'll notice the status I100X flashing green at a steady pace. Once the battery is fully charged, the I100X will switch to a solid green light. Depending on the battery's condition, it may take up to 3 hours to reach a full charge.



INFORMATION

The I100X can be configured as described in **Configuration** prior to charging.

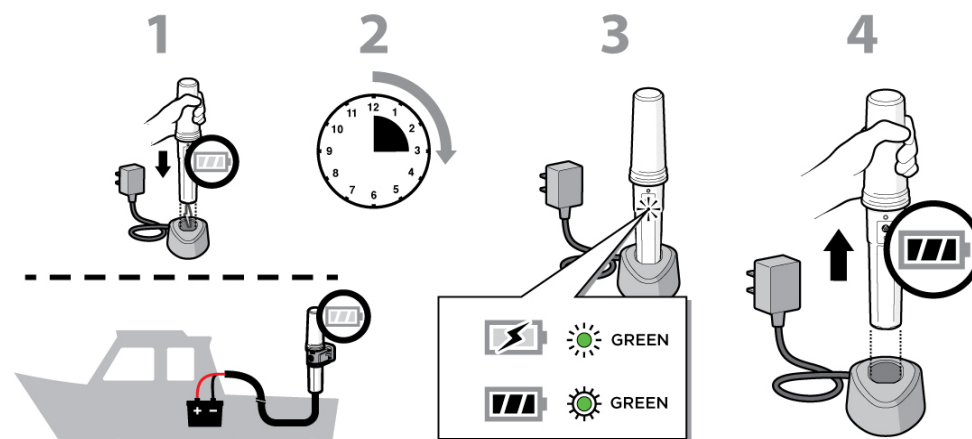


Figure 6 Charging the I100X



INFORMATION

The I100X will not charge if the internal temperature is below 0°C or above 40°C. If the temperature is outside this range the status indicator will be continuously illuminated red to indicate a charging fault.

4 Configuration

4.1 Connecting to the I100X

Insert the I100X into the dock and connect the dock to a PC by using a USB cable. When connecting for the first time, the USB drivers will have to be installed. Simply follow any on-screen instructions to complete the setup.

When you launch quickAIS, the application will automatically detect the I100X inserted in the programming dock.

4.2 Installing quickAIS

1. Click [here](#) and download quickAIS from the I100-X section of the em-trak website.
2. Extract the zip file to your PC.
3. Run the installation file and follow the on-screen instructions to install the software.

4.3 I100X configuration

Once quickAIS is installed, open the application and enter the following information:

- **MMSI number** - Enter the vessel's 9 digit MMSI number. The MMSI must be programmed to operate the I100X.
- **Vessel name** - Enter the name of your vessel.
- **Call sign** - Enter your vessels call sign.
- **Vessel type** - Select the type of your vessel.
- **Vessel's dimensions** - Enter your vessel dimensions to the nearest whole metre, referenced to the location of the I100X.

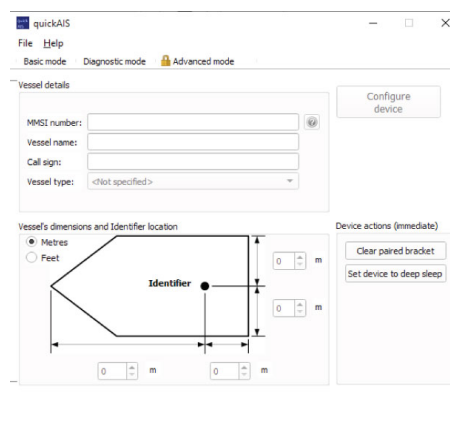


Figure 7 QuickAIS layout



WARNING

Always use a unique MMSI number when setting up the AIS I100X — never duplicate the mothership or any other vessel. Using the same MMSI can cause signal conflicts and tracking errors.

5 Using the I100X

5.1 Ready for use

Once you have charged and configured the I100X it is ready for use. The status indicator and the SOS buttons locations are shown below.

