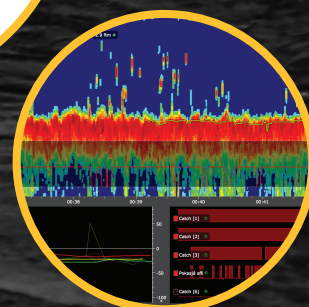
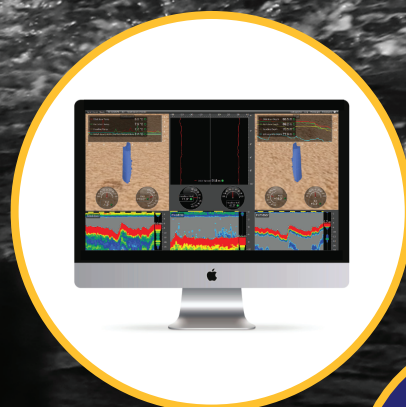


Scala User Guide



MARPORT

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Legal

History

V1	02/07/2016	First release
V2		
V3		

Copyright

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Disclaimer

The present user guide is applicable for the following version of Scala: v1.6.0.0

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

Introduction and Presentation

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

Introduction

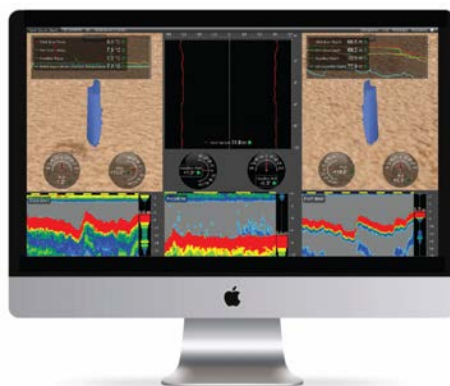
Scala is Marport's Advanced Trawl Monitoring System that collects, processes, stores and displays data sent from multiple sensors, sounders and other connected devices. It gives the user full control over its fishing operations.

In order to suit the working conditions, gear and sensor data type available, this monitoring system offers unparalleled flexibility. It is easily configurable:

- Display up to four simultaneous echogram presentations on a single page.
- Use drag and drop possibilities to customize your page layout.
- Choose from existing gauges, histograms or 3D views or create your own layout with any number of sensors displayable on screen.
- Adjust windows and graphs according to your needs.
- Compare data from equivalent sensors using existing multiple historical line graphs.
- Easily play back historical data.

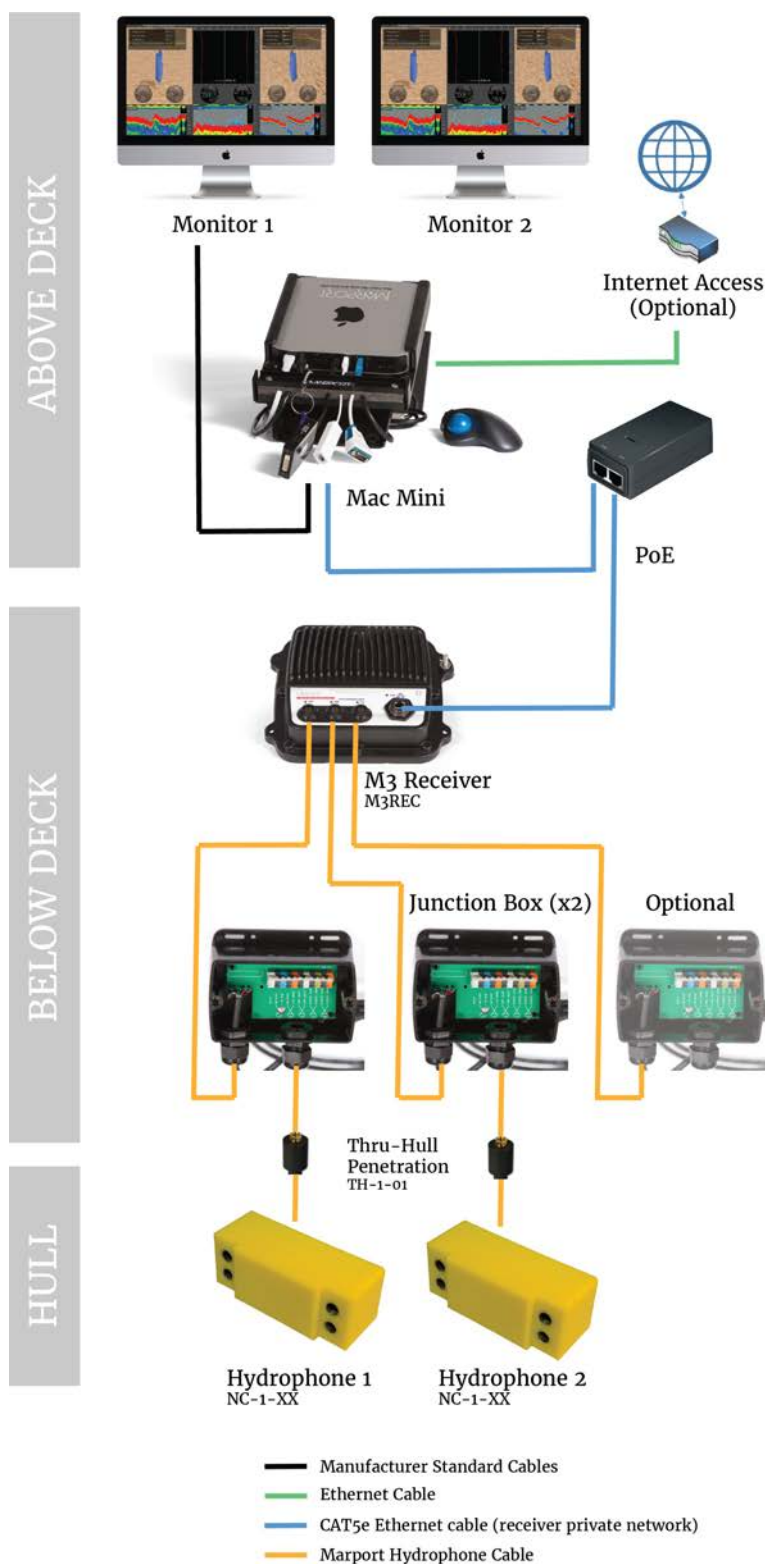
Moreover, a key feature of Scala is that it is designed to meet tomorrow's requirements. It is already prepared for future expansion:

- It is ready to incorporate 3D simulation with bathymetry using a simple GPS data connection.
- It has a range of standard data inputs and outputs, including full recording capability.

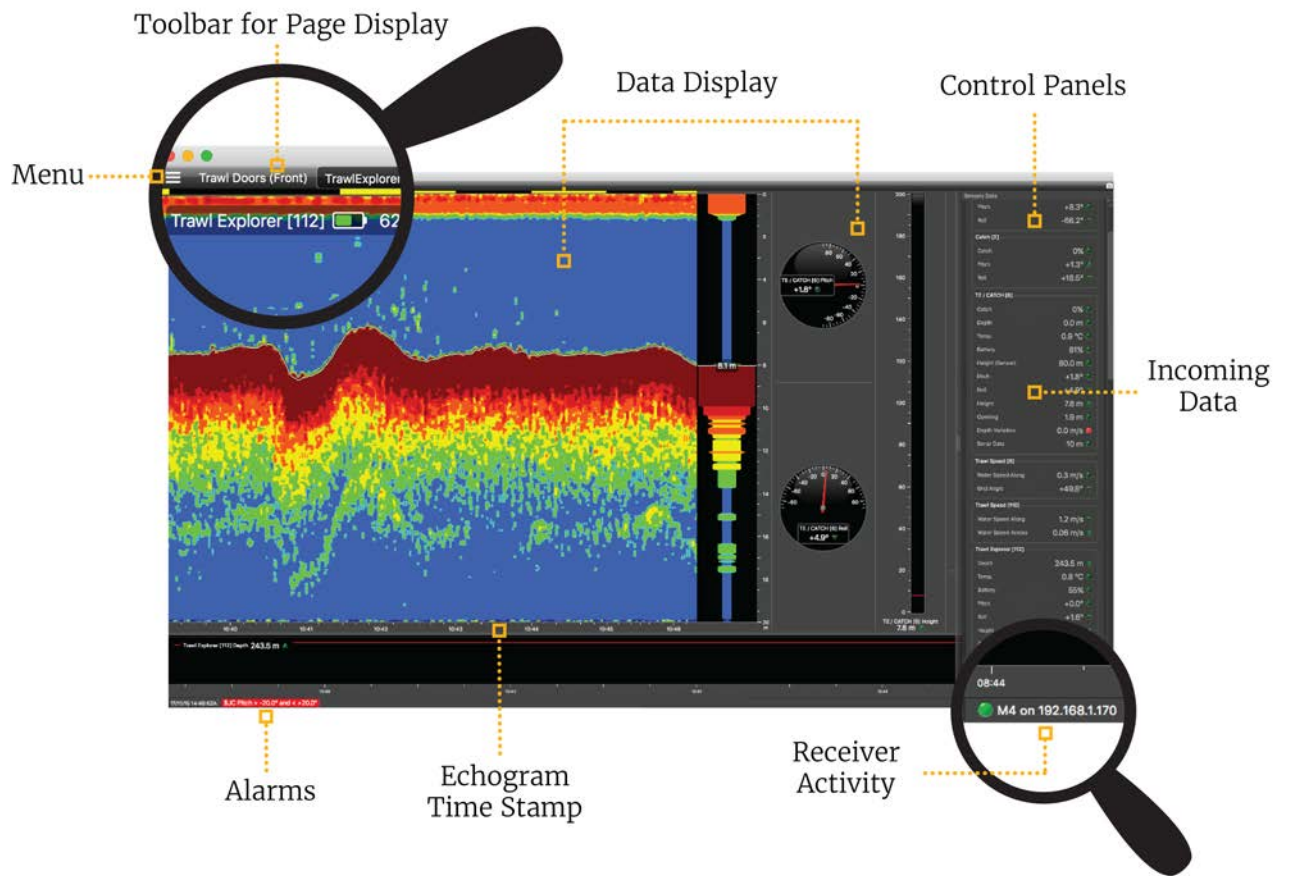


Overview of the System

This schema is an example of a system with M3 receiver.



