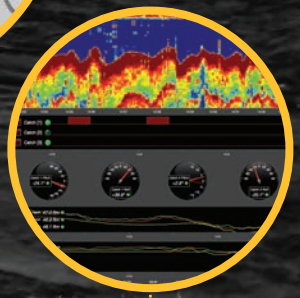
Catch Sensors User Manual



MARPORT

Contents

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History

V1	10/02/17	First release
V2	03/09/18	• New topic: About Time Variable Gain on page 29
V3	07/06/18	• New troubleshooting topic: Sensor cannot connect in wireless connection on page 66 • Interference Check on page 54: more detailed information about **Spectrum** page.
V4	11/30/18	• Frequency Plan on page 71: drawings have been changed, frequencies are now allocated between 34 kHz and 36 kHz and frequency ranges of narrowband and wideband hydrophones are indicated.
V5	07/16/20	Now documents Mosa2 version 02.03, Scala version 01.06.34 and Scala2 version 02.02.
V6	03/08/21	• Now documents Mosa2 version 02.05. • Connecting the Sensor to Mosa2 on page 20: added guidance on how to connect sensor to Mosa2 using the Configuration Cable product. • Added troubleshooting topic: Sensor does not connect correctly with Mosa2 when using the Configuration Cable on page 67 • Added details on the **Down 1 + Down 2** sounding mode in Configuring the Uplink and Down Settings on page 26. • Added contact details for the sales offices in South Africa and Norway in Support Contact on page 70.
V7	07/05/21	• Now documents Scala2 version 02.04 and Mosa2 version 02.07. • Replaced term Configuration Plug by Configuration Cable. • Connecting the Sensor to Mosa2 on page 20: Updated distance between other electrical devices and the computer: 1 m instead of 50 cm. •
V8	01/06/22	• Updated guidelines for installation on the trawl in Installing Catch Sensors on the Trawl on page 50.

V9	08/04/22	• Now documents Scala2 version 02.10.x and Mosa2 version 02.11.x. • Added guidance about connecting the sensor to Mosa2 using the Configuration Cable and Dock in Connecting the Sensor to Mosa2 on page 20. • Added guidance about charging the sensor with the Dock in Charging the Sensor on page 59. • Replaced DealerWeb website by Marport Authorized Service Provider (MASP). • Added contact details of the sales office in United Kingdom, and updated contact details of Iceland sales office.

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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.

The present user guide is applicable for the following versions:

- Scala: 01.06.06-01.06.34 / Scala2: 02.10.x
- Mosa2: 02.11.x

Patents apply to products. U.S. Patents 9,772,416; 9,772,417

Introduction and Presentation

Read this section to get a basic knowledge of your catch sensor.

Tip: Click Marport logo at the bottom of pages to come back to the table of contents.

Introduction

Marport's catch sensors tell you when your trawl starts to fill. Placed on the top of the trawl codend, they monitor the amount of catch that you have and warn you when the trawl is full. You can even use them to determine a precise amount of fish inside the trawl net. This way, you can monitor the contents of the codend as you are fishing, avoid problems of overfilling and increase fish survival rate inside the trawl net. It is recommended to install several sensors along the trawl to better follow the filling processes.

There are two types of catch sensors:

- Catch sensor: gives you the catch status of the trawl (empty or full), along with depth, water temperature and pitch and roll information. Catch sensors can emit on a single frequency of 40 kHz (Marport, Scanmar) or 70 kHz (Simrad, Wesmar), or on a dual frequency (40 kHz/70 kHz).
- Catch Explorer: gives you the catch status of the trawl, with depth, water temperature and pitch and roll information. In addition, it provides an echogram image of the volume of catch inside the codend.

Note:

Scala

Scala2

These labels tag topics or actions that are specific to Scala and/or Scala2. Depending on the version you have, you may follow either one of these labels.

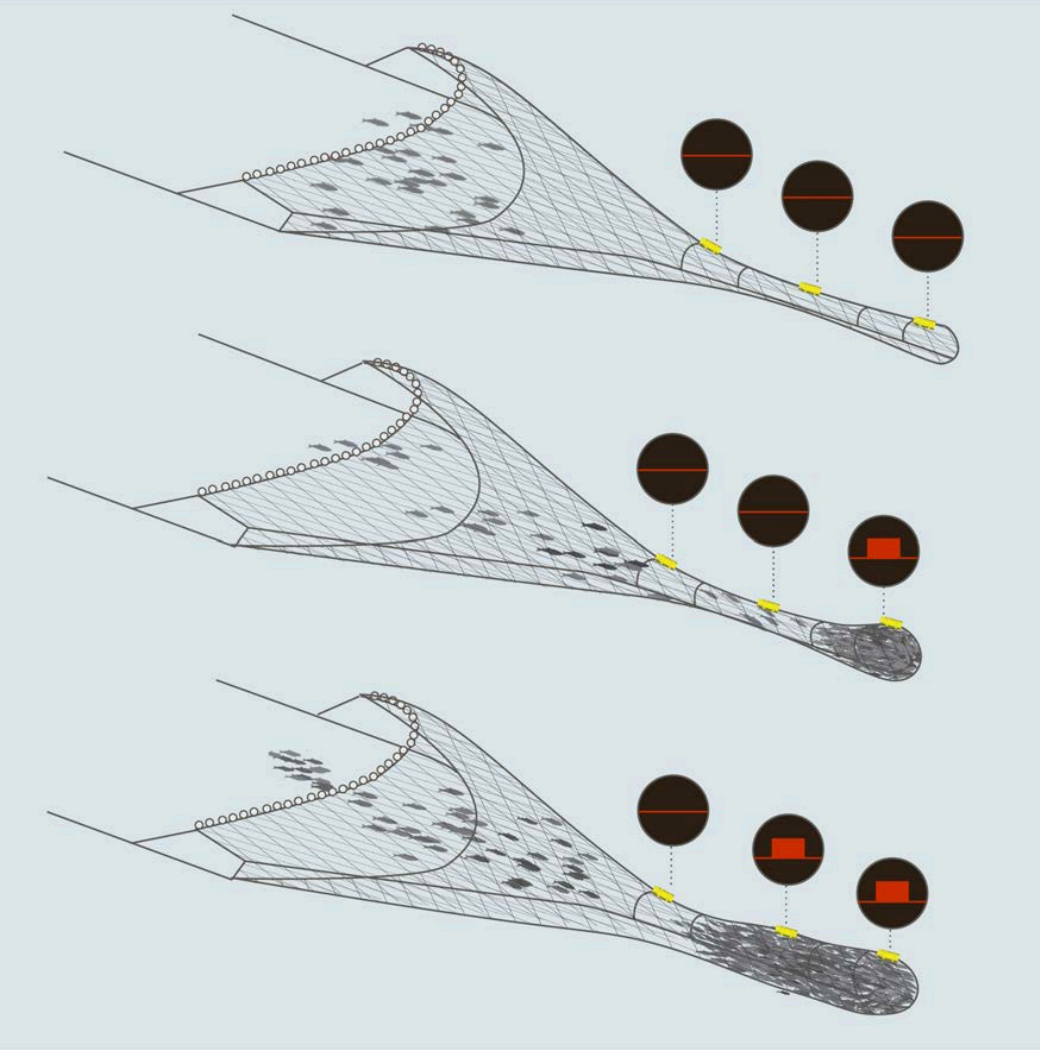
Applications

Here are some examples of data received from Catch Explorer and Catch sensors displayed in Scala/Scala2.

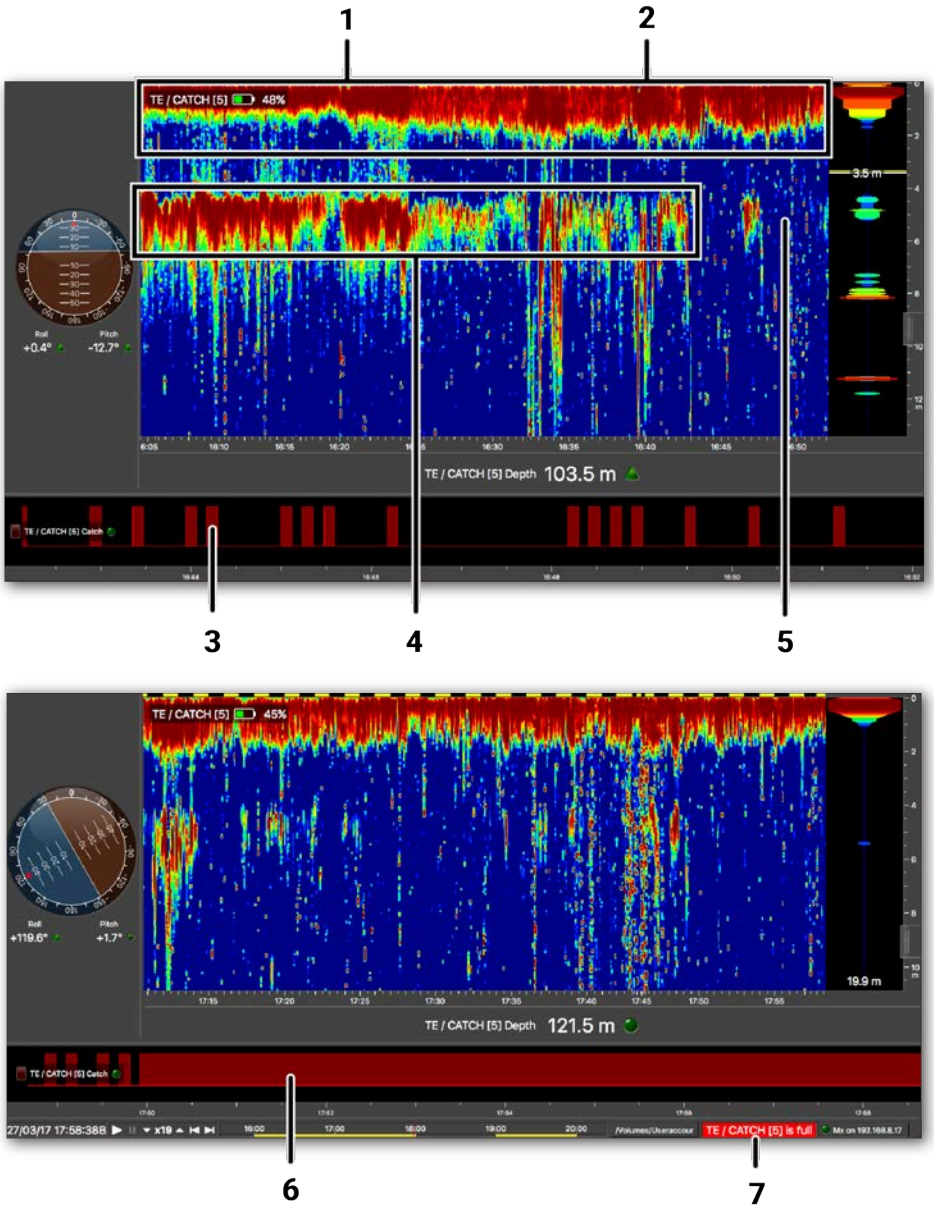
Catch Control System Installation

You can install several sensors on the codend to better follow the filling processes. It is very useful to determine the amount of fish inside the trawl net: you can prevent damage to fish and increase the security of crew and vessel.

For example, you can install three sensors on the codend. They will trigger one by one, according to the amount of fish inside the codend. After a few tows, you can estimate the amount of tonnage of fish that you have depending on whether one, two or three sensors display a full status.



Catch Explorer display



1. Codend

2. Echogram gets denser as the codend fills up and expand

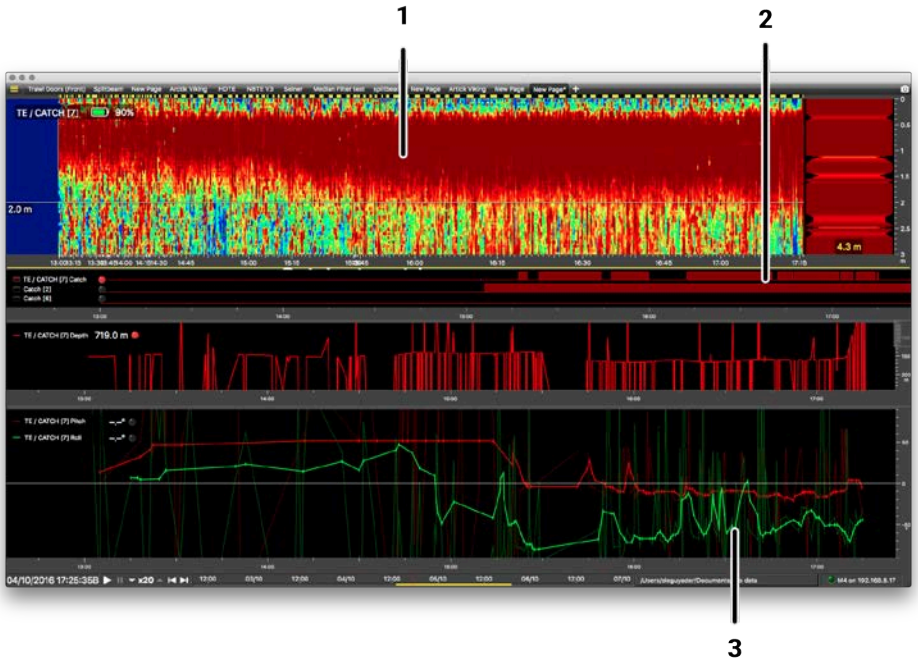
3. Codend is filling up

4. Sea bottom

5. Bottom disappears because fish block the signal

6. Codend is full

7. Alert that Catch is full



1. High strength echogram level gets thicker with fish in the codend
2. Catch pull cords trigger
3. Pitch and roll begin to stabilize

Catch sensors display

Examples of 3 catch sensors with depth, pitch and roll.

Safety Guidelines

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

Basic good practices

When using the product, be careful: strong impacts can cause damage to the electronic components inside.

Never place the product in a hazardous and/or flammable atmosphere.

Product installation and use

Install and use this product in accordance with this user manual. Incorrect use of the product may cause damage to the components or void the warranty.

Only qualified Marport dealers can do maintenance and repairs on internal components of the sensors.

Precautions

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

Description

Firmware

About Catch Firmware

- Standard Catch firmware is compatible with Marport and Scanmar systems. Sensors emit at a frequency around 40kHz.
- Catch hybrid 70 firmware is compatible with Marport, Scanmar, Simrad and Wesmar systems. Sensors can emit at 2 frequencies: 40kHz (Marport, Scanmar) and 70kHz (Simrad, Wesmar).
- Catch hybrid PI firmware is compatible with Simrad PI, Marport and Scanmar systems. Sensors can communicate with Simrad PI and Marport or Scanmar systems at the same time.

