I100-X USER MANUAL
AIS Identifier

CONTENT

FIGURES

1 Notices

When reading this manual, 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.

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

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

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.

1.2 General notices

Position source

All marine Automatic Identification System (AIS) transceivers utilise a satellite based location system such as the Global Positioning System (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 for how long satellite information has been received for.

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.

Accuracy of this manual

The AIS transceiver may be upgraded from time to time and future versions of the AIS transceiver may therefore not correspond exactly with this manual. Information contained in this manual is liable to change without notice. The manufacturer of this product disclaims any liability for consequences arising from omissions or inaccuracies in this manual and any other documentation provided with this product.

2 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 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

2.1 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 radio-telephone 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. See for "Identifier configuration" on page 12 for assistance with configuring the MMSI number.

3 Installing and charging the Identifier

3.1 What's in the box

Figure 1 shows the items that are included with each Identifier. Note that a configuration dock is supplied separately. The contents of the configuration pack are shown in Figure 2.

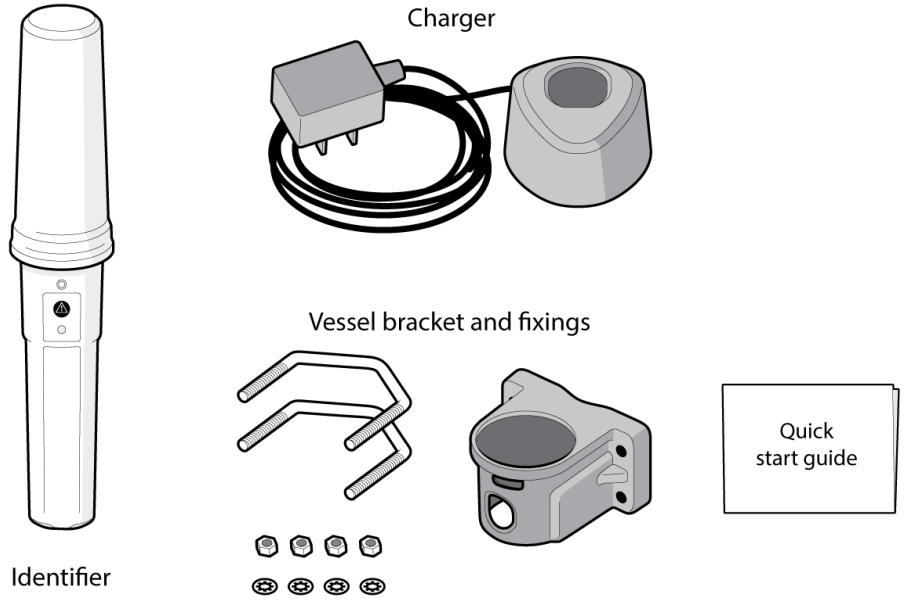

Figure 1 : Package contents

Identifier

The Identifier AIS tracking device. The Identifier is self-contained and incorporates a rechargeable battery pack, VHF antenna and GPS antenna.

Charger

The charger base is used to recharge the Identifier from an AC mains supply.

Vessel bracket and fixings

The vessel bracket is used to attach the Identifier to the vessel. It also automatically switches the Identifier on when installed in the bracket.

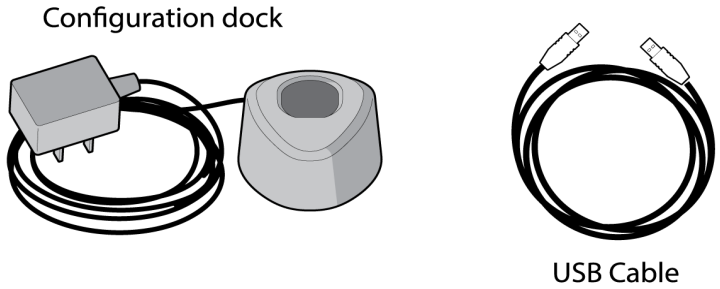

Figure 2 : Configuration pack contents

Configuration pack

The configuration dock is used to connect the Identifier to a PC or Mac during configuration. The configuration dock can also be used to charge the Identifier.