Overview of Scala



Mac Basics

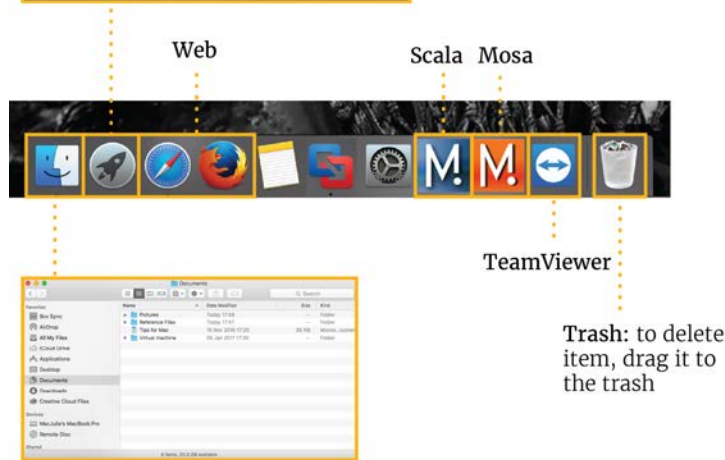
Switching On the Computer



Opening Applications and Files

You can use the bar of icons at the bottom of your screen, called the Dock, to access applications and files. Click icons to open items.

Launchpad: access all your applications



Finder: access your files

Trash: to delete item, drag it to the trash

If you need to search for an item, click the magnifying glass on the top right corner of the screen and type the name of the item.



Switching Off the Computer

From the top left corner of the screen, click **Apple Menu** > **Shut Down**. Also use this menu to restart or put the computer in sleep mode.



Installation

This section explains how to install and start Scala.

Installing Scala

You can install Scala and Scala Replay on your Mac Mini or Mac Pro computer.

Before you begin

- You have 1 to 2 monitors for a Mac Mini, 1 to 6 monitors for a Mac Pro.
- Receiver is connected to the private Ethernet network.

Procedure

1. Plug in the computer the Scala software dongle for basic or full version.
2. Double-click the installation zip file.
3. Click the *.dmg file.
4. From the installation panel, double-click **Sentinel Runtime.pkg**. If a warning appears, click **Open** again.



5. Follow the installation steps.
6. From the installation window that appears, drag **Scala** icon to the **Application** icon.



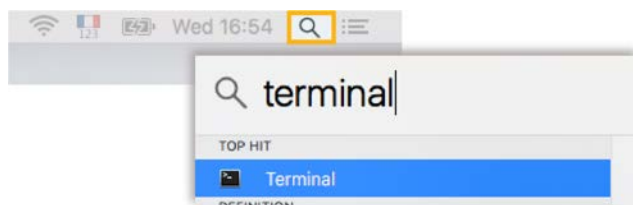
7. Do the same for Scala Replay icon.
Scala and Scala Replay are added to the **Launchpad**.
8. From the **Launchpad**, click and drag Scala icon to the Dock at the bottom of your screen.
You can now open Scala by clicking its icon on the Dock.



9. Change the **Security & Privacy** settings to be able to open Scala:
 - a) From the upper left corner of the screen, click **Apple menu** > **System Preferences** > **Security & Privacy**.
 - b) From the lower left corner of the **Security & Privacy** dialog box, click the lock icon and enter your computer password if you have one.
 - c) At **Allow apps downloaded from**, select **Anywhere**, then close the dialog box.

d) If you are under OS X Sierra, **Anywhere** option is not displayed by default. To display **Anywhere**:

- Click the magnifying glass from the top right corner of your screen and type **Terminal**.
- Select **Terminal** from the results.



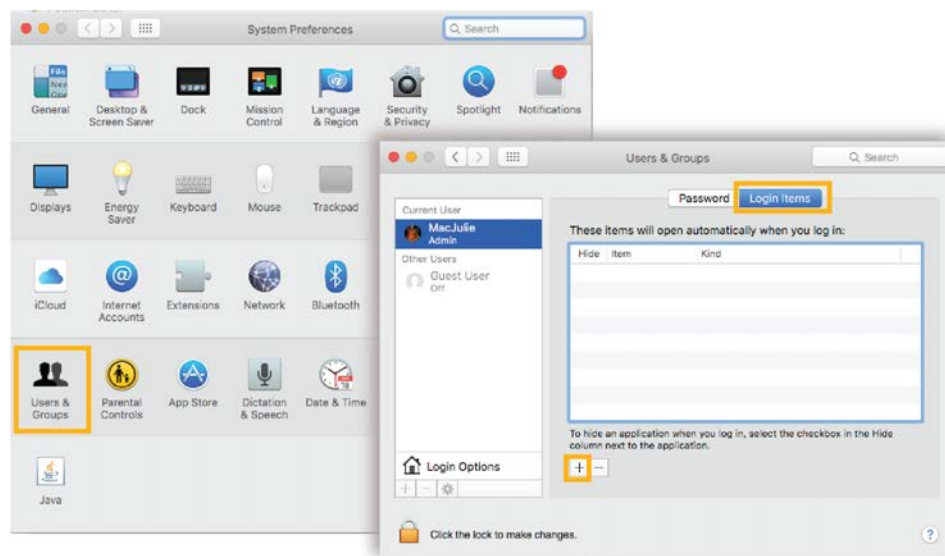
- From the terminal, enter `sudo spctl --master-disable`.
 - Press enter.
- Anywhere** option is now displayed in your **Security & Privacy** preferences.

Automatically Opening Scala and VMware Fusion at Start Up

You need to configure the computers so that Scala and VMware Fusion (software that analyzes sensor data) automatically open when the computer is switched on.

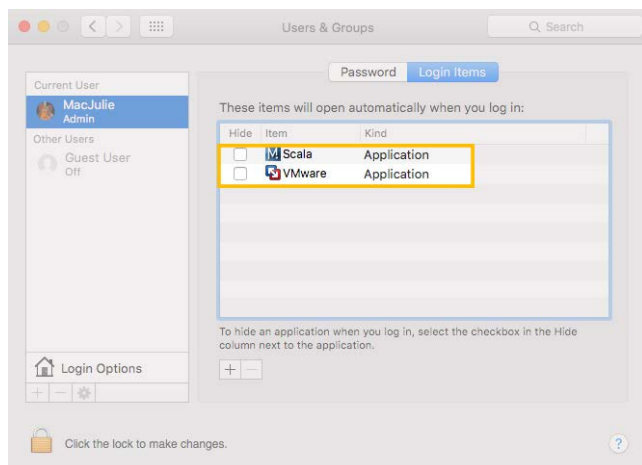
Procedure

1. From the top left corner of the screen, click **Apple Menu** > **System Preferences** > **Users & Groups**.
2. Click the tab **Login Items**.

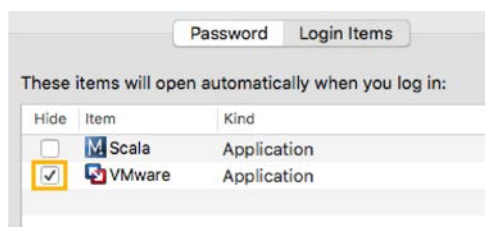


3. Click the plus sign under the list, then go in the **Applications** folder and select Scala.
4. Repeat the step for VMware Fusion.

Scala and VMware Fusion are added to the list.



5. Select **Hide** in front of VMware so that the application window does not open when launched. This prevent the user from closing the window and crashing the system.



Starting Scala

Scala should start when you switch on the computer. If not, you can start Scala from the Dock at the bottom of the screen.


Before you begin

- Scala software dongle is plugged in the computer. Always have the dongle plugged in when using Scala.
- Receiver is connected to the private Ethernet network.

Procedure

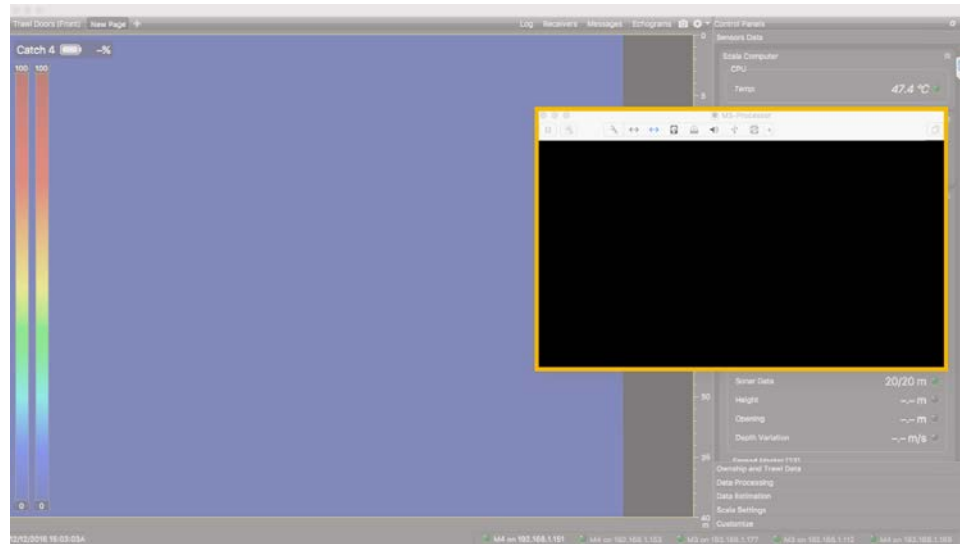
From the Dock at the bottom of the screen, click Scala icon.