Product Name	Firmware Name	Firmware Number
Catch	Catch	FIRM001
	Catch with depth	FIRM017
	Catch with depth, temp	FIRM018
	Catch with pitch & roll	FIRM002
	Catch with pitch & roll, depth	FIRM022
	Catch with pitch & roll, temp	FIRM019
	Catch with pitch & roll, depth, temp	FIRM023
	Catch with temp	FIRM016
Catch hybrid 70	Catch hybrid70	FIRM005
	Catch hybrid70 with depth	FIRM025
	Catch hybrid70 with depth, temp	FIRM006
	Catch hybrid70 with depth, temp, pitch & roll	FIRM008
	Catch hybrid70 with pitch & roll	FIRM007
	Catch hybrid70 with depth, pitch & roll	FIRM027
	Catch hybrid70 with pitch & roll, temp	FIRM026
	Catch hybrid70 with temp	FIRM024
Catch hybrid PI	Catch hybrid sensor (Simrad PI + 70 kHz)	FIRM033

Product Name	Firmware Name	Firmware Number
	Catch hybrid PI	FIRM028
	Catch hybrid PI with pitch, roll, depth	FIRM029
	Catch sensor with depth (Simrad PI)	FIRM034
Catch compatible with Simrad and Wesmar only	Catch compatible Simrad 70 + Wesmar	FIRM003
	Catch compatible Simrad PI	FIRM009
Catch twister	Catch roll twister	FIRM037
Catch Explorer V2	TE/Catch	FIRM127
Catch Explorer V3	TE/Catch V3	FIRM130
	TE/Catch V3 with depth	FIRM131
	TE/Catch V3 with depth, pitch & roll	FIRM133
	TE/Catch V3 with depth, temp, pitch & roll	FIRM134
	TE/Catch V3 with pitch & roll	FIRM132

Technical Specifications

Catch Sensor

Uplink frequency	30 to 60 kHz
Range to vessel	up to 2500 m*
Depth range	up to 1800 m
Data update rate	Catch full: 20 sec. - Catch empty: 30 sec. - Depth: 3-8 sec. - Temp: 3-16 sec. - Pitch & roll: 5-14 sec.
Pitch angle	±90°
Roll angle	±90° (±180° for catch twister)
Pitch & roll accuracy	±0.1°
Depth resolution	0.1 m with 0.1% accuracy
Temp measurement range	-5° C to +25° C
Temp accuracy	±0.1° C
Typical battery life	Up to 740 hours †
Charging time	Standard: 6-8 hours ‡
	Fast Charge: 2.5 hours
Battery type	Lithium-Ion
Weight in air	5 kg
Weight in water	0.9 kg
Warranty	2 years (Sensor & Battery) **

Catch Explorer

Uplink frequency	30 to 60 kHz
Range to vessel	up to 2500 m*
Sounder broadband frequency	Configurable between 360-400 kHz
Sounder range	V2: 5 to 80 m / V3: 5 to 160 m
Data update rate	V2: depth, catch: 2-3 sec. - temp, pitch, roll, battery: 12-24 sec. V3: depth, catch: 4 sec. - temp, pitch, roll, battery: 17 sec.
Echogram update rate	V2: up to 1 image/sec. / V3: up to 3 images/sec.
Pitch angle	±90°

Roll angle	±180°
Pitch & roll accuracy	±0.1°
Depth resolution	0.1 m with 0.1% accuracy
Temp measurement range	-5° C to +25° C
Temp accuracy	±0.1° C
Typical battery life	Up to 19 hours †
Charging time	Standard: 6-8 hours ‡
	Fast Charge: 2.5 hours
Battery type	Lithium-Ion
Weight in air (with housing)	5 kg
Weight in water (with housing)	0.9 kg
Warranty	2 years (Sensor & Battery) **

*Reference only. Depends on functions enabled. / † Depends on sensor uplink power and options. / ‡ Based on average charging time. / **Marport Standard Marine Limited Warranty

Catch Explorer Beamwidths

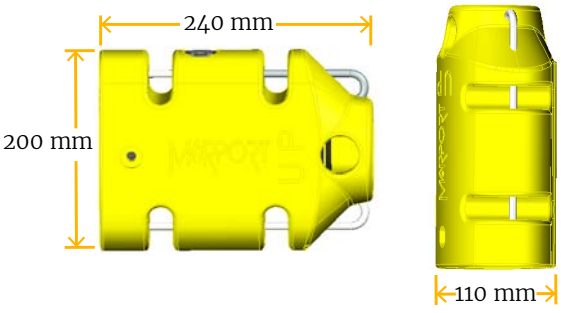
Beamwidths for Uplink pings

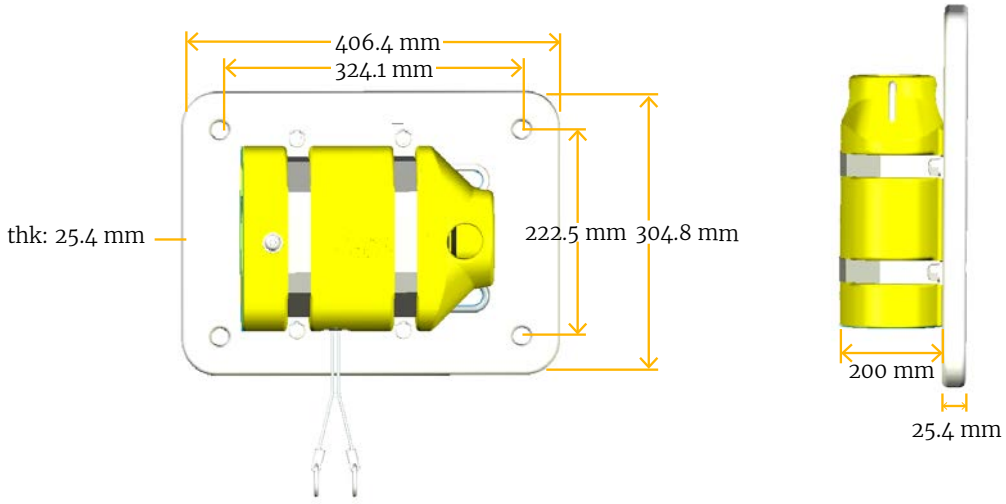
Beamwidth	**@ 35 kHz**	**@ 50 kHz**	**@ 60 kHz**
-3dB	46°	40°	30°

Beamwidths for Down pings

@ 360 kHz	
-3dB	13°

Dimensions

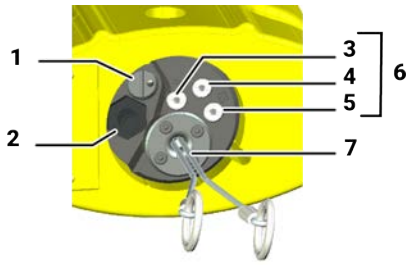




Main Parts

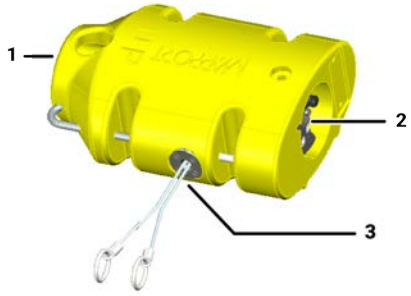
External View

End cap



1. Pressure sensor
2. Temperature sensor
3. Negative charge
4. Water switch
5. Positive charge
6. Shoulder bolts
7. Pull cords (center-pull)

Side view



1. Transducer
2. End cap
3. Pull cords (side-pull)

CAUTION:

- Do not put foreign objects into pressure sensor opening or try to open it.
- Do not remove the shoulder bolts from the outside of the sensor.

It may damage the components.

On the transducer, down sounder is marked by a circle and a A.

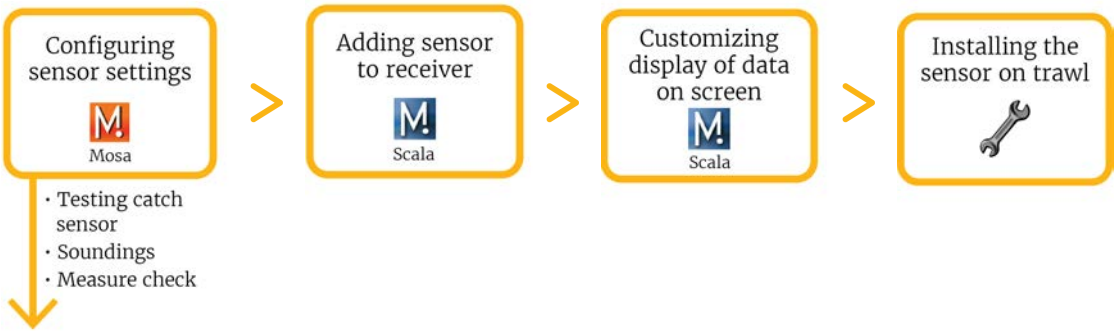
Operational Mode Indicator

Indicators from the transducer

State	Situation	Operation	LED
Charging	Charger plug is connected.	Batteries are charging.	No light.
Running	Sensor is in water or activated with jumper.	After an initialization phase, echo sounder is operating.	 Flashing red
Configuring	Sensor is out of water.	Configuration via wireless communication. Turns off after 10 minutes without user action.	 Flashing green

Installation Steps

Click an installation step to jump directly to the corresponding section.



Note: You can customize the display of data on Scala/Scala2 at any time.

Sensor Configuration

Learn how to configure the sensor settings.

Note: This guide refers to the following versions of **Mosa2:** 02.11.x. If you use another version, the visual interface and options may vary.

Connecting the Sensor to Mosa2

To configure the sensor, you need to connect it to Mosa2 using a wireless communication or using the Configuration Cable.

Using a Wireless Connection

About this task

Important: Mosa 2.11 running on macOS Monterey: A1 sensors cannot connect by short range wireless signal. You must use a Configuration Cable.

Procedure

1. Open Mosa2.

2. Connect the water-switch.

The light on the transducer flashes red.

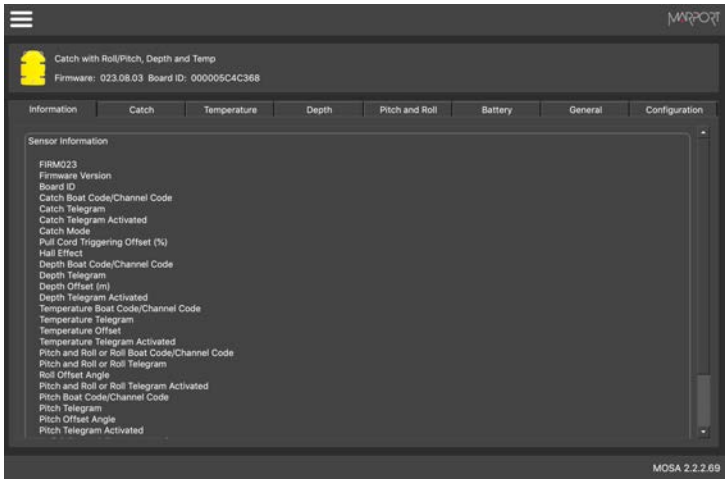
3. Disconnect the water-switch.

After a few seconds, the light flashes green.

4. Wait a few seconds for the sensor to be recognized. When it appears in the discovery page, click .

Results

The sensor configuration pages are displayed.



Using the Configuration Cable

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

About this task

Note: Compatible with Mosa2 02.05.x and above.

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

Procedure

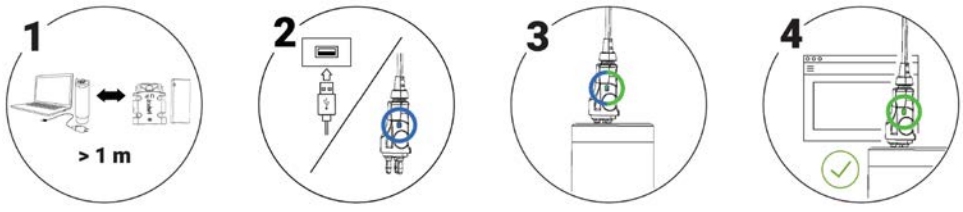
1. Move other electrical devices minimum 1 m away from the computer.
2. Connect the USB connector directly to the computer.

   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.

Example



What to do next

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.

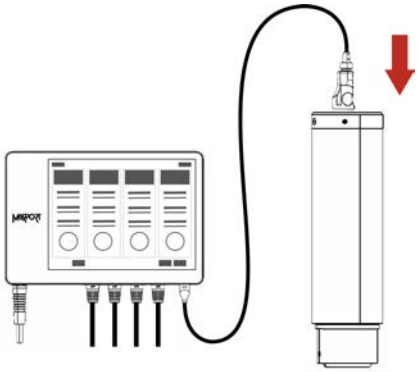
Using the Dock and a Configuration Cable

About this task

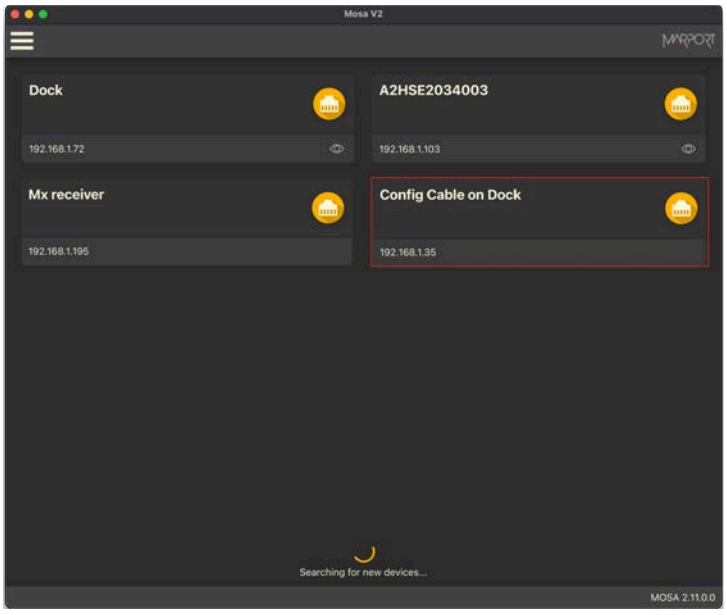
Note: Compatible with Mosa2 02.11.x and above.

Procedure

1. Connect the USB connector of the Configuration Cable to the Dock and the plug to the sensor's endcap.



2. Open Mosa2. The Configuration Cable is displayed on the discovery page.



Click to open the sensor configuration page.

3. To leave Mosa2 configuration page and come back to the discovery page, click ≡ > **Disconnect**.

Calibrating the Catch Sensor

You need to calibrate the catch sensor to make sure you have correct catch measures. This procedure applies for both Catch Explorer and Catch sensors.

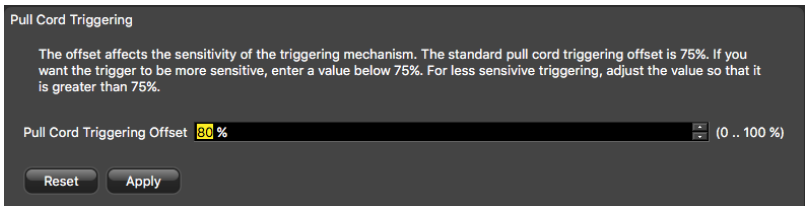
About this task

Catch sensors have two pull cords that are attached to the net. When the trawl fills up, the meshes of the net expand and this pulls the cords. When the cords are pulled up to a certain point, it triggers the catch sensor.

Pull cords can be on the end cap of the sensor (center-pull) or on the side (side-pull). Calibration procedure is the same for both types.

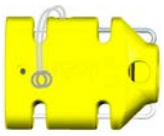
Procedure

1. Click the tab **Catch**.
2. From **Catch Mode**, check that the catch mode is correct:
   - **Center** when pull cords are on the end cap on the top of the sensor.
   - **Side** when pull cords are on the side of the sensor.
3. To change the threshold at which the catch status becomes full when the cords are pulled:
   a) Click **Menu** > **Expert Mode** and enter the password `copernic`.
   b) Click the **Catch** tab, then click **Pull Cord Triggering**.
   c) Adjust the offset. Standard offset is 75%.
   - Set a value below 75% if you want the catch status to become full when the cords are not entirely extended.
   - Set a value above 75% if you want the catch status to become full only when the cords are fully extended.

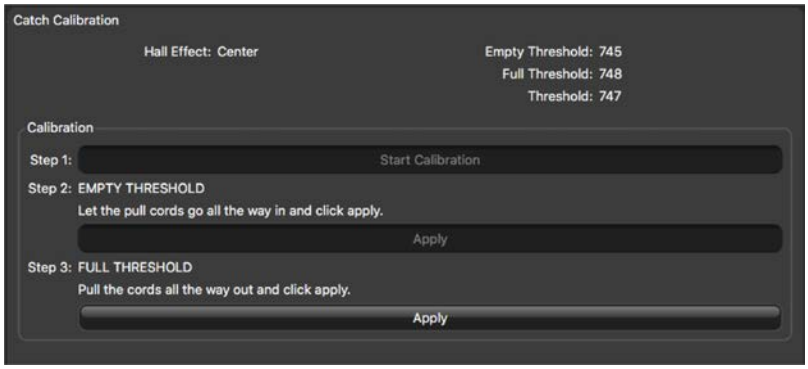


Important: For proper operation, do not set the percentage below 65% or above 85%.

