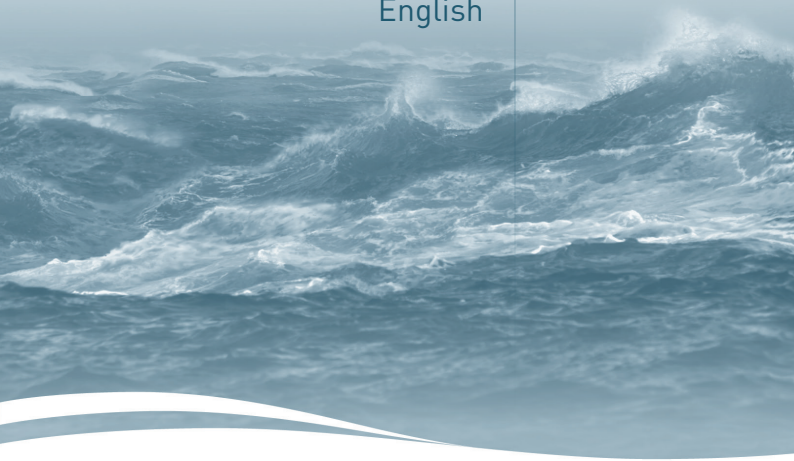
ocean SIGNAL

User Manual

safeSEA M200 Class M

Maritime Survivor Location Device (MSLD incorporating AIS and DSC)

English



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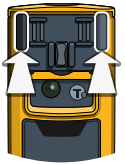
IN CASE OF EMERGENCY

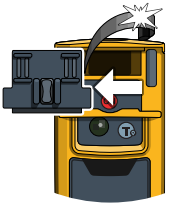
Use only in situations of grave or imminent danger

Only activate your M200 in emergency situations requiring assistance. Deliberate misuse of your M200 may result in a fine.

If the M200 is correctly fitted to a life jacket, it will automatically activate when the life jacket inflates. This guide shows how to manually activate the M200.

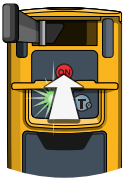


- Press either of the grey arming retainers down.



- Slide the grey activation slider sideways over the depressed arming retainer to remove it. This will release the antenna and activate the M200.

Take great care to keep well clear of eyes and face as the antenna will be released very quickly. Keep at least 30cm (12") clear to avoid possible injury.



- If the strobe light does not start flashing, manually activate the M200 by pressing the ON Key.
- Always turn off the M200 immediately after you have been rescued to avoid interference with other users.

To deactivate the M200, press and hold the TEST/OFF Key until the red LED flashes twice, then release.

ACCIDENTAL ACTIVATION

Once activated, the time to first transmission is approximately 25 seconds. If the M200 is activated in error for longer than 25s, it should be turned off and the nearest Coast Guard Centre or Rescue Coordination Centre should be contacted to explain that there are no follow up rescue actions required. If appropriate, make a call on a VHF radio to announce the same information.

CONTENTS

1. GENERAL

1.1 Exposure to RF Electromagnetic Energy

This product complies with EN62479 (EU) and RSS-102 (Canada).

This product has been evaluated for compliance with the FCC RF exposure limits given in CFR 47 part 2.1093: Portable Device.

1.2 Warnings

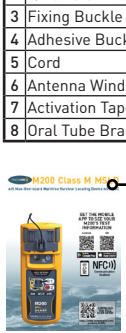
⚠ **This equipment is intended for emergency use only and it should not be used for routine tracking of persons or property, including routine tracking of divers.**

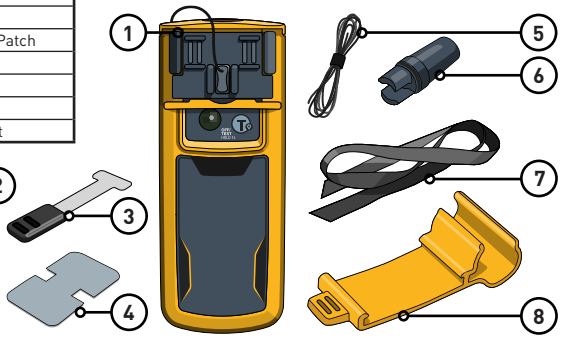
⚠ **If testing is performed more frequently than advised in this manual, then battery life may be reduced.**

⚠ **This radio device is designed to only provide an effective alerting and locating capability in close proximity to a vessel. This radio device is NOT a COSPAS SARSAT EPIRB or PLB.**

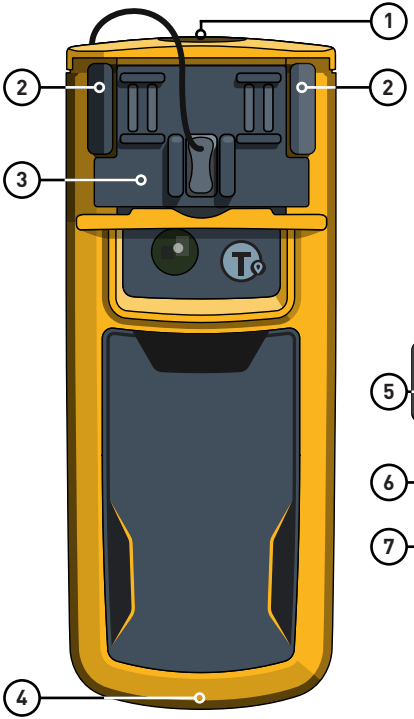
1.3 M200 Box Contents

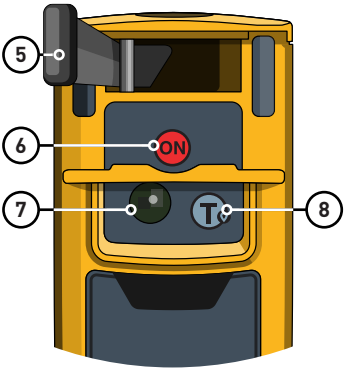
1	safeSEA M200
2	Quick Start Guide
3	Fixing Buckle
4	Adhesive Buckle Patch
5	Cord
6	Antenna Winder
7	Activation Tape
8	Oral Tube Bracket





2. M200 OVERVIEW





1	Cord Attachment Point (on rear)
2	Arming Retainer
3	Activation Slider
4	Cord Attachment Point (on rear)
5	Antenna
6	ON Key
7	Strobe and Indicator LED
8	TEST/OFF Key

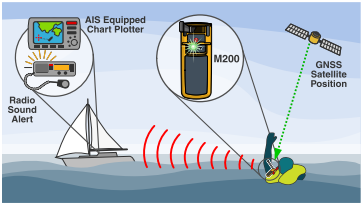
3. INTRODUCTION

The Ocean Signal range of products provides the user with the latest technology specifically designed for compact size and ease of operation. In the event that you fall overboard, the M200 is intended to alert your vessel, and other vessels in range, using real-time location tracking via AIS (Automatic Identification System) and seamless integration of Class M DSC (Digital Selective Calling) as well as a 121.5MHz homing signal.