- ⚠ **Important:** The following window is a software that analyzes sensors data. This program is necessary for the functioning of the receiver. **DO NOT CLOSE this window.** If it appears, click minimize  to hide it and change the settings as indicated in [Automatically Opening Scala and VMware Fusion at Start Up](#) on page 12 to keep it hidden. This icon should always appear at the bottom of your desktop screen:



If you close the window, restart the system.



Results


The application starts.

System Configuration

This section explains how to configure receivers, sensors and other devices to display their data in Scala.

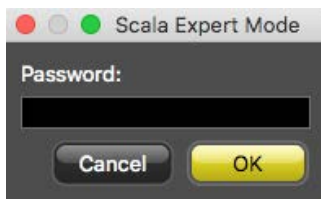
Configuring a Receiver

You need to configure a receiver to display its data in Scala.


1. To configure a receiver, click **Menu**  > **Expert Mode**.



2. From the following window, enter the password **copernic**.



3. Then, click **Menu**  > **Receivers**.

When you have finished changing settings, you need to deactivate the Expert mode: click **Menu**  > **Expert** again.

Defining a Hydrophone

You need to add hydrophones to the system.

About this task

The hydrophones are used to convert acoustic signals from the trawl sensors to analogic signals. You need to define the correct type of hydrophone in your receiver configuration based on the hydrophone installed on your hull.


Refer to [Types of Marport Hydrophones](#) on page 17 to learn about Marport different types of hydrophones.

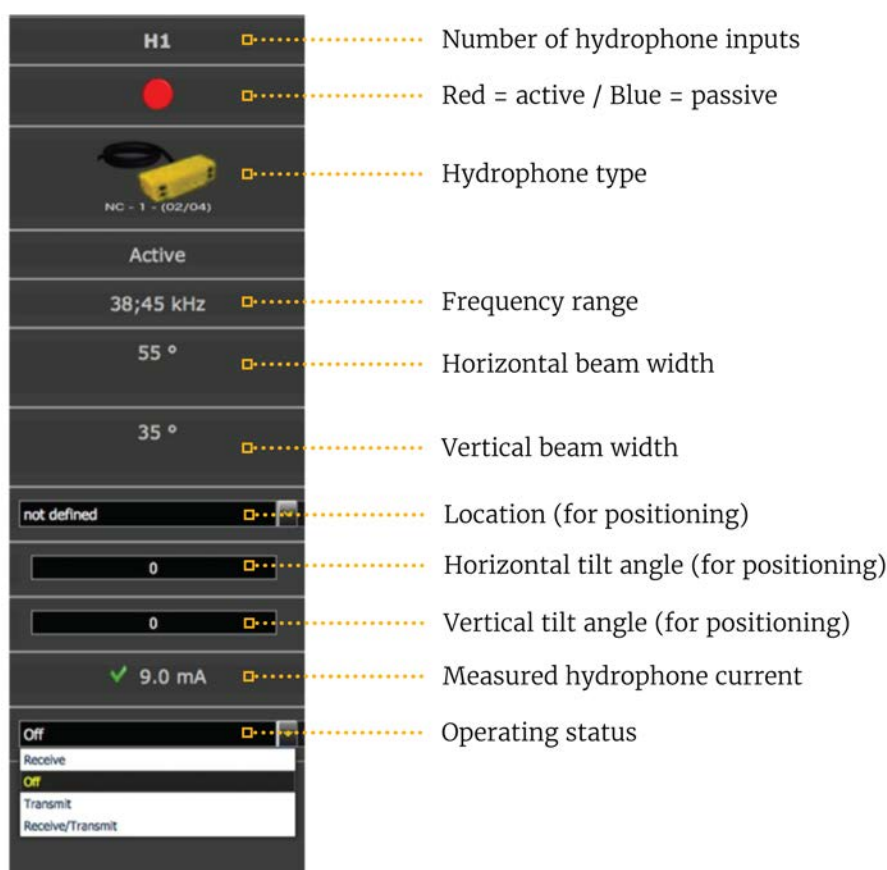
Procedure


1. From the left side of the screen where the system is displayed, click **Hydrophones**



2. To add a hydrophone to the system, click **Click to Add** on one of the hydrophones ports.
3. From the hydrophone selection page, scroll the top part to see the available hydrophones.
4. Click the picture of the correct type of hydrophone between active and passive, and the brand.

 **Note:** When selecting an active hydrophone, you can see the hydrophone current displayed.
5. Click **Ok**.
The panel closes and the hydrophone is added to the **Hydrophones** page.
6. From the **Hydrophones** page, select a location for the hydrophone. The location is important when using net-positioning system function in Scala.
7. You can also define tilt angles and an operating status. For normal sensor reception, select the **Receive** operating status.



-  **Note:** If the hydrophone current is outside normal values, it is indicated with a red cross. Refer to [Types of Marport Hydrophones](#) on page 17 to know what are normal values.



-  **Troubleshooting:** If an active hydrophone shows 0.0 mA current, it might be faulty or the wiring to the hydrophone might be wrong. Check the wiring.

Types of Marport Hydrophones

Product reference	Name	Use case	Bandwidth	Typical current consumption
NC-1-05	Passive broadband hydrophone (no preamplifier)	<ul style="list-style-type: none"> Vessel with very low level of noise. For positioning systems with pinger (one passive hydrophone is necessary for transmission). 	33-60 KHz	0.0 mA
NC-2-02	Passive hydrophone + Broadband preamplifier box	<ul style="list-style-type: none"> Vessel with normal level of noise. Large number of sensors. Use at great depths. Gain configurable (Low or High) Filters configurable (38 and/or 50kHz). 	30-60 KHz	25-29 mA
NC-1-04	Active hydrophone (integrated preamplifier)	<ul style="list-style-type: none"> Vessel with normal level of noise. Limited number of sensors. No filtering options. Not use for positioning system 	38-45 KHz	8-12 mA
NC-1-06	Active broadband hydrophone (integrated preamplifier)	<ul style="list-style-type: none"> Vessel with normal level of noise. Large number of sensors. Use at great depths. Gain configurable (Low or High) Filters configurable (38 and/or 50kHz) 	30-60 KHz	25-29 mA

Defining the Trawl Gear Type

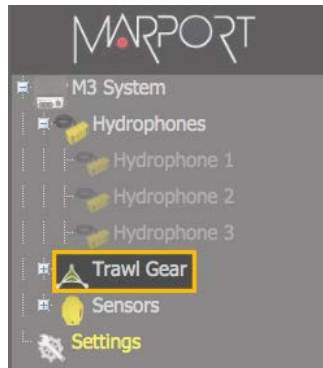
You need to define a trawl gear type to configure sensors.

About this task

Important: If you have already configured a trawl with sensors, adding a new trawl will delete all previous trawl configuration settings.

Procedure

1. From the left side of the screen where the system is displayed, click **Trawl Gear**.



2. From the Trawl Gear List, select your trawl gear type.
A picture of the selected trawl gear is displayed, with the nodes (sensor locations) where sensors can be placed. For a full list of available trawl gears and sensor locations, see [Sensor Locations](#) on page 19.

What to do next

Now you have chosen a type of trawl gear, you can define sensor locations on it.

Adding a Sensor

Before you begin

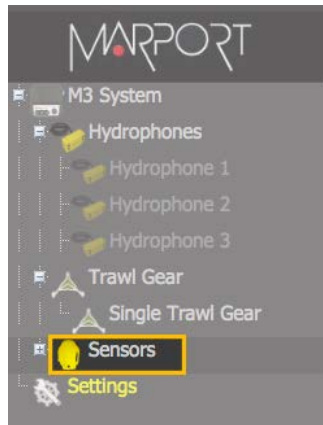
A trawl gear type is defined.

About this task

All sensors added to the system must be given a location, called nodes, on the selected trawl gear type. Nodes have numerical value between 1 and 999. See [Sensor Locations](#) on page 19 for illustration.

Procedure

1. From the left side of the screen where the system is displayed, click **Sensors**.



2. From the sensor selection page that appears, under **Product Category** select the main function of the sensor.
3. From **Product Name**, select the additional options that the sensor has.
A picture with the nodes where sensors can be placed on the selected trawl gear is displayed.
4. From **Trawl Gear Location**, select a node location for the sensor. The list only displays nodes that have no sensor assigned. Refer to the picture to know to which node the number corresponds.
5. Click **Add Sensor**.

What to do next

You can now define sensor options.

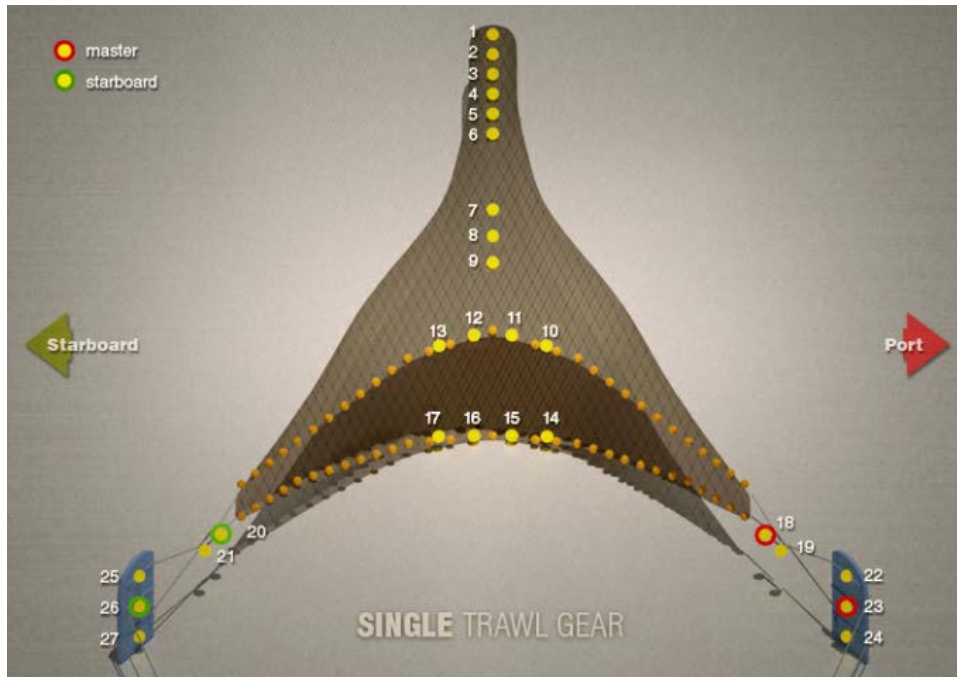
Sensor Locations

Sensor locations in the system are called nodes and have a numerical value between 1 and 999. The following pictures show the node locations on different types of trawl gear.

