

MARPORT | PRO

2024

USER MANUAL

SPEED NAVIGATOR

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Legal

History

V1	12/30/22	First release
V2	02/26/24	<ul style="list-style-type: none">• Updated guidelines on the Down frequency settings for XL bottles in Configuring the Echo Sounder (on page 23).• Updated guidelines on the detection threshold settings in Configuring the Echo Sounder (on page 23).

Copyright

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Disclaimer

Marport endeavors to ensure that all information in this document is correct and fairly stated, but does not accept liability for any errors or omissions.

Introduction & Presentation

Introduction and Presentation

Get a basic knowledge of the sensor.

Introduction

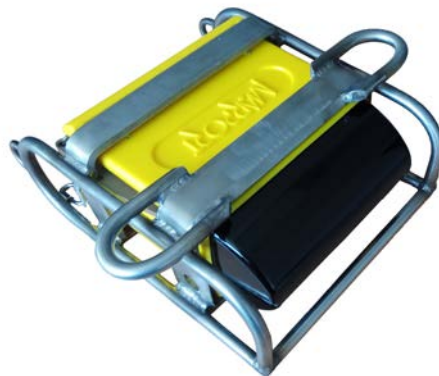
Marport's Speed Navigator is a high-definition net sounder, designed to operate on the trawl headline and tunnel.

It measures the speed of the water flow in two axis: the flow along the direction of the trawl and across it. This way, you can monitor if the trawl is moving at the right speed and with the right geometry. It measures along speed up to 6 knots and cross currents speed up to 3 knots. It also track pitch, roll, depth and temperature data.

The high-definition echogram images allows you to see fish passing through the trawl and have an overview of the trawl opening.

In order to efficiently follow the trawl descent, echogram ranges are configurable from 5 to 160 meters. Moreover, the sensor includes an automatic range mode: the sensor can automatically switch to lower ranges of 20, 10 and 5 meters to get sharper pictures, proving to be particularly useful when fishing close to the bottom.

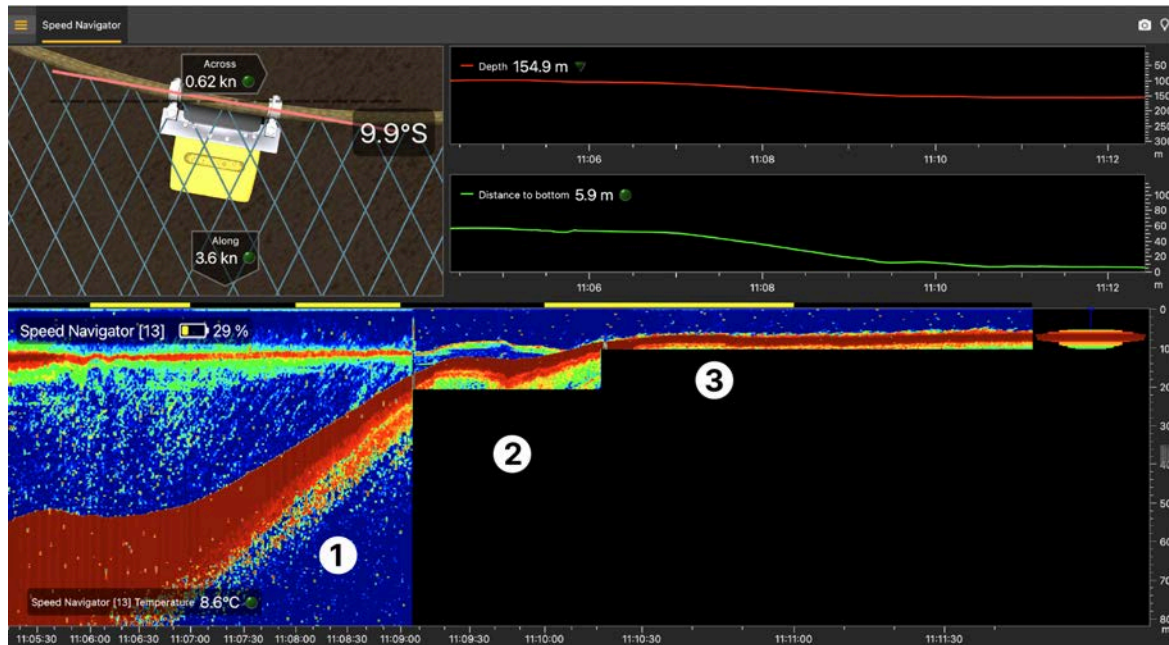
Optionally, the sensor can also measure the temperature, depth, pitch and roll.



Applications

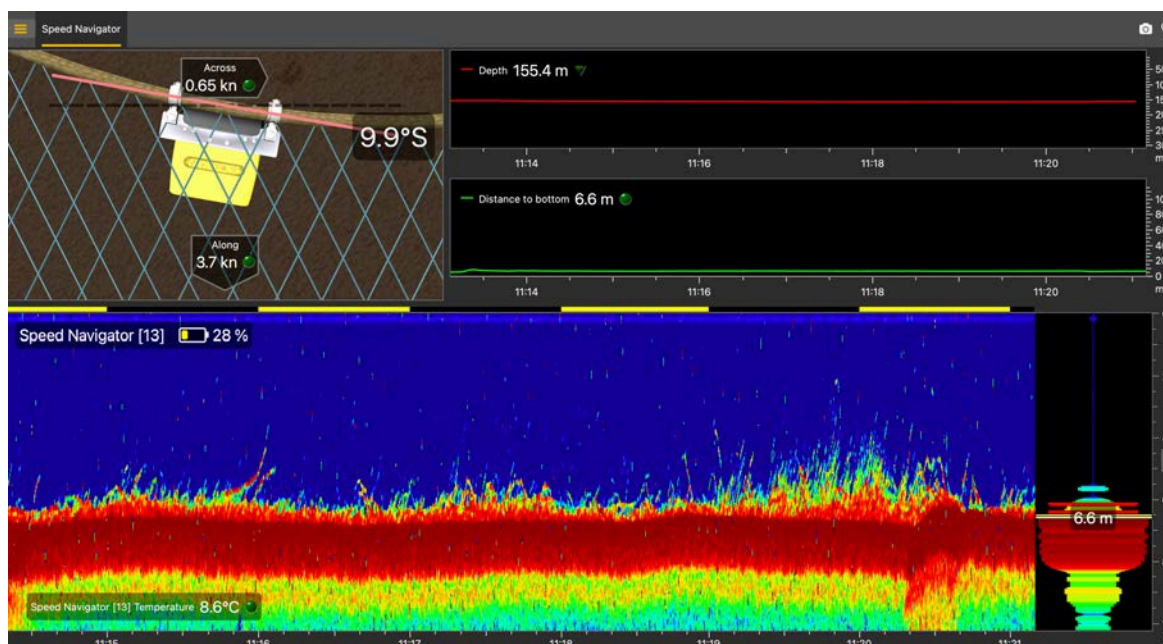
Examples of data received and displayed in Scala2 application.

Below is an example of data received from the sensor. The autorange mode is activated, so the sounding range changes to 20, then 10 meters as the sea bottom gets closer. See **About the Automatic Range Mode (on page 25)** for more details about this mode.



1. Maximum range (80 m) / **2.** Switch to a 20-meter range / **3.** Switch to a 10-meter range

Example of higher quality echogram images when the range reduces automatically, here to 10 meters.



Safety Guidelines

- ! **Important:** To ensure proper and safe use of this equipment, carefully read and follow the instructions in this manual.

Description

System Compatibility

The Speed Navigator is compatible with the following versions of Marport's software and equipment.

Mosa2	02.11.10 or later
Scala2	02.10.03 or later
Mx receiver firmware	08.05.03 or later
Dock	01.01.01 or later

Firmware and Features

This section describes the firmware and features that must be configured on MASP to set up the sensor.

To be operational, the sensor needs to be configured with two files:

- a firmware file (*.A2F): it is the firmware of the sensor,
- an application file (*.A2A): it defines the sensor features and options.

These files are generated via MASP.

Firmware

The latest version of the firmware is available for download on MASP.

Compatibility: F450-02.02.02 and after

Features and Options

The features and options are configurable according to the type of hardware and customer's choices.

Features	<ul style="list-style-type: none">• Product name: Manually entered.• Application: Speed Navigator or Speed Navigator Reversed• Body: Tets• Battery capacity (not configurable): 2-pack
Sounding Options (non-editable)	<ul style="list-style-type: none">• Up• Down
Misc. options	<ul style="list-style-type: none">• SD Card Log: records a log of the sensor activity. This option is useful for troubleshooting support.

Measures	<ul style="list-style-type: none"> • Battery (always activated) • Across Speed (always activated) • Along Speed (always activated) • Pressure (depth) • Temperature • Pitch • Roll
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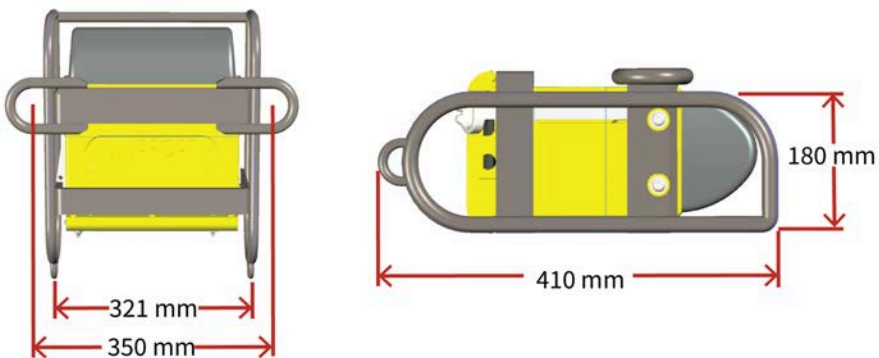
Technical Specifications

Uplink frequency	30 to 60 kHz
Range to vessel	up to 2500 m*
Data update rate	<ul style="list-style-type: none"> • 5-meter range: Echogram @0.16 s - temperature, depth, pitch, roll, battery level, along speed, across speed @8.07 s • 10-meter range: Echogram @0.31 s - temperature, depth, pitch, roll, battery level, along speed, across speed @8.82 s • 20-meter range: Echogram @0.63 s - temperature, depth, pitch, roll, battery level, along speed, across speed @8.79 s • 40-meter range: Echogram @0.84 s - temperature, depth, pitch, roll, battery level, along speed, across speed @5.84 s • 80-meter range: Echogram @0.89 s - temperature, depth, pitch, roll, battery level, along speed, across speed @6.22 s • 160-meter range: Echogram @0.99 s - temperature, depth, pitch, roll, battery level, along speed, across speed @6.99 s
Depth range	up to 1800 m
Depth resolution	0.1 m with 0.1% full scale accuracy
Echogram range	5 (auto) / 10 (auto) / 20 (auto) / 40 / 80 / 160 meters
Pitch and roll range	-180° to +180°
Pitch & roll accuracy	+/- 1°
Temp measurement range	-5° C to +25° C
Temp accuracy	±0.1° C
Across speed range	Up to ± 3 knots

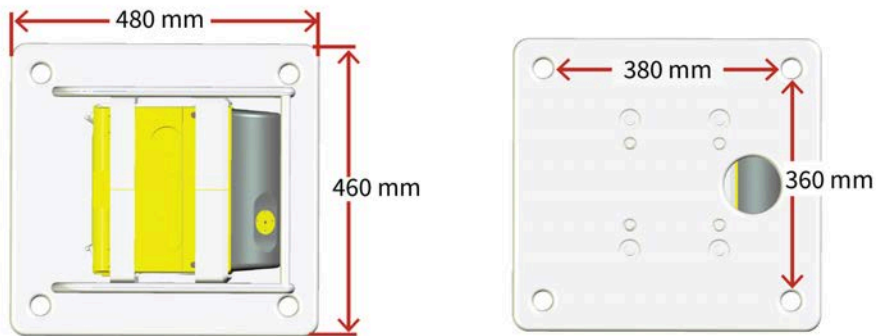
Along speed range	Up to ± 6 knots
Battery type	Lithium-Ion
Weight of sensor + protection cage in air	22.4 kg
Weight of sensor + protection cage in water	13 kg
Warranty	2 years (Sensor & Battery) **

*Reference only. Depends on communication settings and transmission conditions /
† Depends on sensor uplink power and options. Lifetime has been estimated with a
uplink power at 33%. / ‡ Based on average charging time. / **Marport Standard Marine
Limited Warranty

Dimensions

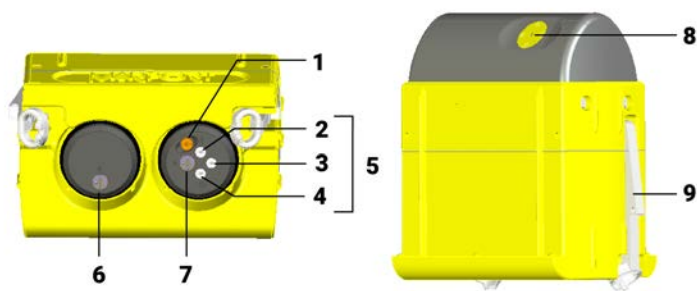


Setup with a board for a reversed installation:



Main Parts

External View



1. Temperature sensor

2. Negative charge

3. Water switch

4. Positive charge

5. Shoulder bolts

6. Pressure-relief spring

7. Pressure sensor

8. EM log pins


9. Latch

Sensor Configuration

Sensor Configuration

Learn how to configure the sensor settings.



Note: To configure the sensor on Mosa2: Press command + A or click **Menu**  and click **User Mode > Advanced**

Connecting the Sensor to Mosa2

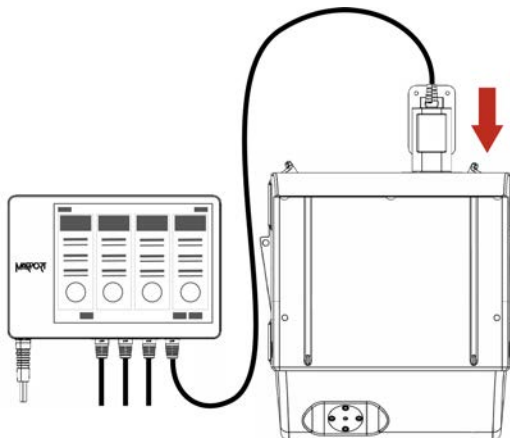
To configure the sensor, you need to connect it to Mosa2 application, using either the Dock or the Configuration Cable.

Using a Dock Charger Plug

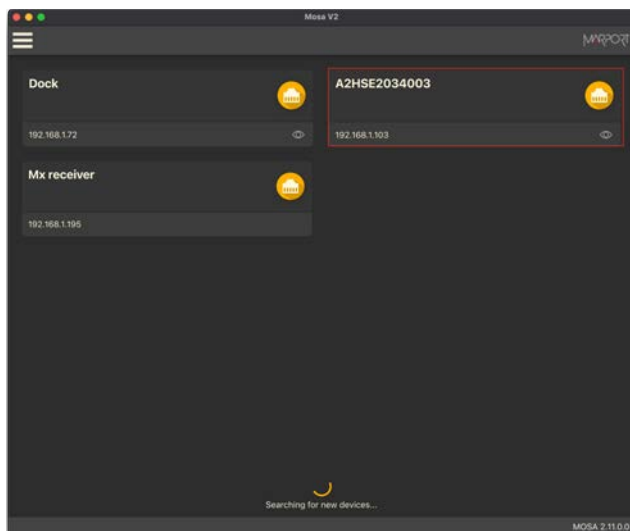




Tip: Refer to Dock user manual to have more details about the use of this product.

1. Connect one Dock charging plug to the sensor's endcap.



2. Mosa2 discovery page opens. The sensor is displayed.



- Click  to open the sensor configuration page.
- Click  to show the deploy animation on the charger plug for 30 seconds.