3.1 AIS System

The AIS system operates on the VHF band. Transceivers are fitted to all commercial ships and an ever-growing number of recreational vessels globally. Shortly after activation an AIS location device, such as the M200, will activate a MOB target and message on plotters in all AIS equipped vessels within the VHF range, alerting them that emergency assistance is required. Often it is a vessel in the close vicinity of an incident that is able to react and effect a rescue quicker than the emergency services. Emergency service craft are fitted with AIS receivers allowing them to pinpoint emergencies in the water more precisely than any other system.

The method in which an AIS message is displayed will depend on the reception equipment being used. AIS enabled plotters will display a ship or Man Overboard target with the M200 preprogrammed AIS unique ID, that identifies it as a Man Overboard device.



Interface diagram showing typical usage

3.2 Near Field Communication (NFC)

The M200 is capable of connection to devices using near field communication (NFC). NFC technology allows communication between two electronic devices over a distance of a few centimetres.

The benefit of using NFC in the M200 is that the power used for communication comes from the mobile device and not the M200. The Ocean Signal mobile app allows a user to access the M200 for viewing the latest test results and battery health, as well as providing a means to configure the M200 with a vessel MMSI, detailed in section 3.3.

Download the app here: Android: iOS:

To use the app simply align your mobile device NFC antenna to the front of the M200 where you see "NFC". Once connected, details about your M200 will be displayed on your mobile device including the product name and serial number, the unique AIS ID and any previous test results that have been stored.

The battery information is also available through the app, including the current battery expiry date and how long the battery has been in use so far.

3.3 Digital Selective Calling (DSC)

DSC Closed Loop refers to the transmission of an addressed message to a closed user group, specifically the vessel's MMSI that you have programmed into your M200 as described above. The distress alert from the M200 is sent only to your vessel's DSC VHF radio, also known as the mothership.

DSC Open Loop refers to an "all-ships" call that alerts all ships with a DSC VHF radio within range.

Your M200 is supplied with open loop DSC enabled. In the event of a man-overboard emergency situation, the M200 will continue to transmit the AIS distress messages as well as a GMDSS DSC distress alert that is sent to all ships and stations within range that have a DSC VHF Radio. This distress alert will contain the current GNSS position of the casualty in the water (once a GNSS fix is obtained) and is sent via VHF channel 70, maximising the chances of rescue from a nearby vessel in the event that your own ship is unable to assist.

The originating MMSI displayed on the DSC receiving radio will be the unique self-identification number pre-programmed into the M200 which cannot be changed. This number will always start with '972' irrespective of the country it was purchased in and will allow the DSC receiver to immediately identify a man-overboard situation requiring immediate assistance.

3.3.1 Programming MMSI Numbers

If your own vessel has a DSC enabled VHF radio, it is strongly recommended to programme your vessel's MMSI number into your M200 for testing purposes only. This is achieved using NFC and the Ocean Signal Mobile App, see section 3.2 for download links. Once the app is downloaded, follow the on-screen instructions to add your vessel MMSI to the M200.

A group MMSI can also be added if desired. This is an additional unique 9-digit MMSI number, assigned by the radio authorities to identify a group of vessels and will start with a zero (0).

3.3.2 Enabling DSC Closed Loop Functionality

Once your vessel's MMSI number has been programmed into the M200 via the app, the DSC operational mode can be switched to closed loop. In this mode the M200 will only transmit a DSC distress alert to your own vessel's MMSI for the first twelve minutes of activation. It will not immediately transmit to all ships and stations within range.

> ⚠ **If a group MMSI is programmed into your M200, the M200 will transmit DSC distress alerts to this number instead of your individual vessel MMSI number during closed loop operation.**

If the DSC transmission from the M200 is not acknowledged within the first twelve minutes, the M200 will then revert to open loop DSC and will begin to transmit to all ships within range.

It is recommended not to switch to a closed loop function unless your personal circumstances dictates it to be necessary. Ensure that your VHF radio will acknowledge a closed loop DSC alert before switching to this functionality.

3.3.3 Manual DSC All Ships Distress Alert

Whilst the M200 is active, an Open Loop 'All Ships' DSC distress alert can be manually initiated by pressing and holding the ON key for 2 seconds, then release. After a few seconds, the M200 will transmit a DSC distress alert to all ships with a DSC VHF radio within range.

Once an open loop DSC All Ships transmission is manually initiated, the M200 will then continue to operate and transmit in DSC Open Loop mode.

3.3.4 DSC Acknowledgement

Once activated, a DSC distress alert will only be terminated if the M200 is deactivated or if an acknowledgement is received from a Class A DSC radio or Coast Station. Non-commercial Class D DSC radios are not able to transmit an All-Ships DSC acknowledgement.

The International Maritime Organisation sets out the procedure for responding to DSC distress alerts in their document COMSAR/Circ.25.

3.3.5 DSC Self-Cancellation

When active, the M200 will continue to transmit DSC distress alerts until it receives an acknowledgment. If the M200 is deactivated before an acknowledgement is received, the M200 will transmit a final self-cancellation message via DSC advising that the distress alert has been cancelled.

3.4 121.5MHz Homing Frequency

The 121.5MHz frequency is used for homing purposes. When active, the M200 will transmit a 121.5MHz homing signal that helps guide search and rescue services within the local search area to the M200's precise location.

Class M DSC devices are required to turn on and monitor the DSC channel for acknowledgements for five (5) minutes after each DSC transmission. The 121.5MHz Homer transmitter cannot operate during this period.

During a Functional, Homer and DSC Test, the 121.5MHz Homer test transmission is sent at a reduced power level. This is the default setting within the M200 in order to comply with European regulations. Outside of Europe, the 121.5MHz Homer transmission can be tested at the operational power level, by connecting to the M200 via NFC using the Ocean Signal app and switching the 121.5MHz power level to "Operational".

⚠ The 121.5MHz test transmission should be reset to a low power level before testing the 121.5MHz Homer transmission within Europe.