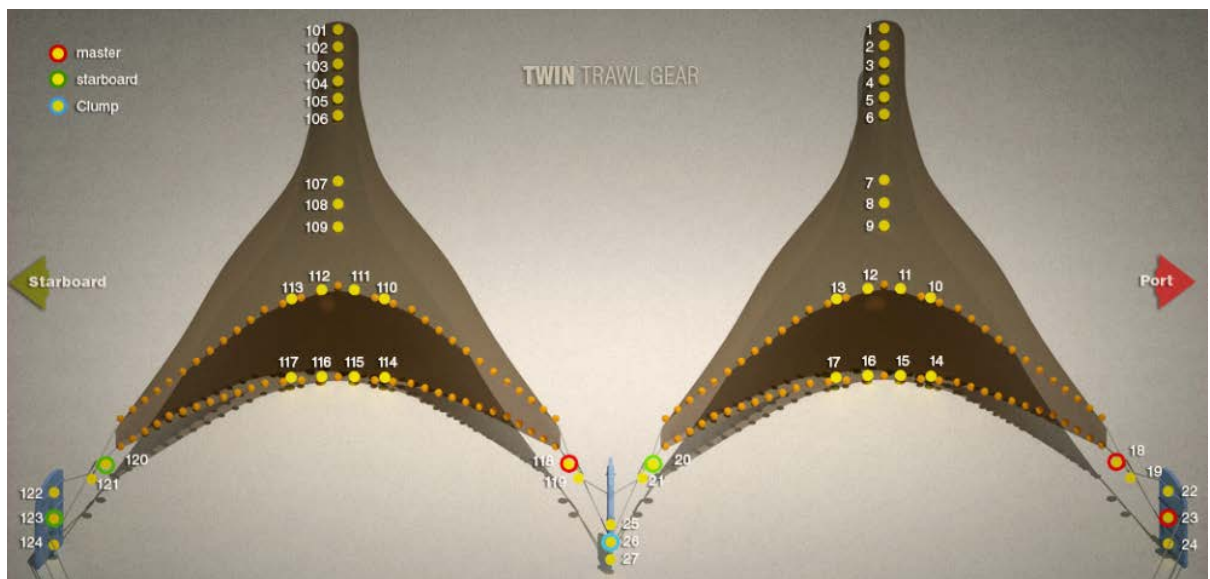
The nodes are displayed when defining sensor locations on a trawl gear in the receiver settings. When looking at sensors data in the control panels, each sensor will have its defined sensor location or node number shown next to its name.

You can refer to these pictures to know the location of the sensor.