4. To calibrate the catch sensor, from the tab **Catch**, click **Catch Calibration**.
5. Click **Catch Calibration**.
6. To calibrate the sensor for the empty status:
   a) Let the cords hang loose.



   b) From **Step 2: EMPTY THRESHOLD**, click **Apply**.
   After a few seconds, the **Apply** button becomes gray.

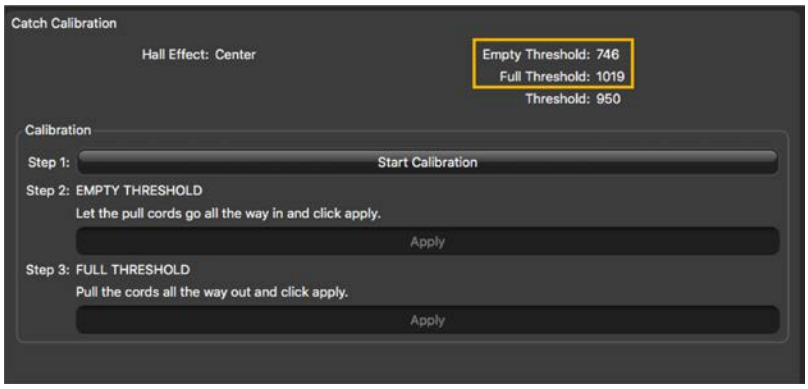


7. To calibrate the sensor for the full status:

   a) Pull and hold the cords as far as possible.

   b) At the same time, click **Apply** from **Step 3: FULL THRESHOLD**.

      After a few seconds, the **Apply** button becomes gray. Measures from **Empty Threshold** and **Full Threshold** change.



What to do next

You can test the catch sensor to check if the empty or full status appear correctly when the cords are pulled.

Testing the Catch Sensor on Mosa2

You need to test the catch sensor to check if the empty/full status works correctly. You can do this regularly.

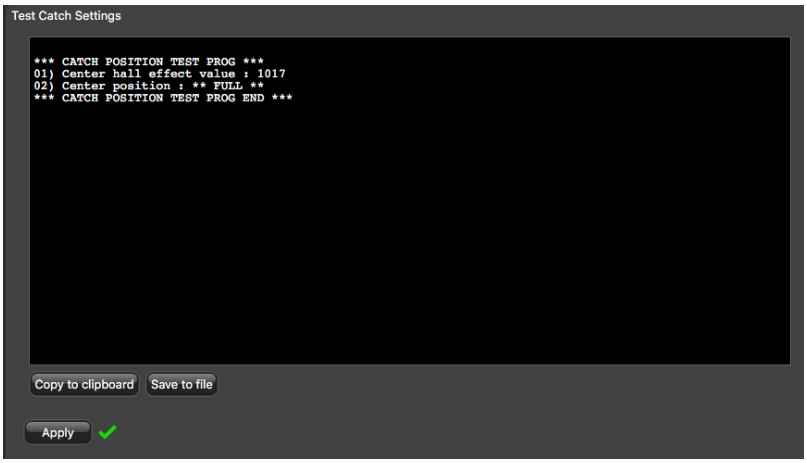
Before you begin

The sensor is connected to Mosa2.

Procedure

1. Click the tab **Catch**.
2. Click **Test Catch Settings**.
3. Pull the cords to a desired length and click **Apply** at the same time.

   Measures are displayed in the black area.



4. Check from **Center/Side position** that the measure is correct:
   - EMPTY: pull cords hang loose or are pulled for three-quarters of the length.
   - FULL: pull cords are pulled at the maximum length.

Note: The empty/full status depends on the pull cord triggering offset set in **Catch** parameters.

Catch Explorer Specific Settings

You need to set these settings for a Catch Explorer sensor.

Configuring the Uplink and Down Settings

You can configure different settings for uplink and down soundings.

Before you begin

The sensor is connected to Mosa2.

About this task

Remember: Always click **Apply** after you change a setting and make sure there is a green check mark ✓.

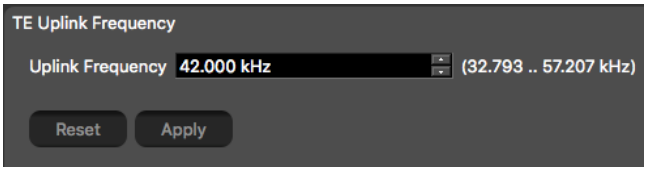
Procedure

Click the tab **Trawl Explorer**.

Uplink

Procedure

1. From **TE Uplink Frequency**, enter a frequency for the signal toward the vessel.



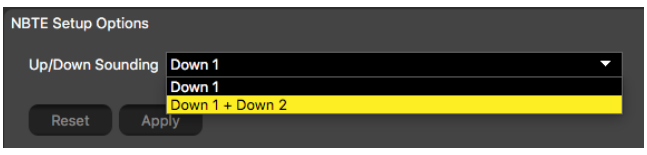
Important: This parameter must be the same in the sensor settings in Scala/Scala2.

2. You can add a delay to the update of data to increase battery lifetime:
   a) Click **Menu** ☰ > **Expert Mode** and enter the password `copernic`.
   b) From **Delay Prp**, enter a delay between 1 and 5 seconds.

Down Sounding

Procedure

1. For Catch Explorer V2 only: in **NBTE Setup Options** you can select **Down 1 + Down 2** if you want to compare two different settings on the down sounding (for example, two ping lengths or 2 frequencies). The sensor will send two consecutive pings toward down direction.



Note: Configure **Down 1** sounding in **Down** settings and **Down 2** sounding in **Up** settings (**Up Sounding Range**, **Ping Up Length**, **Ping Up Frequency**, **Up channel minimum TS**, **Up TVG Mode**, **TVG Up**).

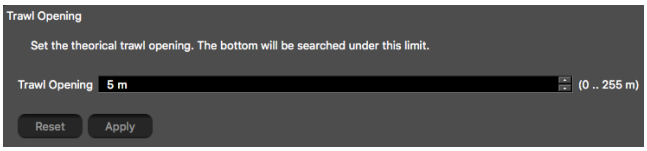
2. From **Down Sounding Range**, select the range according to how many meters you want to see under the sensor.

Note: The range influences the display of echogram images. The smaller the range, the shorter the listening time, which gives better quality images. But the bigger the range is, the lesser the image quality is, because data arrives slower.

Note: The range of the down sounding can automatically change to 20 meters if the distance to the bottom becomes lower than 20 meters and if you entered a trawl opening lower than 20 m. See next step to activate or not this feature.

Important: This parameter must be the same in the sensor settings in Scala/Scala2.

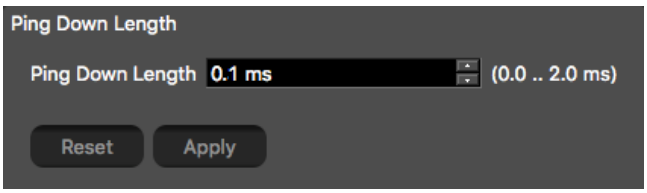
3. If you want the range of the down sounding to automatically change to 20 m when the bottom is closer (< 20 m):



- Enter the height of the trawl opening. It must be lower than 20 m. This is to make sure the sensor will search for the bottom beginning from this distance. This way, the sensor will not confuse the bottom of the codend with the bottom of the sea. For example, if the bottom of the codend is at 4 meters, enter a greater distance, such as 5 meters.

Note: With the autorange feature, the echogram displays better quality images when the distance to the bottom is smaller.

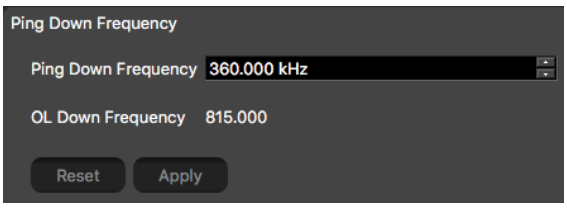
4. If you do not want the range of the down sounding to automatically change, enter 20 m or more.
5. From **Ping Down Length**, enter a pulse length. Choose a pulse length according to the distance at which you need to detect fish. (the longer the pulse, the further you can see, but with a lower resolution):



- Detection between 20 cm and 2 m: enter 0.1 ms (recommended for Catch Explorer sensors)
- Detection above 50 cm: enter 0.4 ms.

Note: The maximum detection depth depends on ping frequency and type of bottom. The lower the ping frequency is, the longer the detection depth is.

6. From **Ping Down Frequency**, enter a frequency for the down sounding.



Important: Frequency needs to be between 360-400 kHz.

Important: TE/Catch V3 Do not change ping frequency on a V3 sensor or it will have to be returned to a Marport sales' office for target strength calibration.

Target Strength

Procedure

1. TE/Catch V3 For V3 version of sensors, **Down channel minimum TS** helps you detecting targets on the echogram. You can put -79 dB if you want to detect small targets. Otherwise, leave the default settings at -73 dB.

Important: This parameter must be the same in the sensor settings in Scala/Scala2.

2. Select the appropriate TVG (Time Variable Gain) mode. See About Time Variable Gain on page 29 for more information.

   TE/Catch V3 For V3 version of sensors, go to **Down TVG Mode**:

- 20 log: focus on bottom or school of fish (recommended for Catch Explorer).
- 40 log: focus on individual targets.

- 30 log: compromise between the two above settings.

TE/Catch V2 For V2 versions of sensors, go to **TVG Down**:

- In **TVG Coefficient**, enter between 0.500 and 0.520 to have approximately the equivalent of 20 log (recommended for Catch Explorer), 0.75 for 30 log or 1 for 40 log.
- In **Attenuator Coefficient**, enter between **-15** and **-25**. This coefficient is specific to Catch Explorer sensors.
- Leave **VCO Coefficient** default settings at 3.

About Time Variable Gain

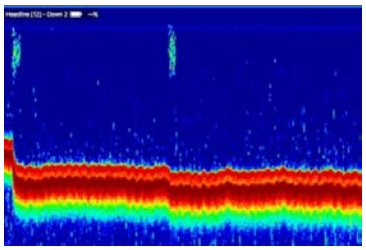
TVG (Time Variable Gain) is a method that compensate signal loss in the water. Basically, the aim is to have targets or sea bottom displayed in the same color on the echogram, whatever the distance from the sensor.

When the sounder sends pings, the deeper the target is, the more attenuated signals will be received and sent back. As a result, if the signal is too much attenuated, echoes (target strength) received from a target might not be as strong as they should be. TVG is here to compensate this effect. It uses a lower gain level when signals travel toward a target at a small distance and higher gain level when signals travel toward deeper targets. The end result is to compensate sounding attenuation and therefore to show a same target strength for a same target at different depths.

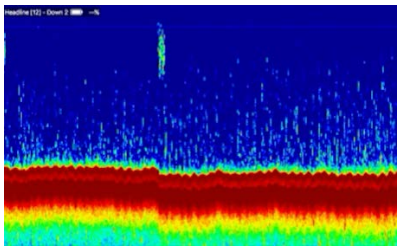
You can choose between three different TVG modes:

- 20 log: use to focus on the bottom, footrope or a school of fish (recommended for Catch Explorer).
- 40 log: use to focus on individual targets.
- 30 log: compromise between the two others.

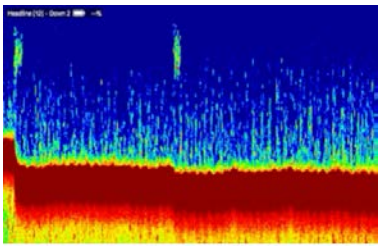
20 log



30 log



40 log



Configuring Catch Sensor Telegrams

If you have a Catch sensor (40kHz), you need to configure the telegrams it transmits. This does not apply for Catch Explorer sensors.

About this task

Telegrams are used to define the acoustic communication between the sensor and the receiver. Data (e.g. temperature, depth) are recognized by the receiver according to the type of telegram defined (e.g. TL, CL). The telegram defines intervals between pulses emitted by the sensor, and one interval represents one value. For example, if the interval between 2 pulses of a TL temperature telegram is 12 s, the temperature is 6.5 °C.

The temperature, depth, pitch and roll options that are displayed on Mosa2 depend on the firmware installed.

Important: Make sure there is a minimum distance of 100 Hz between PRP telegrams and of 400 Hz with the uplink frequency of NBTE sensors. See Frequency Plan on page 71 for a full list of boat/channel codes..

Remember: Always click **Apply** after you change a setting and make sure there is a green check mark ✓.

Catch

About this task

Catch telegrams are sent every 20 sec. for a full status and every 30 sec. for an empty status.

Procedure

1. Click the tab **Catch**.

2. From **Catch Boat Code/Channel Code**, choose a frequency.

Temperature

Procedure

1. Click the tab **Temperature**.

2. From **Temperature Boat Code/Channel Code**, choose a frequency.
3. From **Temperature Telegram**, choose between:
   - TL: sends data between every 11 to 16 sec.
   - TN: sends data between every 3 to 11 sec.

   Note: TN sends data more often, but it reduces the battery life.
4. You can deactivate temperature data to save battery life:

   a) From Mosa2, click **Menu** ☰ > **Expert** and enter the password `copernic`.

b) From **Temperature Activation**, select **No**.

Depth

Procedure

1. Click the tab **Depth**.

2. From **Depth Boat Code/Channel Code**, choose a frequency.
3. From **Depth Telegram**, choose among the telegrams according to the depth at which you are fishing. They all send data every 3 to 8 sec, but at different depth ranges.

Note: The lower the depth range is, the more precise the measures are.

- D3 = 300 m
- D6 = 600 m
- D12 = 1200 m
- D18 = 1800 m

4. You can deactivate depth data to save battery life:

a) From Mosa2, click **Menu** ☰ > **Expert** and enter the password `copernic`.
b) From **Depth Activation**, select **No**.

Pitch and Roll

Procedure

1. Click the tab **Pitch and Roll**.

2. If you send pitch and roll data on the same channel:

a) From **Pitch and Roll or Roll Boat Code/Channel Code**, select a frequency.
b) From **Pitch and Roll or Roll Telegram**, choose between:

- **Telegram CL**: sends data every 11 to 14 sec.
- **Telegram VQ**: sends data every 5 to 9 sec.

Note: VQ sends data more often, but it reduces the battery life.

3. If you send pitch and roll data on two different channels:

a) From **Pitch and Roll or Roll Boat Code/Channel Code**, select a channel for roll data.
b) From **Pitch and Roll or Roll Telegram**, choose roll telegram between:

- **Telegram D3**: sends data every 3 to 8 sec.
- **Telegram AL**: sends data every 11 to 15 sec.

Note: D3 sends data more often, but it reduces the battery life.

c) From **Pitch Boat Code/Channel Code**, select a channel for pitch data.

d) From **Pitch Telegram**, choose between:

- **Telegram D6**: sends data every 3 to 4 sec.
- **Telegram AN**: sends data every 3 to 6 sec.

4. You can deactivate pitch and roll data to save battery life:

a) From Mosa2, click **Menu** ☰ > **Expert** and enter the password `copernic`.
b) To deactivate the roll: from **Pitch and Roll or Roll Activation**, select **No**.
c) To deactivate the pitch: from **Pitch Activation**, select **No**.

Catch Hybrid PI

About this task

Catch hybrid PI firmware is compatible with Simrad PI, Marport and Scanmar systems. Sensors can communicate with Simrad PI and Marport or Scanmar systems at the same time.

Catch data are sent to Simrad PI system and to Marport or Scanmar systems. Depth, temperature, pitch and roll data are sent only to Marport or Scanmar systems.

Procedure

1. Click the tab **Catch**.

2. The settings for catch data sent at 40kHz and settings for depth, temperature, pitch and roll data are the same as above.
3. From **Catch PI Frequency**, choose a frequency to communicate with a Simrad PI receiver.
4. From **Catch PI Telegram**, choose the update rate of data sent to Simrad PI receiver. The update of data is quicker when **Fast** is set, but this reduces the battery life.
   - **Telegram Fast**: sends a full status signal every 5 sec. / Empty status every 5.5 sec.
   - **Telegram Normal**: full status every 32 sec. / Empty status every 34 sec.
   - **Telegram Slow**: full status every 123 sec. / Empty status every 126 sec.
5. If you need to deactivate the transmission of data to PI system, click the tab **Catch** and from **Catch PI Activation**, select **No**.