⚠ The 121.5MHz Homer signal is transmitted at a reduced power level during testing only. When active, the M200 will transmit the 121.5MHz Homer at an operational power level.

4. LIFE JACKET INSTALLATION

If your M200 is not already pre-installed into the life jacket, please follow the instructions below carefully.

⚠ **The following guide is a generic guide to installation of the M200 to a life jacket. Although the M200 is designed to fit most life jackets, always check with your life jacket manufacturer to ensure that there are no special fixing instructions for that model.**

⚠ **Once completed, the installation should be tested to ensure correct activation takes place. Refer to the life jacket manufacturer for the inflation process.**

The M200 is activated when the activation slider is pulled from the front of the device by the tension in the tape created by the inflation of the life jacket. The M200 will not activate if the life jacket does not inflate.

This manual provides installation instructions for life jackets with separate bladders and life jackets with stitched / welded-in bladders.

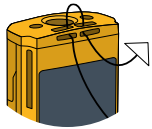
⚠ **For life jackets with small, separate bladders that narrow significantly, close to the oral tube, the installation method for the welded-in bladder should be used. This method provides a fixing point for the activation tape that can be positioned where needed to allow for maximum movement when activated.**

The images throughout this entire **Section 4** assume that the oral inflation tube is on the left hand side of the life jacket when viewed from the front. If the tube is on the right hand side then the tape should be fitted on the opposite sides shown.

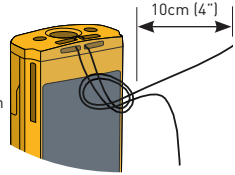
4.1 Tethering the M200

To prevent accidental loss, use the provided length of cord to secure the antenna winder and tether the M200 to a fixed point in the life jacket.

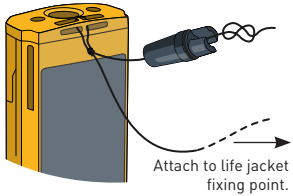
- Pass the cord through the attachment points on the rear of the M200 as shown.



- Tie a knot to both strands, leaving approximately 10cm (4 inches) from one end of the cord as shown.



- Pass the short end of the cord through the antenna winder and tie a figure of eight knot to secure.
- Use the remaining length of cord to tether the M200 to a fixed point on the life jacket. Select a secure point on the life jacket that the cord cannot detach or untie from if the M200 is accidentally removed from its bracket.



⚠ **Ensure that the M200 is securely tied to a fixed point that will NOT inhibit inflation. The fixing point will be identified in the life jacket user manual.**

4.2 Fitting to Life Jacket with separate bladder

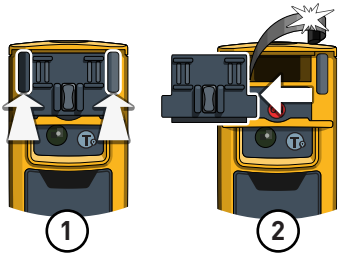
For attachment instruction to a fixed bladder, or a small and narrow separate bladder, see section 4.3

4.2.1 Remove the Activation Slider.

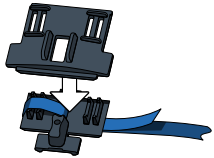
⚠ **The M200 will activate when removing or re-attaching the grey slider. Ensure it is turned off immediately by pressing and holding the TEST/OFF Key until the red LED flashes twice, then release.**

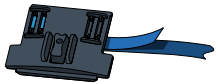
⚠ **Take great care to keep well clear of eyes and face as the antenna will be released very quickly. Keep at least 30cm (12") clear to avoid possible injury.**

- Press either of the grey arming retainers down.
- Slide the grey activation slider sideways over the depressed arming retainer to remove it. This will release the antenna and activate the M200.
- Deactivate the M200.



4.2.2 Attach the Activation Tape



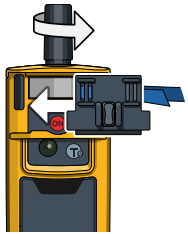


- There is a front and rear section of the activation slider. Place the rear of the activation slider so that it sits over the activation tape and then pass the tape back through the slot in the middle.
- As the tape is threaded through the middle, ensure that the tape lies flatly between the small protrusions of the two up-stands.
- Place the front section of the activation slider on top of the rear section and tape. Squeeze the front and rear sections together tightly.
- The activation tape will now be trapped in place by the action of closing the front and rear sections together.
- The assembled activation slider is now ready for assembly onto the M200.

4.2.3 Insert the activation slider into the M200

⚠ **The M200 will activate during this process. Ensure it is turned off as soon as the activation slider is in place. Deactivate the M200 by pressing and holding the TEST/ OFF Key until the red LED flashes twice.**

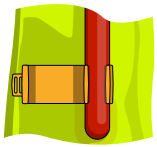
- Place the antenna end cap into the recess.
- Pass the antenna winder through the hole in the top of the M200 and place over the antenna end cap.
- Rotate the winder anti-clockwise until the antenna is flush with the M200 when fully wound. Do not remove the tool until the slider is in place.
- Keeping the activation slider tether clear, insert the slider back into position between the two arming retainers. Ensure that the tape remains flat between the slider and the M200. This will lock the antenna in place and activate the M200.
- Deactivate the M200.
- Remove the antenna winder to allow the antenna to rest behind the activation slider.



⚠ **Failure to remove the antenna winding tool will prevent automatic antenna deployment after the life jacket inflates.**

⚠ **Ensure that the activation slider tether does not become trapped in the assembly. This may restrict the release of the activation slider upon life jacket inflation.**

4.2.4 Attach the Oral Tube Bracket to the life jacket



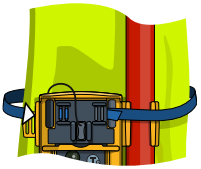
- Place the Oral Tube Bracket as low down the oral tube as possible.

To activate the M200, the activation tape must be wrapped around a substantial part of the life jacket bladder. Many modern life jackets taper towards the neck for comfort and support in the water and correct installation of the M200 must ensure that the tape is around the larger part of the bladder rather than a tapered section where expansion may not be sufficient.

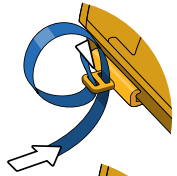
Fitting the Oral Tube Bracket as low down on the oral tube as possible will usually assist in ensuring that the tape is passed around the largest bladder section available.

- If there are whistles and lights fastened to the oral tube, then place them above the M200 bracket or attach them elsewhere to the life jacket.