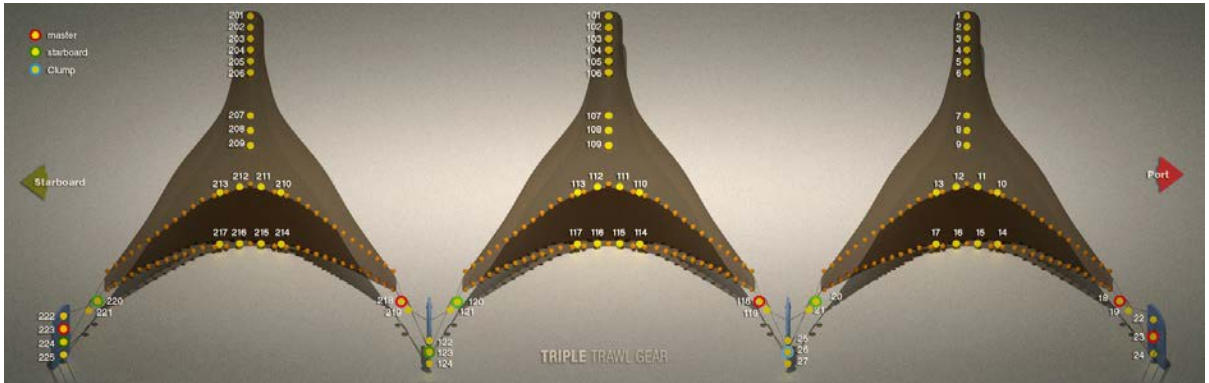
Single Trawl Gear



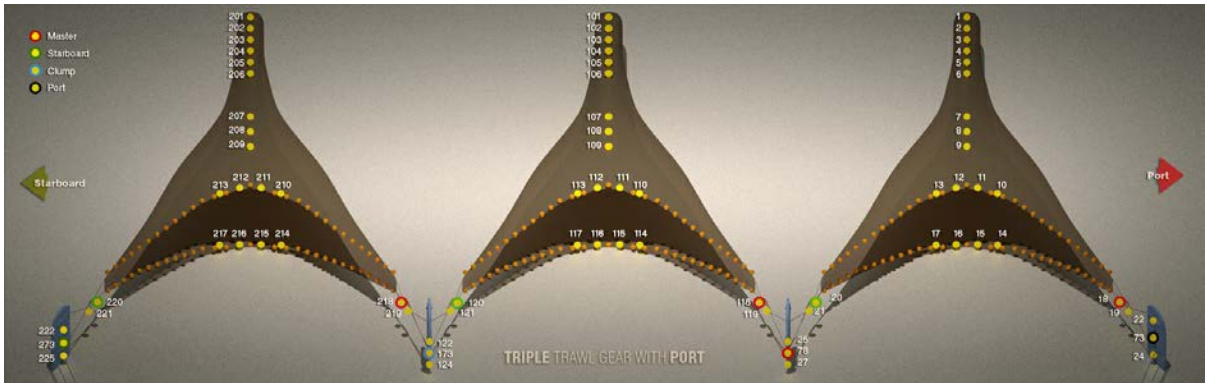
Twin Trawl Gear



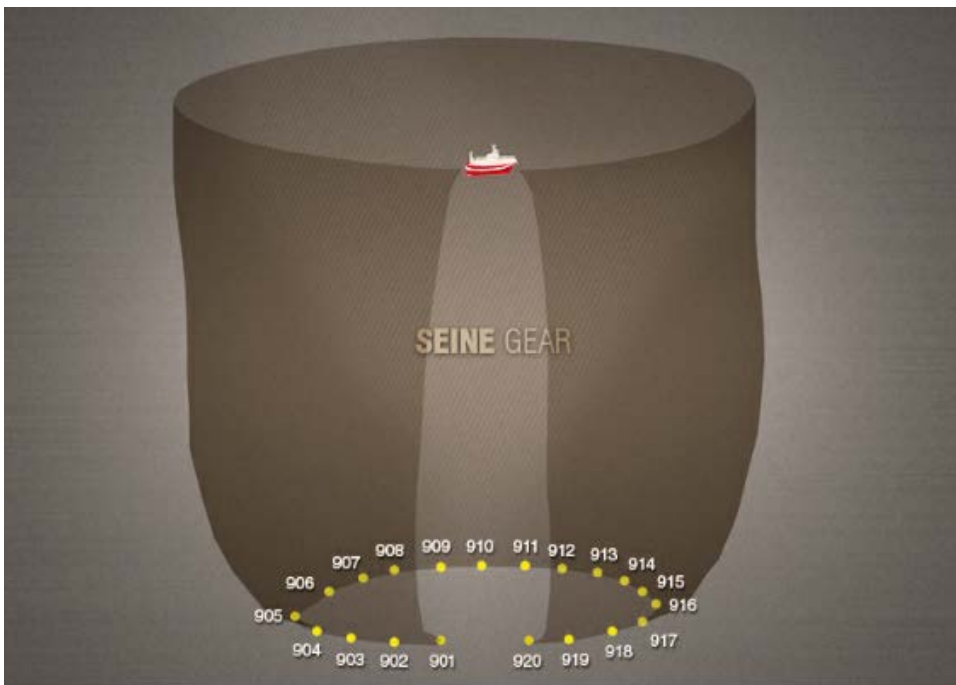
Triple Trawl Gear



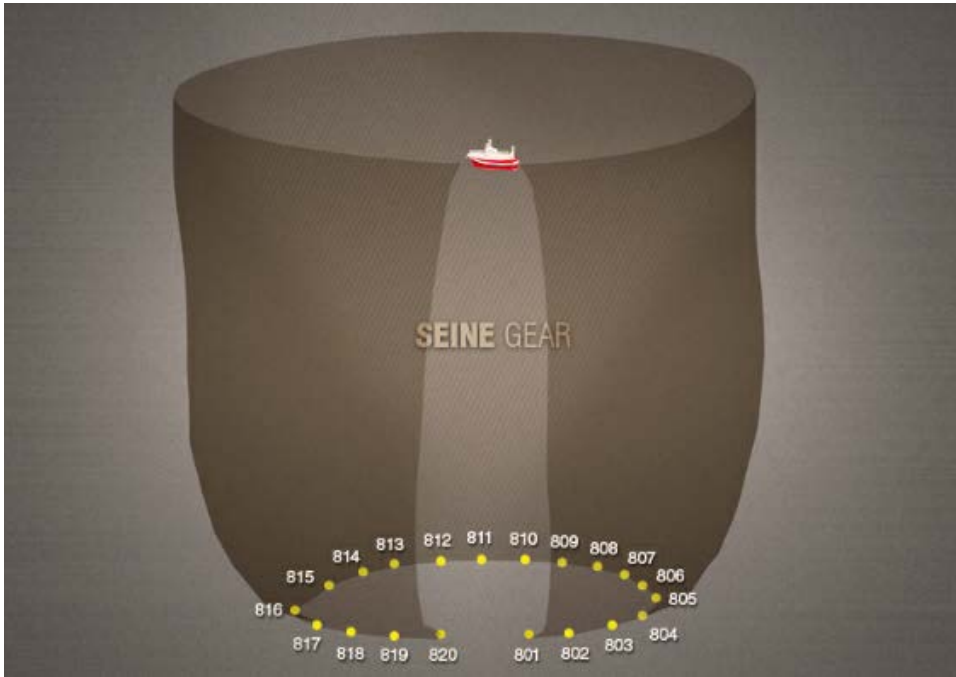
Triple Trawl Gear with Port



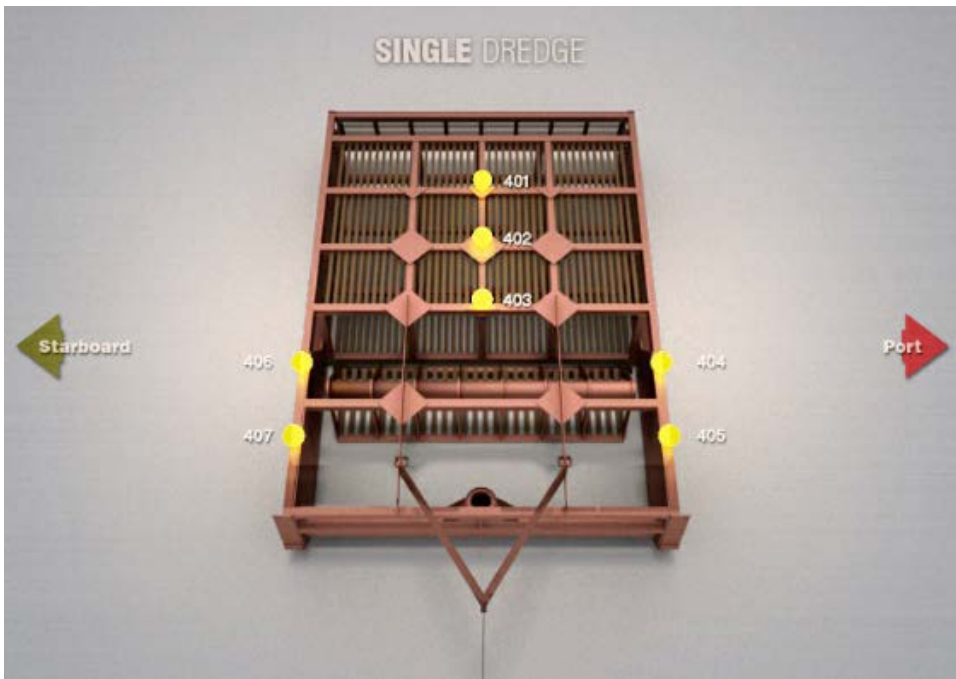
Port Seine Gear



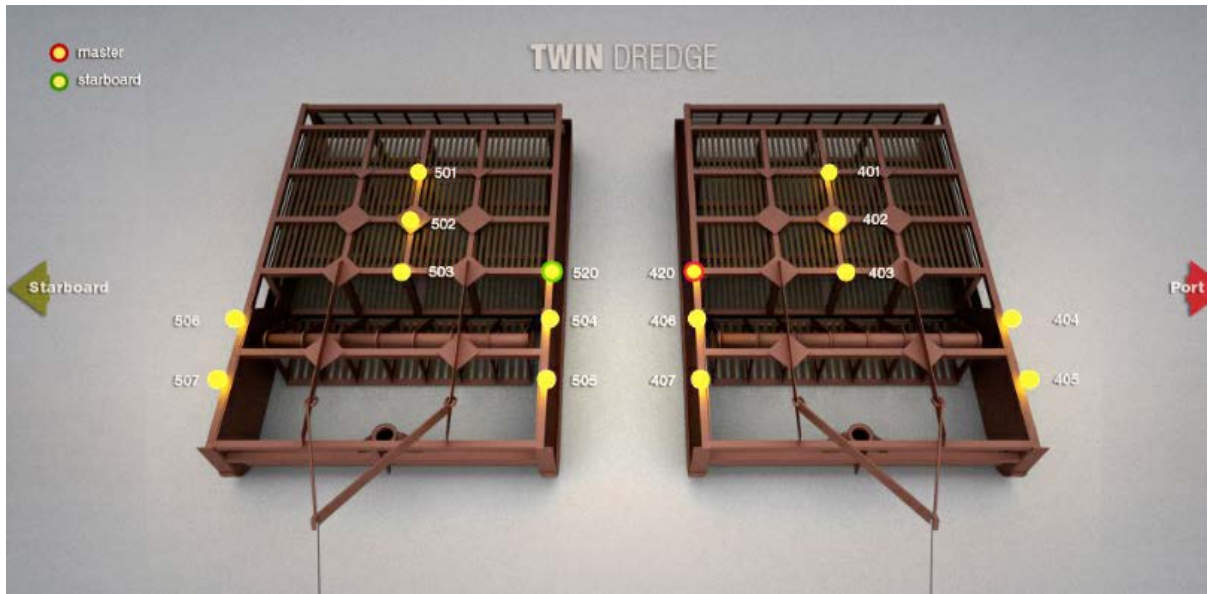
Starboard Seine Gear



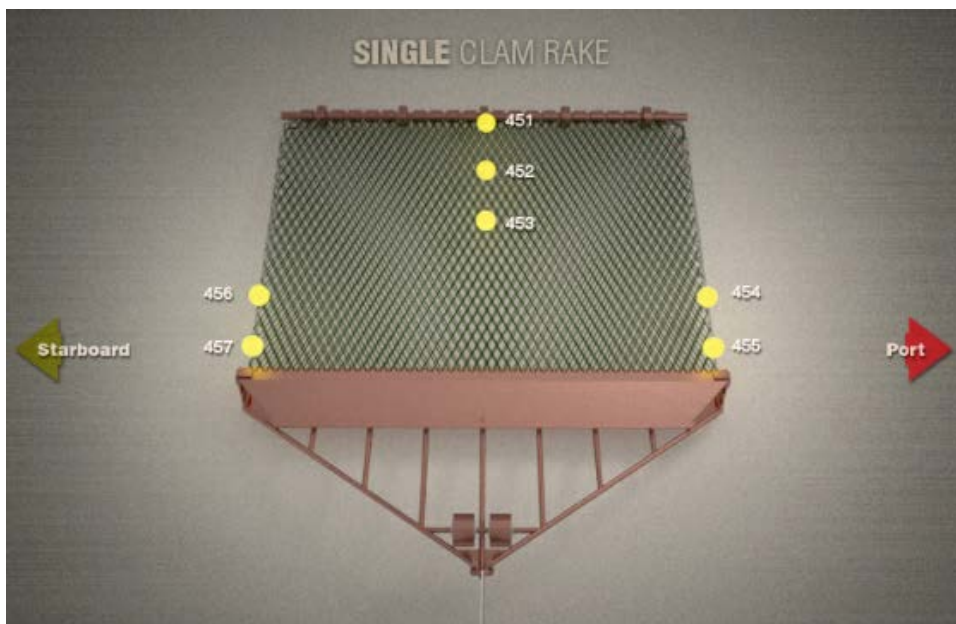
Single Dredge Gear



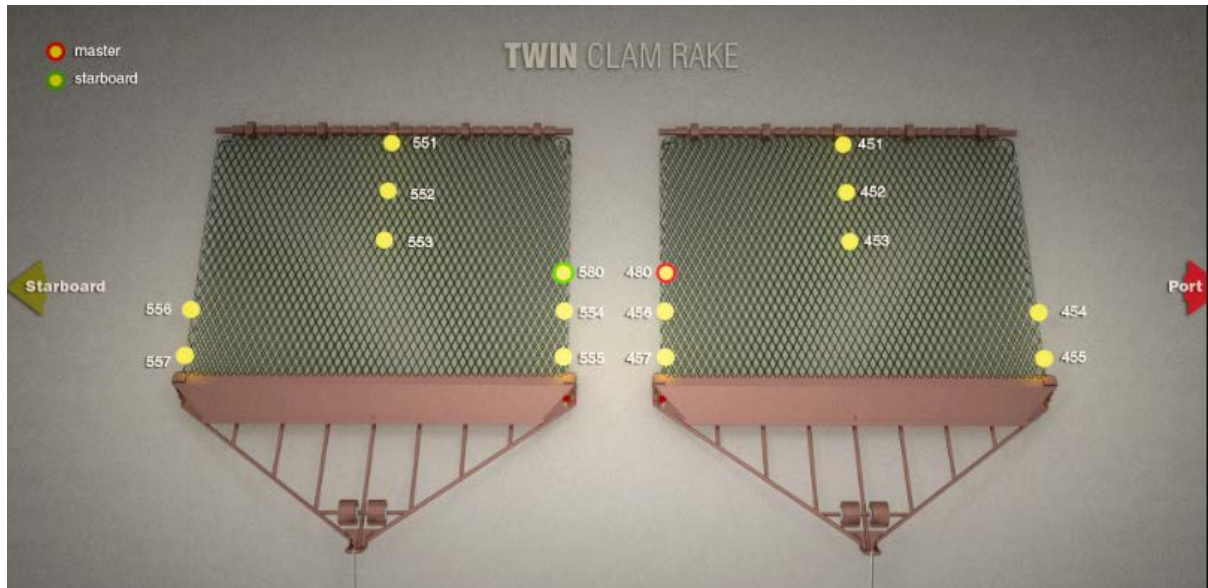
Twin Dredge Gear



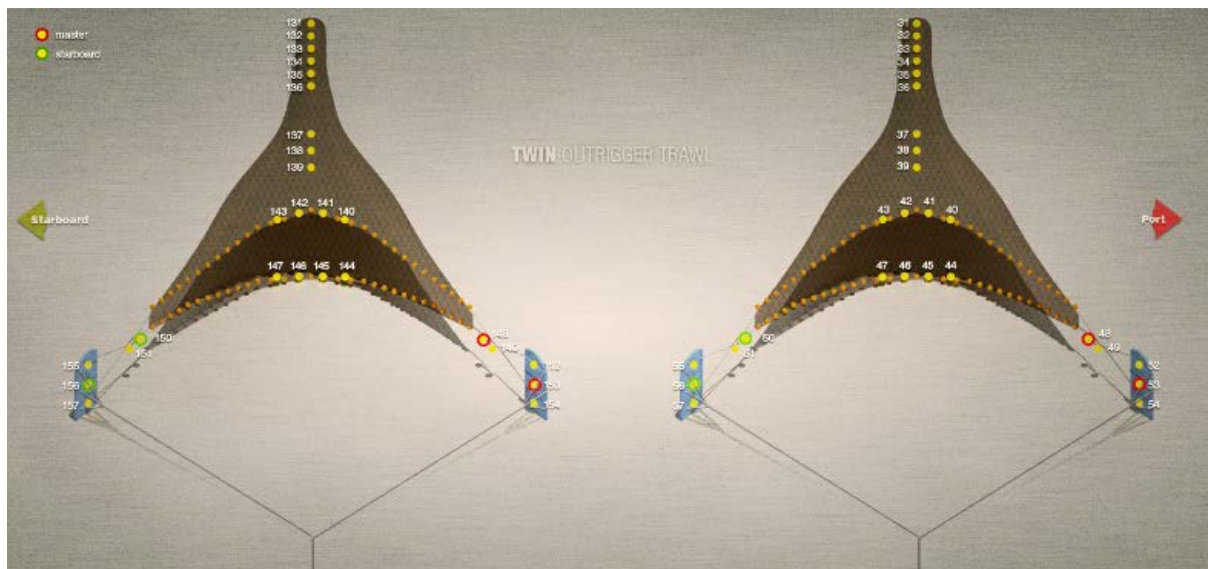
Single Clam Rake



Twin Clam Rake



Twin Outrigger Trawl



Defining Sensor Parameters

Before you begin

You can define sensor parameters if you add new sensors or want to change existing sensor parameters. Sensor parameters depend on the type of sensor you have, so refer to your sensor user guide to know which parameters to use.

- A trawl gear type is defined
- A location is defined for the sensor

Procedure

1. From the left side of the screen where the system is displayed, click the name of the sensor you want to configure.
The sensor configuring page appears.
2. Fill in the parameters.
3. Click **Apply** when you have finished.

Configuring Net Positioning Function Using Door Sensors

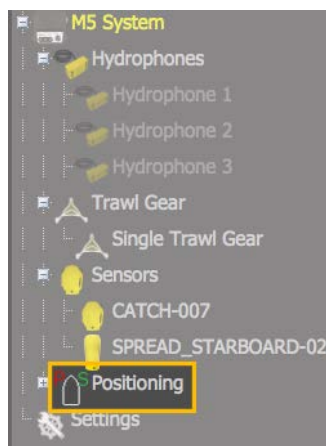
When you have a system with doorspreads with position data or slant ranges, you need to complete the positioning page to get accurate measurements of the door positioning.

Before you begin

- The sensor page is already configured.


Procedure

1. From the left side of the screen where the system is displayed, click **Positioning**.



The positioning configuration page appears.

2. From the **Baseline** part, enter the baseline and misalignments measurements:
 - a) For the baseline, indicate the distance between the two receiving hydrophones.
 - b) You can complete the misalignment X and Z, for more accurate positioning. See [Calculations for Positioning Systems](#) on page 26. Otherwise, you can enter 0.