USB Cable

The USB Cable is sued to connect the configuration dock to the PC.

3.2 Installing the Identifier bracket

The Identifier must be located in the supplied mounting bracket when in use. Insertion into the bracket activates the Identifier and the Identifier is inactive when removed from the bracket.

The bracket should be fixed to the vessel using the supplied u-bolts, washers and nuts as shown in Figure 6. The bracket should be mounted to a non-metallic vertical pole and installed in a location where the status indicator is visible. Ideally the Identifier should be installed at least 2m above sea level. The area around and above the Identifier should be clear from any obstructions as these may affect GPS reception and / or VHF transmission range.

Ensure that the Identifier bracket is installed in the orientation shown in Figure 3. Do not mount the Identifier horizontally as it will reduce the transmit range.

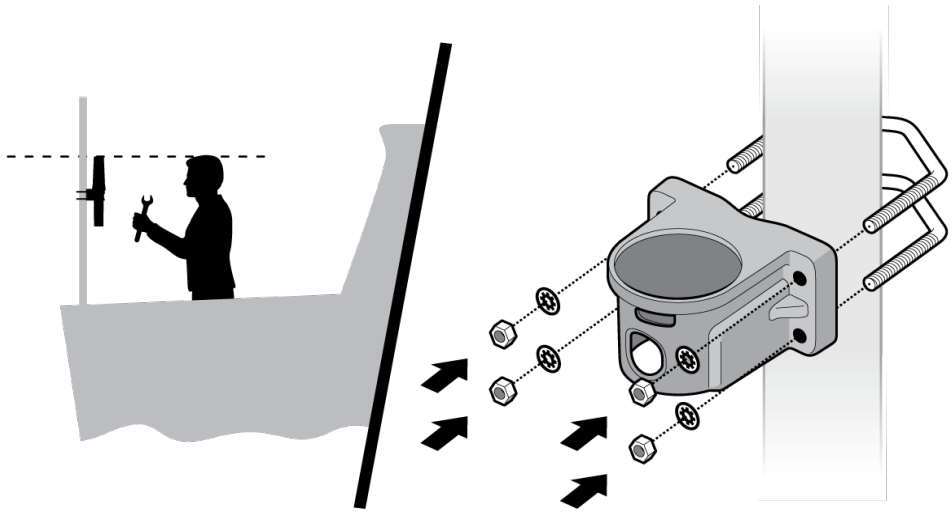

Figure 3 : Installing the Identifier bracket

3.3 Connecting to vessel power (optional)

The Identifier can be connected to the vessel power supply using an optional power cable. The vessel must be capable of providing a 12V 1.6A / 24V 1A supply to the unit. Contact your dealer to source a suitable cable.

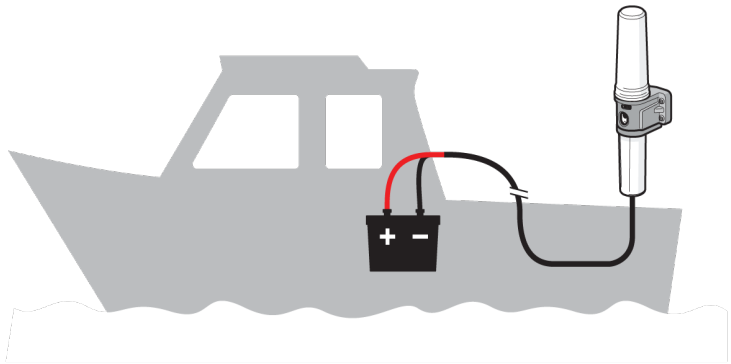

Figure 4 : Connecting to vessel power

3.4 Charging the Identifier

The Identifier is shipped with a partial charge, and if to be used without a connection to vessel power, requires a full charge prior to installation on a vessel. The Identifier is charged by placing it in the charging dock as shown in Figure 5.

During charging the status indicator will flash green at a steady rate. When charging is complete the status indicator will stop flashing and remain constantly illuminated Green. Depending on the condition of the battery a full charge can take up to 3 hours to complete.