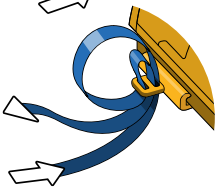
4.2.5 Attach the M200



- Fold the bladder behind the oral tube in accordance with the life jacket manufacturer's instructions.
- Rest the M200 on the mounting bracket and pass the free end of the activation tape round the rear side of the bladder, taking care not to twist the tape.
- Clip the M200 into the mounting bracket taking care not to trap any loose tape.

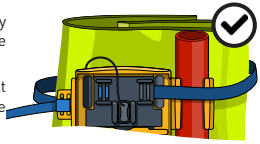


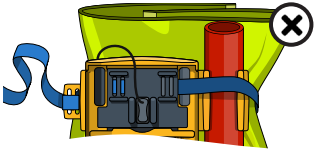
- Feed the free end of the tape up through the innermost slot on the side of the Oral Tube Bracket. Loop the emerging tape over the attachment point and feed back up through the outermost slot.

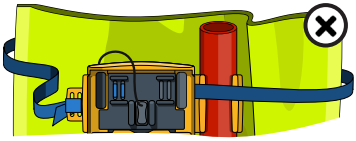


- Feed the tape back down through the innermost slot so that it emerges at the same point where it originally entered.
- Pull the free end of the tape so that the bladder is able to inflate and remains folded in accordance with the life jacket manufacturer's instructions.

- **Do not over-tighten the tape**. Test for tightness by ensuring you can freely insert a finger between the tape and the bladder.
- The tape should not impinge on the bladder, but be tight enough so that any unfolding of the bladder causes the activation of the M200.







4.3 Fitting to Life Jacket with bladder stitched into cover

This installation method is suitable for life jackets with a bladder that is welded / stitched into the cover, and for life jackets with a small, separate bladder that narrows significantly, close to the oral tube.

When using this method, the fixing buckle and patch should be adhered to the widest part of the bladder so that it is as far away from the M200 as possible, whilst remaining in-line with the slider but not passing over the oral tube. For small, separate bladders, this can be positioned on the rear of the bladder if suitable.

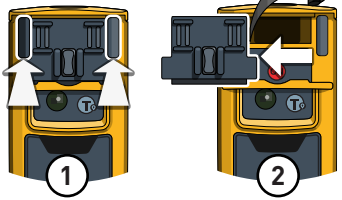
⚠ **The M200 should always be situated between the oral tube and fixing patch**

4.3.1 Remove the Activation Slider.

⚠ **The M200 will activate when removing or re-attaching the grey slider. Ensure it is turned off immediately by pressing and holding the TEST/OFF Key until the red LED flashes twice, then release.**

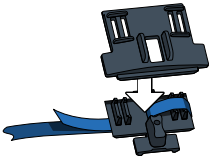
⚠ **Take great care to keep well clear of eyes and face as the antenna will be released very quickly. Keep at least 30cm (12") clear to avoid possible injury.**

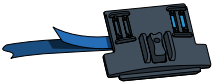
- Press either of the grey arming retainers down.
- Slide the grey activation slider sideways over the depressed arming retainer to remove it. This will release the antenna and activate the M200.
- Deactivate the M200.



4.3.2 Attach the Activation Tape

- There is a front and rear section of the activation slider. Place the rear of the activation slider so that it sits over the activation tape and then pass the tape back through the slot in the middle.
- As the tape is threaded through the middle, ensure that the tape lies flatly between the small protrusions of the two up-stands.
- Place the front section of the activation slider on top of the rear section and tape. Squeeze the front and rear sections together tightly.
- The activation tape will now be trapped in place by the action of closing the front and rear sections together.
- The assembled activation slider is now ready for assembly onto the M200.

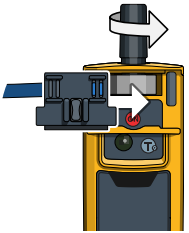




4.3.3 Insert the activation slider into the M200

The M200 will activate during this process. Ensure it is turned off as soon as the activation slider is in place. Deactivate the M200 by pressing and holding the TEST/ OFF Key until the red LED flashes twice.

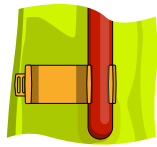
- Place the antenna end cap into the recess.
- Pass the antenna winder through the hole in the top of the M200 and place over the antenna end cap.
- Rotate the winder anti-clockwise until the antenna is flush with the M200 when fully wound. Do not remove the tool until the slider is in place.
- Keeping the activation slider tether clear, insert the slider back into position between the two arming retainers. Ensure that the tape remains flat between the slider and the M200. This will lock the antenna in place and activate the M200.
- Deactivate the M200.
- Remove the antenna winder to allow the antenna to rest behind the activation slider.



Failure to remove the antenna winding tool will prevent automatic antenna deployment after the life jacket inflates.

Ensure that the activation slider tether does not become trapped in the assembly. This may restrict the release of the activation slider upon life jacket inflation.

4.3.4 Attach the Oral Tube Bracket to the life jacket



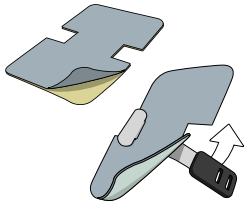
- Place the Oral Tube Bracket as low down the oral tube as possible.

To activate the M200, the activation tape must be wrapped around a substantial part of the life jacket bladder. Many modern life jackets taper towards the neck for comfort and support in the water and correct installation of the M200 must ensure that the tape is around the larger part of the bladder rather than a tapered section where expansion may not be sufficient.

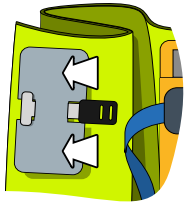
Fitting the Oral Tube Bracket as low down on the oral tube as possible will usually assist in ensuring that the tape is passed around the largest bladder section available.

- If there are whistles and lights fastened to the oral tube, then place them above the M200 bracket or attach them elsewhere to the life jacket.
- Clip the M200 into the mounting bracket taking care not to trap any loose tape.

4.3.5 Attach the fixing buckle patch assembly

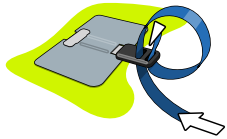


- Remove the backing from the adhesive buckle patch.
- Attach the fixing buckle to the buckle patch. Ensure that the two ears of the 'T' are positioned on the side of the patch without the adhesive. This will ensure that when the buckle is tensioned it cannot be pulled through the adhesive patch.