 - c) Enter 0 for the misalignment Y.

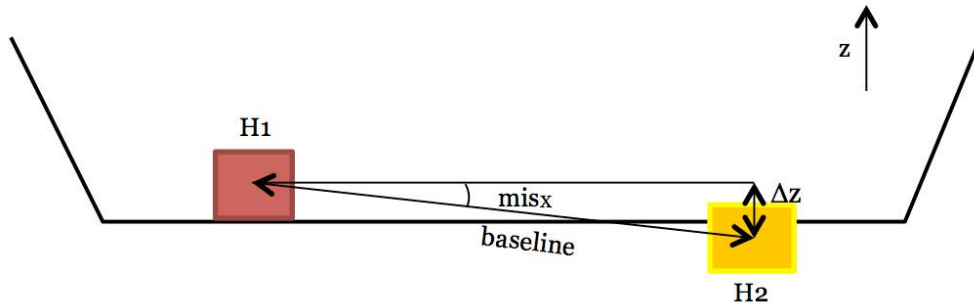
 **Note:** Baseline is important if you want to have a minimum of precise information about the doors' positioning.

3. From **Lever Arm**, enter 0 in the fields.
4. From **Inputs**, enter the port and starboard hydrophones, according to the hydrophone configuration.
5. From **Algorithm**, select **Compensate** to take into account the misalignment.
6. Click **Apply**.

Calculations for Positioning Systems

The following calculations enable you to calculate the misalignment angles for the configuration of the positioning.

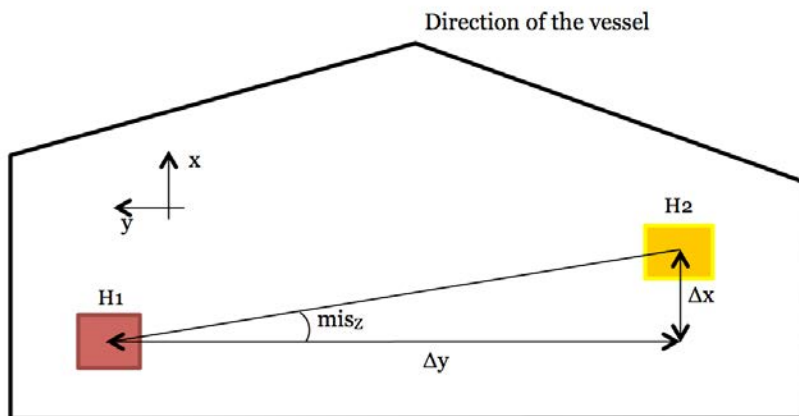
X axis



$$\Delta z = z_2 - z_1$$

$$mis_x = \arctan\left(\frac{\Delta z}{BL}\right)$$

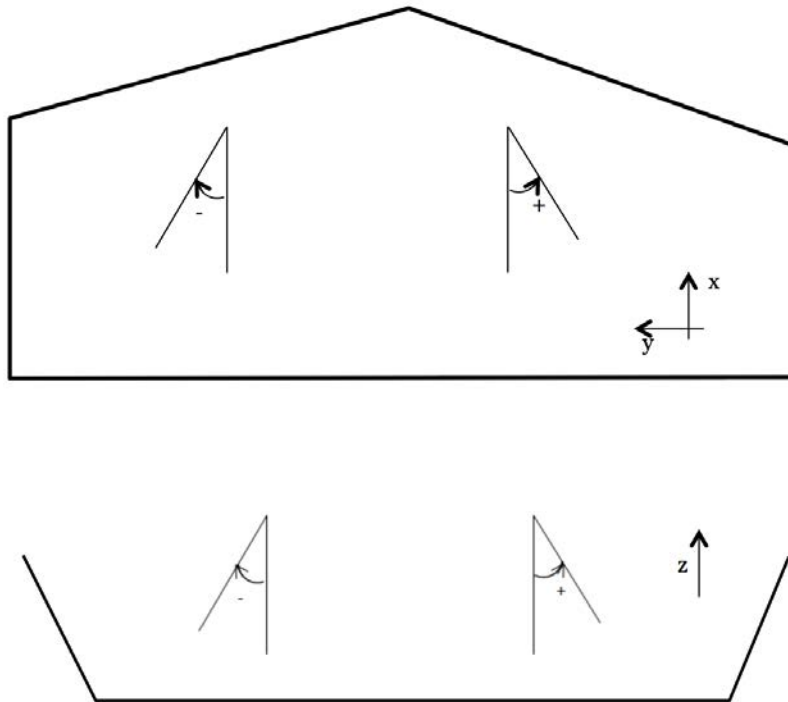
Z axis



$$mis_z = \arctan\left(\frac{\Delta x}{\Delta y}\right)$$

Sign of Angles

The sign of the angles are important. On Scala, the convention is the following:



Exporting/Importing the Receiver Configuration

You can export and import a configuration you made for a receiver.

About this task

- ❗ **Important:** You need to have a Java version lower than **Java 1.7 (update 80)** to be able to import and export configuration settings via the system control panel on Firefox. Java version initially installed on the computer enables you to do it, but if you updated Java version, you will not be able to import or export configuration settings.

Procedure

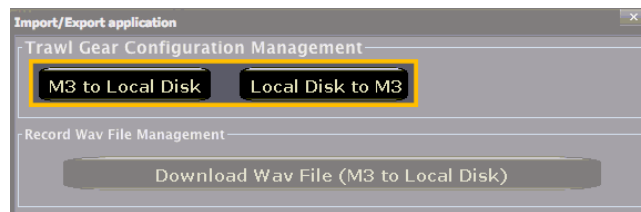
1. Enter your receiver IP address in Firefox web browser to access the system control panel web page.
2. From the system view on the right side, click **Settings**.



3. From Java window, click **Activate** then **Run**.
4. Click **Open Import/Export Application**.



- Click **Receiver to Local Disk** to export a configuration file or **Local Disk to Receiver** to import an existing configuration file.



When exporting your configuration, you get a *.M4REF file. Use this file when importing the configuration.