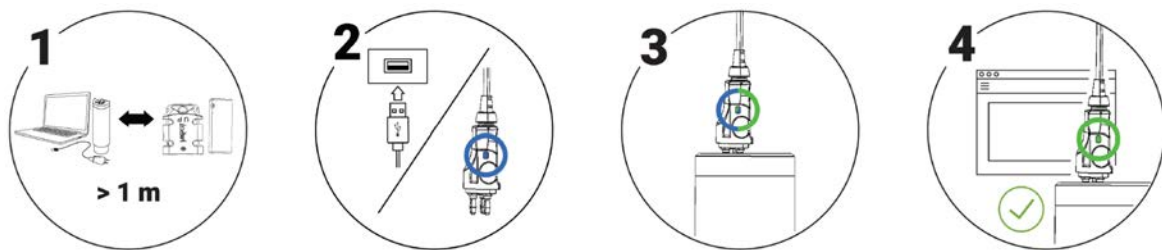
Using the Configuration Cable

Connect the Configuration Cable from the computer to the sensor to display the sensor configuration page on Mosa2.





Tip: Refer to the Configuration Cable Quick Reference Guide available on our website for more details about the use of this product.

1. Move other electrical devices minimum 1 m away from the computer.
Mosa2 opens automatically and the startup wizard is displayed. The LED on the plug is solid blue.
3. Connect the three-pin plug to the sensor.
The LED on the plug blinks alternatively blue and green.
4. Wait a few seconds. The configuration page of the sensor is displayed on Mosa2.
The LED on the plug is solid green.

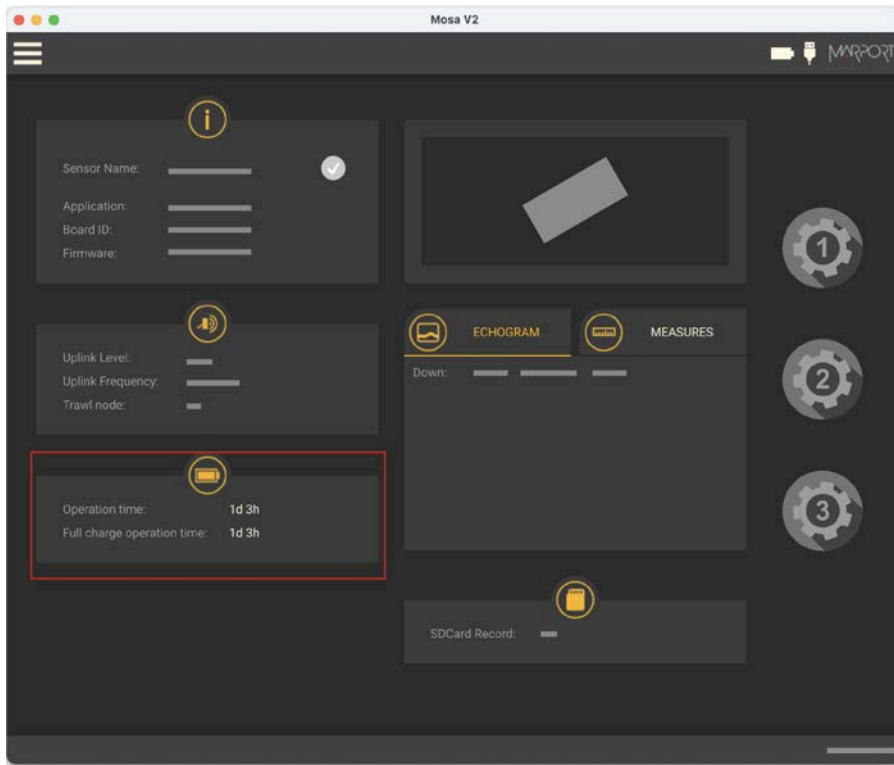


You can now configure the sensor.

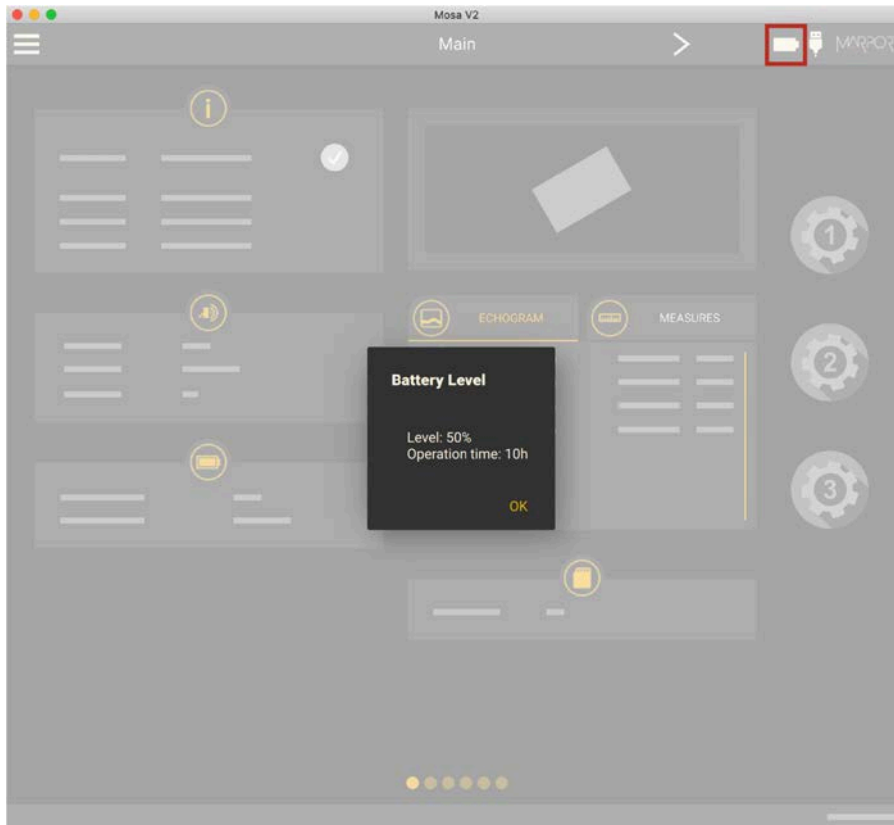
 **Note:** You can keep the Configuration Cable continuously connected by USB, and virtually eject or connect it. When no sensor is connected to the Configuration Cable, click **Menu**  > **Eject Config Plug** or **Connect Config Plug**. When ejected, you come back to the discovery page. It stays disconnected until you virtually connect to it or manually disconnect then connect it.


Battery Information

The battery lifetime is displayed on the first page.




You can also check the battery level at anytime from the top bar:

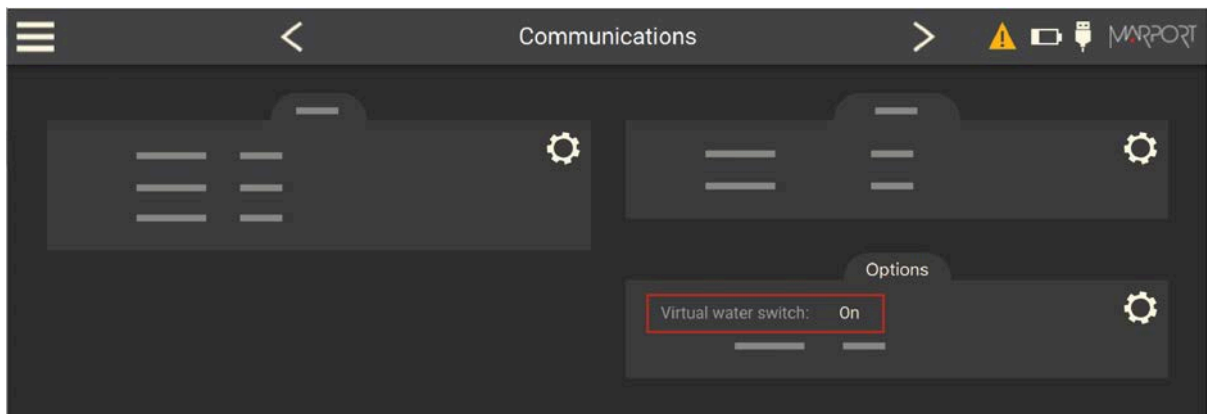


-  **Note:** When you change settings such as the uplink power or sounding range, it affects the battery consumption and remaining lifetime. The battery information will update after the sensor has been switched on and operating for 10 minutes.

About the Virtual Water-Switch Option

Mosa2 has a virtual water-switch option that changes the conditions under which the sensor is running.

-  **Note:** The virtual water switch is available only for the **Pro** line of sensors (PCBA A2S Gen 2 and later, and all A2H versions). It is activated by default.



- When the virtual water-switch is activated: the sensor runs when the depth is more than 2 meters and the water-switch is in contact with water. We recommend to activate it to prevent the sensor from running outside water. For example, if the sensor is hauled on deck and stays inside the net, the water-switch remains wet and keeps emitting. This will significantly reduce the battery life-time.



Note: When activated, an orange warning icon is displayed in the top bar.



- When the virtual water-switch is deactivated: the sensor runs only when the water-switch is in contact with water. The depth is not taken into account. We recommend to deactivate it if the sensor is operating close to the surface or if you need to test the sensor in the office.

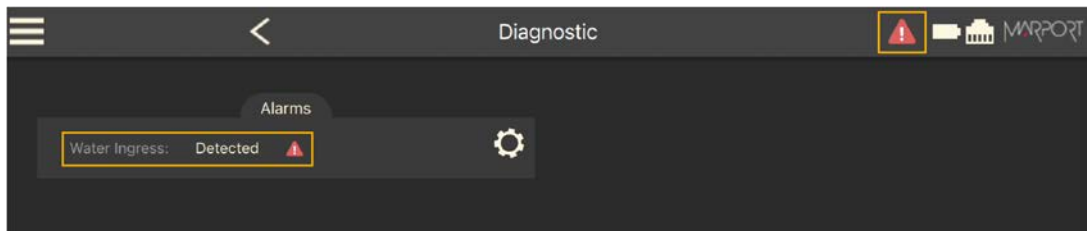
Diagnostic Information

Scala2 and Mosa2 applications warn the user in case of water ingress in the sensor.

- **Note:** Diagnostic information is available for Marport Pro sensors (A2S and A2H PCBA versions), from the firmware version **F450-02.02.00 or later** and Mosa2 version **02.11.08**.

In case of water ingress in the sensor, alarms are displayed in Scala2 Virtual Charger Room, in Mosa2 and on the charger plug when connected to the sensor.

- Mosa2 displays a dialog at the start of the application and warning icon in the toolbar and diagnostic page:



- The charger plug displays a warning icon:



When the alarm appears, take the sensor out of water immediately and contact Marport support.

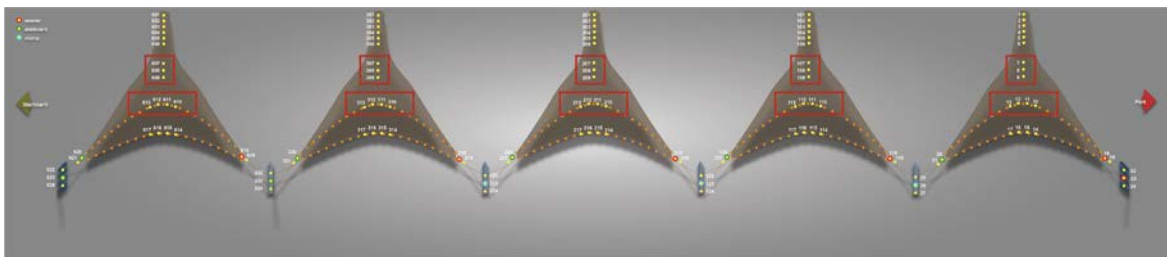
- **Warning:** In case of water ingress in the product, do not charge it: battery may vent or rupture, causing product or physical damage.


Configuring the Trawl Node

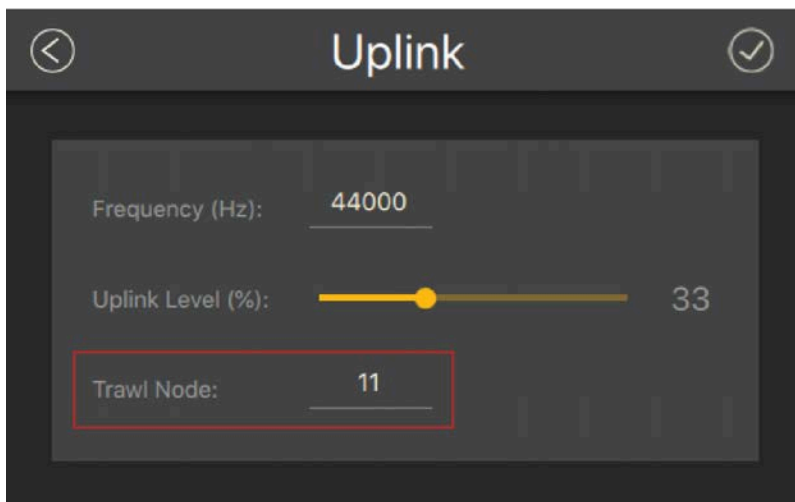
You need to give a trawl node to the sensor. It is the number corresponding to the position of the sensor on the trawl.


The trawl nodes corresponding to the positions on the headline and tunnel are the following:

Trawl number	Node numbers - Headline	Node numbers - Tunnel
Trawl 1	10 to 13	7 to 9
Trawl 2	110 to 113	107 to 109
Trawl 3	210 to 213	207 to 209
Trawl 4	310 to 313	307 to 309
Trawl 5	610 to 613	607 to 609



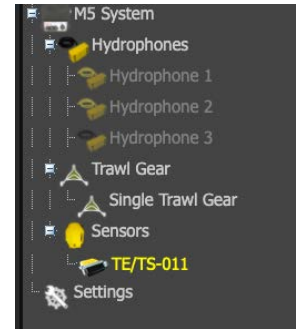
1. Go to the **Communications** page, then click  in **Uplink**.
2. Enter a node according to the position of the sensor on the trawl.



 **Important:** Make sure to put the same number when adding the sensor to Scala2 receiver page. If not, change it accordingly.



Add Sensor Product	
Add from Marport Sensor Configuration Tool	
1. Product Category	TE/TS
2. Product Name	Speed Navigator
3. Trawl Gear Location	011

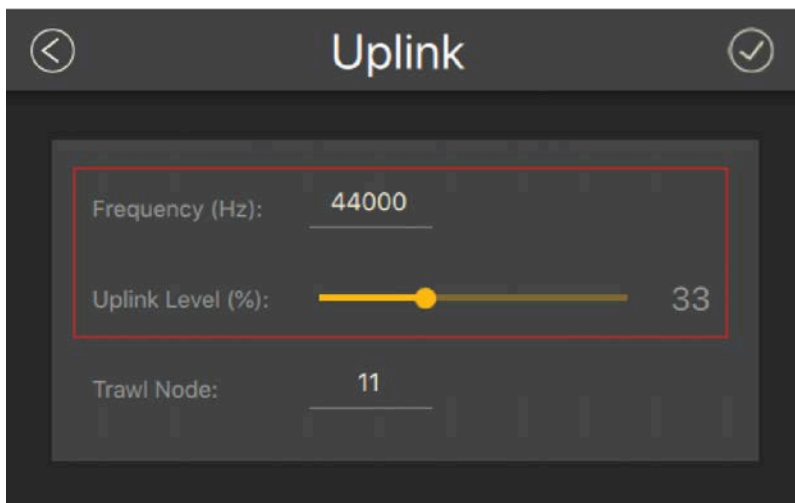


3. Click

Configuring the Uplink Frequency and Power

Configure the settings of the communication link between the sensor and the vessel.

1. Go to the **Communications** page, then click in **Uplink**.



2. Choose the communication protocol.
3. Enter a frequency for the communication with the vessel. Default is 44,000 Hz.
4. Drag the slider to change the power of the uplink signal.