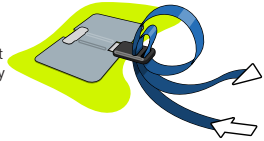


- Fold or manipulate the bladder to find a suitable area for the adhesive buckle patch to be positioned. Ensure that it is positioned in-line with the activation slider and as far away from the M200 as possible.
- Adhere the fixing buckle patch assembly to the bladder, pressing down firmly to set the adhesive.

- Feed the free end of the tape up through the innermost slot on the fixing buckle. Loop the emerging tape over the attachment end and feed back up through the outermost slot.



- Feed the tape back down through the innermost slot so that it emerges at the same point where it originally entered.



- Whilst folding the bladder in accordance with the life jacket manufacturer's instructions, pull the free end of the tape to shorten the distance between the M200 and fixing buckle.

  Shortening the tape will ensure that as the bladder inflates and the buckle patch moves away from the M200, the slider will be pulled from the M200 as it does so, resulting in its activation.

4.4 Fitting the M200 without using an oral inflation tube

For installation into survival suits or life jackets that do not have an oral inflation tube, a separate fitting kit is required. This is available from Ocean Signal. Follow the instructions supplied with the kit.

M200 Survival Suit Fitting Kit ..... Part Number: 743S-06134

5. OPERATION

Only use in situations of grave and imminent danger. Misuse may result in a severe penalty.

Ensure that the M200 is always fitted with an unused battery that is within the marked expiry date. Failure to do so may result in reduced operating time when used in a real emergency. Please observe the recommendations on testing in section 6.

5.1 Semi-Automatic Activation

When correctly packed in a life jacket the M200 will automatically activate when the life jacket inflates. Should the jacket fail to fully inflate, it may be necessary to assist the grey activation slider by pulling on the tape to fully release it.

5.2 Manual Activation

KEEP THE M200 FAR AWAY FROM EYES WHEN ACTIVATING.
The antenna will be automatically released.

- To manually activate your M200 in an emergency, press either of the grey arming retainers down and slide the grey activation slider over it to remove.
- The strobe and infra-red light will start flashing. The M200 will automatically start transmitting after approximately 25 seconds. Please note that infra-red light is not visible by sight.
- If the M200 fails to activate when the slide is removed, press the ON key down until the green LED starts flashing. Release the ON key.
- Upon activation, the indicator LED will show two (2) flashes during an AIS transmission and four (4) flashes during a DSC transmission. See section 5.2.1 for full details of the flash sequences that can be seen during activation of the M200.

NOTE: if the M200 has been switched to closed loop DSC functionality, this will change from four flashes during a DSC transmission to one (1) long flash during a DSC transmission for the first twelve minutes of activation.

- When operating the M200, tether the device to your body or life jacket to avoid accidental loss.
- Hold your M200 with the antenna standing vertically. Keep the area marked 'DO NOT OBSTRUCT' free and clear whilst in use. Obstruction or covering of this area may interfere with GNSS reception.

5.2.1 LED Indications on Activation

TYPE	LED SEQUENCE		STATUS	WHEN
Visual Aid to Location		1x strobe & infra-red* flash	These flashes will aid Search and Rescue to pin-point your precise location when in range.	Once every 2.5 seconds >10% battery
Visual Aid & Low Battery Warning		1x amber, strobe and infra-red* flash	An amber flash will precede the strobe and infra-red flash every 2.5s when the M200 has less than 10% battery life remaining.	Once every 2.5 seconds <10% battery
Receiver Status Indicator		DSC receiver: 2x amber flashes **121.5MHz: 1x green or amber	Two amber flashes indicate the DSC receiver is in standby mode while DSC transmissions are being sent. The third flash denotes the 121.5MHz homing transmission status: green indicates active, amber indicates standby mode	Once every 5 seconds
		DSC receiver: 2x green flashes **121.5MHz: 1x amber flash	Two green flashes indicate the DSC receiver is on and awaiting a DSC acknowledgement after a DSC transmission is sent. The third flash indicates the 121.5MHz homing transmitter is in standby mode.	
		DSC receiver: 2x blue flashes **121.5MHz: 1x green flash	Two blue flashes indicate a DSC acknowledgement has been received. No further DSC transmissions will be sent. The third flash indicates that the 121.5MHz homing transmitter is active.	
GNSS Search/Fix		1x cyan flash	A cyan flash will occur every 5 seconds whilst the M200 is searching for a GNSS location fix.	Once every 5 seconds
		3x cyan flashes	Three cyan flashes will occur when a new or updated GNSS location fix has been obtained.	Once at GNSS Fix
AIS Transmit		2x green flashes	Two green flashes will occur during each AIS transmission that includes a GNSS location fix	8 times every minute
		2x red flashes	Two red flashes will occur during each AIS transmission that does not include a GNSS location fix.	

***Infra-red light is not visible by sight

****** Class M DSC devices are required to turn on and monitor the DSC channel for acknowledgements for five (5) minutes after each DSC transmission. The 121.5MHz Homer transmitter cannot operate during this period.

Cont.

TYPE	LED SEQUENCE		STATUS	WHEN
DSC Transmit Open Loop		4x green flashes	Four green flashes will occur during a DSC open loop transmission (to all ships) that includes a GNSS location fix.	Once every 5 minutes for first 30 minutes, then once every 10 minutes***
		4x red flashes	Four red flashes will occur during a DSC open loop transmission (to all ships) that does not include a GNSS location fix.	
DSC Transmit Closed Loop		1x long green flash	One long green flash will occur during a DSC closed loop transmission (to own vessel only) that includes a GNSS location fix.	Once every 5 minutes for first 12 minutes then reverts to Open Loop****
		1x long red flash	One long red flash will occur during a DSC closed loop transmission (to own vessel only) that does not include a GNSS location fix.	

***DSC transmissions will continue until a DSC acknowledgement is received, the unit is deactivated or the battery is depleted.

****Closed Loop DSC transmissions will automatically revert to Open Loop DSC transmissions after 12 minutes if no DSC acknowledgement is received from own vessel (the manually programmed MMSI number - see section 3.3).

5.3 Deactivation

To manually deactivate your M200 after use or if it is accidentally activated, press and hold the TEST/OFF Key until the red LED flashes twice, then release.

5.4 Rewinding the antenna

- Use the small grey Antenna Rewind tool supplied with the M200.
- Bend the M200 antenna so that the end can be viewed through the circular opening from above the M200.
- Slot the Antenna rewind tool into the circular opening so that the antenna end is locked into the rewind tool.
- Rotate the tool anti-clockwise until the antenna is fully wound.
- Whilst holding the antenna in place with the tool, replace the grey activation slider and then remove the tool.