Catch Hybrid 70

About this task

Catch hybrid 70 firmware is compatible with Marport, Scanmar, Simrad and Wesmar systems. Sensors can emit at 2 frequencies: 40kHz (Marport, Scanmar) and 70kHz (Simrad, Wesmar).

Catch data are sent at 70kHz and 40kHz frequencies. Depth, temperature, pitch and roll data are sent only to 40kHz (Marport, Scanmar).

Procedure

1. The settings for catch data sent at 40kHz and settings for depth, temperature, pitch and roll data are the same as above.
2. From **Catch 70kHz Channel**, choose an appropriate channel for Simrad or Wesmar receivers.

3. If you need to deactivate the transmission of data at 70kHz, click the tab **Catch** and from **Catch 70 kHz Activation**, select **No**.

Configuring the Uplink Power

You can increase the uplink power of the sensor to increase the power of the signal transmitted. It is useful if you have interferences or if the sensor is far from the vessel.

Before you begin

The sensor is connected to Mosa2.

Procedure

1. From Mosa2, click the tab **General**.

2. From **Uplink Power Adjustment Level**, choose the uplink power (values in percentage are for Mosa version 01.02.00 and later):

Sensor	Recommended Uplink Powers	Conditions	Estimated Battery Life
Catch sensor	1800 / 43%	• Sensor is far from vessel (e.g. more than 800 m depending on conditions, high depth, placed on codend) • High level of interferences • Issues receiving data • Low SNR	approx. 30 days
	3080 / 92% and up to maximum	Increase if 1800 uplink power is not enough.	The more you increase the uplink power, the shorter the battery life becomes.
Catch Explorer	1800 / 58%	• Sensor is far from vessel (e.g. more than 800 m depending on conditions, high depth, placed on codend) • High level of interferences • Issues receiving data • Low SNR	• Approx. 19 hours with PRP delay = 0 sec. • Approx. 35 hours with PRP delay =3 sec
	3080 / 100%	Increase if 1800 uplink power is not enough.	The more you increase the uplink power, the shorter the battery life becomes.

Note: The average battery life also depends on the uplink frequency, sounding range and options activated.

Testing Measures

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

Before you begin

The sensor is connected to Mosa2.

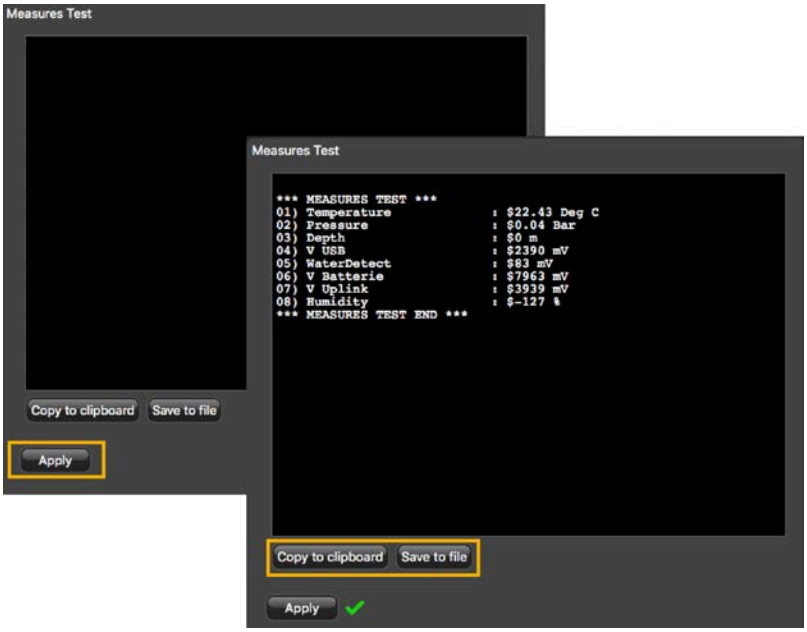
Procedure

1. From Mosa2, click **Menu** ☰ > **Expert** and enter the password `copernic`.
2. Click the tab **General**.
3. From **Measures Test**, click **Apply**.

   The measures taken by the sensor are displayed.
4. Check the following measures:
   - The temperature is consistent with the sensor environment.
   - The depth is between 0 and 2m.
   - The battery is between 6.9V and 8.1V.

   Troubleshooting: If depth is incorrect, you can put an offset in **Depth** > **Depth Offset**.

   The other measures are only useful for the support service.
5. To save the test results on your computer:



   - Click **Save to file** to download the file.
   - Or, click **Copy to clipboard** then press **Cmd + V** on a word processor like Pages to paste the contents.

Exporting Sensor Configuration Settings for Record Keeping

You can export in a *.txt file all the settings configured for the sensor (such as ping length, frequency, range, TVG...).

Before you begin

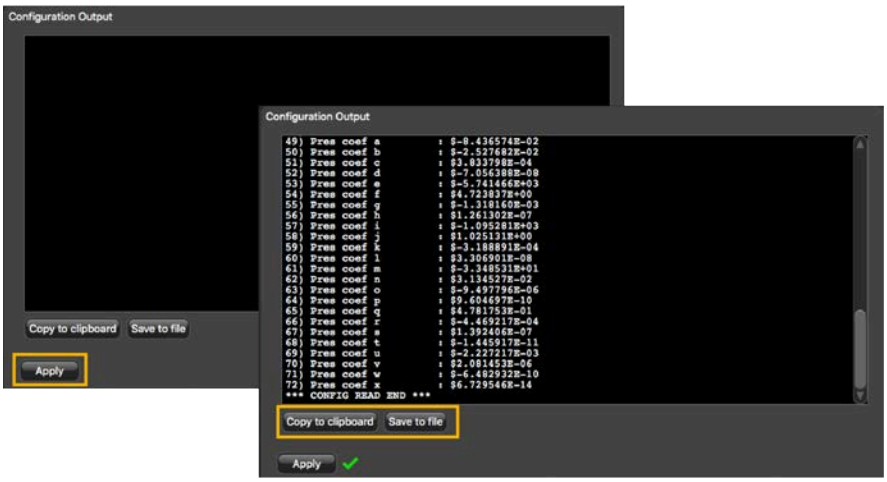
- You have finished configuring the sensor.
- The sensor is connected to Mosa2.

Procedure

1. Click the tab **Configuration**.

2. Click **Configuration Output**.
3. Click **Apply** under the black area.

   The settings are displayed.
4. To save the settings:



   - Click **Save to file** to download the file on the computer.
   - Or, click **Copy to clipboard**, then press **Cmd + V** on a word processor like Pages to paste the contents.

Exporting Sensor Configuration Settings for the Receiver

You can export on an XML file the sensor settings that you configured on Mosa2. You can afterward use this file when adding the sensor to a receiver.

Before you begin

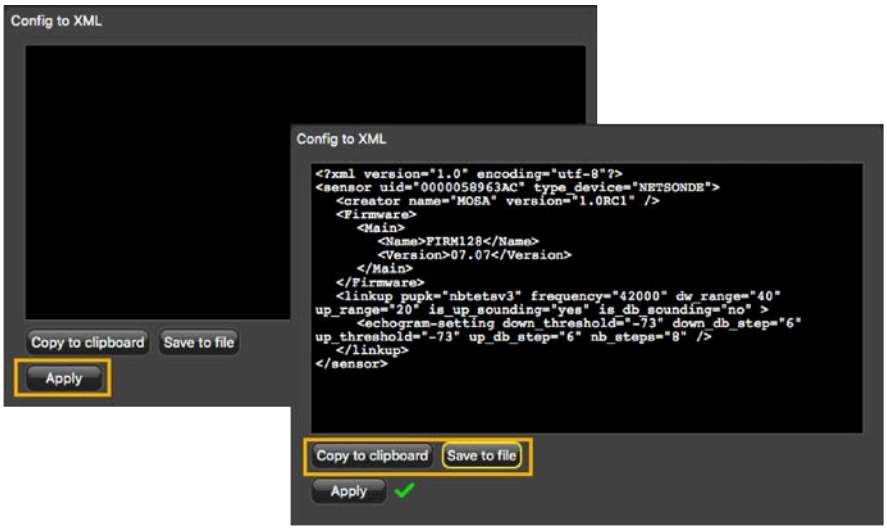
- You have finished configuring the sensor.
- The sensor is connected to Mosa2.

Procedure

1. Click the tab **Configuration**.

2. Click **Config to XML**.
3. Click **Apply**.

   The settings are displayed.
4. To save the settings:



   - Click **Save to file** to download the XML file on the computer.
   - Or, click **Copy to clipboard**, then press **Cmd + V** on a word processor like Pages to paste the contents.
5. Change the name of the XML file saved on your computer.

   Note: When you export the sensor settings, the XML file always has the same name. Changing its name will prevent you from overwriting it the next time you download sensor settings.

What to do next

See Adding the Sensor with a Configuration File on page 38 to know how to add the sensor to a receiver with this file.

System Configuration and Display

Learn how to configure the receiver to be able to receive and display catch sensor data.

Note: This guide refers to the following versions: Scala 01.06.06-01.06.34, Scala2 02.10.x. If you use another version, the visual interface and options may vary.

Adding the Sensor to the Receiver

You need to add the sensor to the receiver in order to display its data on Scala/Scala2.

Firmware	Receiver version	Scala/Scala2 version
Catch	all	all
TE/Catch V2	04.02.02 or later	01.00.04 or later
TE/Catch V3	04.02.28 or later	01.02.05 or later

Adding the Sensor with a Configuration File

You can add the sensor to the receiver with a configuration file that contains the sensor settings you configured on Mosa2.

Before you begin

- You have exported an XML file containing the sensor settings (See Exporting Sensor Configuration Settings for the Receiver on page 36).

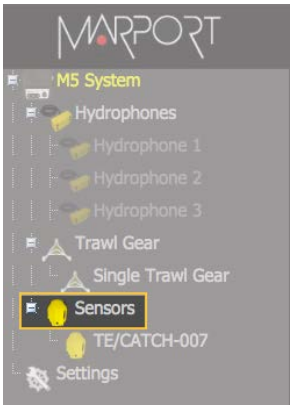
Important: You need to have **Firefox version 22 to 51**.

Procedure

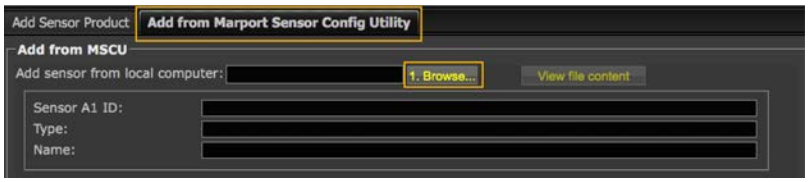
1. Enter your receiver IP address in Firefox web browser to access the system web page. The system web page gives access to the configuration of the receiver.

   Note: Default IP addresses are: 192.168.10.177 for M3 and M6 receivers, 192.168.1.170 for M4 receiver. Add the address as a bookmark in Firefox to easily access it.

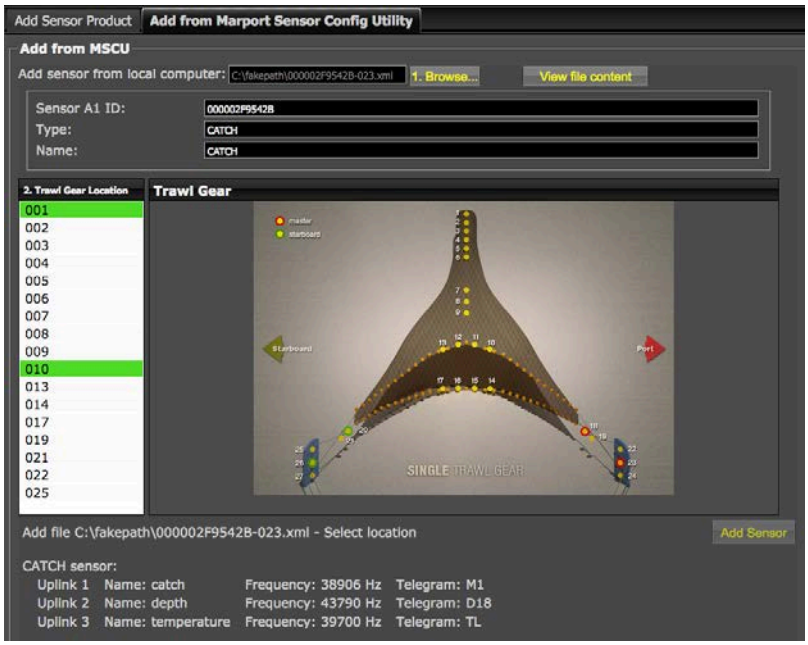
2. From the left side of the page, click **Sensors**.



3. Click the tab **Add from Marport Sensor Config Utility**.
4. Click **Browse** and select the XML file.



Information about the sensor is displayed.

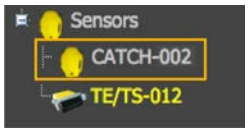


5. Select a node from the list on the left. Nodes in green are already used.

Note: We recommend you to choose nodes between 1 and 6 because they are placed on the codend.

6. Click **Add Sensor**.

The sensor is added to the system, with all its settings.



Results

You can see incoming data in the control panels, in Scala **Sensors Data**/ Scala2 **Mx**.

What to do next

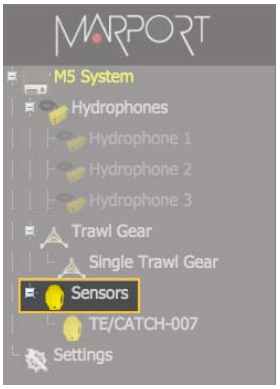
- If you want to apply filters on data received by the sensor, see Configuring the Sensor Settings on page 40.
- You can now configure the display of incoming data in Scala/Scala2.

Adding the Sensor Manually

You can add the sensor to the receiver from Scala/Scala2, by entering the same settings as the ones in Mosa2.

Adding the Sensor to the Receiver

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



5. On the **Add Sensor Product** page, select the options according to your type of sensor:

Type of sensor	Product category	Product Name	Trawl Gear Location
Catch Explorer	TE/Catch	• TE/Catch (V3) with different options* • TE/Catch (V2)	Codend: nodes between 1 and 6
Catch	Catch	• Catch • Catch with different options*	
Catch hybrid PI	PI Sensor	PI Catch	

*The options depend on the firmware installed.