Note: A higher level of uplink power reduces the battery lifetime.

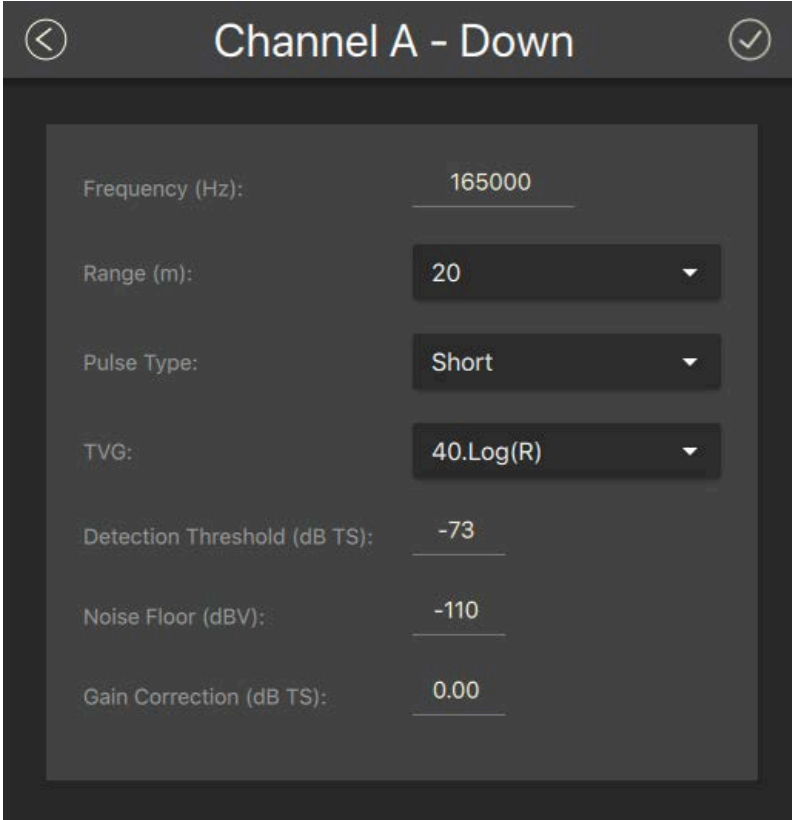
Recommended uplink powers	Conditions	Estimated battery life
33%	Works for most conditions.	23 hours
100%	<ul style="list-style-type: none"> • Sensor is far from vessel (e.g. more than 800 m depending on conditions, high depth) • High level of interferences • Issues receiving data • Low SNR 	-

Configuring the Echo Sounder

Configure the echo sounder settings of the Speed Navigator.

1. Go to the **Echo Sounder** page.
2. To select the direction of the sounding, click  in **Sounding Mode**, then choose a **Mode** between **Down** or **Up**.


3. Go back to the page, then click  in **Down Sounding** or **Up Sounding**, depending on the **Sounding Mode** that was configured.



Channel A - Down

Frequency (Hz):	165000
Range (m):	20
Pulse Type:	Short
TVG:	40.Log(R)
Detection Threshold (dB TS):	-73
Noise Floor (dBV):	-110
Gain Correction (dB TS):	0.00

4. Set the **Frequency (Hz)** at 165,000 Hz. If you notice noise on the echogram, you can put 210,000 Hz to not interfere with the uplink signal of the sensor or other sensors.
5. The **Range (m)** of the sounding is the maximum distance at which targets and bottom can be detected.

 **Note:** We recommend to set the maximum range value when using the automatic range in order to see the sea bottom as soon as possible.

6. The **Pulse Type** is automatically set, depending on the echogram range:
- 5 to 20 m: 100 μ s
 - 40 m: 200 μ s
 - 80 m: 300 μ s
 - 160 m: 500 μ s

7. Select a **TVG** setting to compensate the signal loss in water and have targets or sea bottom displayed in the same color on the echogram, whatever the distance from the sensor:
 - 20 log: focus on bottom or school of fish.
 - 40 log: focus on individual targets.
 - 30 log: compromise between the two above settings.
8. Set the **Detection Threshold (dB TS)** to -79 if you want to detect small targets. Otherwise, leave the default settings at -73 dB.
9. Do not change the other echo sounder settings.

About the Automatic Range Mode

The sensor has an automatic range mode that is useful to get better quality echograms when the trawl is close to the bottom.

Principle

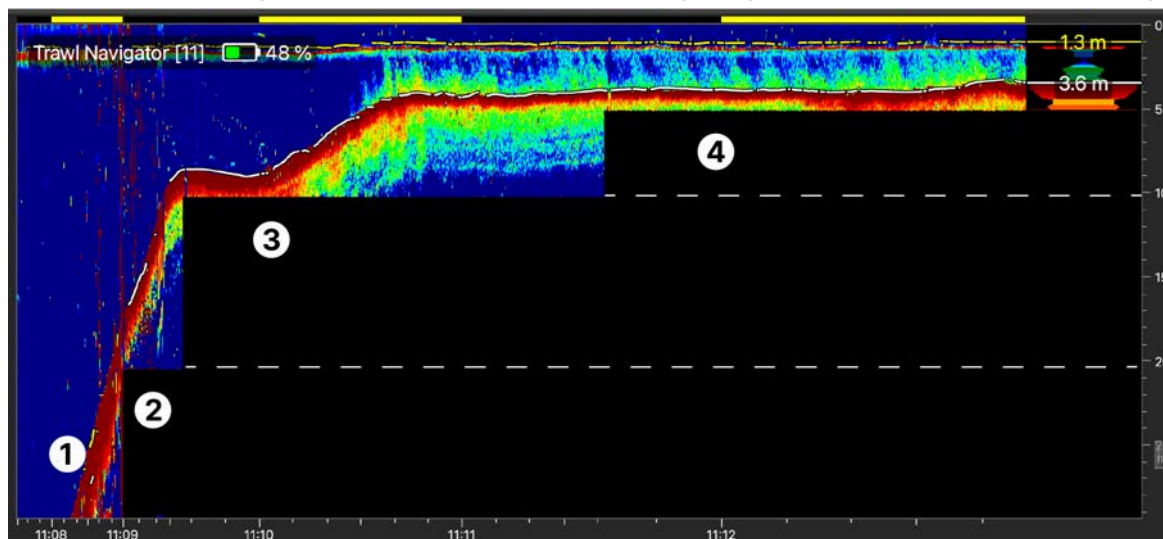
Range influences the display of echogram images. The smaller the range, the shorter the listening time and the better the quality of images. But if you set a bigger range, data arrives slower which results in poorer image quality.

You can activate the automatic range mode if you need to get better quality echograms when the trawl is close to the bottom. This mode is recommended when bottom trawling.

The echogram can automatically switch to a 20-meter range when the distance to the bottom is less than 20 meters, to a 10-meter range when the distance is less than 10 meters and to a 5-meter range when less than 5 meters.

The change of range depends on the settings configured on Mosa2.

The image below shows the range changing as the sensor gets closer to the sea bottom. The sensor is configured with a 40-meters sounding range and 1.5-meter trawl opening.




1. Maximum range / **2.** Switch to a 20-meter range / **3.** Switch to a 10-meter range / **4.** Switch to a 5-meter range

Mosa2 settings

The following **Sounding Mode** options must be set in Mosa2:

- **Automatic Range** must be activated.
- The **Mode** must be set to **Down only**.
- The **Trawl Opening**:
 - must be lower than 19 meters to be able to switch to a 20-meter range.
 - must be lower than 9 meters to be able to switch to a 10-meter range.
 - must be lower than 4 meters to be able to switch to a 5-meter range.

 **Note:** The trawl opening value sets the minimum distance to see inside the trawl. As a result, if the trawl opening distance is equal or higher than 19, 9 meters or 4, the sensor will not reduce the range respectively to 20, 10 or 5 meters.

See **Configuring the Echo Sounder (on page 23)** for details about Mosa2 settings.



Checking Speed Measures with EM Log Tester

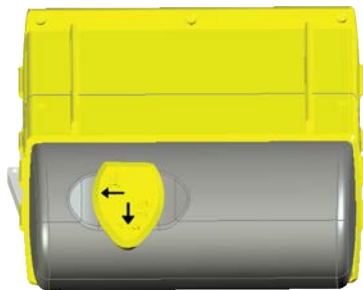
You can check the speed measures of the sensor using an EM Log tester.


- The speed of the sensor is calibrated.
- The sensor is connected to Mosa2.

If you do not have the EM Log tester, please refer to your local Marport sales office.

The EM Log tester is also useful to check that the sensor is still operational over time. You can check speed before every fishing campaign to make sure the sensor works properly.

1. From Mosa2, click **Menu**  > **Expert** and enter the password `copernic`.
2. Go to the **Measurements** page, then click  in **Speed**.
3. Put the EM Log tester on the EM Log pins according to the following picture. Make sure the 4 pins are correctly aligned and hold still the EM log.





-  **Tip:** You can place a double-face adhesive tape at the center of the four pins to stick the tester to the EM log pins.

4. Click **EMlog Test**.

The along speed must be between 2 and 3 knots for a standard installation (1.10 Along Gain) and 2.5 to 3.8 for a reversed installation (1.26 Across Gain), and the across speed must be between -3 and -2 knots.



-  **Troubleshooting:** If the along speed is negative and the across speed positive, it means that you placed the EM Log tester upside down.
-  **Troubleshooting:** If an error message says the offset and gain are incorrect or the EM log tester is broken, it may be because the EM log tester was not totally immobile during the test. Consider using double-face adhesive tape to stick the tester to the pins.

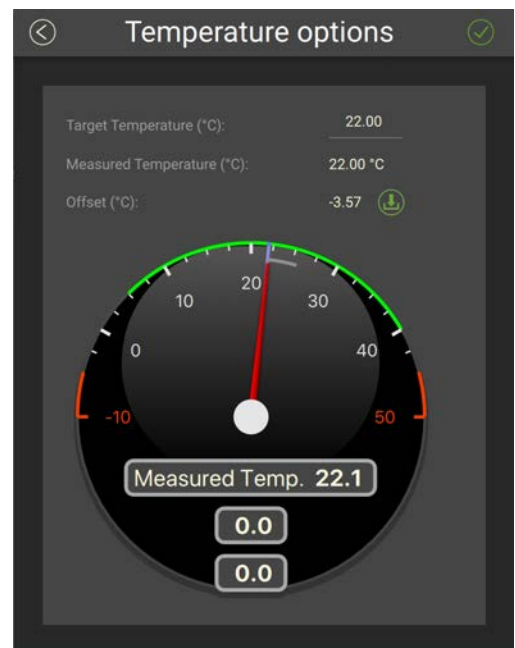
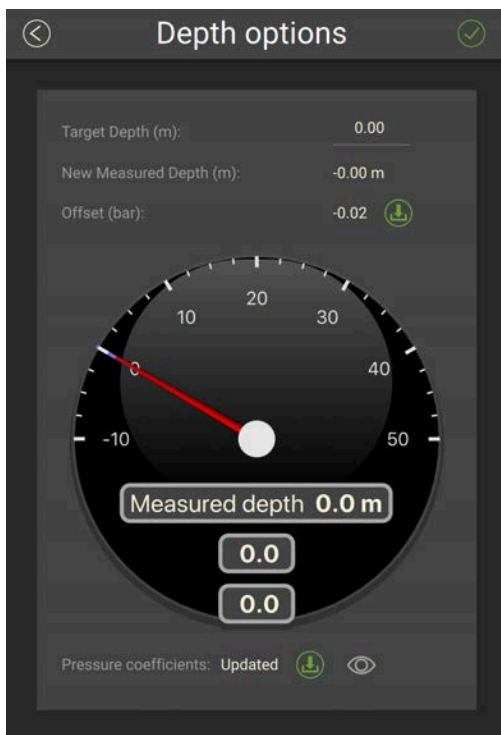
Applying Offsets to Measurements


You can apply offsets to temperature and depth measurements if the measured values does not correspond to the environment of the sensor.

1. Go to **Measurements** page and click  next to depth or temperature to apply offsets.

2. Enter a target value. Click .

The measured value becomes the same as the target value. The value of the offset is displayed.



3. If you need to reuse offsets from a previous configuration, click  then select the configuration file (*.A2C).

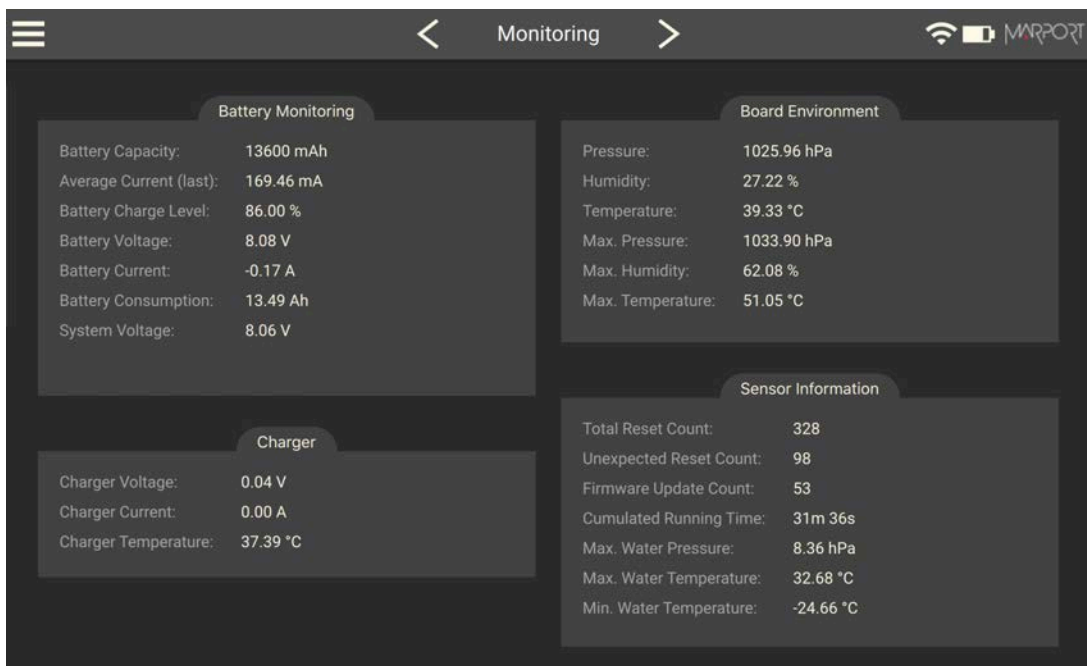
Testing Measures

You can test the measures taken by the sensor (e.g. battery level, temperature, depth) to check that there are no faults.

You can test the sensor in water or in air. In air, the following measures will be wrong: along speed, across speed, height, conductivity.

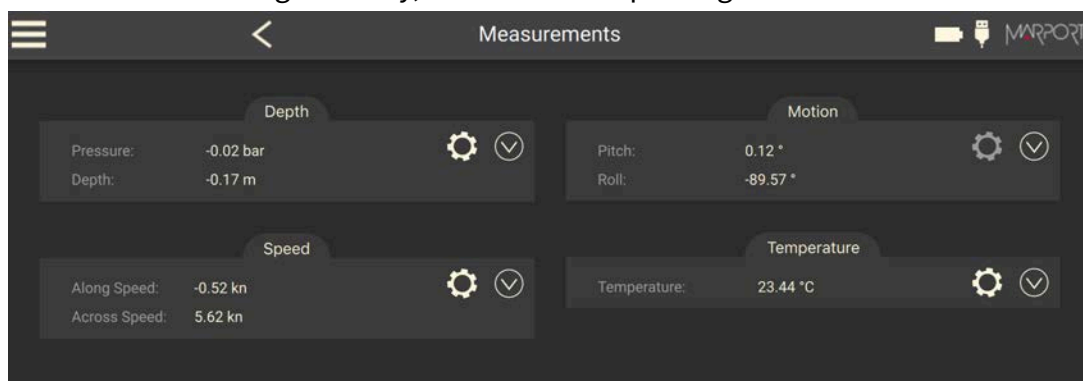
1. Press command + A or click **Menu** ☰ and click **User Mode > Advanced**
2. Go to the **Monitoring** page.