⚠ **If the M200 has activated when replacing the grey slider, then deactivate immediately by pressing and holding the TEST/OFF Key until the red LED flashes twice, then release.**

⚠ **Rotating the antenna rewind tool in the clockwise direction may result in damage to the antenna.**

5.5 False Alerts

If the M200 has been accidentally activated for longer than approximately 25 seconds, it should be immediately turned off and the nearest Coast Guard Centre or Rescue Coordination Centre should be contacted to explain that the M200 Man Overboard device has been activated in error and there are no follow up rescue actions required. If appropriate, make a call on a VHF radio to announce the same information.

5.6 Message Reception

MOB AIS message display will depend on the reception equipment being used. AIS enabled plotters will either display a ship or AIS Man Overboard target with the M200 unique self ID. The DSC radio will display a DSC alert with the M200 unique self ID.

6. TESTING

In the event of a test failure, repeat the test. If the test failure reoccurs, contact Ocean Signal at help@oceansignal.com.

Routine testing of your M200 is recommended to ensure it is in good working order. Please follow the guidance on the frequency that tests should be carried out. Each test will reduce the battery capacity slightly and reduce the operation time of your M200 during an emergency.
The M200 will automatically shut down at the end of each test, indicated by the red LED flashing twice.

6.1 Functional, Homer and DSC Test

This test should be carried out once a month throughout the lifetime of an installed battery.

An MMSI number must be programmed into the M200 before commencing this test and the target radio must be within range.

To test your M200 is functioning correctly, press and hold the TEST/OFF Key. After one second the red LED will start to flash indicating that the Functional and DSC Test Mode is activated. The key may now be released.

After the TEST/OFF key is released the M200 will send out three homer 121.5MHz swept tone transmissions at a reduced power level. These audible tones may be heard on a compatible radio receiver if positioned in close proximity.

The 121.5MHz test transmission is sent at a reduced power level in order to comply with European regulations. This test transmission power level may be increased if testing outside of Europe. See section 3.4 for details.

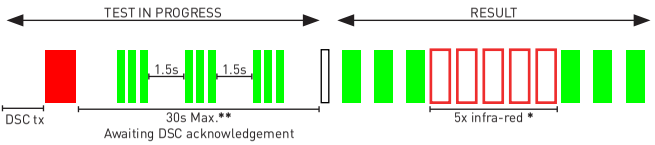
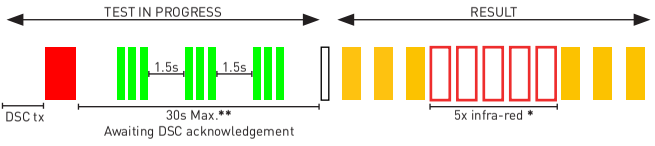
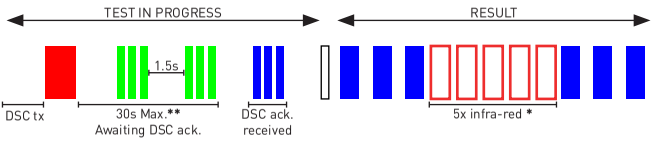
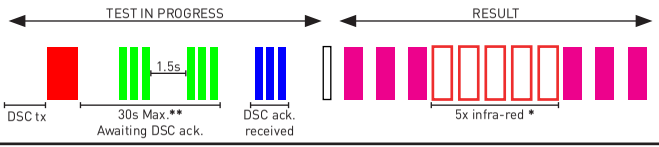
Following the 121.5MHz transmissions, A DSC test transmission will then be sent to the MMSI number programmed into your M200, see section 3.3. This test DSC transmission will be indicated on the M200 by a long red flash followed by 3 green flashes every two seconds until an acknowledgement is received from the target radio.

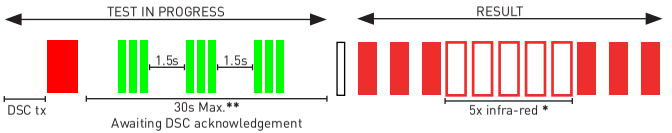
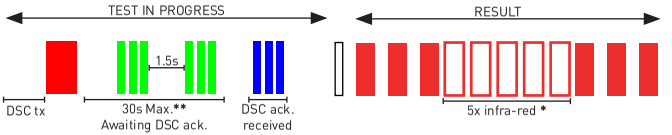
At the end of the test, the strobe will flash and the indicator LED will produce a flash sequence. This flash sequence indicates the pass/fail result. The following table provides full details of the possible flash sequences and their meaning.

6.1.1 LED indicator table colour key.

LED COLOUR		LED COLOUR	
	GREEN		MAGENTA
	RED		STROBE
	AMBER		INFRA-RED
	BLUE		(**NOTE**: Infra-red light is not visible by sight)

6.1.2 LED indications on DSC test

LED SEQUENCE	RESULT
	**GREEN** DSC transmission success. No DSC acknowledgement received. Battery Full
	**AMBER** DSC transmission success. No DSC acknowledgement received. Battery used for over 1hr and requires replacement.
	**BLUE** DSC transmission success. DSC acknowledgement received. Battery full.
	**MAGENTA** DSC transmission success. DSC acknowledgement received. Battery used for over 1hr and requires replacement.

LED SEQUENCE	RESULT
	**RED** DSC transmission sent. No DSC Acknowledgement received. Test Failure. View test result data using NFC and Mobile App.
	**RED** DSC transmission sent and Acknowledgement received. Test Failure. View test result data using NFC and Mobile App,
	**RED** No MMSI configured. Test cannot be completed.

***** Infra-red light is not visible by sight.

****** The duration between DSC transmission and DSC acknowledgement is determined by the response time from the DSC VHF radio and not the M200.

In the event of a test failure, contact Ocean Signal Ltd for advice at help@oceansignal.com

Battery replacement must be carried out at an Ocean Signal authorised battery replacement centre. Visit www.oceansignal.com for a list of authorised centres.

6.2 AIS and GNSS Test

This test should be carried out no more than once a year throughout the lifetime of an installed battery.

This test should only be performed where the M200 has a clear and unobstructed view of the sky. This is required to allow the GNSS receiver to acquire a signal from sufficient satellites to allow it to determine a position. Keep area marked 'DO NOT OBSTRUCT' free and clear.

To initiate an AIS transmission and GNSS test, press and hold the TEST/OFF Key. After one second the red LED will start to flash. After a short while (approx. 5 seconds), the red LED will remain on and steady, indicating that the AIS and GNSS Test Mode is activated. The key can now be released.