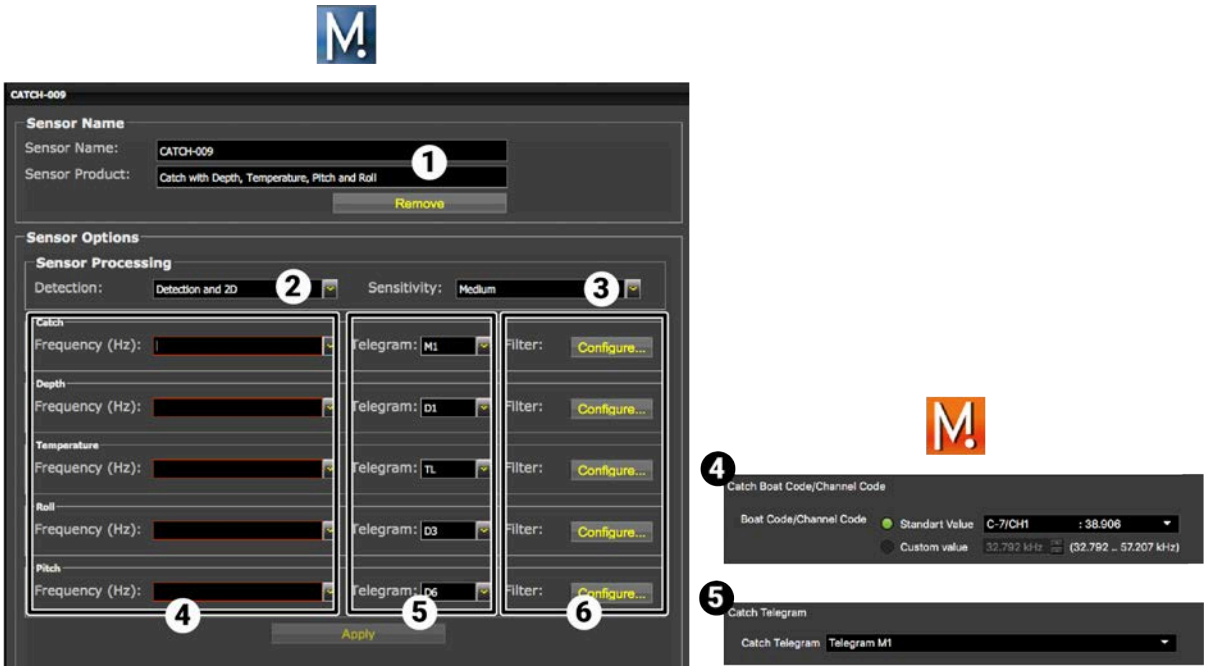
Note: Sensors with Catch hybrid 70 firmware can be added to Marport, Scanmar, Simrad and Wesmar receivers. They transmit at a frequency around 40kHz for Marport and Scanmar receivers and also at a frequency around 70kHz for Simrad and Wesmar receivers.

Note: Sensors with Catch hybrid PI firmware can be added to Marport, Scanmar and Simrad PI receivers.

Configuring the Sensor Settings

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

Catch Sensor



Note: The options (depth, temperature, etc.) vary according to the firmware installed.

1	Sensor name displayed in Scala/Scala2 and its features.
2	This setting helps detecting the signal of the sensor among other sensor or echosounder signals. Change only if you have issues receiving data. • **Detection and 2D**: default value. This setting helps distinguishing the sensor signals when there are a lot of interferences (e.g. echosounders). It selects the correct signals according to very selective criteria. • **Detection**: If you do not receive data, it may be because the **Detection and 2D** setting is too selective with the signal. **Detection** is less selective and allows more signals to be received. • **Detection for Seiner**: no need for this sensor
3	• **Low**: if the signal of the sensor is high = the trawl is close to the vessel (SNR min. 18 dB). • **Medium**: Default setting. Compromise between the two other settings (SNR min. 12 dB). • **High**: if the signal of the sensor is low = the trawl is far from the vessel (SNR min. 6 dB).
4	Enter the same frequencies as those entered in Mosa2 in **Boat Code/Channel Codes**.
5	Enter the same telegrams as those entered in Mosa2 for each option.
6	Click **Configure** to change filters applied on incoming data. Filters are particularly useful to reduce interferences on the echogram data. **Tip:** Catch telegram has a specific filter called **Debounced**: you can choose to display status as full when receiver has received 2, 3 or 4 "full" signals from the sensor.

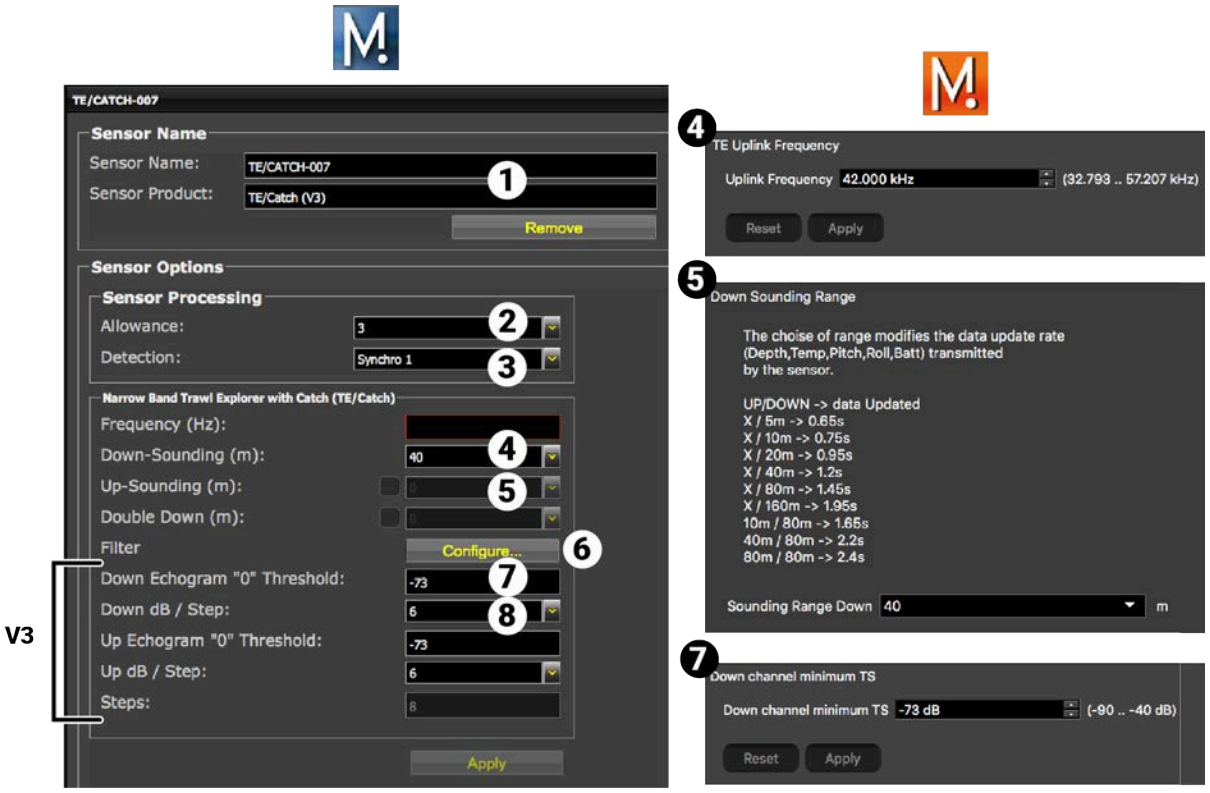
Click **Apply** when you have finished.

PI Catch Sensor

1	Sensor name displayed in Scala/Scala2 and its features.
2	This setting helps detecting the signal of the sensor among other sensor or echosounder signals. Change only if you have issues receiving data. • **Detection and 2D**: default value. This setting helps distinguishing the sensor signals when there are a lot of interferences (e.g. echosounders). It selects the correct signals according to very selective criteria. • **Detection**: If you do not receive data, it may be because the **Detection and 2D** setting is too selective with the signal. **Detection** is less selective and allows more signals to be received. • **Detection for Seiner**: no need for this sensor
3	• **Low**: if the signal of the sensor is high = the trawl is close to the vessel (SNR min. 18 dB). • **Medium**: Default setting. Compromise between the two other settings (SNR min. 12 dB). • **High**: if the signal of the sensor is low = the trawl is far from the vessel (SNR min. 6 dB).
4	Enter the same frequency as the one entered for the uplink frequency in Mosa2.
5	Enter the interval at which signals are sent. They must be the same as in Mosa2. The update of data is quicker when **Fast** is set, but this reduces the battery life. • **Fast**: full every 5 sec. / Empty every 5.5 sec. • **Normal**: full every 32 sec. / Empty every 3 sec. • **Slow**: full every 123 sec. / Empty every 126 sec.
6	Click **Configure** to change filters applied on incoming data.

Click **Apply** when you have finished.

Catch Explorer



1	Sensor name displayed in Scala/Scala2 and its features.
2	This setting helps detecting the signal of the sensor among other sensor or echosounder signals. Change only if you have issues receiving data. · Choose between **0-2** only if no interferences on the vessel (not recommended). · **3** is default setting. · Choose between **4-6** if you have issues receiving data. It allows you to receive more data, but be aware they might be wrong data.
3	This setting also helps detecting the sensor signal. Leave default setting at Synchro 1.
4	Enter the same frequency as the one entered for the uplink frequency in Mosa2.
5	Range of the down sounding. Corresponds to **Sounding Range** in Mosa2. Catch Explorer V2 only: select **Double down** if using **Down 1 + Down 2** sounding mode.
6	Click **Configure** to change filters applied on incoming data. Filters are particularly useful to reduce interferences on the echogram data. **Tip:** Catch telegram has a specific filter called **Debounced**: you can choose to display status as full when receiver has received 2, 3 or 4 "full" signals from the sensor. **Tip:** Please refer to Scala/Scala2 user guide for more information about the filters.

7	Helps you detecting targets on the echogram. Corresponds to **Channel minimum TS** in Mosa2.
8	Do not change this setting.

Click **Apply** when you have finished.

Results

The sensor is added to the system. You should see incoming data from the control panels, in **Sensors Data**. You can now configure the display of incoming data in Scala/Scala2.

Configuring Data Display

You can display on pages in Scala/Scala2 measurements taken by the sensors (e.g. catch status, depth, pitch and roll...).

About this task

Sensor measurements are displayed in the control panels, in the Scala **Sensors Data**/ Scala2 **Mx** tab. Data title should be:

- **TE/CATCH** for a Catch Explorer
- **CATCH** for Catch sensors
- **PI-CATCH** for Catch hybrid PI sensors.

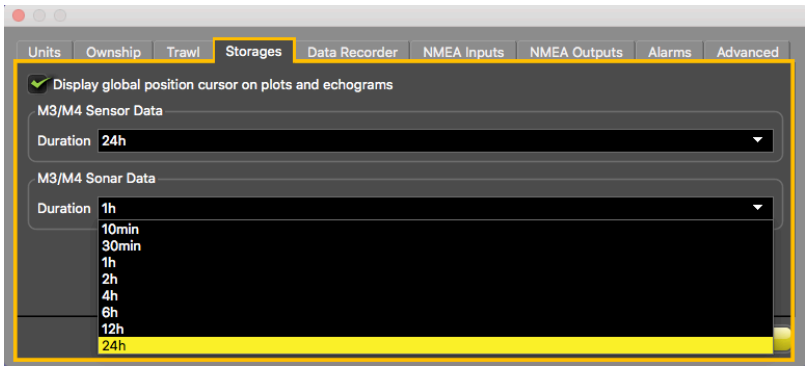
The title is followed by the node where the sensor was placed when added to the system. Data displayed (e.g. pitch & roll, temperature) depends on the firmware installed.

Procedure

1. For a Catch Explorer, we recommend to put in Scala/Scala2 a storage time of data of 24h. It can take a few hours before the trawl is full. If you do not change the storage time, you can only zoom out on a scale of 2 hours. With 24h, you will be able to zoom out on a larger scale and see the progression of the trawl filling up.

   a) Click **Menu** ☰ > **Settings**.

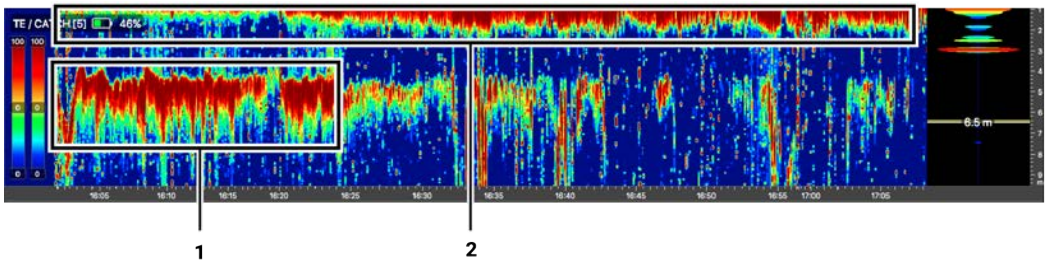
   b) Scala Click the tab **Storages**, then, from **M3/M4 Sensor Data** and **M3/M4 Sonar Data** duration, select **24h**.



2. From the top left corner of the screen, click **Menu** ☰ > **Customize**.

3. To display echogram images of a Catch Explorer: from **TE/CATCH** in Scala **Sensors Data** / Scala2 **Mx**, click + hold **Sonar Data** and drag it to the page display.

Below is an example of an echogram image.



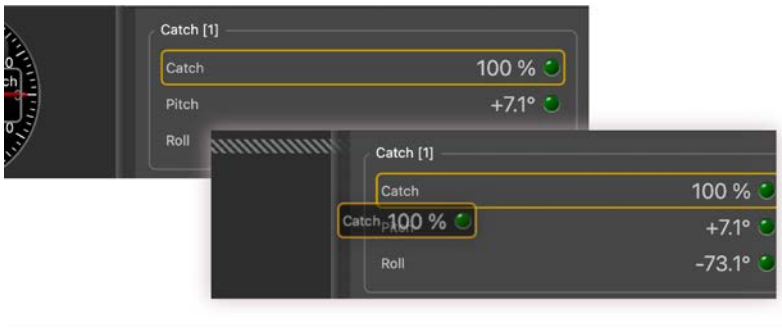
When the codend is not totally full, you can see the bottom of the sea (**1**). When the codend is filling up, you can see at the top that the echogram gets denser (**2**) and the sea bottom disappears. It is because fish can block the signal.

Note: When the trawl is empty, the codend moves a lot, as well as the sensors attached to it. You may not have correct echogram images at the beginning of a tow because the sensors are not correctly oriented toward the vessel. The codend and sensor become stable when the trawl begins to fill. The codend can move again when the codend is full.

Note: We recommend you to deactivate **Draw Bottom Line** option. Right-click the echogram to check if it is activated.

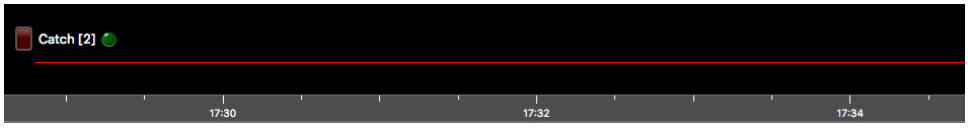
4. To know if the trawl is empty or full:

a) Open the control panels and drag **Catch** data to a page.

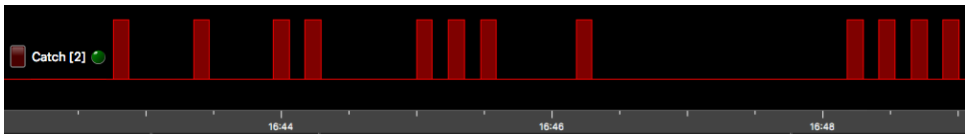


b) In the **Choose new Gauge Type** dialog box, select **History Plot**.

When the codend is empty, the history plot is:

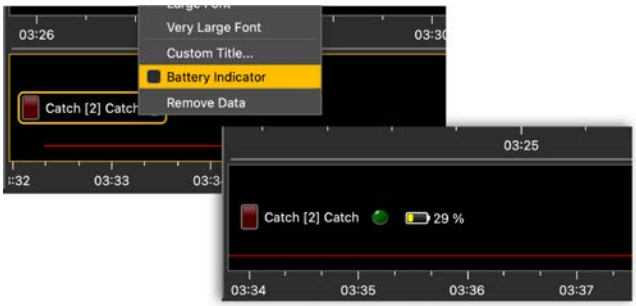


When the codend is filling up:



When the codend is full:

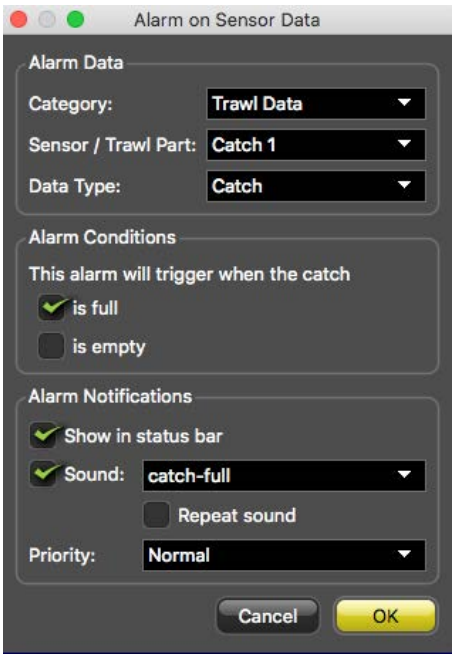
5. If you have a firmware version 08.03 and above, you can display the battery level on the plot. Right-click the title of the plot and click **Battery Indicator**.