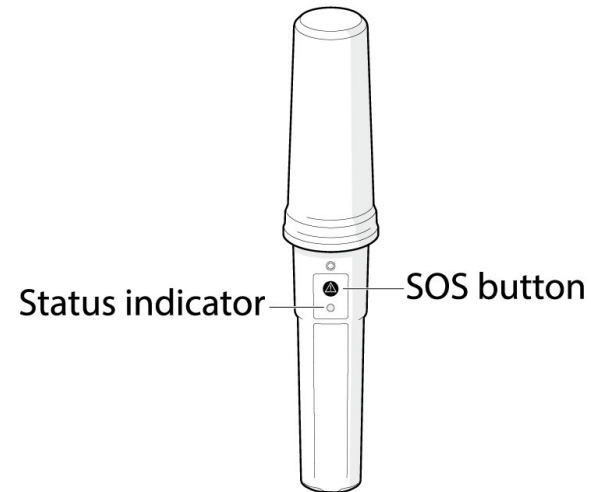


Figure 8 Status indicator light

5.2 Activating and deactivating the I100X

To activate the I100X, simply place it into the bracket, and to deactivate remove it from the bracket.

If you insert the I100X into a bracket it is not paired to, it will continue to report position and vessel data but will also send a bracket security alert. To fix this, install the I100X into the correct paired bracket.



INFORMATION

The I100X pairs with the first bracket it is inserted into.



CAUTION

Ensure power cable or waterproof cap is fitted at all times when the transceiver is deployed.



Figure 9 Activating the I100X

The I100X is designed to fit into the bracket in only one direction. Forcing it in the wrong way could damage the I100X.



INFORMATION

The I100X will transmit vessel position every 5 minutes once activated.

5.3 Status indicator

While active in the vessel bracket

The status indicator shows the current operating state of the I100X. The status indicator flashes every 5 seconds. The number of flashes and colour indicates the status conditions defined in the table below. The key status indications are also shown in Figure 10.

While charging

The status indicator flashes green while charging. Once charging is complete, it will stay solid green. If there's a charging error, the indicator will turn solid red—this is usually caused by high temperatures. For safety, the charger won't operate above 40°C.

Indication	Colour	Flashes count
SOS alert	RED	1
Charge fault	RED	0 (Solid)
Geofence alert	BLUE	1
Low battery	YELLOW	1
Bracket mismatch	YELLOW	4
No position	YELLOW	5
TX error	YELLOW	6
No MMSI	YELLOW	7
Operating normally in bracket	GREEN	1
Charging	GREEN	Continuous flashing
Charge complete	GREEN	0 (Solid)

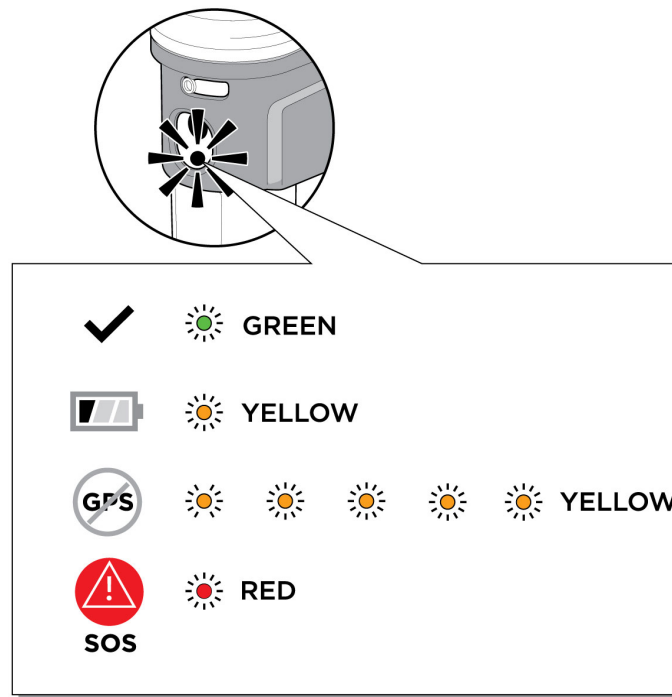


Figure 10 Indicator light

5.4 Indicator box light

The LED light on the indicator box mirrors the light on the I100X.