Applying Filters on Incoming Data

In some cases acoustic signal sent by trawl sensors might be perturbed by environmental acoustic noise (on the trawl or around the boat) or interference with echo sounder systems installed on the boat hull.

Typically, these perturbations would be seen as isolated targets on echograms. In order that the user do not mix echogram targets coming from perturbations with real fish targets, it is possible to apply predefined filters.

Available filters depend on the type of sensor. You can customize filters and adjust their threshold values (the threshold will define how big a suspicious isolated target needs to be in order to be removed by the filtering).

Types of Filters



This table shows the filters available, as well as dependencies when some filters are set as active (in some cases they work in combination).

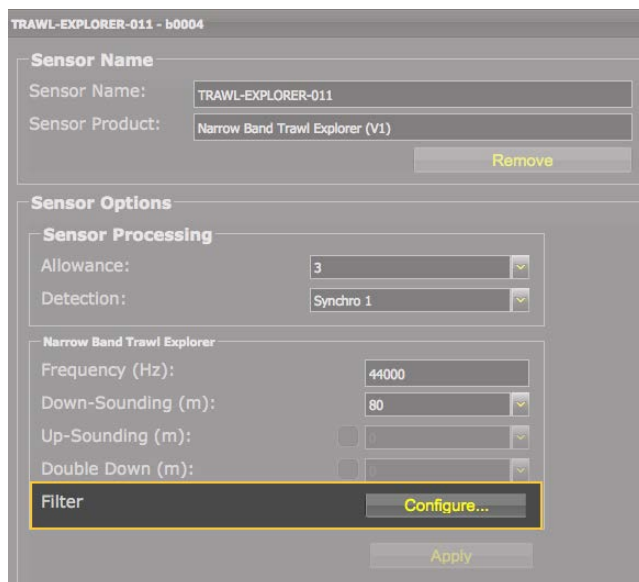
Filter	Definition	Filters Also Active
Min/Max	Only data that is within range of selected Min/Max values is sent and displayed on the user interface.	None by default, but you can also select Rate of Change, Some Smoothing and More Smoothing in Advanced tab.
Rate of Change	Applies a limit of how fast data can change when sent and displayed on the user interface.	Min/Max
Some Smoothing	Smoothens data and prevents jumps in the display. This can add some delay to the information displayed.	Min/Max, Rate of Change
More Smoothing	Filters at higher grade than Some Smoothing. Creates more delay and detail in data may be lost.	Min/Max, Rate of Change
Debounced 2, 3 or 4	Only for catch sensors. Displays catch status as full when receiver has received 2, 3 or 4 "full" signals from catch sensor. You can also choose no filtering.	–

Filter	Definition	Filters Also Active
Signal Interference / Echosounder Interference / Echosounder and signal interference reduction	Only for NBTE and HDTE echograms. Used in echogram part of narrow band sensors and similar to Some Smoothing for sensors. Removes noise and interference from for example the vessel echo sounder. Choose accordingly to the level of noise you have, and if you want to see more or less interferences on the echogram. For example, if you have a low level of noise you can choose Echosounder Interference Reduction. If you have a high level of noise, you can choose Echosounder and Interference Reduction. Then, adapt the level of filtering (low/medium/high).	-

Applying Filters

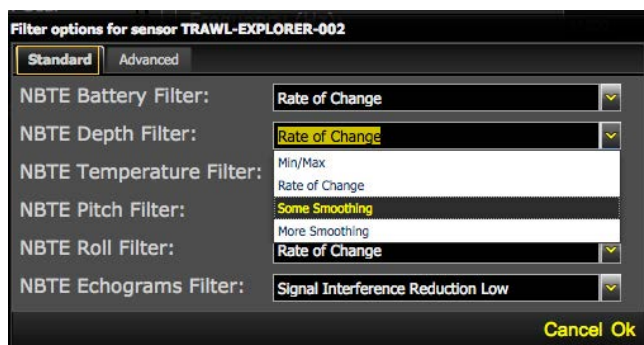
Procedure

1. From the top left corner, click the menu icon  and select **Expert**.
2. Enter the password **copernic**.
3. Click the menu icon  again and select **Receivers**.
4. From the left side of the screen where the system is displayed, click a sensor, for example Trawl Explorer.
5. From **Sensor Options**, at **Filter**, click **Configure**.

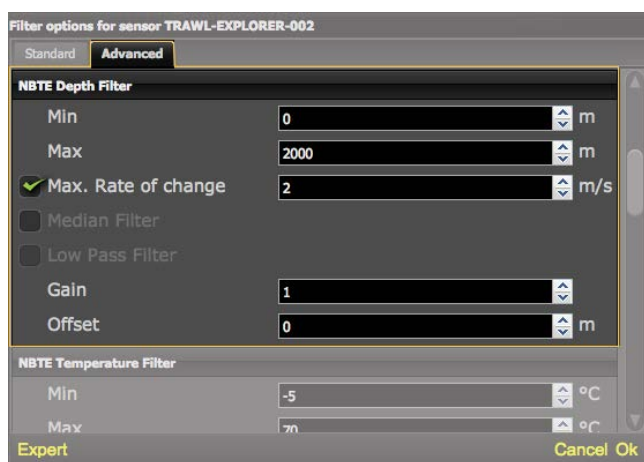


A panel listing available filters appears. The filters displayed depend on the functions of the selected sensor.

6. From the **Standard** tab, select filters for each function. See [Types of Filters](#) on page 28 for details about the filters.



7. To change the default threshold values for the filters, click the **Advanced** tab. Functions are listed with their threshold values. Change them according to your need.

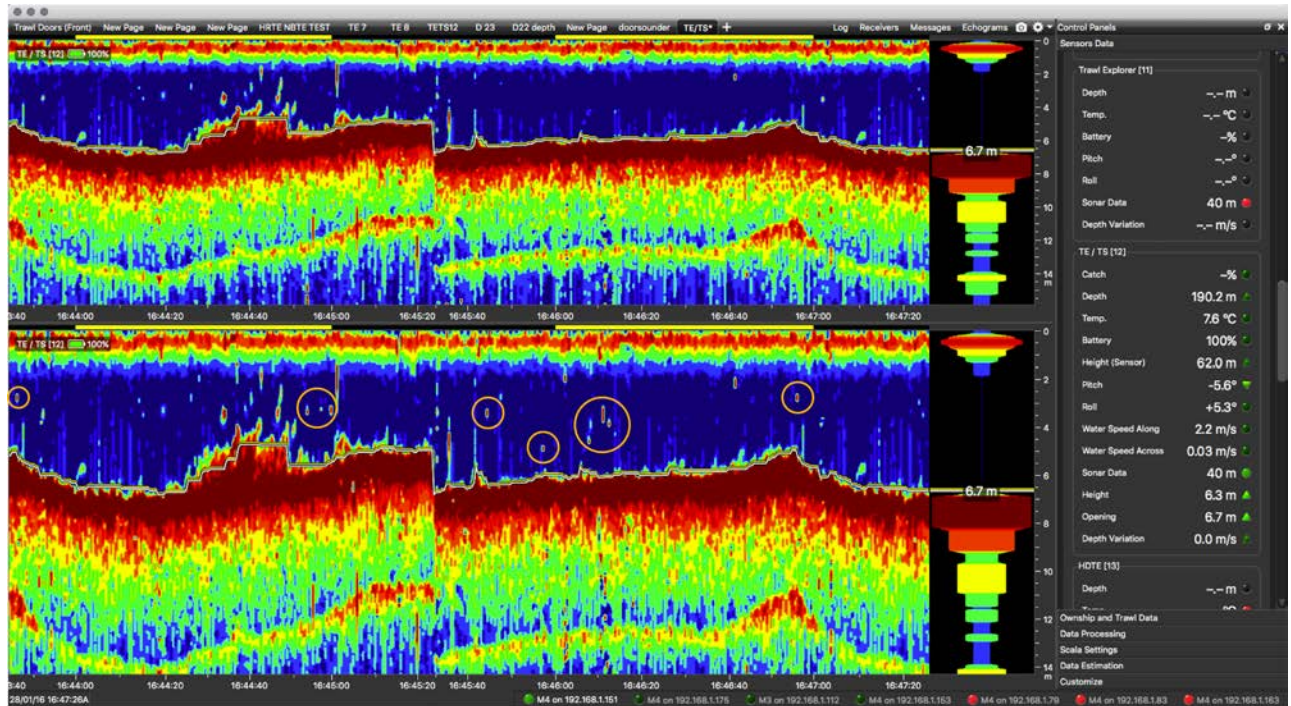


Filtering Examples on Echograms

Here are examples of the effects of some filters on echograms..