Note that the Identifier can be configured as described in See **Configuring the Identifier** on page **12** prior to charging.

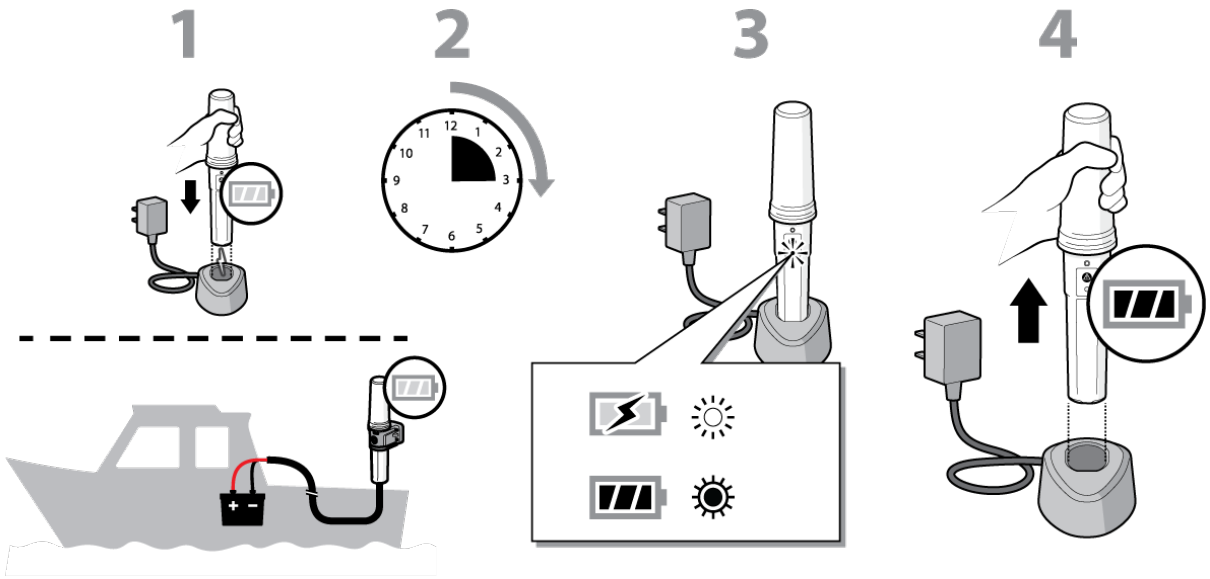

Figure 5 : Charging the Identifier

The Identifier 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 Configuring the Identifier

Visit www.em-trak.com/Installation to download the latest version of the configuration software. Select the product you have purchased to access the configuration software, product manual, and answers to a selection of FAQs that you may find useful. If you require assistance with your installation, contact support@em-trak.com.

4.1 Connecting to the Identifier

Connect the Identifier by inserting it into the configuration dock and connecting the configuration dock USB cable to a PC. The first time the connection is made the USB drivers may need to be installed. Follow any on screen instructions.

Once the drivers are installed, launch the quickAIS application. The latest version of the configuration dock will be automatically detected by quickAIS. For earlier versions of the configuration dock select the relevant communications port from the drop down menu. The port will be listed as “USB Serial Port (COMx)” where x is the number of the port.

4.2 Identifier configuration

The Identifier can be programmed with the following vessel information using quickAIS. A screen shot showing key features of the application is provided in Figure 6.

- **MMSI number**

  Enter the vessel’s 9 digit MMSI number. The MMSI must be programmed to operate the Identifier.

- **Vessel's name**

  Enter the vessel name or other identification.

- **Call sign**

  Enter the vessel call sign (if available).

- **Vessel type**

- Select the most appropriate vessel type from the drop down list.

- **Vessel's dimensions**

  Enter the vessel dimensions, referenced to the location of the Identifier, to the nearest whole metre.

  Optionally vessel dimensions may be entered in feet by selecting the ‘Feet’ option. Dimensions entered in feet will be converted to metres and rounded to the nearest whole metre when programming the Identifier.