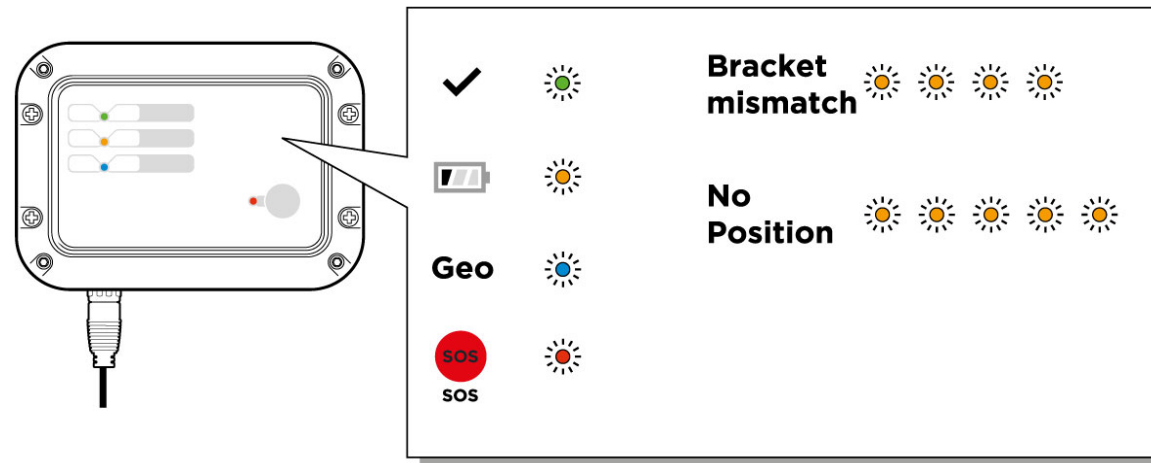


Figure 11 I100X box status indicators

5.5 SOS button

Pressing and holding the SOS button down for a minimum of 5 seconds activates the SOS function. When activated, the I100X transmits an AIS Safety Related Message with the text contents 'MAYDAY MAYDAY'. The message repeats every minute while the function is active.

While active the status indicator flashes red every 5 seconds. Press and hold the SOS button for another 5 seconds to disable the SOS function.



Figure 12 SOS function activation

5.6 Deep sleep

If you want to put the I100X into storage it should be put into sleep mode. Sleep mode can be enabled by using the quickAIS application.

When you want to wake the I100X up from deep sleep, simply insert it into the charging dock and connect it to the PC.

6 Troubleshooting

Possible cause	Solution
The I100X status indicator does not flash when placed in the holder.	- The I100X is in 'deep sleep' mode and requires charging in order to activate for use. - The I100X battery is exhausted and requires charging.
The I100X status indicator periodically flashes more than once when placed in the holder.	See Status indicator on page 21
The AIS transmission range of the I100X is reduced.	The I100X should be mounted as high as possible on the vessel and should not be attached to a vertical metal surface or pole as this will interfere with the operation of the internal VHF antenna.
The I100X does not obtain a GPS position fix (status indicator flashes amber 5 times).	- Remove the I100X from the charger and reinsert. - Check that the charger is plugged into a mains outlet and that the outlet is live.
The I100X status indicator is continuously illuminated red when the I100X is being charged.	- The temperature is too high or low to safely charge the battery. Move the I100X to a location where the temperature is between 0°C and 40°C. - A charging error has occurred - please contact your dealer.

7 I100X Specifications

Parameter	Value
Dimensions	350mm x 63mm max. diameter (without bracket)
Weight	250g (I100X unit only)
Power	Built in 2200mAh Lithium-Ion battery pack
Charger	100-240VAC input, 5V 1.2A output.
GNSS receiver	72 channel receiver and internal GPS and GLONASS antenna
VHF transmitter frequency range	156.025 to 162.025MHz
Transmitter output power	1W radiated (EIRP)
Channel bandwidth	25kHz
Modulation mode	25kHz GMSK
Environmental	IEC60945 'Exposed' category
	Waterproof to IPx6 and IPx8 (1m for 1h)
	Operating temperature -20°C to 55°C

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