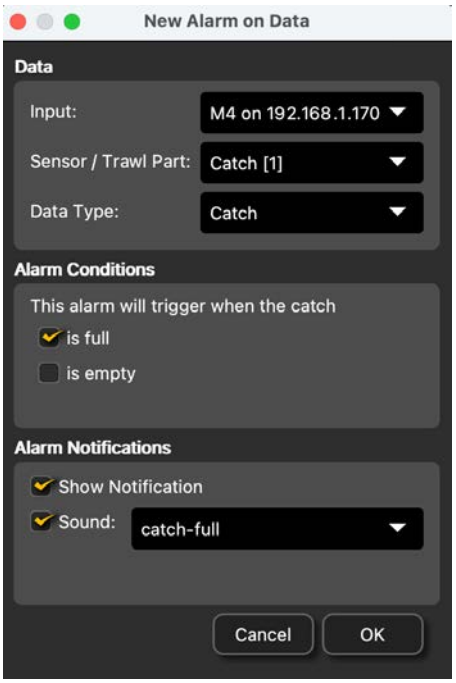
6. To be alerted when the trawl is full:

a) From the top left corner of the screen, click **Menu** ☰ > **Settings**.
b) From the **Settings** dialog box, go to the **Alarms** tab.
c) Click **Add**.
d) In **Alarm Data** and **Alarm Conditions**, enter the following settings:

Scala



Scala2

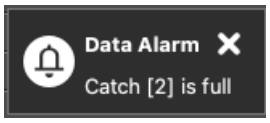


Note: If you have several Catch sensors, you can select other sensors from **Sensor / Trawl Part**.

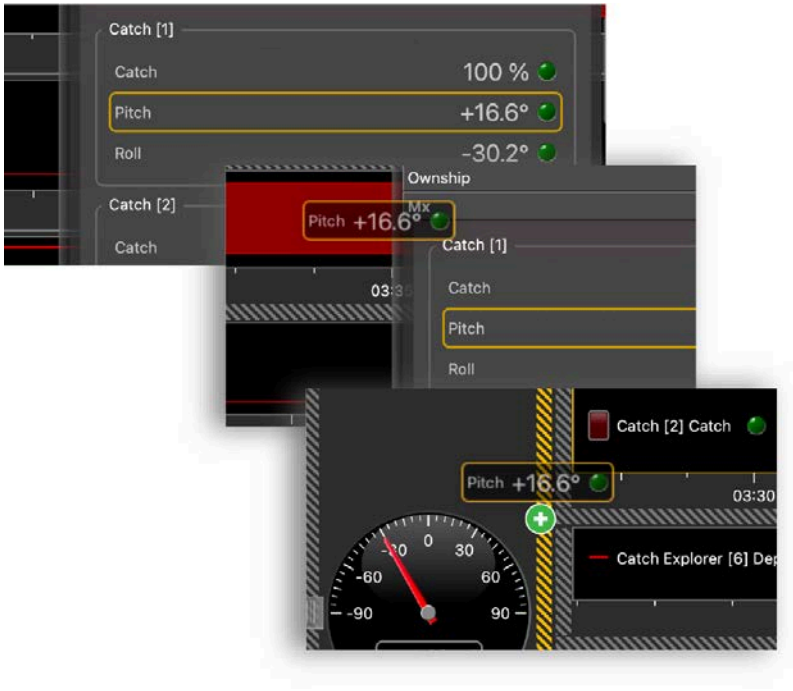
a) In **Alarm Notifications**, choose if you want to display a visual and sound notification:

- Scala In the status bar:

- Scala2 With a notification:

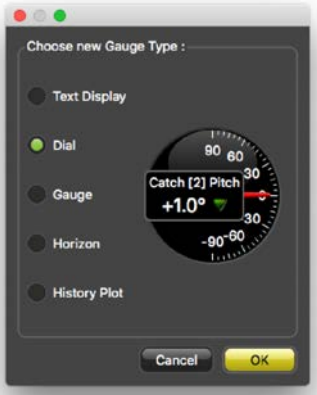


7. To display pitch and roll data, click + hold data and drag it to the page display.



From **Choose new Gauge Type** dialog box, select the type of display.

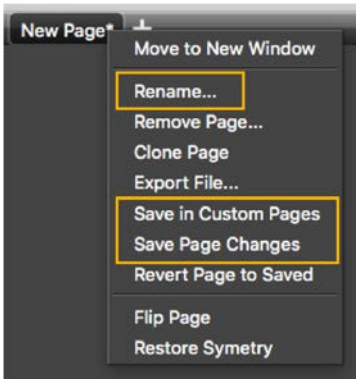
Scala



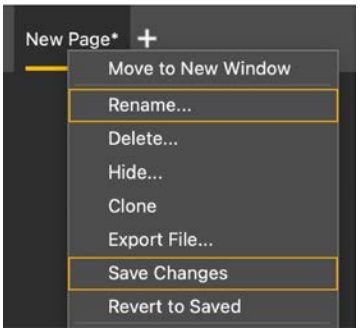
Scala2

8. To save the changes you made:
    1. To rename the page, right-click the name of the page and click **Rename**.
    2. To save the page, right-click the name of the page and click **Save Changes**.
    3. **Scala** To have a backup of the page, right-click the name of the page and click **Save page template as**.
    Your page is saved in Scala's page backups.

Scala



Scala2



9. Deactivate the Customize mode when you have finished customizing pages: click **Menu** ☰ > **Customize** again.

Installation

Learn how to install catch sensors on the trawl gear.

Installing Catch Sensors on the Trawl

You can install one or several Catch and Catch Explorer sensors on the codend of the trawl.

About this task

Sensors can be installed with the pull cords on the side or on the center of the sensor.

Pull cords are attached to the net. When the net fills up and the meshes expand, cords are pulled and this triggers the catch sensor.

You can install a stabilization board for Catch Explorer sensors.

Procedure

1. Install the sensor on the top of the codend with the **UP** side of the housing oriented toward the vessel. You can install a double-mesh piece of netting to stabilize the sensor. Make sure there is nothing in front of it that would block its signal.

   Tip: If the meshes of the net obstruct the Catch Explorer signal, you can install the sensor inside the codend.

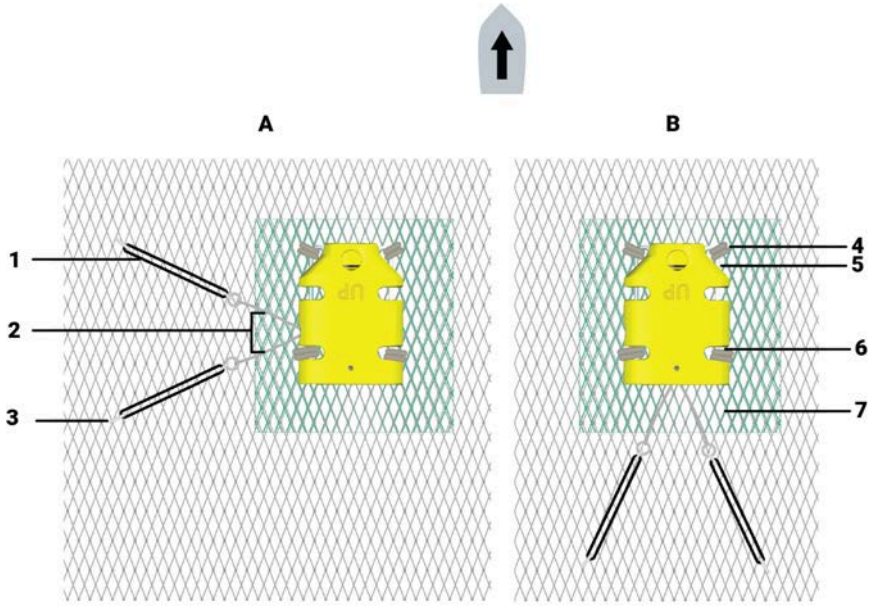
2. Securely attach the sensor to the net by its front and back attachment lugs:

   a) We recommend to attach the front and back attachment lugs with rope. This prevents metal to metal contact and extends the life of the housing.
   b) When you attach the sensor, stretch the net codend at the point where you need the catch status to become full.
   c) Once installed, make sure that when the net is fully stretched out it does not cause stress on the attachments points.

3. If you use a stabilization board:

   a) Put the mounting straps through the lugs on the sides.
   b) Attach the stabilization board with rope to prevent rapid wear on the board.

4. Attach one end of each rubber strap to the pull cords of the sensor, and the other ends to the net. Make sure the pull cords are taut enough to trigger when the net is full, but loose enough not to trigger when the net is empty.

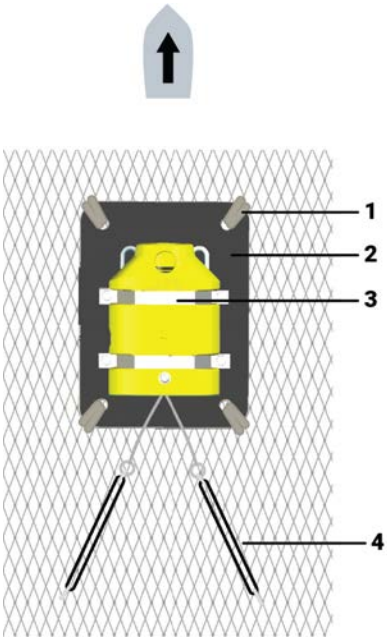


A. Side-pull
B. Center-pull

1. Rubber strap
2. Pull cords
3. Snap hook
4. Knot with rope

5. Front attachment lug
6. Back attachment lug
7. Double-mesh piece of netting for stabilization

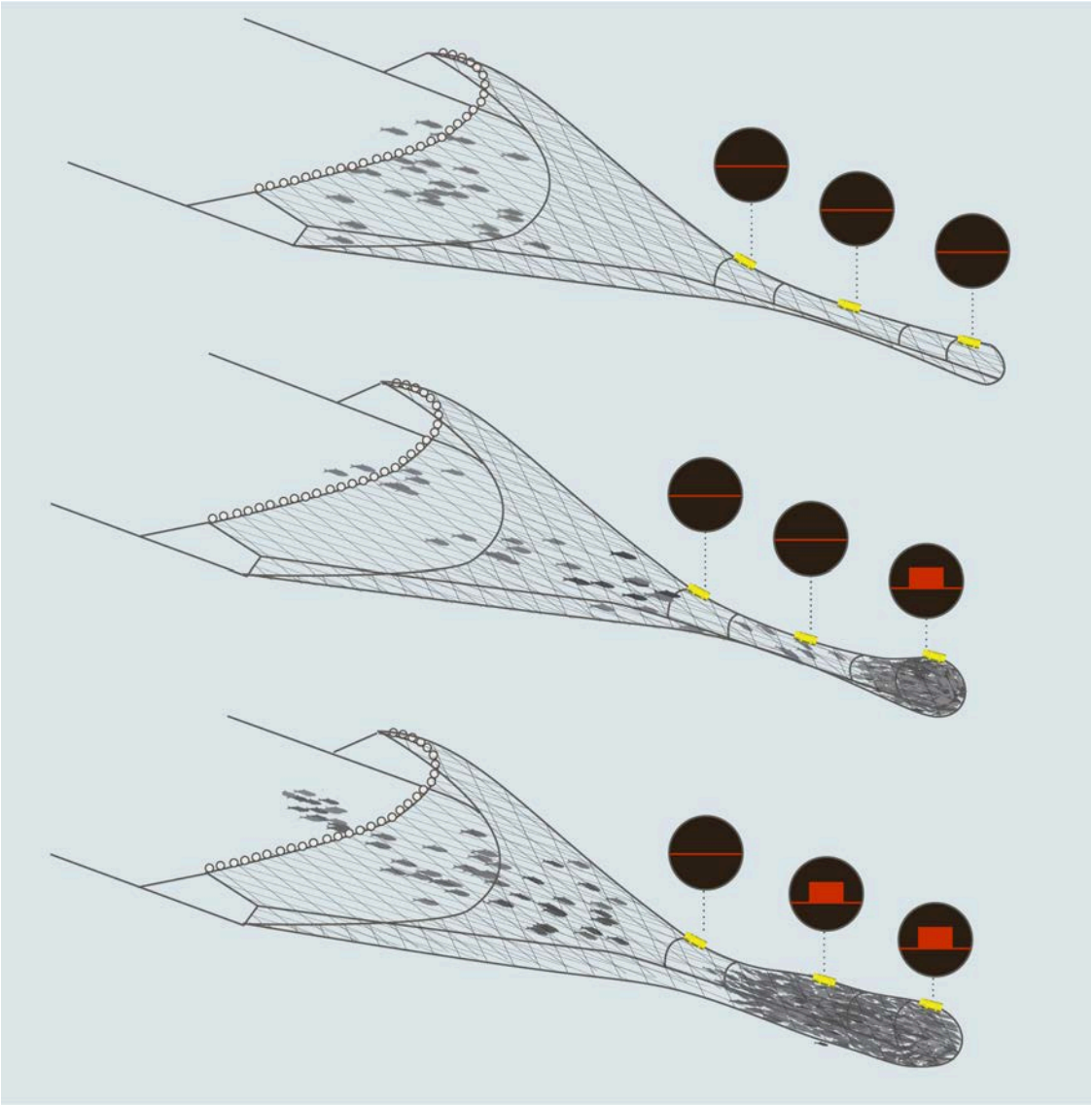
Catch Explorer:



1. Knot with rope
2. Stabilization board
3. Mounting strap
4. Rubber strap

Example of installation.

5. Install several sensors on the codend to better follow the filling processes. The sensors will trigger one by one, according to the amount of fish inside the codend. After a few tows, you can estimate the amount of tonnage of fish that you have depending on whether one, two or three sensors display a full status.



Maintenance and Troubleshooting

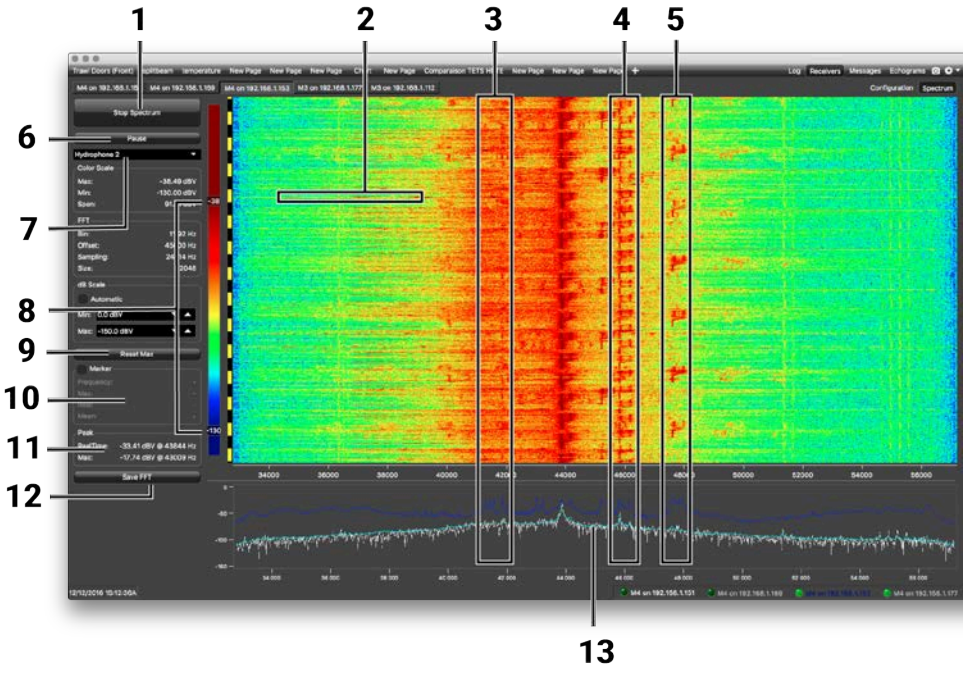
Read this section for troubleshooting and maintenance information.