To store the configuration in the Identifier click the ‘Configure Device’ button and acknowledge the MMSI programming warning.

It is possible to change any previously configured information except for the MMSI number. Changes to he MMSI number can only be made in the quickAIS 'Advanced' mode. Contact your supplier or em-trak technical support for further details.

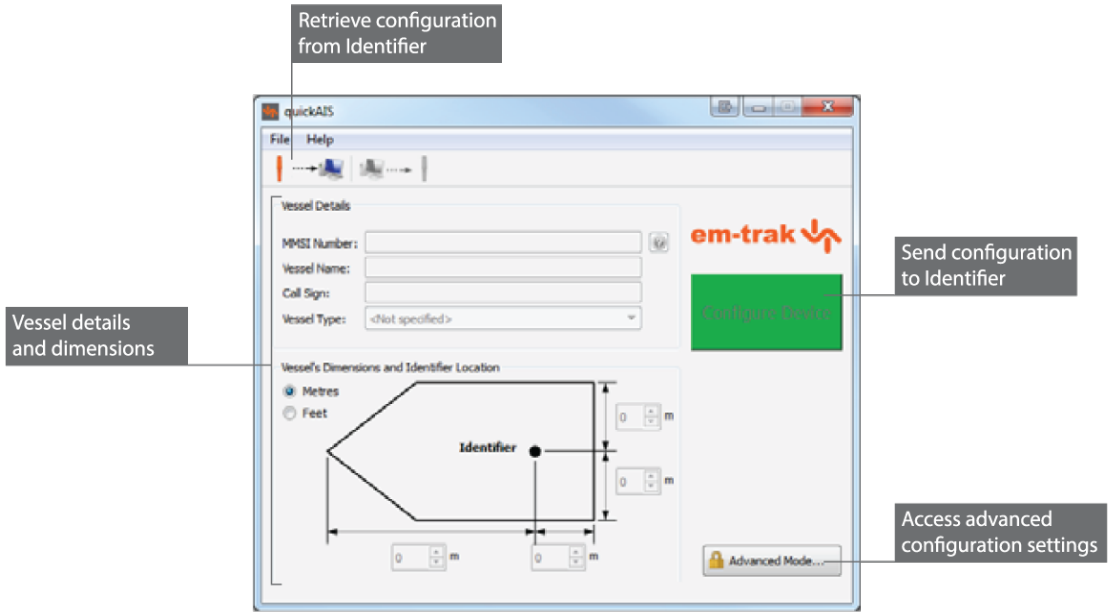

Figure 6 : Quick AIS layout

5 Using the Identifier

The Identifier is ready for use once charged and configured. The location of the status indicator and SOS button are shown in Figure 7.

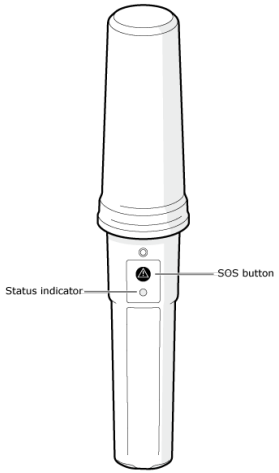

Figure 7 : Identifier status and SOS button

5.1 Activating and deactivating the Identifier

The Identifier is activated by placing it in the supplied vessel bracket and deactivated when removed from the bracket. Note that the Identifier is 'paired' to the first bracket with which it is used. When inserted into an incorrect bracket the Identifier will continue to report position and vessel data combined with a bracket security alert.

To activate the Identifier insert and lock into the vessel bracket as shown in Figure 8.

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

Figure 8 : Activating the Identifier

The Identifier will only fit into the bracket in one orientation, as shown in Figure 8. Do not try to force the Identifier into the bracket in the wrong orientation.

The Identifier will transmit vessel position every 5 minutes once activated. Under normal operating conditions the battery will provide 5 days operating life before a the Identifier needs to be recharged.

5.2 Status indicator

While active in the vessel bracket, the status indicator shows the current operating state of the Identifier. 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 9.