You can check information about the battery, board and sensor.



3. Go to the **Measurements** page.

You can see the values of the activated measures, such as depth, temperature. If the sensor is working correctly, measures are updating.



4. Click  to check and, if necessary, adjust data measured by the sensor:
- **Depth:** Place your sensor on a desk or on the ground and enter 0 in **Target Depth**.
 - **Temperature:** Enter the estimated temperature of your environment.

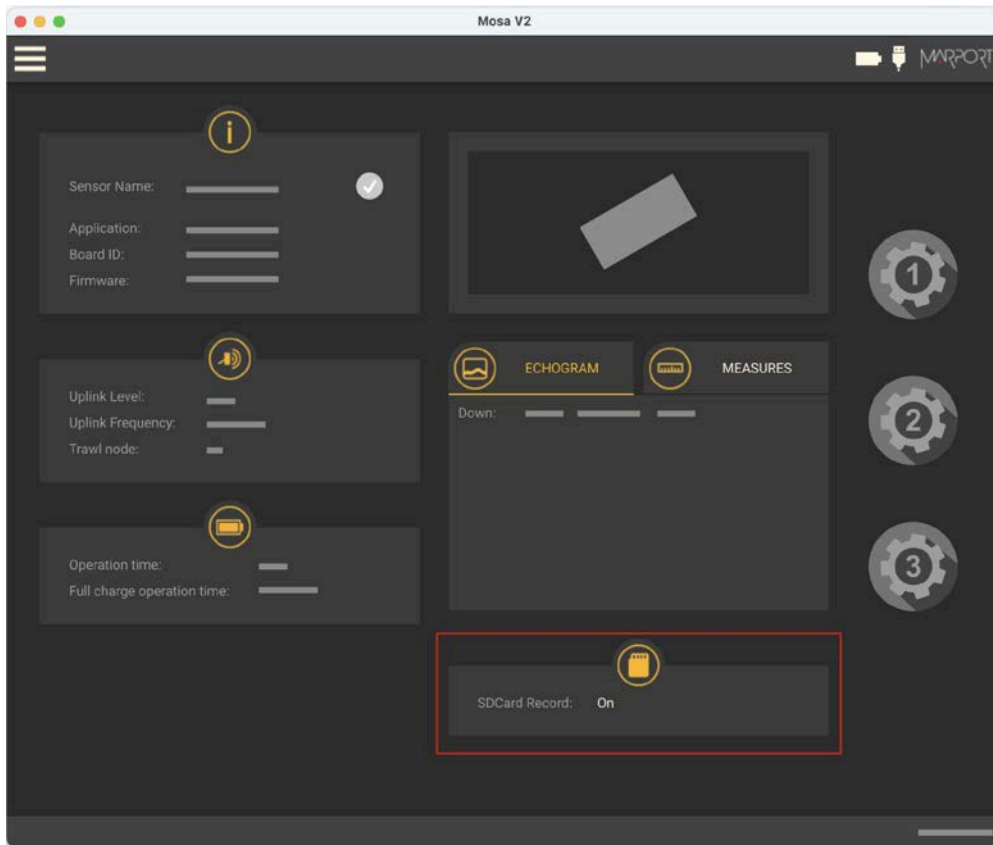
SD Card Recording

This topic explains the SD card recording feature (this feature is optional).

Overview


Data recorded on the SD card are in higher resolution, with a higher refreshing rate.

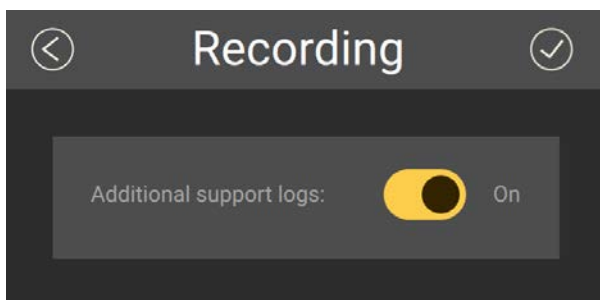
You can see on Mosa2 main page if the SD card recording feature is activated:



Additional settings

We recommend to activate the support logs to help support teams for error diagnosis.



1. Go to the **Communications** page, then click  in **Recording**.
2. Activate **Additional support Log**.





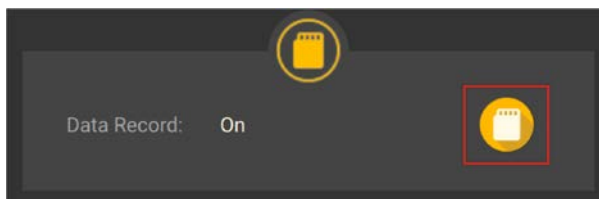
Getting data from the SD card

The last 99 recorded sensor data files and last 99 battery files are displayed. Two types of files are on the SD card:

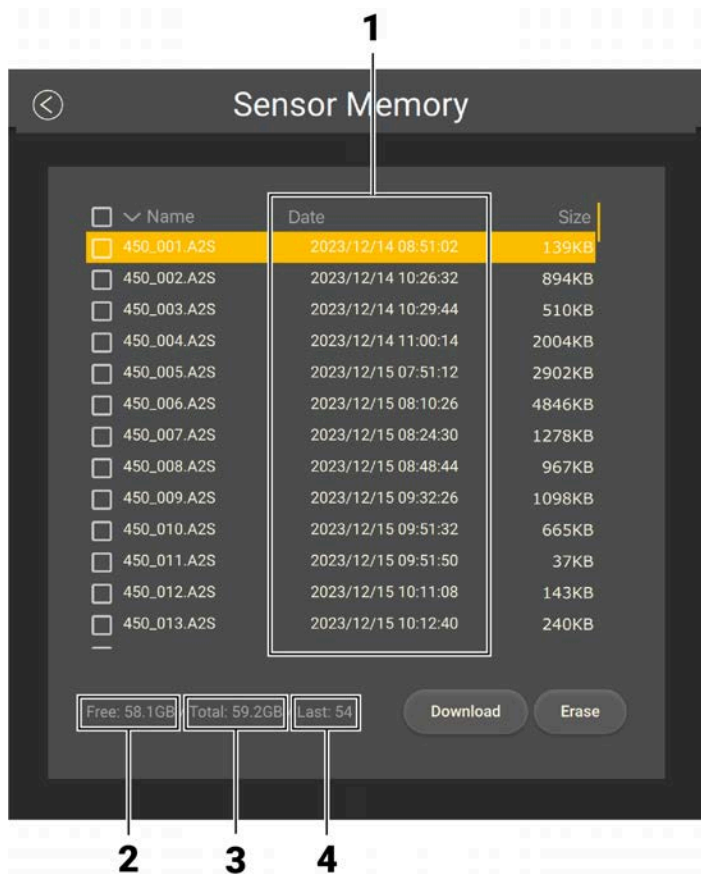
- Files containing measures recorded by the sensor. Their name begins by "450". These data are more precise and recorded more often than data received on the receiver. One file corresponds to a tow (time between entering and leaving water). The recording date displayed in the second column is synchronized with your computer time.
- BATT = Files created when the sensor is charging (1 file per charging cycle). They are useful for support teams for troubleshooting.

 **Note:** The first time the sensor connects to Mosa2 or if the sensor desynchronizes, a clock with a warning icon  is displayed in the top toolbar. Click it to synchronize the time of the SD card with the computer's time.

1. Press command + E or click **Menu**  and click **User Mode > Expert**.
2. On the first page, click  in **Data Recording**.



Recorded files are displayed. Click the title of the columns to sort them by their name, date or size.



1. Time of end of towing
2. Free memory
3. Total memory size
4. Index of the last file written

See **Replaying Data Recorded on a SD Card (on page 50)** to learn how to replay these data in Scala2.


Saving a Configuration on Mosa2

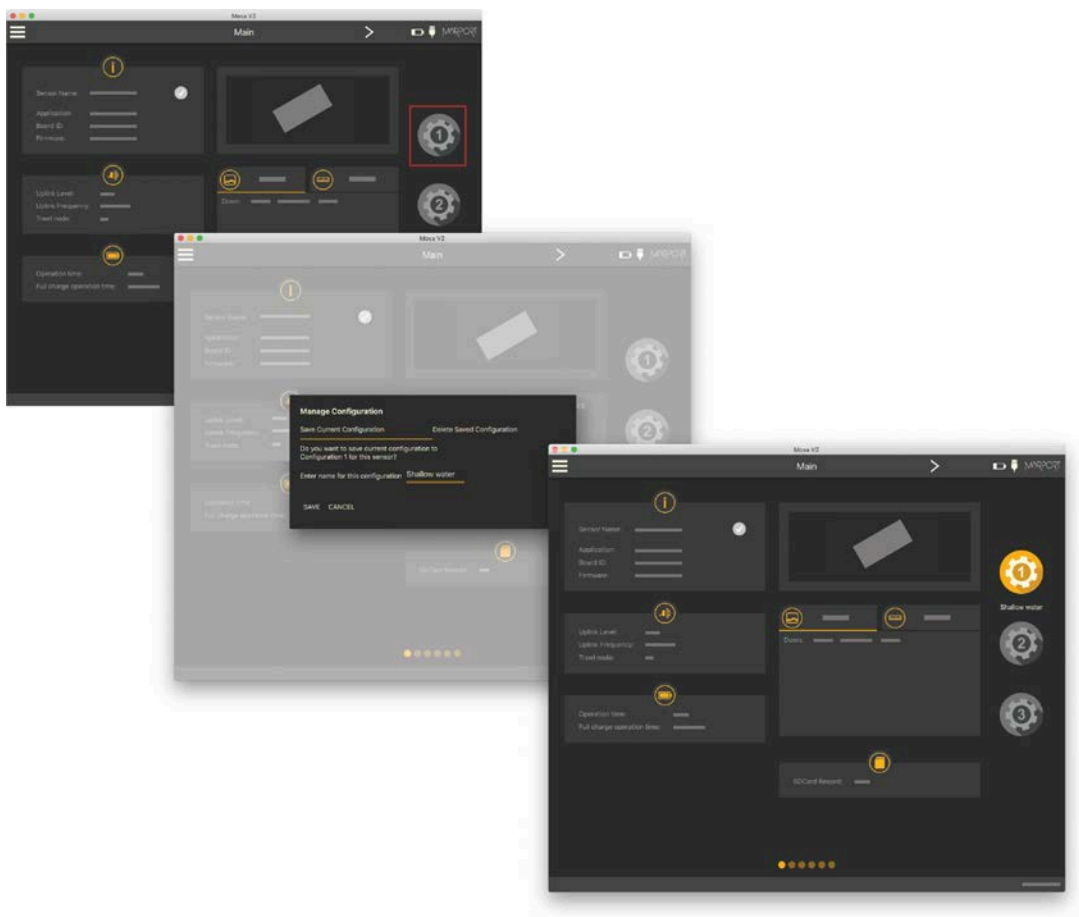
You can save different configurations of the sensor to be able to quickly change the configuration when you change your fishing method.

- You have finished configuring the sensor.

You can have up to three different configurations for the sensor. When you change your fishing method, you can apply a corresponding configuration in one click. For example:

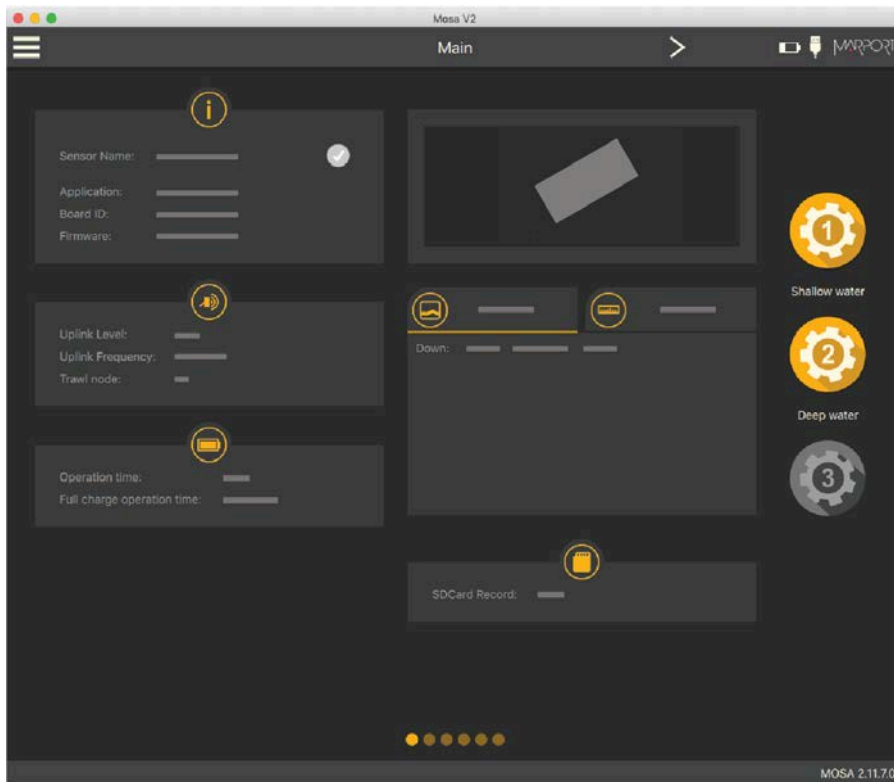
- If fishing in shallow water, you can use a configuration with an uplink level of 33%, a short pulse and a short range.
- If fishing in greater depths, you can change for a configuration with an uplink level of 100%, a long pulse and a long range.

1. When you are finished configuring the sensor, for example to use the sensor in shallow water, click one of the wheel icon  on the first page of Mosa2.
2. In the window that appears, enter a name for the configuration and save it. The wheel icon becomes orange and the name of the configuration is displayed underneath.



3. To create another configuration, for example this time to use the sensor in deep waters, change the settings of the sensor on Mosa2.

4. When you are finished, click the second wheel icon and save the configuration.



5. If you need to change the sensor configuration back to the first configuration (shallow water), click the corresponding wheel.

The configuration is applied.

6. If you need to make changes to a configuration:

- a. Change settings.
- b. Maintain the click on the corresponding wheel until the **Manage Configuration** window appears.
- c. Click **OK** in **Save Current Configuration**.

7. To delete a configuration:

- a. Maintain the click on the corresponding wheel until the **Manage Configuration** window appears.
- b. Click **OK** in **Delete Saved Configuration**.

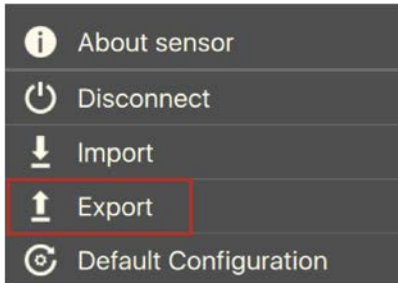
Exporting Sensor Configuration

You can export the sensor settings you configured on Mosa2 on a file. You can afterward use this file when configuring a similar sensor.

- You are finished configuring the sensor.

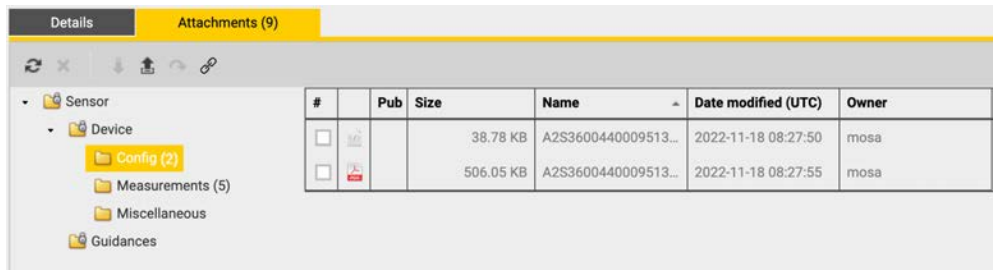
If you have issues with your sensor, send this file to support teams.