Interference Check

You can check if there is noise interfering with the reception of signals.

Scala Spectrum Analyzer Display

The following picture explains the main parts of the spectrum analyzer page on Scala/Scala2.



1. Start/Stop spectrum analyzer
2. Noise interference
3. Pulses of the sensors (PRP)
4. Narrow band/HDTE signals
5. Door sounder signals
6. Pause spectrum analyzer
7. Select hydrophone
8. Drag to adjust color scale
9. Reset the Max line.
10. **Marker**: display frequency and levels of noise (dB) at the mouse pointer location on the graph.
11. **Peak**:
    - **RealTime**: latest highest level of noise recorded.
    - **Max**: highest level of noise recorded since the beginning of the spectrum.
12. Export recorded max, mean and real time noise levels in a txt file.
13.
    - Dark blue line: maximum signal level
    - Cyan line: average signal level
    - White line: last received signal level

Scala Checking Noise Interference

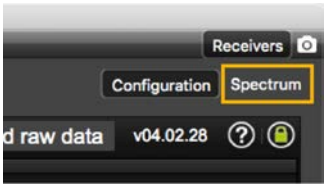
You can use the spectrum analyzer to check the noise level of the hydrophones and check for interference.

About this task

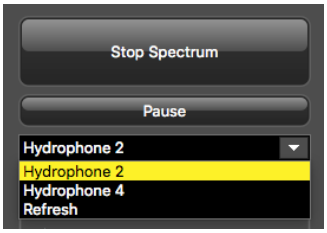
See Spectrum Analyzer Display on page 54 for details about the spectrum analyzer display.

Procedure

1. Click **Menu** ☰ > **Expert Mode** and enter the password `copernic`.
2. Again in the menu, click **Receivers**.
3. From the top right corner of the screen, click **Spectrum**.



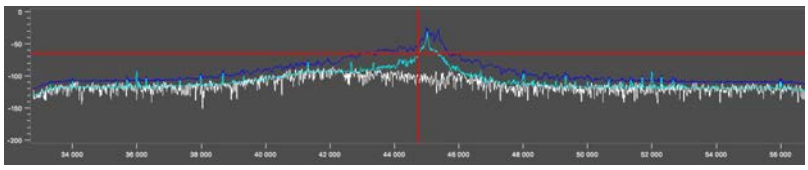
4. Select the hydrophone you want to test. Only the hydrophones that are switched on are displayed. Select refresh to update the list.



5. From the top left corner of the screen, click **Start Spectrum**.

   The graph at the bottom of the page shows three levels of noise in dBV:

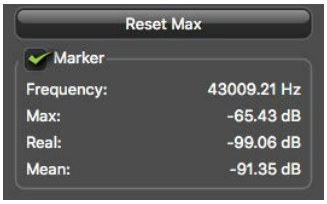
   1. **RealTime** (white): level of noise recorded in real time.
   2. **Mean** (cyan): mean recorded level of noise. It is useful to assess the noise floor.
   3. **Max** (dark blue): shows the latest highest level of noise recorded. It is useful to see on which frequencies are the sensors.



   The acceptable average level of noise depends on the conditions (distance from the sensor to the hydrophone, fishing method, type of hydrophone). You can have better performance with the following levels:

   - Active wideband hydrophone with high/low gain: below -100 dBV
   - Active narrowband: NC-1-04 below -80 dBV / NC-1-07 below -100 dBv
   - Passive hydrophone: below -110 dBV

6. To see the maximum, mean and real time measures of noise level at a specific frequency, select **Marker** on the left side of the screen and move the mouse over the graph.



   Frequency and levels of noise (dB) at the mouse pointer location are displayed under **Marker**.

7. Under **Peak**, you can check:
   - **RealTime**: the latest highest level of noise recorded.
   - **Max.**: the highest level of noise recorded since the beginning of the spectrum.
8. Check that there is more than 12dBV between the maximum noise level (dark blue line) and the average noise level (light blue line) on the peak of sensor frequencies.
9. If you changed the configuration of the hydrophone or sensors, click **Reset Max** to reset the dark blue line showing the maximum level of noise.
10. To save data recorded by the spectrum in a *.txt file, click **Save FFT**.

    The FFT file lists for the entire bandwidth used by the hydrophone (frequencies are in Hz) the maximum and mean levels of noise since the FFT export has started and the last real time level of noise before the export (dBV).

FFT level for Hydrophone 1 of Receiver 192.168.1.153			
Freq	Max	RealTime	Mean
32793	-129.07	-136.64	-138.50
32804	-129.31	-138.41	-139.65
32816	-128.72	-142.89	-139.02
32828	-128.09	-147.78	-139.86
32840	-127.95	-143.07	-140.06

11. When you have enough data, click **Stop Spectrum**.

Scala2 Checking Noise Interference

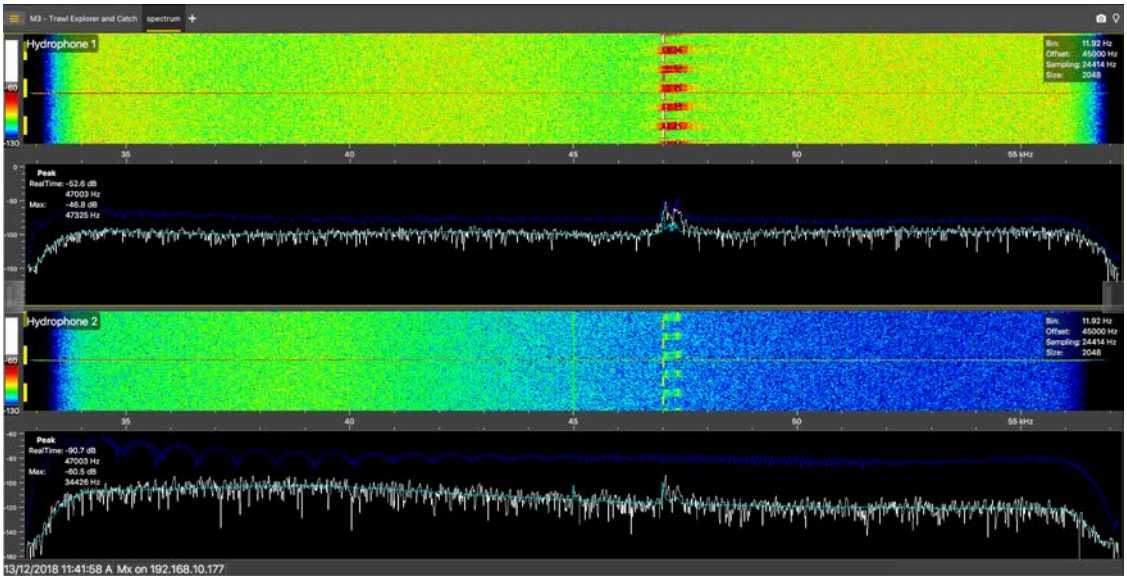
Use the spectrum analyzer to check the noise level of the hydrophones and check for interference.

Procedure

1. Click Add + to create a new page on which you will add the spectrum analyzer(s).
2. Right-click the IP address of the receiver in the status bar and click **Start Spectrum**.

3. Open the control panels and go to the **Mx** panel.
4. Go to **Hydrophone** data, then drag and drop **Spectrum** data to a page. These data appear only when the spectrum has been started.

5. The spectrum analyzer is displayed. You can display up to 6 spectrum analyzers at the same time. Below is an example of a page with two spectrum analyzers.



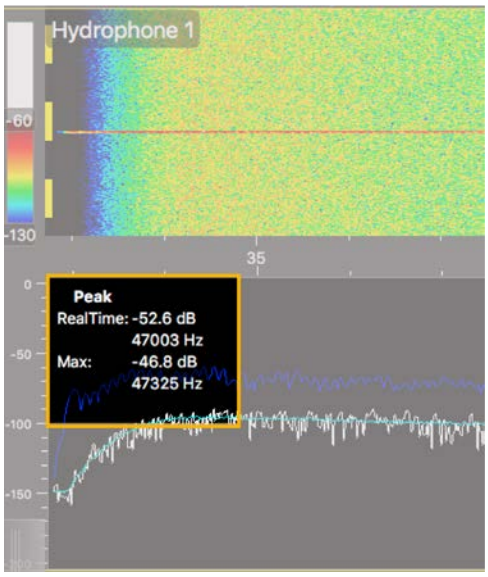
The FFT plot shows three levels of noise in dBV:

1. **RealTime** (white): level of noise recorded in real time.
2. **Mean** (cyan): mean recorded level of noise. It is useful to assess the noise floor.
3. **Max** (dark blue): shows the latest highest level of noise recorded. It is useful to see on which frequencies are the sensors.

The acceptable average level of noise depends on the conditions (distance from the sensor to the hydrophone, fishing method, type of hydrophone). You can have better performance with the following levels:

- Active wideband hydrophone with high/low gain: below -100 dBV
- Active narrowband: NC-1-04 below -80 dBV / NC-1-07 below -100 dBv
- Passive hydrophone: below -110 dBV

6. Scroll on the frequency or dBV scales to zoom in and out.
7. Under **Peak**, you can check:

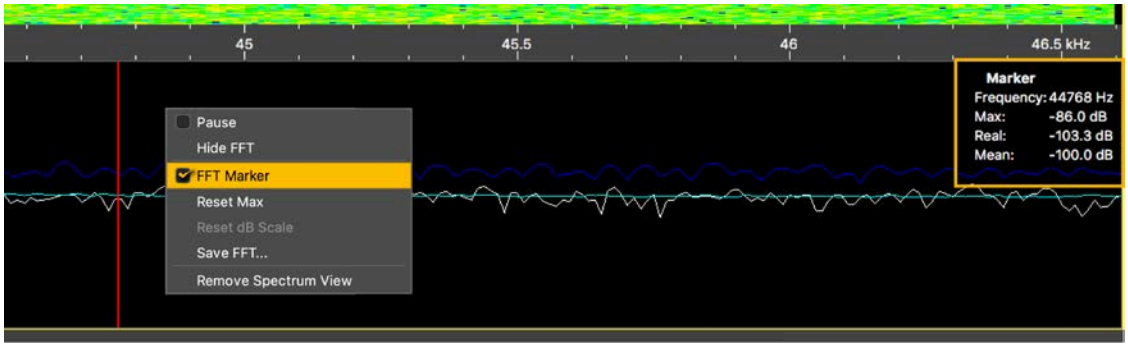


- **RealTime**: the latest highest level of noise (dBV) recorded and its frequency.
- **Max**: the highest level of noise recorded since the beginning of the spectrum and its frequency.

8. Check that there is more than 12 dBV between the maximum noise level (dark blue line) and the average noise level (cyan line) on the peak of sensor frequencies.
9. If you changed the configuration of the hydrophone or sensors, right-click the graph and click **Reset Max** to reset the dark blue line showing the maximum level of noise.
10. To check the maximum, mean and real time measures of noise level at specific frequencies:

    a) Right-click the FFT plot and click **FFT Marker**.
    b) Click and drag the marker at a specific point.

    Frequency and levels of noise at the marker position are displayed on the right side of the graph.



11. Right-click the spectrum and click **Pause** if needed.
12. To save data recorded by the spectrum in a *.txt file, right-click the FFT plot and click **Save FFT**.

    The FFT file lists for the entire bandwidth used by the hydrophone (frequencies are in Hz) the maximum and mean levels of noise since the FFT export has started and the last real time level of noise before the export (dBV).

FFT level for Hydrophone 1 of Receiver 192.168.1.153			
Freq	Max	RealTime	Mean
32793	-129.07	-136.64	-138.50
32804	-129.31	-138.41	-139.65
32816	-128.72	-142.89	-139.02
32828	-128.09	-147.78	-139.86
32840	-127.95	-143.07	-140.06

13. Right-click the spectrum analyzer and click **Hide FFT** to hide the FFT plot.
14. Right-click the IP address of the receiver in the status bar and click **Stop Spectrum**.

Charging the Sensor

Charge the sensor at any battery level with either Marport Dock charger, Basic Sensor Charger or Medusa II Multi-charger.

About this task

The sensor uses lithium-ion batteries. Charge them only with Marport's chargers.

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

Important: For Basic/Medusa chargers and Dock products with serial number before DOC2107XXX: 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.

Procedure

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

   Note: Check that the charging pins are not damaged. If they are, contact you local Marport dealer for replacement. Below is an example of shoulder bolts damaged because of insufficient maintenance.

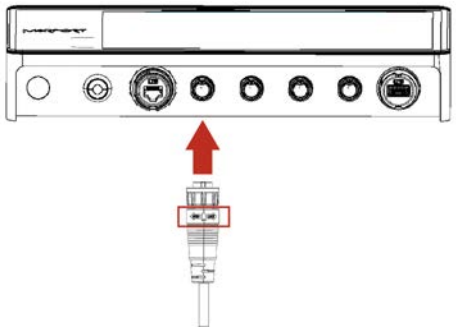
2. Place the sensor and charger in a dry room like the deck or bridge. The optimal temperature while charging is between 10 and 25 °C.
3. Place the sensor away from any installing material (e.g. wet ropes) and fix the sensor with brackets to keep it stable while charging.
4. Allow good air circulation around the charger for cooling.
5. Connect the 3-pin charging connector to the sensor shoulder bolts.

6. You can apply a small film of electrical contact grease lubricant on pins.

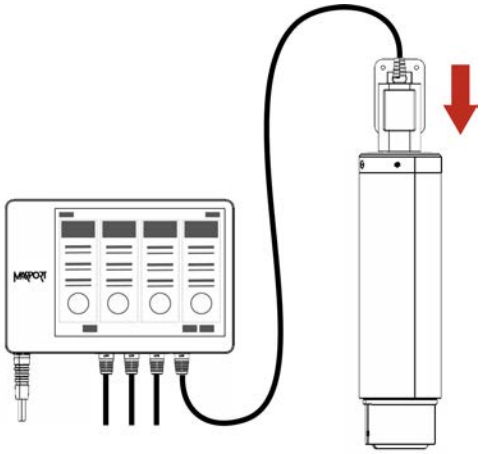
   Tip: To maintain the electrical pins, polish them with fine sandpaper.

7. Plug in the charger to a 115-230 Vac 50-60 Hz socket.
8. To charge with a Dock:

   a) Make sure the Dock is connected to a power supply and turned on.
   b) Connect the charger plug to one of the 4 charging ports.



   c) 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.

9. To charge with a Basic/Medusa Charger:

   a) If you have the Medusa multi-charger, turn the power switch to the **ON** position. The power switch lights on. If not, check the AC power cord connection.
   b) Connect the 3-pin charging connector to the sensor shoulder bolts.
   c) Look at the LED(s) on the charger box to know the charge status. For the multi-charger, there is a LED for each sensor charging cable. The charge status are:

- Green LED: > 90 %
- Orange LED: from 70 % to 90 %
- Red LED: < 70 %

Note: If the sensor is in configuration mode, it will begin to charge after 10 minutes. As long as it is in configuration mode, the charger's LED remains red, whatever the charge level.

10. Wait for the battery to charge: standard charging cycle takes 6 to 8 hours. A fast charge configuration allows a 70 % charge in 1 hour and full charge in 2.5 hours.

Results

Once charged, the operational life time can be up to approximately 740 hours for a Catch sensor and 19 hours for a Catch Explorer.

The operational life time depends especially on the uplink power of the sensor, but also on the sounding range, uplink frequency and options activated.

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:

- Remove any marine life with a piece of wood or screwdriver.
- Wash away mud or debris with warm water.

CAUTION: Do not use highly abrasive materials or jet wash.

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

Regularly clean the pull cord magnet or it may stop working: remove the metal disk fixed on the housing and clean the magnet with a swab or Q-tip. See Replacing the Pull Cords on page 62 to know how to remove the components.