The M200 is limited to 10x AIS and GNSS tests over the lifetime of the installed battery. In the event that all tests have been previously used and there are none available, the red LED will flash repeatedly upon release of the TEST/OFF key, then shut down.

Contact Ocean Signal for advice at help@oceansignal.com.

After the TEST/OFF key is released the LED will produce a cyan flash every five seconds whilst the M200 is searching for a GNSS location fix.

At the end of the test, the strobe will flash and the indicator LED will produce a flash sequence. This flash sequence indicates the pass/fail result.

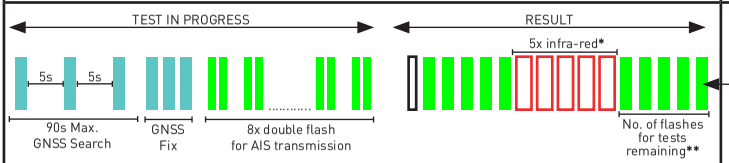
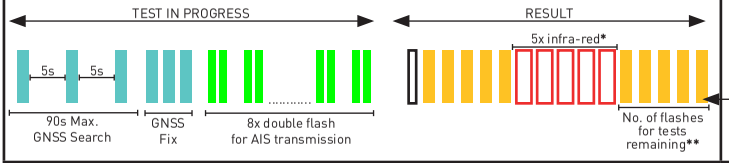
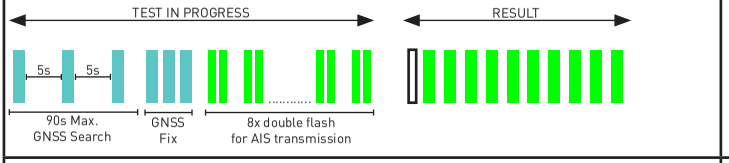
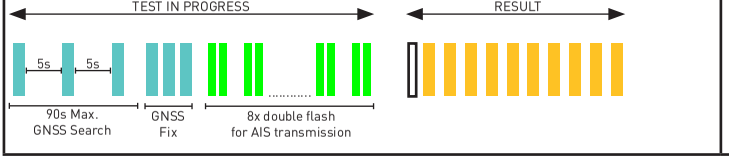
In the event of a test failure, repeat the test. If the test failure reoccurs, contact Ocean Signal Ltd for advice at help@oceansignal.com.

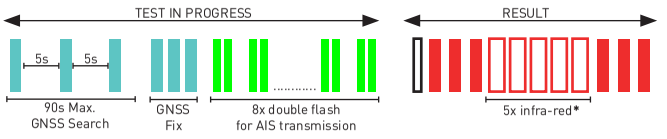
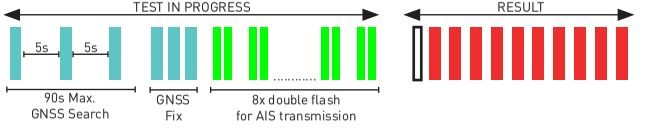
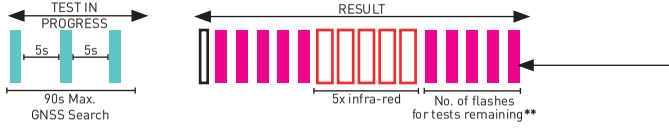
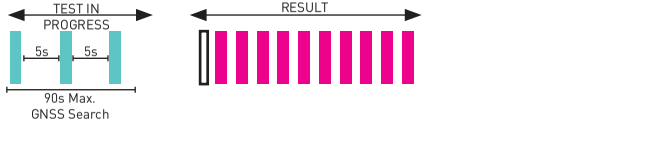
Batteries should be replaced at an authorised battery replacement or service centre.
See www.oceansignal.com for details.

6.2.1 LED Indicator Table Key.

LED COLOUR		LED COLOUR	
	GREEN		MAGENTA
	RED		STROBE
	AMBER		INFRA-RED
	CYAN		(**NOTE**: Infra-red light is not visible by sight.)

6.2.2 LED Indications on GNSS and AIS Test

LED SEQUENCE	RESULT
	**GREEN** Test Successful. Battery Full. **No. of flashes reduces as no. of tests remaining decreases.
	**AMBER** Test Successful. Battery used for over 1hr and requires replacement. **No. of flashes reduces as no. of tests remaining decreases.
	**GREEN** Test Successful. Battery Full. This was the last available test. No further tests remaining.
	**AMBER** Test Successful. Battery used for over 1hr and requires replacement. This was the last available test. No further tests remaining.

LED SEQUENCE	RESULT
	**RED** Test failure. View test result data using NFC and Mobile App.
	**RED** Test failure. View test result data using NFC and Mobile App. This was the last available test. No further tests remaining.
	**MAGENTA** Test failure. No GNSS fix. **No. of flashes reduces as no. of tests remaining decreases.
	**MAGENTA** Test failure. No GNSS fix. This was the last available test. No further tests remaining.

*Infra-red light is not visible by sight.

** No. of flashes indicates how many tests are remaining.

5 flashes = 5 (or more) tests remaining, 4 flashes = 4 tests remaining, 3 flashes = 3 tests remaining, and so on.

7. APPENDIX

7.1 Maintenance and Troubleshooting

Your M200 should not need servicing during its lifetime, with the exception of changing the battery before the marked expiry date. Battery replacement must be carried out at an Ocean Signal authorised battery replacement centre.

Regular cleaning, inspection and testing are advised. Clean any grime or salt residue from the unit with a weak solution of detergent in warm water. Never use solvents as this may affect the structural integrity of the plastics used. Rinse well with fresh water after cleaning and dry thoroughly.

Inspect the units for signs of case damage or cracks. Check the labels are intact and the battery is within the expiry date. Ensure the antenna is free to extend and in good condition.

Check for correct M200 operation using the available test modes (section 6). If the unit appears to fail testing, contact a service representative at Ocean Signal Ltd. See www.oceansignal.com for full contact details.

7.2 Batteries

The M200 uses a lithium manganese dioxide battery pack to power the device. These batteries have a five year storage life before any significant reduction in capacity. Each M200 product is marked with a battery expiry date, located on the rear of the unit.

The battery must be replaced either prior to the expiry date or after the M200 has been used, even if only activated for a short period of time. Battery replacement must be carried out at an Ocean Signal authorised battery replacement centre.