1. Click **Menu**  > **Export**.



2. From the window that appears, choose a folder on your computer to save the file and click **Open**.

The configuration file is exported and saved on your computer as an A2C file. If you are connected to the internet, it is also automatically sent to MASP in XML and PDF files:



Importing a Sensor Configuration

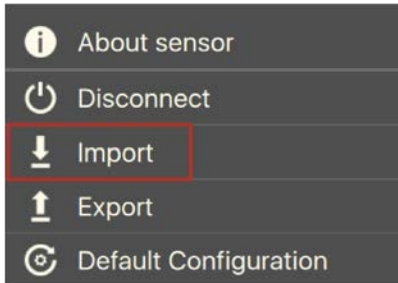
You can apply to a sensor a configuration that has already been made on another sensor.

- You have exported a configuration (see **Exporting Sensor Configuration (on page 36)**) and have the *.A2C or XML configuration file.

Only the following settings are imported: trawl node, recording settings (SD card, support logs), communication options (virtual water switch, simulation mode), uplink level and frequency, echo sounder settings.

! **Important:** If the new configuration changes the echo sounder settings, you must re-calibrate the sensor for target strength value.

1. Press command + A or click **Menu**  and click **User Mode > Advanced**
2. Click **Menu**  > **Import**.



3. From the window that appears, select the *.A2C or XML configuration file.

The configuration is loaded into the sensor.

System Configuration & Display

System Configuration and Display

Learn how to configure the receiver and display the sensor data in Scala2 application.


Adding the Sensor to the Receiver

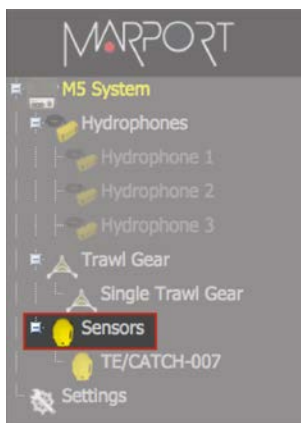
You need to add the sensors to the receiver in order to display their data on Scala2.

For compatibility details, see **System Compatibility (on page 8)**.

Adding the Sensor to the Receiver

You need to add the sensors to the receiver using the system web page.

1. From Scala2, click **Menu**  > **Expert Mode** and enter the password `copernic`.
2. Right-click the IP address of the receiver at the bottom of the page, then click **Configure Receiver**.
3. From the left side of the receiver page, click **Sensors**.



4. From the page **Add Sensor Product** select:

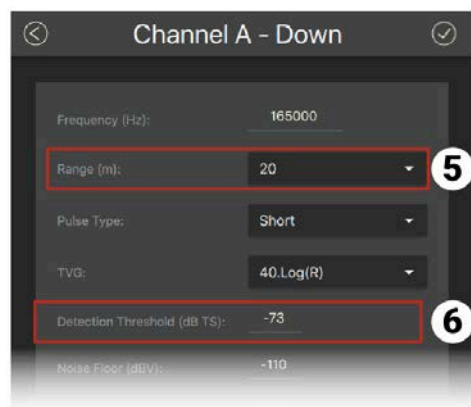
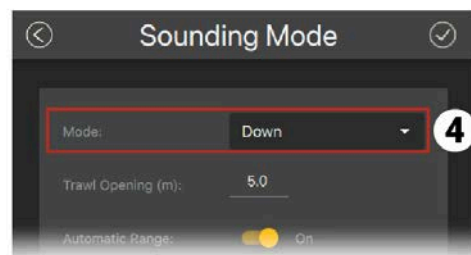
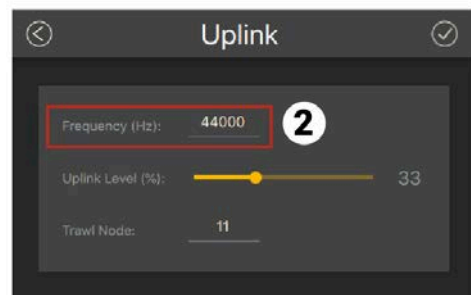
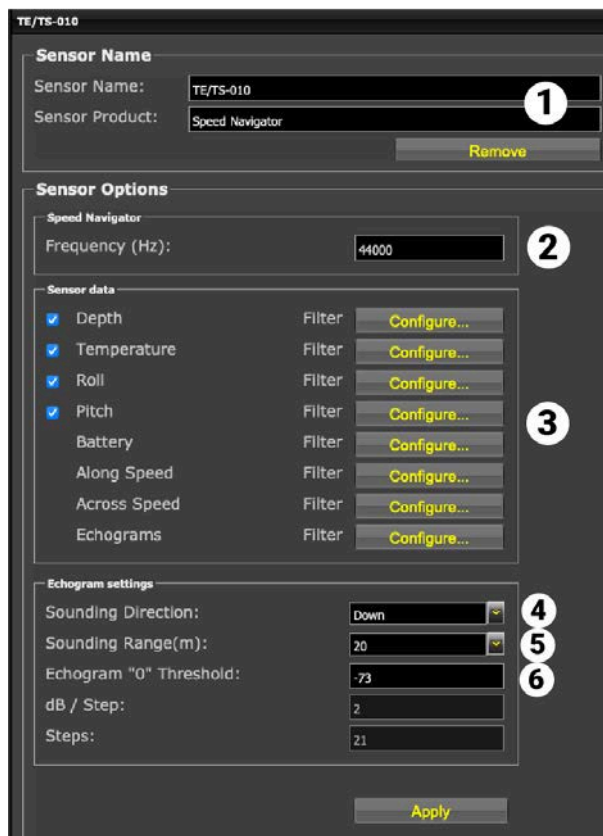
Add Sensor Product	
Add from Marport Sensor Configuration Tool	
1. Product Category	TE/TS
2. Product Name	Speed Navigator
3. Trawl Gear Location	011



- a. **Product Category:** TE/TS
- b. **Product Name:** Speed Navigator
- c. **Trawl Gear Location:** same as defined in Mosa2 (see **Configuring the Trawl Node (on page 20)**).

Configuring the Sensor Settings

You need to complete communication settings when you add the sensor to the receiver.

! **Important:** Make sure the settings you enter here are the same as in Mosa2.




1	Sensor name displayed in Scala2 and its features.
2	Enter the same frequency as the one entered for the uplink frequency in Mosa2.
3	<p>Click Configure to change filters applied on incoming data. Filters are particularly useful to reduce interferences on the echogram data.</p> <p> Note: Be aware that echogram filters such as Echosounder and Interference Reduction may remove small targets on the echogram.</p> <p> Tip: Please refer to Scala2 user guide for more information about the filters.</p>
4-5-6	Select the same sounding direction, range, and detection threshold as those set in Mosa2.

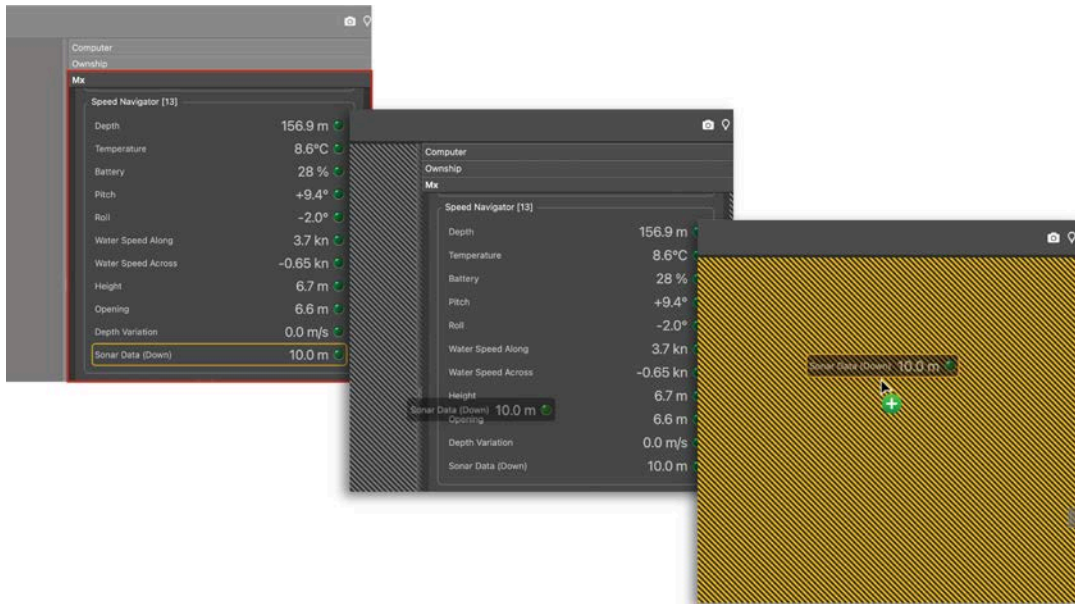
Click **Apply** when you have finished.

Configuring Data Display in Scala2

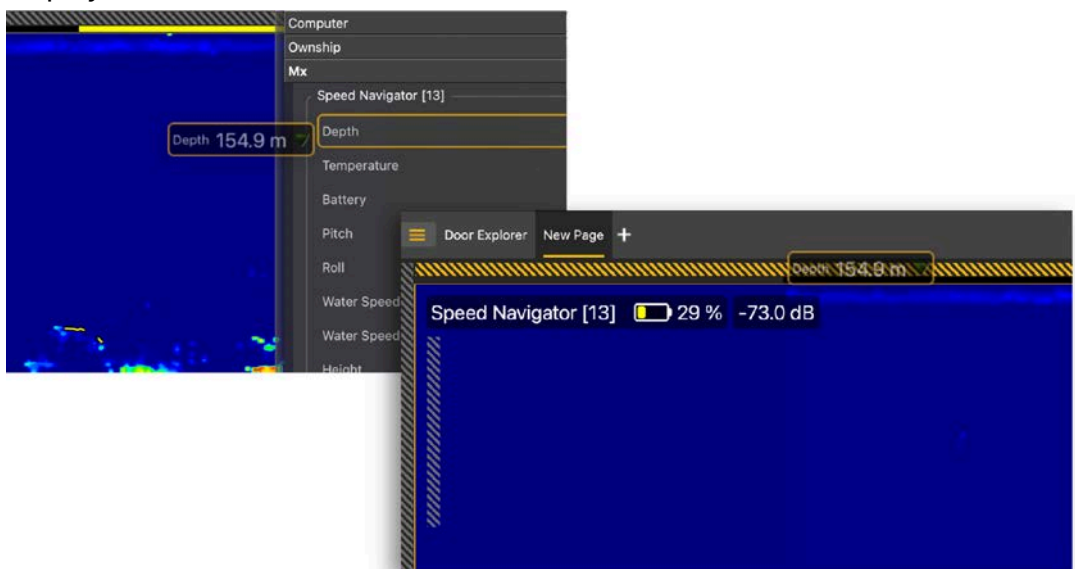
You can display the sensor's measurements and echograms on Scala2 pages.

Connect in **Customize** mode to configure the display of data. From the top left corner of the page click **Menu**  > **Customize** and enter the password `eureka`.

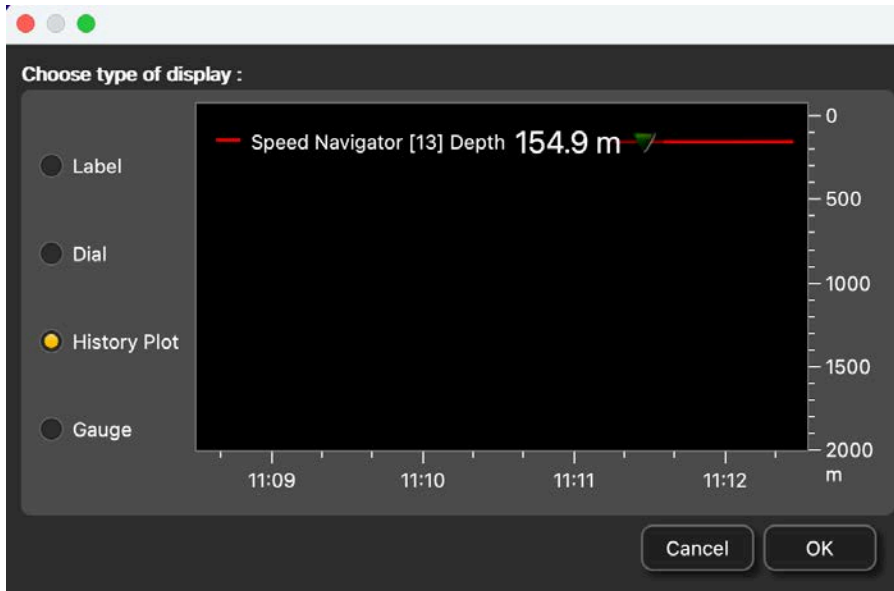
1. Open the control panels and go to the **Mx** tab.
2. To display the echograms, click + hold **Sonar Data** from a Speed Navigator sensor and drag it to the page display.



3. Click + hold other data, such as depth, pitch, roll, and drag it as well to the page display.

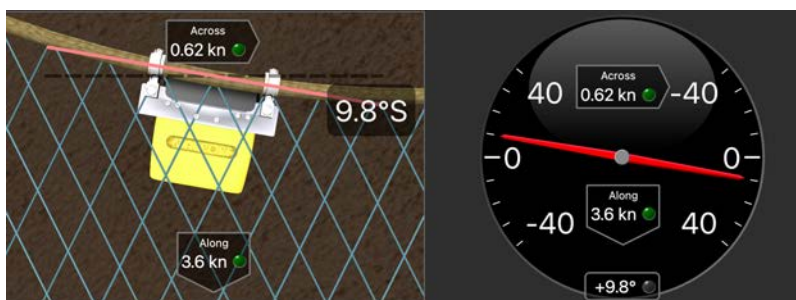
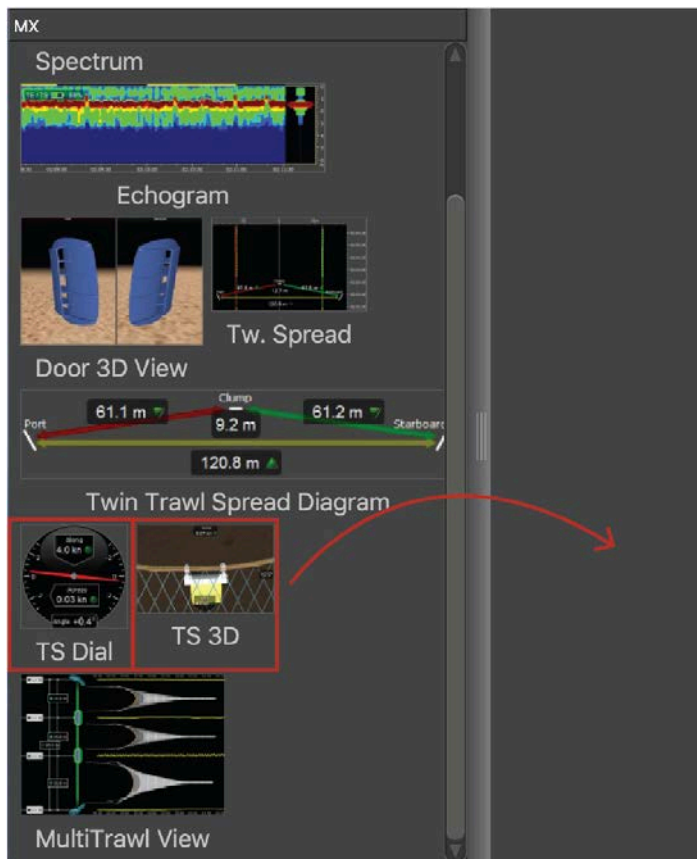



4. Select the type of display.



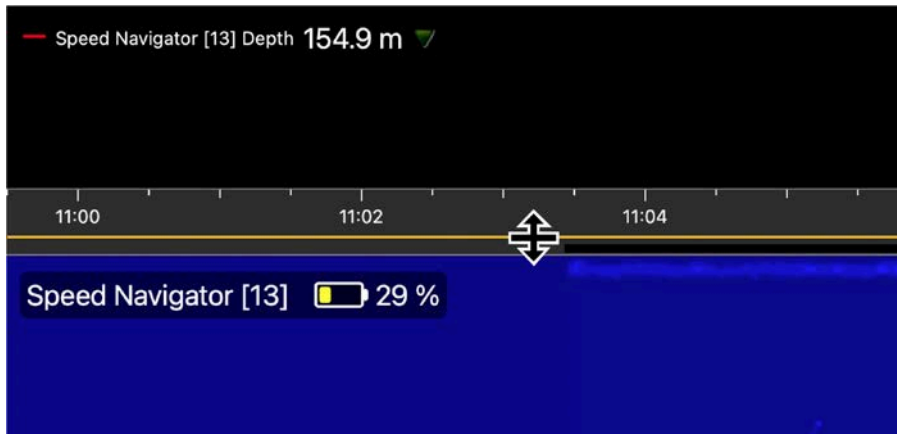
5. To display the **Water Speed Along** and **Water Speed Across** data in 3D views:

- Open the customization panels and go to the **MX** tab.
- Click + hold **TS Dial** or **TS 3D** and drag it to the page.