Maintenance Checklist

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

Before use	• 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 61 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	• 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:

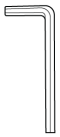
- Make sure the sensors on the end cap are in good condition and clean.
- Connect the sensor to a charger and check the charging status.
- Switch on the sensor by shorting the center lug to the negative lug, then listen for a ping noise and check if you see the LED switched on.
- Test the sensor measures 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.

Replacing the Pull Cords

You can replace the catch pull cords when they are worn out or damaged.

Before you begin

For this task you need the following tools:

	
9/64" Allen key	Anti-seize

About this task

Only qualified Marport technicians can do this task.

Procedure

1. Remove the old pull cords.

   1. Remove the four screws on the pull cord assembly with a 9/64 size Allen key.
   2. Remove the cords, spring and magnet from the hole.

2. Install the new pull cords.

   1. Install the new pull-cord assembly on the side or on the end cap of the sensor.
   2. Apply anti-seize on the four screw threads, then tighten the screws with the 9/64 size Allen key.

What to do next

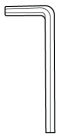
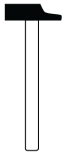
You need to calibrate the new catch sensor. See Calibrating the Catch Sensor on page 23.

Replacing the Catch Magnet

You can replace the magnet that is part of the pull cord assembly when the magnet is broken.

Before you begin

For this task you need the following tools:

			
9/64" Allen key	Drift punch / pliers	Arbor press / hammer	Anti-seize

About this task

Only qualified Marport technicians can do this task.

Procedure

1. Remove the old pull cords.

1. Remove the four screws on the pull cord assembly with a 9/64 size Allen key.
2. Remove the cords, spring and magnet from the hole.

2. If the pull-cords are in good condition, only replace the magnet.

1. To remove the old magnet, remove the pin between the arms of the magnet using a drift punch or pliers.
2. Slide the rope end between the arms of the new magnet with the pin facing up **(1)**.
3. Install the pin down through housing arms to secure rope in place. You can use an arbor press or hammer.
4. Check that the rope is not pinched between the pin and housing arms and that the pin does not interfere with the spring.

3. Install the new pull-cord assembly.

1. Put the new pull-cord assembly in the hole on the side or end cap of the sensor.
2. Apply anti-seize on the four screw threads, then tighten the screws with the 9/64 size Allen key.

What to do next

You need to calibrate the new catch sensor. See Calibrating the Catch Sensor on page 23.

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**:
   1. Click the magnifying glass from the top right corner of your screen and type `Terminal`.
   2. Click **Terminal** from the results.
   3. Enter in the terminal: `sudo spctl --master-disable`.
   4. Press Enter.
      Anywhere option is now displayed in **Security & Privacy** preferences.

Sensor cannot connect in wireless connection

When trying to connect to the sensor by wireless connection, the sensor appears on Mosa2 discovery area but you cannot click it OR the sensor does not appear on the discovery area.

Remember: First, always connect the sensor to a charger, then disconnect it. The sensor will reboot and this may resolve the issue.

➜ The sensor is out of the range of the wireless signal.

- Bring the sensor closer to the computer.

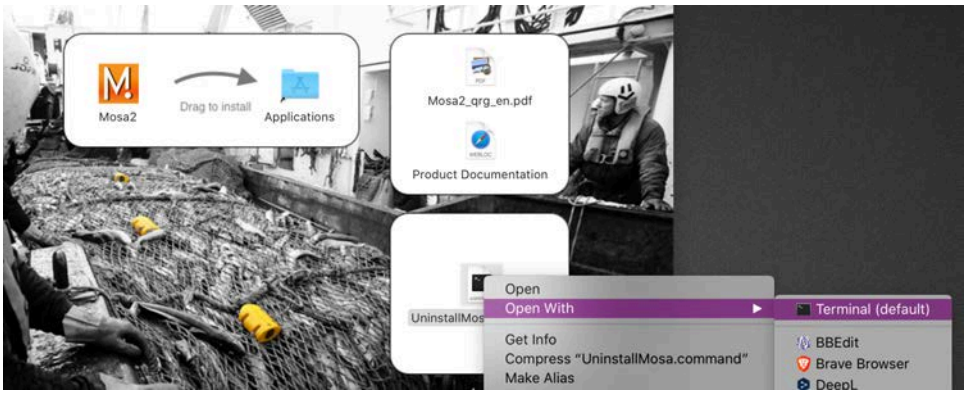
➜ If the sensor is not detected by Mosa2, the issue might come from the short-range wireless connection of the computer.

1. Close Mosa2.
2. Click the short-range wireless symbol in the top-right corner of the menu bar while holding the Shift (#) + ALT (#) keys on your Mac's keyboard.
3. Click **Debug** > **Remove all devices**.
4. Open Mosa2.

➜ In some cases, the computer keeps an history of some wireless devices and this interfere with the correct detection of sensors. You need to launch a script to uninstall Mosa2 and erase all wireless preferences.

1. Double-click the DMG file of a Mosa2 version **02.03.00 and after**.

2. Right-click **UninstallMosa.command** and select **Open With** > **Terminal**.



3. From the terminal window, enter your computer password and press **Enter**.

   Note: For security reasons, the terminal window will not display anything when you type the password.

   The terminal window displays **Process completed** when the script is completed. Mosa2 is uninstalled from your computer and all wireless settings on the computer are erased.

4. Open the DMG file to install Mosa2 again.

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.

- 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.

Data in Scala/Scala2 is wrong

Data displayed in Scala/Scala2 is wrong. For sensors with echograms, the echogram is noisy.

➜ There are signal interferences.

1. First, check that the sensor frequencies and telegrams are the same in the sensor configuration (via Mosa2) and the receiver configuration (via Scala/Scala2 or the system web page).
2. Check the frequencies of your other sensors and make sure there is enough distance between them.
3. Check the noise on the spectrum (see Checking Noise Interference on page 55). If the frequency where the sensor is placed is too noisy, change for a less noisy frequency:
   1. Catch sensor: see Configuring Catch Sensor Telegrams on page 30
   2. Catch Explorer: see Configuring the Uplink and Down Settings on page 26

   Important: Do not forget to also change the frequency on the system web page (accessible through Scala/Scala2 receiver page).
4. You can increase the uplink power of the sensor to increase the power of the signal transmitted to the receiver: see Configuring the Uplink Power on page 34.
5. For sensors with echograms you can change the Echogram filter on the system web page (Scala/Scala2 receiver page):
   1. From Scala/Scala2, click **Menu** ☰ > **Expert Mode** and enter the password `copernic`.
   2. Scala Click menu again, then **Receivers**.
   3. Scala2 Right-click the IP address of the receiver at the bottom of the page, then click **Configure Receiver**.
   4. From the left side of the page, click the name of the sensor.
   5. From the sensor configuration page, click **Configure** next to **Filter**.
   6. From NBTE Echograms Filter select **Echosounder and Interference Reduction Medium** or **High**.

Echogram is fixed and blue

The echogram displayed in Scala/Scala2 is completely blue. There is no yellow line moving on top of the echogram, which means that no sonar data is received.

➜ Sounder frequency may be outside the correct frequency range.

1. From Mosa2, click **Trawl Explorer** > **Ping Down Frequency** and check that the frequency is between 360-400 kHz.
2. If not, change the frequency.

➜ You may have dragged and dropped wrong sonar data to the display.

1. Check that the name of the sensor on the top left corner of the echogram is Catch Explorer.
2. If not, from **TE/CATCH** sensor data, click + hold **Range of Sonar Data** and drag it to the page.

➜ The sounder in the transducer is damaged.

- Contact the support service for repair.

Catch Explorer images are incorrect when beginning towing

At the beginning of a tow, the Catch Explorer does not display correct echogram images.

➜ When the trawl is not full yet, the codend moves a lot, as well as the sensors attached to it. You will not have correct echogram images at the beginning of a tow because the sensors are not correctly oriented toward the vessel.

- The codend and sensor will become stable when the trawl begins to fill.

Catch status remains full or empty

Catch status displayed on Scala/Scala2 remains blocked on full or empty status.

➜ The catch magnet may be broken.

1. From Mosa2, test the catch sensor (see Testing the Catch Sensor on Mosa2 on page 25).
2. If the status remains full or empty, the catch magnet placed at the basis of the pull-cords may be broken. See Replacing the Catch Magnet on page 63 to check and replace it.

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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Marport France SAS

8, rue Maurice Le Léon

56100 Lorient, France

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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.

Boat & Channel Codes

This list shows the standard frequencies for PRP telegrams. When you configure boat codes, make sure to respect the correct interval between frequencies (see table above).

Codes		
BC/CH	Frequency	FID (Scanmar)
C-1/CH1	42833	45
C-1/CH2	41548	32
C-1/CH3	41852	35
C-1/CH4	40810	25
C-1/CH5	42500	42
C-1/CH6	43200	49
C-2/CH1	42631	43
C-2/CH2	41417	31
C-2/CH3	41690	33
C-2/CH4	40886	26
C-2/CH5	42300	40
C-2/CH6	43100	48
C-3/CH1	42429	41
C-3/CH2	41285	30
C-3/CH3	41548	32
C-3/CH4	40970	27
C-3/CH5	42100	38
C-3/CH6	43000	47
C-4/CH1	42226	39
C-4/CH2	41852	35
C-4/CH3	41417	31
C-4/CH4	41160	29

C-4/CH5	42700	44
C-4/CH6	43300	50
C-5/CH1	42024	37
C-5/CH2	41690	33
C-5/CH3	41285	30
C-5/CH4	41060	28
C-5/CH5	42900	46
C-5/CH6	43400	51
C-6/CH1	39062	3
C-6/CH2	39375	7
C-6/CH3	39688	11
C-6/CH4	40000	15
C-6/CH5	40312	19
C-6/CH6	40625	23
C-7/CH1	38906	1
C-7/CH2	39219	5
C-7/CH3	39531	9
C-7/CH4	39844	13
C-7/CH5	40156	17
C-7/CH6	40469	21

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.

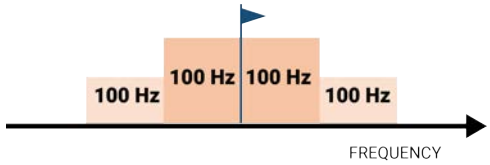


Figure 1: PRP sensors (e.g. Catch sensor, Trawl Speed, Spread sensor...)

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

Figure 2: Marport Pro sensors (e.g. Trident, Door Explorer)

Example: If the frequency of the sensor is 40kHz, there should be no sensors between 39.8-40kHz and 40-50.2kHz.

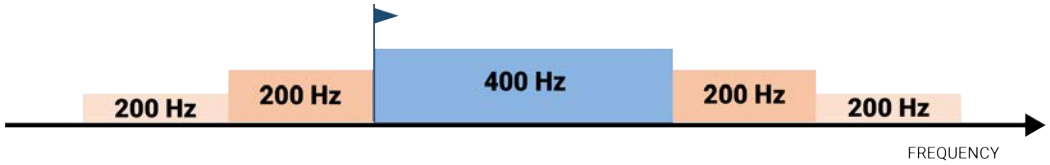


Figure 3: NBTE sensors (e.g. Speed Explorer, Trawl Explorer, Catch Explorer, Door Sounder)

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

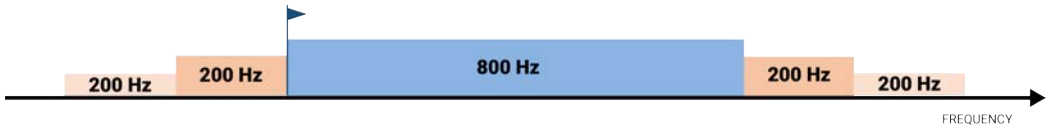


Figure 4: HDTE narrow band mode

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

Figure 5: HDTE wide band mode

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

Frequency of the sensor

Bandwidth

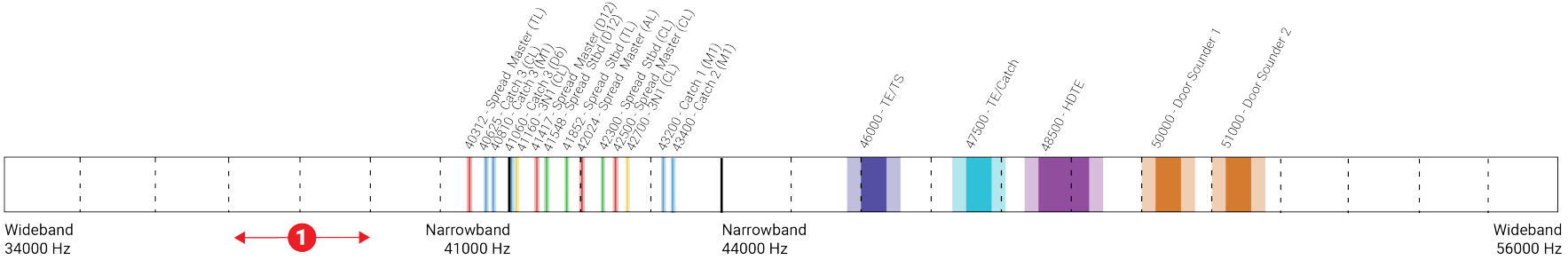
Mandatory distance with other sensors

Recommended distance with other sensors

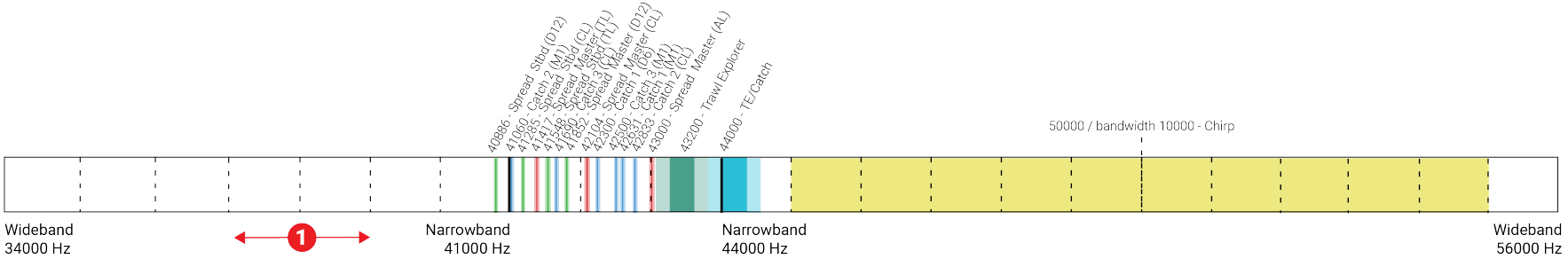
Examples of frequency allocations

- 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.

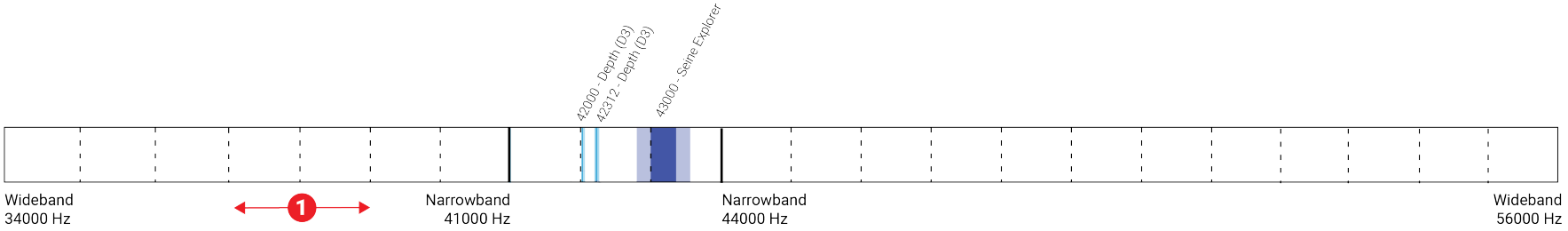
Example of a system with Spread, Catch, Trawl Speed sensors and Speed Explorer, Catch Explorer, HDTE and Door Sounder.



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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