⚠ **The battery should be replaced before the expiry date has passed to ensure reliable operation and full capacity in emergency situations.**

⚠ **Always use an Ocean Signal authorised battery replacement centre when a battery change is required. Failure to do so will invalidate type approval and warranty and may also mean that the unit does not operate correctly in a distress situation.**

⚠ **Never dispose of the M200 or its batteries in a fire.**

⚠ **Never attempt to remove, puncture of dismantle the battery.**

⚠ **Never attempt to charge the battery.**

⚠ **Extreme temperature caused by failure to observe the above warnings may cause the battery to explode or catch fire, which can result in injury or damage to surrounding personnel or property.**

⚠ **Dispose of used products and its included batteries in a responsible manner. National and local regulations on battery disposal may apply including restricting the disposal of the batteries within this product in domestic refuse.**

7.3 Battery Safety Information

Manufacturer name: LB9M
Volts: 6.0V nominal
Approximate weight: 34g
Chemical System: $LiMnO_2$
Lithium weight/cell: 0.55g
Total lithium weight/battery: 1.1g
Rechargeable: No

For information regarding the physical and chemical properties, the potential health and safety measures and the environmental effects of the battery used with this product, refer to the Product Safety Data Sheet which can be viewed or downloaded directly from the Ocean Signal website, www.oceansignal.com.

7.4 Handling and Storage

This product should be stored in a cool and well ventilated area. Elevated temperatures can result in a reduction of battery life.

Avoid accidentally short-circuiting batteries. Prolonged short-circuiting can cause the battery temperature to rise and significantly reduce battery life.

7.5 Transportation

The M200 battery module (LB9M) has been tested in accordance with subsection 38.3 of part III of the UN Manual of Tests and Criteria. Test reports are available from Ocean Signal on request.

The M200 Man Overboard device should be transported by air in accordance with the IATA dangerous goods regulations: class 9, UN3091, proper name "Lithium metal batteries contained in equipment" and should be packed in accordance with packing instruction 970, section II.

The M200 Man Overboard device can be carried as personal luggage on board aircraft under the conditions of the clause 2.3.5.8. of the IATA Regulations.

7.6 Accessories

M200 Survival Suit Fitting Kit ..... Part Number: 743S-06134
M200 Fittings Pack ..... Part Number: 743S-05981

7.7 Specifications

AIS Transmission

Transmit Power Nominal (EIRP) ..... 1 Watt
Frequency ..... 161.975/162.025MHz ±500Hz
Baud Rate ..... 9600 Baud
Synchronisation ..... UTC
Messages ..... Message 1 (position) , Message 14 (MOB Status)
Repetition Interval ..... 8 messages /minute
..... Message 14 sent twice every 4 minutes

DSC Transmission

Transmit Power Nominal (EIRP) ..... 1 Watt
Frequency 156.525MHz
Messages ..... Individual Distress Relay
..... All Ships Distress Alert
Message Repetition ..... Once every five/ten minutes
Baud Rate ..... 1200 Baud

121.5MHz Homing Transmission

Transmit Power (PERP) 25-100mW
Frequency 121.5MHz
Modulation ..... Swept Tone AM (3K20A3X)
Modulation Factor 0.85-1.0
Modulation Duty Cycle ..... >35%
Frequency Stability ..... ±10ppm
Duty Cycle (when active) 50%

NFC

Frequency 13.56MHz

Visible light Strobe

Light Type ..... High Intensity LED
Light Colour ..... White
Intensity ..... >1 Candela
Flash Rate ..... 24 per minute

Infra-Red Strobe

Light Type ..... IR LED
Light Colour 850nm
Intensity Nominal 1.5mW/sr
Flash Rate ..... 24 per minute

Battery

Type ..... Lithium Manganese Dioxide($LiMnO_2$)
Operating Lifetime ..... >12 hours @ -20°C (-4°F)
Lithium Metal Weight (for air transport) ..... <2g per battery
Replacement Interval ..... 5 years

GNSS Receiver

Satellite Channels	72 Acquisition
Sensitivity	-167dBm
Cold Start Re-acquisition	-148dBm
GNSS Antenna	Microstrip Patch

Environmental

Temperature Range (operational)	-20°C to +55°C
Temperature Range (storage)	-30°C to +70°C
Damp Heat (humidity)	40°C at 93%
Drop (hard surface)	1m: 6 sides
Designed to meet Drop (water)	20m
Waterproof	IP68, 10m depth for 1 hour
Thermal Shock	45°C into 100mm of water > 1 hour

Physical

Weight	119 grams
Dimensions	120mm x 48mm x 32mm
	74mm over bracket

7.8 Licensing (US Only)

Under the rules of 47 C.F.R Part 95, licensing or registration of MSLD devices is not required. MSLDs are not authorised to be used on Land.

7.9 Approvals

7.9.1 European Declaration of conformity

Ocean Signal Ltd. declares equipment type safeSEA M200 is in compliance with Dir. 2014/53/EU. https://
https://www.oceansignal.com/products/M200/RED-DofC/

The safeSEA M200 is compliant with regulation ECC/DEC/(22)02 regarding the use of Class M MOB devices.

⚠ **The following statement is for US customers only: This device has not been authorized as required by the rules of the Federal Communications Commission. This device is not, and may not be, offered for sale or lease, or sold or leased, until authorization is obtained.**

7.10 Warranty

7.10.1 Limited Warranty

Your Ocean Signal product is warranted against manufacturing defects in materials and workmanship for a period of two years from the date of purchase and in accordance with the following conditions:

Ocean Signal will at its discretion, repair or replace faulty product free of charge excluding the cost of shipping. Proof of purchase from the original purchaser shall be required in order for a warranty claim to be valid. All claims shall be made in writing to Ocean Signal Ltd. or an approved service dealer or distributor.

Ocean Signal shall not be liable to the buyer under the above warranty:

- for any repairs or modifications carried out on the product using parts that are not supplied or approved by the manufacturer Ocean Signal, including batteries and for work carried our other than by Ocean Signal or approved service dealers.
- for any part, material or accessory that is not manufactured by Ocean Signal, the consumer will be covered by the guarantee / warranty offered to Ocean Signal by the manufacturer or supplier of such a component.
- for product which has not been fully paid for.
- for any product supplied by Ocean Signal to a customer under an alternative warranty or commercial agreement.
- for the cost of shipping product to and from the customer.

The battery is only warranted until the date of expiry and provided that it is tested in accordance with the information provided within this user manual as noted by the electronic witness stored within the product.

The following specific item is excluded from this warranty:

- damage to the antenna.

This warranty does not affect your statutory rights.

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