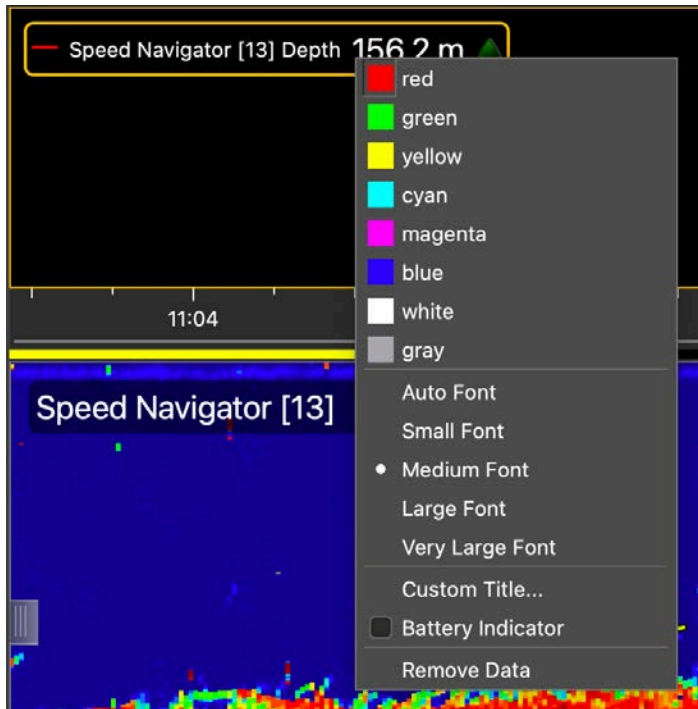


 **Note:** On the **TS Dial**, the bearing angle is negative when the sensor is oriented toward port and positive when oriented toward starboard.

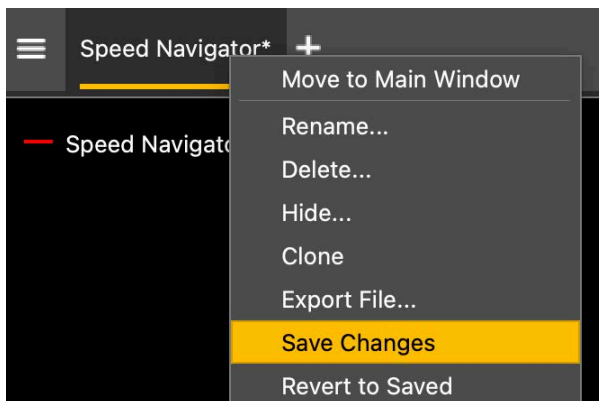
6. Drag the lines around the blocks of data to resize them.



7. Right-click the title or the values of the data to display customization options.



8. To save the changes, right-click the tab with the name of the page and click **Save Changes**.



Outputting Scala2 Symmetry Data to Scantrol

You can output across speed data from Scala2 to Scantrol iSYM application.

- You need to have iSYM version 3.5.10 (beta version) and above
- Make sure you have a license to use Marport software with Scantrol.

! **Important: Scala2 2.10.x and later:** If the system is configured to operate on a twin trawl with one speed sensor on each trawl, but only one trawl is put in water: **make sure that the speed sensor in water is the one from the first trawl, configured with a node between 10 and 13.** If not, Scala2 will not send any speed measurements.

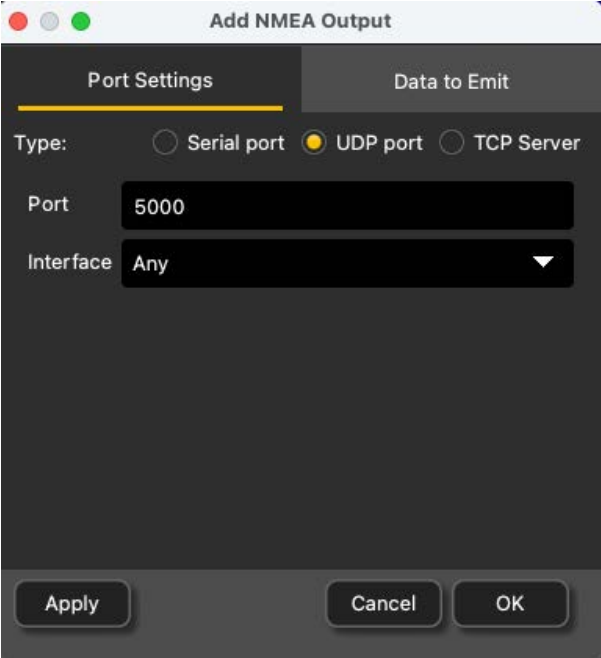
1. Scantrol and Marport computers must be connected together via an Ethernet wired network. Both computers must be on the same sub-network to communicate with each other: 192.168.0.XX.

For example, the network IP address can be set at **192.168.0.10** on Scantrol computer and at **192.168.0.12** on Marport computer. The subnet mask address is 255.255.255.0 for both.

2. In Scala2, go to **Settings > NMEA Outputs.**

3. In **Port Settings**, select **UDP port.**

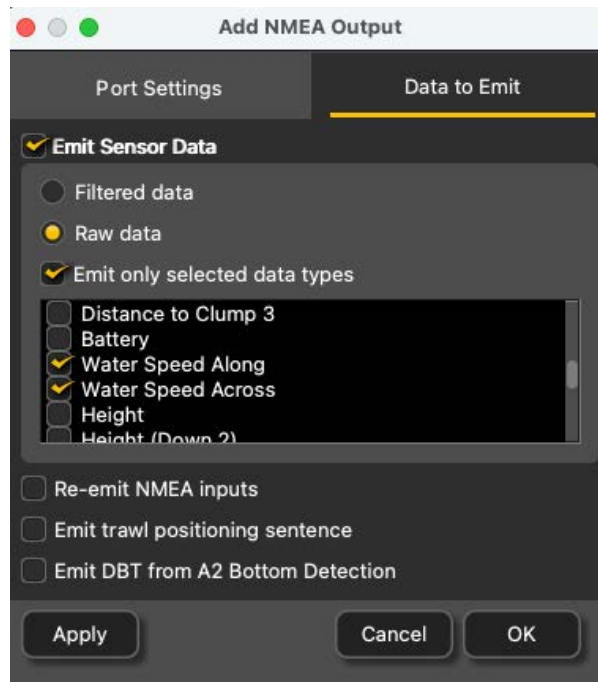
4. Enter a port number, for example 5000, and leave **Interface** at **Any.**



📄 **Note:** The port number must be different from the one on which Scantrol data are received (if applicable).

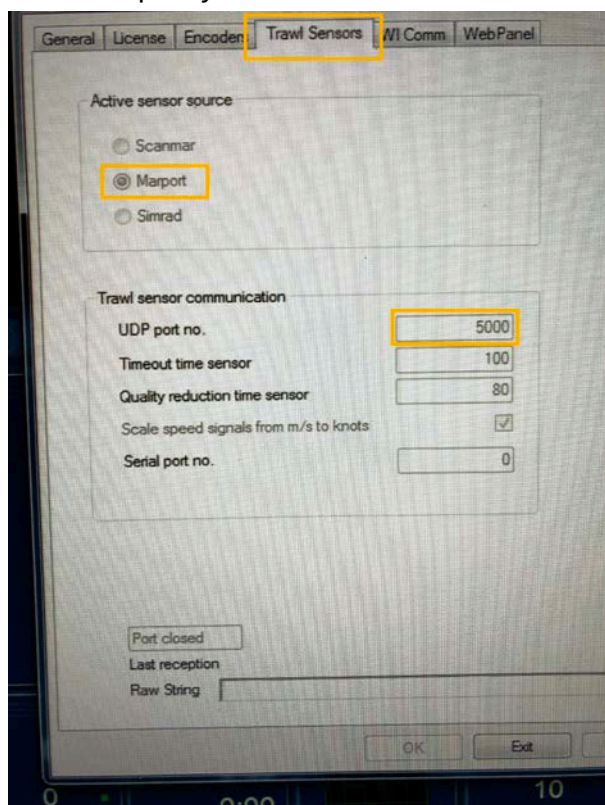
5. In **Data to Emit**,



- a. Select **Emit Sensor Data > Raw data**.
- b. Select **Emit only selected data types**, then select **Water Speed Along** and **Water Speed Across**.



6. Go to iSYM's **System Settings**.
7. Go to **Trawl Sensors** tab, then select **Marport** in **Active sensor source**.


8. Configure the communication settings in **Trawl sensor communication**. Enter the same port you set in Scala2.



-  **Note: Port closed** mention at the bottom of the window does not impact the configuration and should be ignored.
-  **Tip:** If you need to test the NMEA connection but the sensors are not in water: configure the same output settings in ScalaReplay2, then replay SDS files containing data.

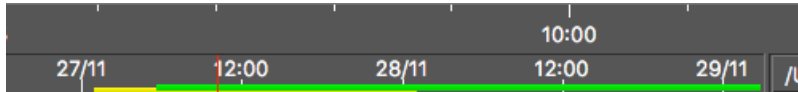
Replaying Data Recorded on a SD Card

You can replay data that have been recorded in high definition on the SD card .

-  **Note:** Data in high definition is available only when downloading them from the sensor memory. Data received in Scala2 will have a lower definition.

1. Download from Mosa2 the files recorded on the sensor memory.
2. Right-click the timeline and click **Change Directory** to choose the source directory where the files are stored.

In the replay bar, the recording period of the files in high definition is displayed in green.



In the control panels, data that were received in live are displayed in the **Mx** panel and data recorded on the SD card are displayed in the **A2S Data** panel.



3. Go to the control panels, then click and drag data from the **A2S Data** panel to a page.

Installation

Installation

Learn how to install the sensor on the trawl gear.

Installing the Sensor on the Trawl

Follow these guidelines to install a Speed Navigator in standard or reversed configuration.

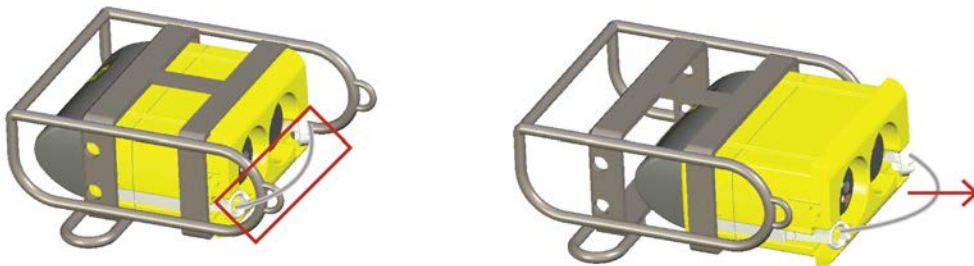
 **CAUTION:**



Handling precaution and a good maintenance of the EM log head is essential for the proper operation and lifetime of the flow sensors. Make sure to always use a protective cage when using the sensor. The protective cage must be approved by Marport. Any additional protective devices installed in front of the head may disrupt the flow and therefore alter the water speed measurements.

Even when the sensor is protected with a cage, make sure the head of the sensor does not hit any rail or protruding object when hauling the trawl on deck.

The sensor is maintained in the cage by a latch mechanism. Pull the cord at the back of the sensor to release the latch and remove the sensor from the cage. The cage will stay mounted to the headrope.

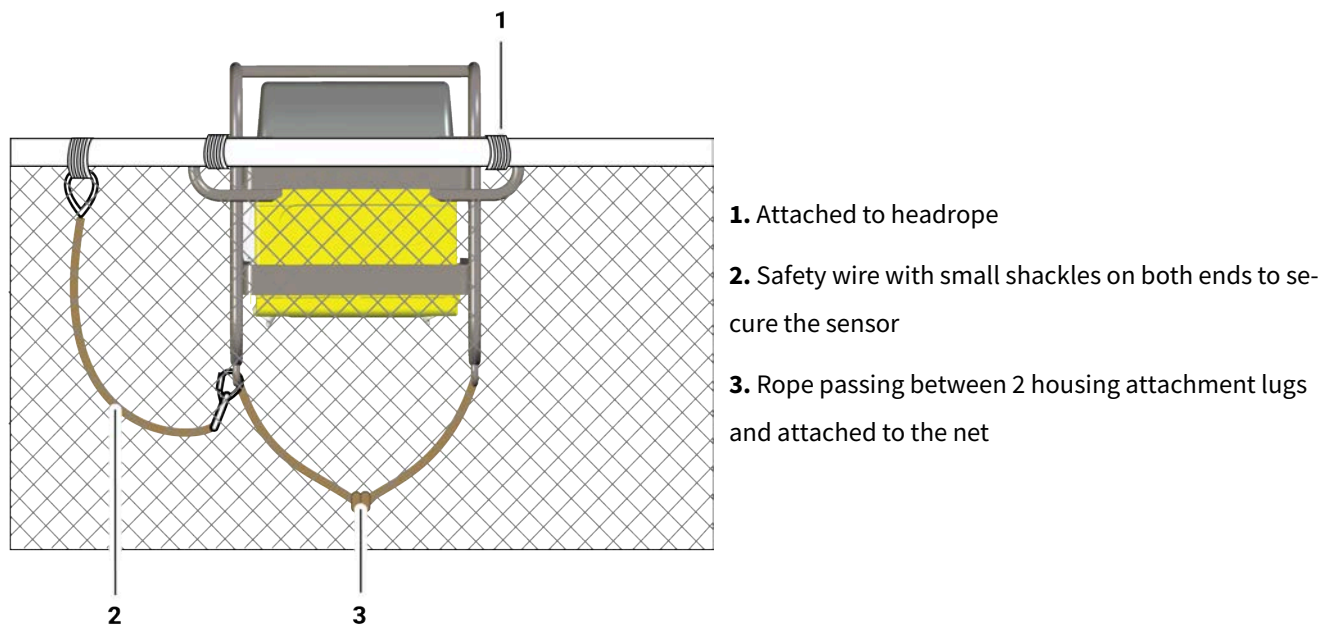


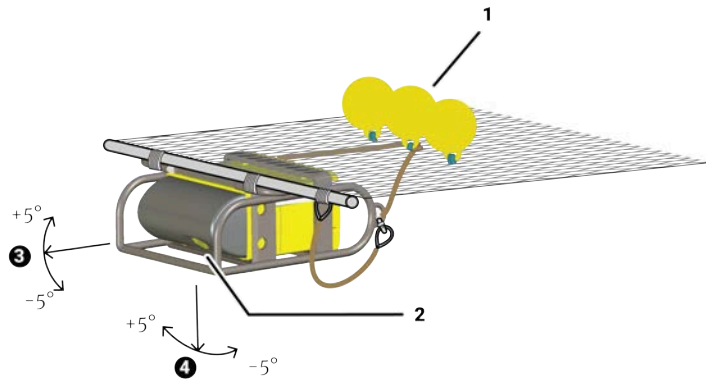
When the sensor is installed on the headrope, you may not see the footrope. If you want to see it, move back the sensor of a few meters.