Indication	Colour	Flashes count
SOS alert	RED	1
Charge fault	RED	0 (Solid)
Geofence alert	BLUE	1
Low battery	YELLOW	1
Bracket mismatch	YELLOW	1
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)

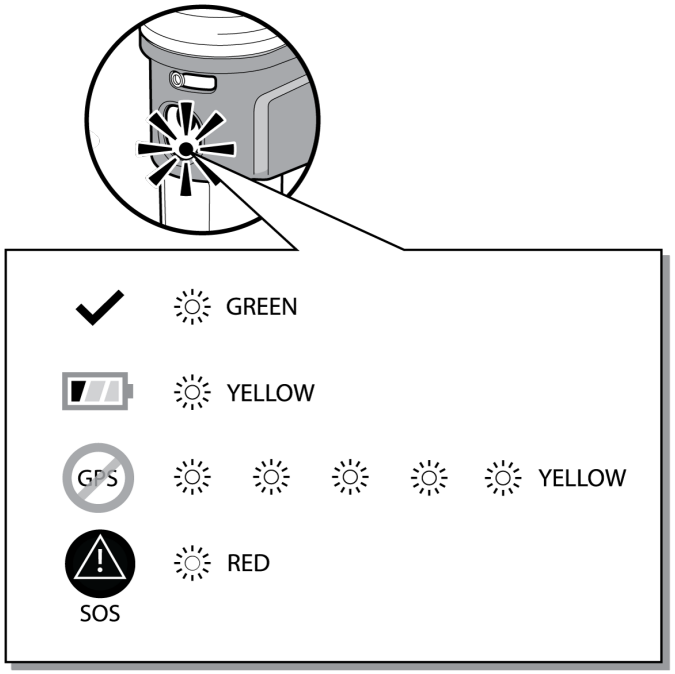

Figure 9 : Common status indications - while active

While charging

The status indicator flashes green. When charging is complete the status indicator will remain continuously illuminated green. A charging error is indicated by the status indicator continuously illuminated red. The most likely cause of a charging error is high temperature. The charger will not operate above 40°C for safety reasons.

5.3 SOS button

The SOS function is activated by pressing and holding the SOS button for a minimum of five seconds. When activated the Identifier will transmit an AIS Safety Related Message with the text contents 'MAYDAY MAYDAY'. The message is repeated every minute while the function is active.

While the SOS function is active the status indicator will flash red every five seconds. To disable the SOS function press and hold the SOS button for at least five seconds.

Figure 10 : SOS function activation

The SOS function is operable with the Identifier located in or out of the vessel bracket and also when the Identifier is in the charger.

5.4 Deep sleep

When the Identifier is not going to be used for a long period of time, or it needs to be put into storage, it can be set to deep sleep mode. This is enabled using quickAIS.

When you need to wake it up from deep sleep mode insert it in a charger or configuration dock.

6 Troubleshooting

Issue	Possible cause and remedy
The Identifier status indicator does not flash when placed in the holder.	• The Identifier is in 'deep sleep' mode and requires charging in order to activate for use. • The Identifier battery is exhausted and requires charging.
The Identifier status indicator periodically flashes more than once when placed in the holder.	• See **Status indicator** on page 16
The AIS transmission range of the Identifier is reduced.	• The Identifier 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 Identifier does not obtain a GPS position fix (status indicator flashes amber 5 times).	• Ensure that the Identifier is installed outdoors with a clear unobstructed view of the sky. • Avoid locating the Identifier close to large metal structures.
The Identifier status indicator does not flash when the Identifier is placed in the charger	• Remove the Identifier from the charger and reinsert. • Check that the charger is plugged into a mains outlet and that the outlet is live.
The Identifier status indicator is continuously illuminated red when the Identifier is being charged.	• The temperature is too high or low to safely charge the battery. Move the Identifier to a location where the temperature is between 0°C and 40°C. • A charging error has occurred - please contact your dealer.

7 Identifier Specifications

Parameter	Value
Dimensions	350mm x 63mm max. diameter (without bracket)
Weight	250g (Identifier 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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