The sensor must be placed in a way that there is less than +/- 5 degrees of pitch and roll. You may need to add floats to the back of the sensor to achieve this.

Standard Installation

The Speed Navigator is placed below the headrope, EM log pins facing down.

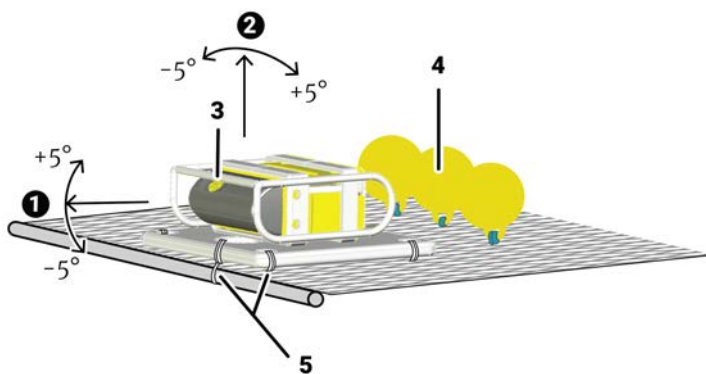




1. Floats at the back help stabilizing the pitch and roll of the sensor.
2. EM log pins facing down. Make sure nothing is in front (rope, floats): it would impede its signal.
3. Maximum pitch $+5^\circ / -5^\circ$
4. Maximum roll $+5^\circ / -5^\circ$

Reversed Installation

In this installation, the EM log pins face up instead of down. In this case, the Speed Navigator is installed on a board to provide more stability. The aim of this installation is to prevent the EM log pins and transducer to hit the deck when the trawl is hauled.



1. Maximum pitch $+5^\circ / -5^\circ$
2. Maximum roll $+5^\circ / -5^\circ$
3. EM log pins facing up. Make sure nothing is in front (rope, floats): it would impede its signal.
4. Floats at the back help stabilizing the pitch and roll of the sensor.
5. Ropes attaching the board to the head-line and net.

Maintenance & Troubleshooting


Maintenance and Troubleshooting


Read this section for troubleshooting and maintenance information.


Charging the Sensor with the Dock

Connect a sensor to one of the 4 charging connectors of the Dock to display its level of charge.


- Make sure the Dock is connected to a power supply and turned on.

 **Warning:** In case of water ingress in the product, do not charge it: battery may vent or rupture, causing product or physical damage.

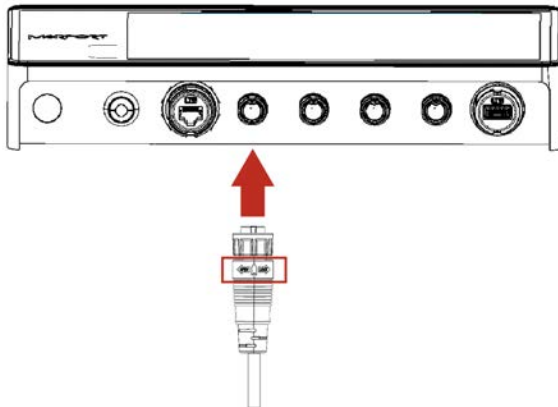
 **Note:** For Dock products with serial number before DOC2400000: Do not leave the sensors connected on a charger that is switched off. If the charger is not connected to the mains voltage, the sensor switches on and this will drain the battery.

 **Note:** Avoid full discharges and charge the battery whenever possible, at any battery level. Lithium-ion batteries do not have a charge memory, so they do not need full discharge cycles.

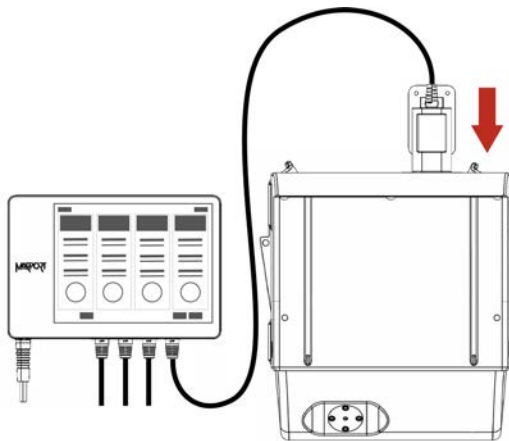
1. Before charging the sensor: wash with fresh water and dry the sensor. This prevent corrosion of the charging pins.

 **Important:** Check that the charging pins are not damaged. If they are, contact you local Marport dealer for replacement.

2. Connect the charger plug to one of the 4 charging ports.



3. Connect the 3-pin charging connector to the sensor charging pins.



The Dock screen and Virtual Charger Room display the state of charge of the sensor.


Cleaning the Sensor


You need to regularly clean the sensor for proper performance.

Wash the sensor with fresh water and dry it before you charge or store it.

Regularly check that the sensor is clean. If not:

- Wash away mud or debris with warm water.
- Use Isopropyl alcohol to clean the end cap and transducer. Use a steel wool pencil to clean the shoulder bolts, and very fine sandpaper (180 grit) to clean between them.

 **Notice:** Do not use highly abrasive materials or jet wash.

 **Notice:** Special care should be taken with sensors and components sensitive to mechanical shock or contamination.

Regularly clean the EM log pins with Isopropyl alcohol or with a Scotch-Brite scouring pad. You can also use a fiberglass cleaning pen supplied with the sensor to clean them:



Maintenance Checklist

We recommend you to follow this maintenance schedule for better performance and to avoid any trouble with the equipment.

Before use	<ul style="list-style-type: none"> • Check that all attachment equipment are not worn or torn. Replace when appropriate. • Check that the sensor is clean. See Cleaning the Sensor (on page 58) for cleaning procedures. • Check the battery level 24 hours before use and recharge if necessary.
After use	Wash the sensor with fresh water.
Between uses	When the sensor is not in use, store in a dry area, without humidity, at a temperature between -10° and 70 °C (14 to 158 °F).

Not used for more than 3 months	<ul style="list-style-type: none"> • Do not leave the batteries at full charge or discharged for a long period of time or they will wear out. • Every 6 months, put the sensor in charge for less than an hour.
Every 2 years	The sensor must be returned to an approved Marport dealer for inspection and maintenance.

If the sensor has not been not used for more than 3 months, we highly recommend to check the following points before using it:

- Make sure the sensors on the end cap are in good condition and clean.
- Connect the sensor to a charger and check the charging status.
- Switch on the sensor by shorting the center lug to the negative lug, then listen for a ping noise and check if you see the LED switched on.
- Test the sensor measures with Mosa2: depth, temperature, pitch, roll, and if applicable: spread distance, echogram, catch status, speed measures (using the EM log tester).
- If you have a test hydrophone, check the reception in the wheelhouse with Scala.

Troubleshooting

Learn how to solve common problems.

Mosa2 does not open due to error message

Mosa2 displays an error message saying it cannot be opened.

→ Your Mac security preferences do not allow you to open applications not downloaded from the App Store.

1. From the upper left corner of the screen, click **Apple menu > System Preferences > Security & Privacy** .
2. Click the lock icon and enter the password, if applicable.
3. At **Allow apps downloaded from**, select **Anywhere**, then close the dialog box.
4. **macOS Sierra or later: Anywhere** option is not displayed by default. To display **Anywhere**:
 - a. Click the magnifying glass from the top right corner of your screen and type `Terminal`.
 - b. Click **Terminal** from the results.
 - c. Enter in the terminal: `sudo spctl --master-disable`.
 - d. Press Enter.

Anywhere option is now displayed in **Security & Privacy** preferences.

Sensor does not connect correctly with Mosa2 when using the Configuration Cable



Remember: If the sensor does not connect correctly with Mosa2, always:

- Disconnect both USB connector and three-pin plug.
- Connect again the Configuration Cable.
- Make sure the three pins are fully inserted inside the sensor.

→ Mosa2 does not automatically open when connecting the Configuration Cable.

- Check that you see Marport Captain icon in the desktop taskbar. If you do not see it: close, then open Mosa2. The icon should appear in the taskbar.



Note: Marport Captain is a program running in the background. It allows Mosa2 automatic opening and displays shortcuts to Mosa2 and Scala applications installed on the computer. It should not be closed.

- If the problem persists, install Mosa2 again.

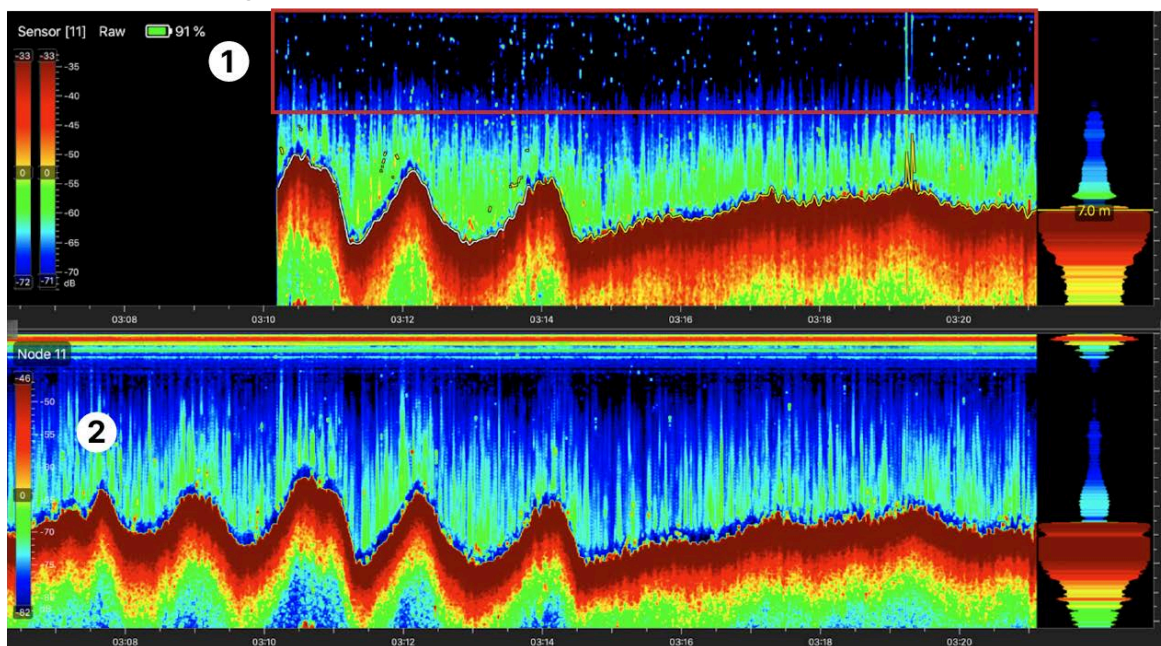
→ At the end of step 2 of the configuration wizard, the sensor does not respond. Mosa2 displays a red cross and the Configuration Cable LED is red.


- Check that no other instance of Mosa2 application is already running on the computer. If this is the case, close both applications, then open only one.
 - Or else, connect the sensor to a charger and wait until it is fully charged.
- The sensor has been disconnected from Mosa2.
- Check that the Configuration Cable is not connected to a USB hub. The Configuration Cable must be connected directly to the computer.
 - If the computer goes to sleep mode, the sensor may be disconnected. Change the settings on your computer to increase the time before sleep mode.
 - If the problem persists, connect the sensor to a charger and wait until it is fully charged. Then try again to connect.
- Mosa2 displays a critical error message.
- Disconnect both USB connector and three-pin plug. Then, connect again the Configuration Cable. If the message is still displayed, it means there is an issue with the sensor's components. Contact Marport support.

The echogram has a lot of interference


- There is interference between the sensor down frequency and the uplink signal. For example, when the down sounding is at 165 kHz, it is sensitive to noise between 155 kHz and 175 kHz. When set at 52 kHz, the uplink signal causes noise to up to 156 kHz because of the third harmonic ($52 \times 3 = 156$ kHz), causing interference with the down sounding. The solution is to change the uplink frequency to less than 50 kHz, or change the down frequency to 210 kHz.


On the example below, we can see that the top echogram is noisy (1). Once the down frequency is changed, the noise is removed (2).

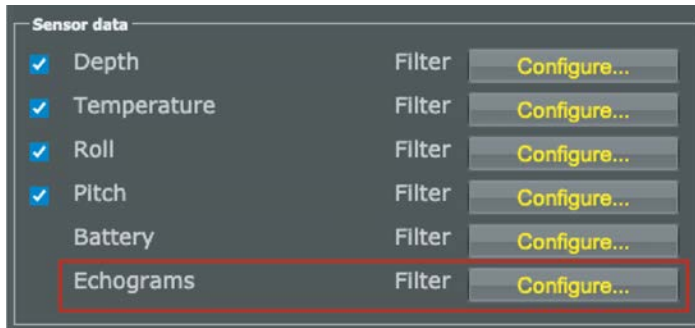


1. From Mosa2, go to the **Echo Sounder** page, then click  in **Down Sounding**.
2. Change **Frequency (Hz)** to 210,000 Hz.

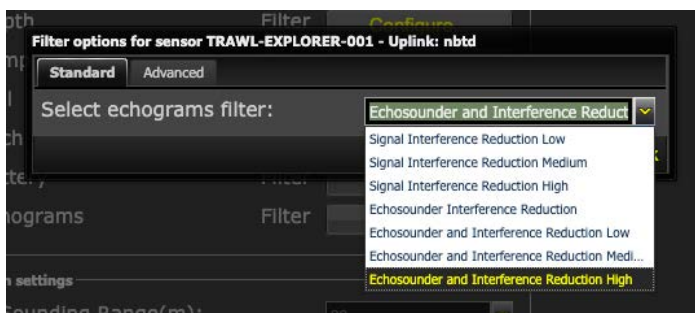
→ There is interference from environmental noise or other equipment such as echosounders. You need to increase the level of the echogram filter in Scala2.

 **Important:** Increase the level of the echogram filter only if the echogram has a lot of interference. Be aware that this filter will remove small targets.

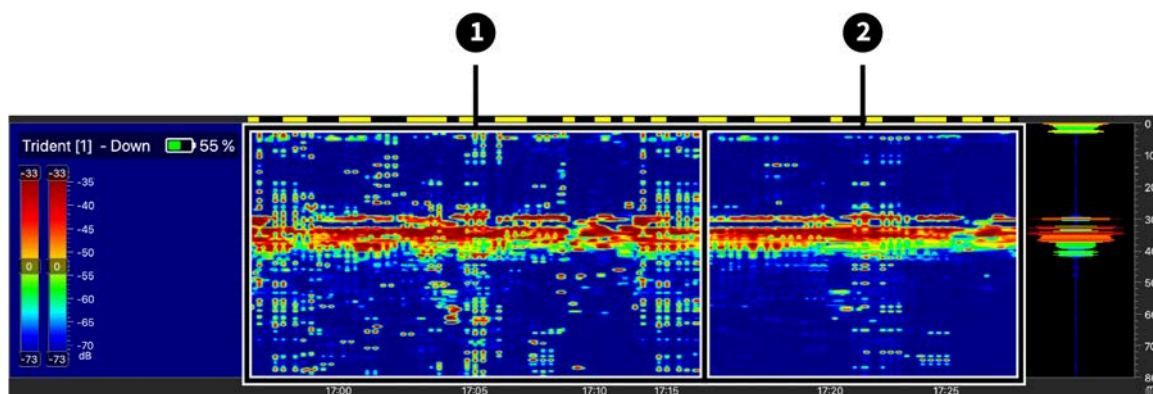
1. From Scala2, click **Menu**  > **Expert Mode** and enter the password `copernic`.
2. Right-click the IP address of the receiver at the bottom of the page, then click **Configure Receiver**.
3. Click the name of the sensor in the system tree view.
4. In **Sensor Options**, click **Configure** in front of **Echograms**.



5. In **NBTE Echograms Filter**, select **Echosounder and Interference Reduction Medium** or **Echosounder and Interference Reduction High**.



Here is an example of result when applying this filter:



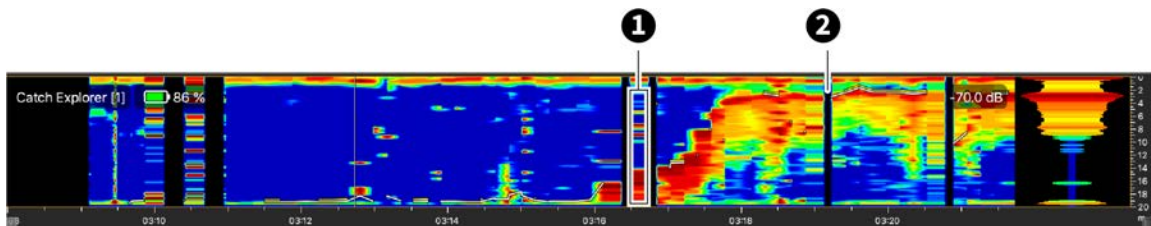
1. Noisy echogram with default filter (**Echosounder and Interference Reduction Low**)

2. With **Echosounder and Interference Reduction High** filter applied.

The echogram display is interrupted

The echogram displayed in Scala2 has black gaps, as shown on the picture below.


→ There is a loss of communication between the sensor and the boat. If the acoustic signal from the sensor is not received, the last sonar data is repeated for a few seconds, then stopped. This will show black lines on the echogram.




1. Repeated sonar data / 2. Loss of reception

Do the following actions to diagnose the issue:

1. Check the frequencies of the other sensors and make sure there is enough distance between them.
2. Check the noise on the spectrum (see). If the frequency where the sensor is placed is too noisy, change for a less noisy frequency.


 **Important:** Do not forget to also change the frequency on the system web page in Scala2.

3. You can change the echogram filter settings on the system web page:
 - a. From Scala2, click **Menu**  > **Expert Mode** and enter the password `copernic`.
 - b. Right-click the IP address of the receiver at the bottom of the page, then click **Configure Receiver**.
 - c. From the left side of the page, click the name of the sensor.
 - d. From the sensor configuration page, click **Configure** next to **Filter**.
 - e. From NBTE Echograms Filter select **Echosounder and Interference Reduction Medium** or **High**.

Speed data is wrong

Speed data displayed in Scala2 is wrong.

→ By default in Scala2, speed units of measure are in meter/second. If you are used to knots, these measures will seem too low.

1. Check the units of measure.
2. If they are in meter/second instead of knots, click **Menu**  > **Settings**.
3. From the tab **Units**, from **Speeds**, select **Knot**.

→ EM log pins may be dirty.

1. Clean the EM log pins using Isopropyl alcohol or a Scotch-Brite scouring pad. Use EM log cleaning pens supplied with the sensor to clean EM log pins.



2. From Mosa2, check speed measures with the EM log tester (see **Checking Speed Measures with EM Log Tester (on page 27)**).

→ The sensor is not correctly installed on the trawl or the pitch and roll are not working correctly.

1. Check the sensor position on the trawl (see **Installing the Sensor on the Trawl (on page 53)**).
2. From Mosa2, check that the pitch and roll are both between 5 and -5° when the sensor is laid flat.
3. If speed data is still wrong, check speed measures with the EM log tester (see **Checking Speed Measures with EM Log Tester (on page 27)**).
4. If speed data is still wrong, check the speed calibration and do it again if necessary.

Scantrol application do not receive speed measurements

You have a system configured as a twin trawl and put only one trawl in water. Scantrol does not receive anymore speed measurements from the speed sensor.

→ **Scala2 2.10.x and later:** If the system is configured to operate on a twin trawl with one speed sensor on each trawl, but only one trawl is put in water: **make sure that the speed sensor in water is the one from the first trawl, configured with a node between 10 and 13.** If not, Scala2 will not send any speed measurements.

The sensor is not running when testing out of water

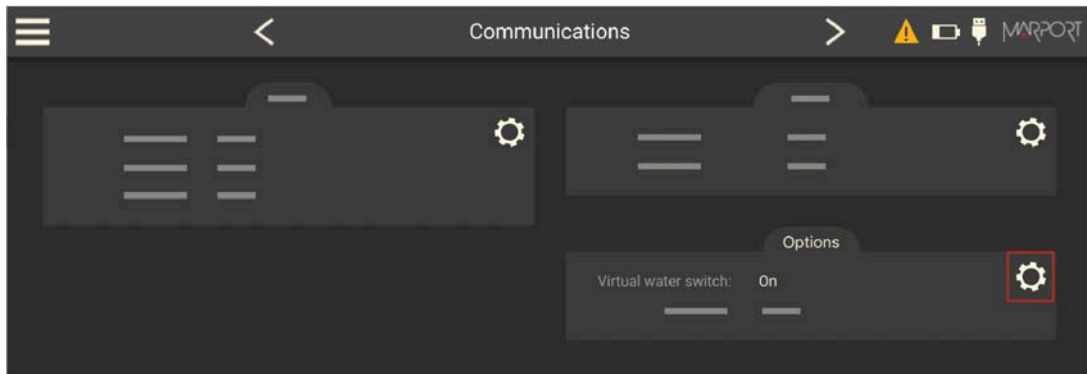
You activated the sensor water-switch outside water or in a low level of water (for example for testing purpose) but it does not switch to running mode and does not emit any data.

→ The virtual water-switch option may be activated in Mosa2. When this option is activated, the sensor runs only at a depth more than 2 meters. For more details, read **About the Virtual Water-Switch Option (on page 18)**.

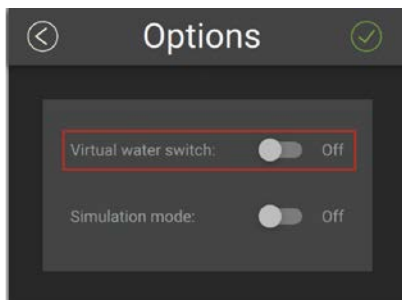
1. Connect the sensor to Mosa2 and check if there is an orange warning sign at the top of the window. If yes, it means the virtual-water switch is on.



2. Go to **Communications** page, then in **Options**, click .



3. Deactivate the **Virtual water switch** option.



Support Contact

You can contact your local dealer if you need maintenance on your Marport products. You can also ask us at the following contact details:

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Appendix

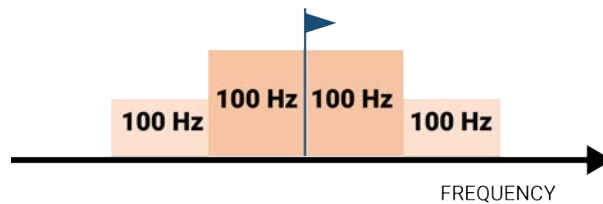
Frequency Plan

It is important to carefully plan the setup of your sensors before adding them to the system. You can create a table with a list of frequencies and complete it when you add sensors.

Frequencies and intervals

The diagrams below show the bandwidth of the different types of Marport sensors and intervals you must respect when adding other sensors.

Figure 1. PRP sensors (e.g. Catch sensor, Trawl Speed, Spread sensor...)



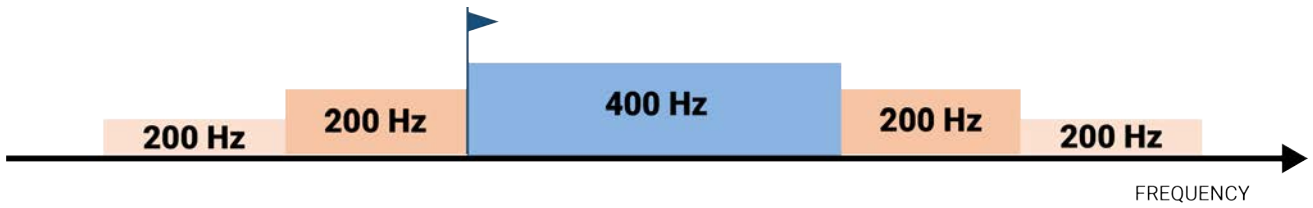
Example: If the frequency of the sensor is 40kHz, there should be no sensors between 39.9 and 40.1kHz.

Figure 2. Marport Pro sensors (e.g. Trident, Door Explorer, all Navigator range except Catch)



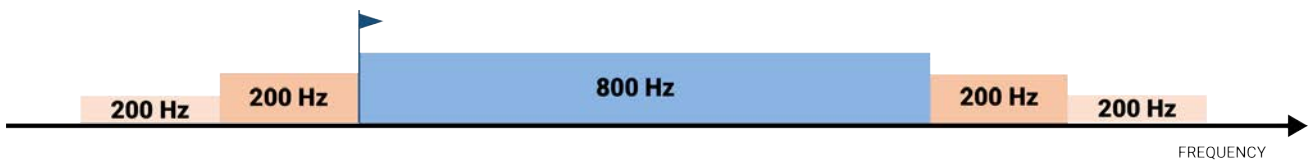
Example: If the frequency of the sensor is 40kHz, there should be no sensors between 39.8 and 41.2kHz.

Figure 3. NBTE sensors (e.g. Speed Explorer, Trawl Explorer, Catch Explorer, Catch Navigator, Door Sounder)



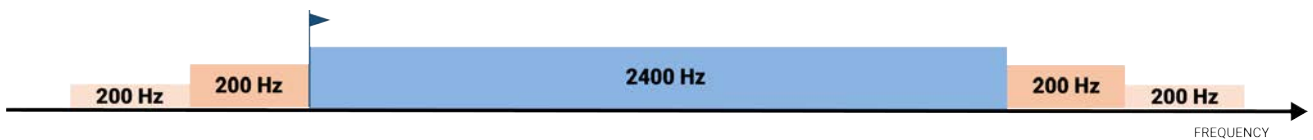
Example: If the frequency of the sensor is 40kHz, there should be no sensors between 39.8kHz and 40.6kHz.

Figure 4. HDTE narrow band mode



Example: If the frequency of the sensor is 40kHz, there should be no sensors between 39.8kHz and 41kHz.

Figure 5. HDTE wide band mode



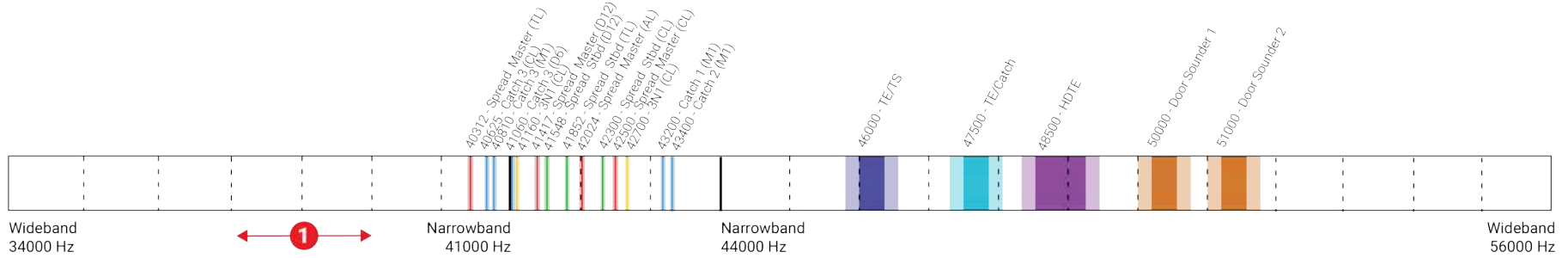
Example: If the frequency of the sensor is 40kHz, there should be no sensors between 39.8kHz and 42.6kHz.

- Frequency of the sensor
- Bandwidth
- Mandatory distance with other sensors
- Recommended distance with other sensors

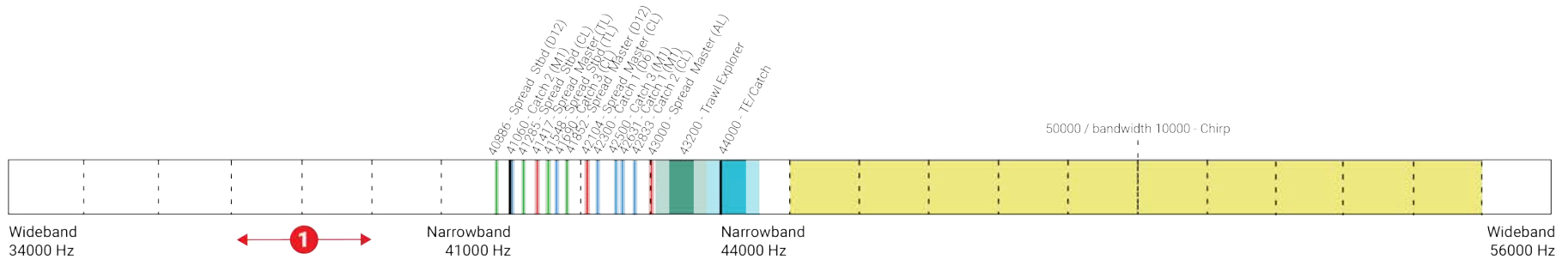
Examples of frequency allocations

- We recommend to allocate frequencies between 34 and 56 kHz for wideband hydrophones and between 41 kHz and 44 kHz for narrowband hydrophones.
- Echosounders are usually placed around 38 kHz, make sure to allow enough distance with them.

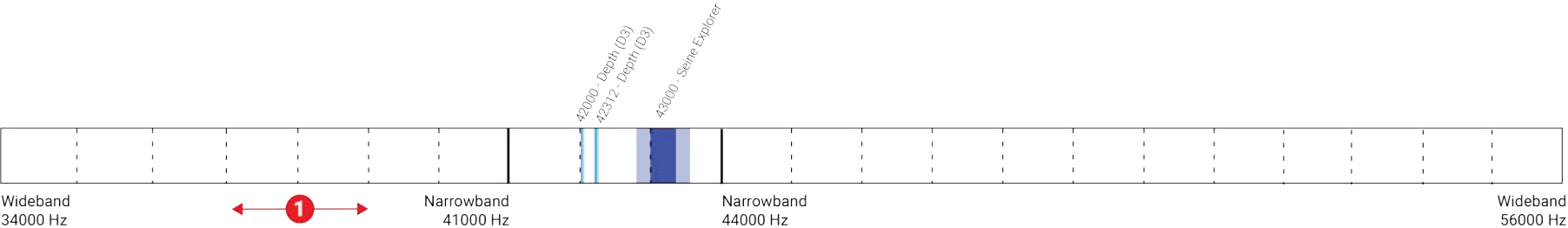
Example of a system with Spread, Catch, Trawl Speed sensors and Speed Explorer, Catch Explorer, HDTE and Door Sounder.



Example of a system with Spread sensors with positioning, Catch sensors, Trawl Explorer and Catch Explorer.



Example of a system for purse seining, with a Seine Explorer and depth Seine sensors.



- Bandwidth
- Mandatory distance with other sensors

1 Avoid allocating frequencies between 37 and 39 kHz because this range is generally used by echosounders.

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