Echosounder Interference Reduction Filter

On a TE/TS echogram:

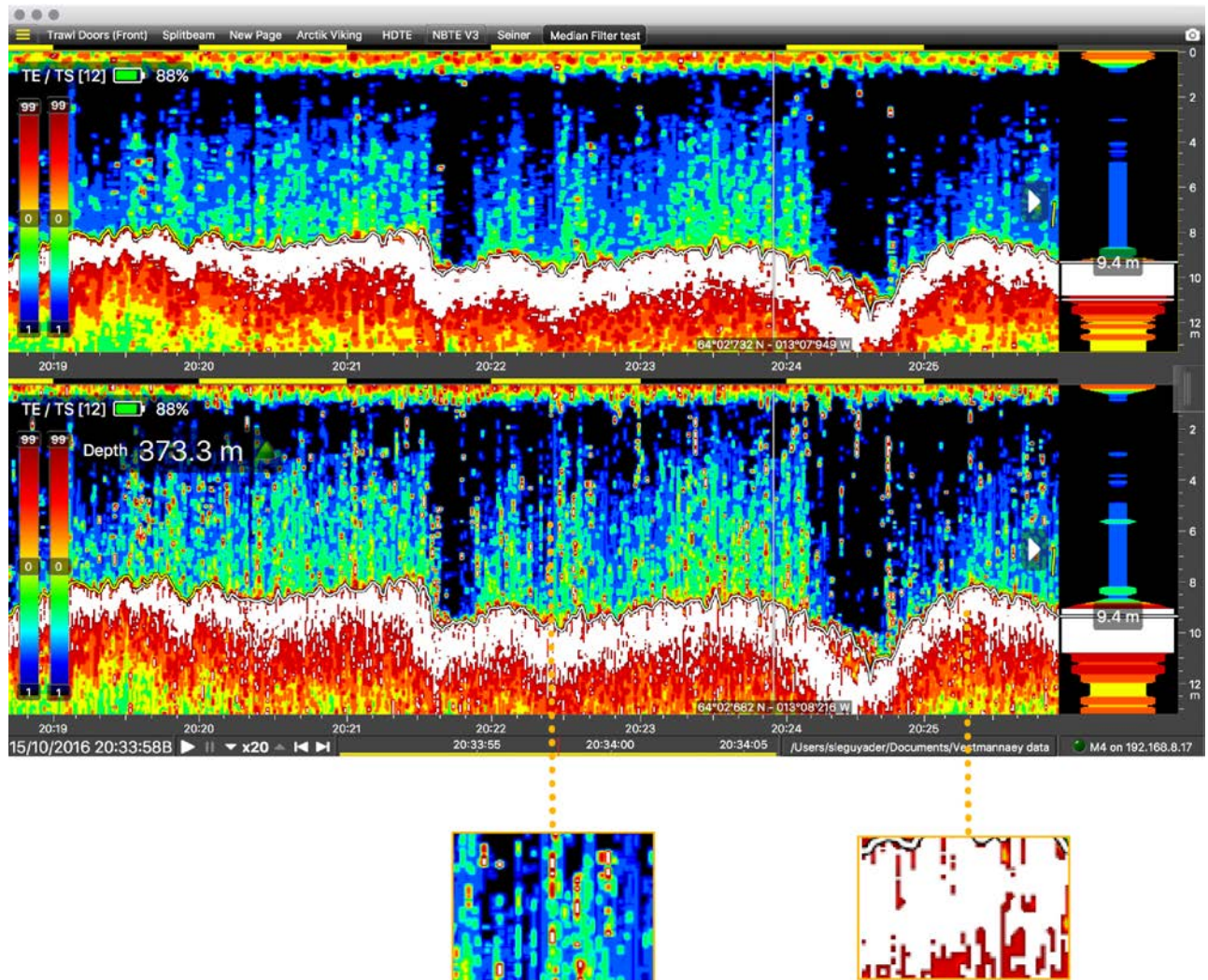


The echogram above has filtered data and echogram below has raw data.

You can see on the second echogram that there are interferences due to an echosounder (circled in orange). These interferences are mostly removed when the Echosounder Interference Reduction filter is applied (first echogram).

Signal Interference Reduction Medium

On a TE/TS echogram:



The echogram above has filtered data and echogram below has raw data.

You can see on the second echogram small red points or lines in the water column and sea bottom that are interferences due to a noisy environment or to an echosounder. These interferences are mostly removed when the Signal Interference Reduction filter is applied. The Medium level of the filter means data are moderately smoothened.



Adding Data from Other Systems

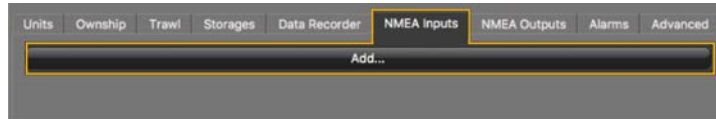
You can display data received by other systems than Marport's, for example GPS, DBT (Depth Below Transducer), warp length, compass or wind data.



Before you begin

Check the equipment from which you want to receive data to help you complete the parameters.

Procedure

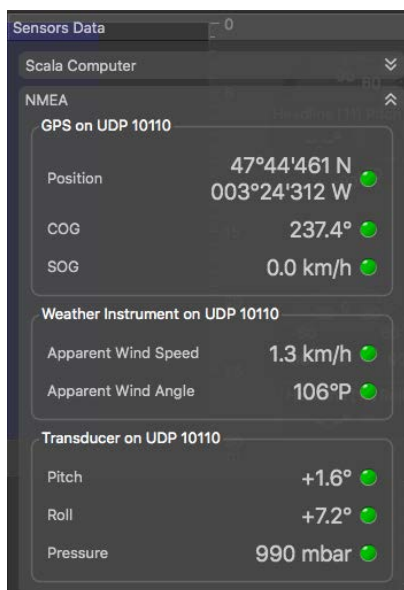
1. From the top left corner, click the menu icon  and select **Customize**.
2. Enter the password **eureka**.
3. Click the menu icon  again and select **Settings**.
4. From the **NMEA Inputs** tab, click **Add**.



5. Choose the type of connection between serial port, UDP server or TCP server.
 - For a serial port:
 - a) From **Port**, select the incoming data you want to add.
 - b) From **Baud**, choose the transmission speed (bit per second).
 - c) Leave the other default parameters if you have no specific requirements.
 - d) Select a different input format if you have Marelec or RappMarine equipment.
 - e) To broadcast the input data to other equipment than Scala, select **Output to UDP** and choose the target port and address.
 -  **Tip:** The address written by default enable to broadcast to all equipments.
 - For a UDP server:
 - a) Enter the port.
 - For a TCP server:
 - a) Enter the server and port.
 - b) Select a different input format if you have Marelec or RappMarine equipment.
6. Click **OK**.
 -  **Note:** Minimum data requirements to use positioning are: compass, GPS, warp length and sensors.

Results

In the control panels, the new data appear under **Sensors Data > NMEA**.



LEDs blink green when data are received (it may be steady green if data are received continuously). When communication with the NMEA devices is lost, LEDs do not blink anymore.

What to do next

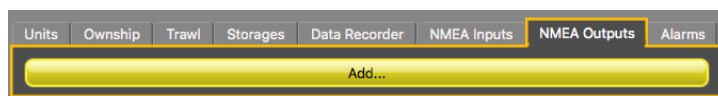
When you have finished, you need to deactivate the Customize mode: click **Menu > Customize** again.

Outputting Data to Other Systems

You can send to other systems data you have received.

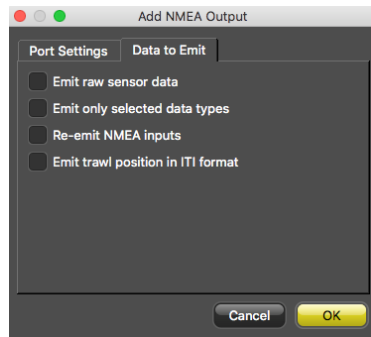
Procedure

1. From the top left corner, click the menu icon and select **Customize**.
2. Enter the password **eureka**.
3. Click the menu icon again and select **Settings**.
4. From the **NMEA Outputs** tab, click **Add**.



5. Choose the type of connection between serial port, UDP server or TCP server.
6. Enter the output parameters.
7. From the **Data to Emit** tab, select which data you want to output:
 - The first two options only output Marport data.
 - Select **Re-emit NMEA inputs** if you also want to output data that you added as NMEA inputs.

- Select **Emit trawl position in ITI format** if you need data for positioning, for example for cartography software.



 **Note:** NMEA data for positioning are outputted in the following sentences: \$PSIMS and @IITPT. See [NMEA Outputs](#) on page 37 for more details.

8. Click **Ok**.

What to do next

When you have finished, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Reference

NMEA Inputs

Scala can decode and use the following types of NMEA sentences.

Standard	Sentence	Logical sensor	First version compliant	Extracted data
NMEA 0183 v3.01	\$xxGGA	GPS	1.0.0.0	Time, latitude, longitude, altitude
	\$xxGNS	GPS	1.0.0.0	Time, latitude, longitude, altitude
	\$xxVTG	GPS	1.0.0.0	COG, SOG (knots and km/h)
	\$xxHDT	Gyro	1.0.0.0	Heading
	\$xxDPT	Sounder	1.0.0.0	Depth below surface (data are sum of depth below transducer and draft between transducer and water surface)
	\$xxMWV	Wind	1.0.0.0	Relative wind speed and angle (only)
	\$xxDBT	Sounder	1.2.0.0	Water depth referenced to the transducer.
	\$xxMTW		1.4.0.0	Water temperature

Standard	Sentence	Logical sensor	First version compliant	Extracted data
	\$xxVBW	DVL	1.4.0.0	Speed through Water
	\$xxVLH	DVL	1.4.0.0	Distance (trip and total)
	\$xxVHW	DVL	1.4.0.0	Speed and heading
	\$xxEMI	DVL	1.4.0.0	Emission mode
	\$xxQUA	DVL	1.4.0.0	Quality of measurement
	\$xxVEL	DVL	1.4.0.0	Velocity
	\$xxDBK	Sounder/ DVL	1.4.0.0	Depth below keel
	\$xxGLL	GPS	1.2.6.0	Time, latitude, longitude
Proprietary	\$xxNAV	GPS	1.0.0.0	Ifremer navigation sentence. Time, latitude, longitude
	\$xxSYN	Winch	1.0.0.0	Winch lengths (starboard, port, inner starboard, inner port) Winch tensions (starboard, port, inner starboard, inner port)
	\$xxIFM	Gyro	1.0.0.0	Ifremer versatile sentence. <ul style="list-style-type: none"> • OCGYR: pitch, roll, heading • TRFUN: winch lengths (starboard, port) and winch tensions (starboard, port)
	\$PFEC	GPatt	1.0.5.0	Furuno heading, pitch and roll
	\$SCWLS	Winch	1.0.6.0	Scantroll Winch length (starboard)
	\$SCWLP	Winch	1.0.6.0	Scantroll Winch length (port)
	\$SCWTS	Winch	1.0.6.0	Scantroll Winch length (starboard)
	\$SCWTP	Winch	1.0.6.0	Scantroll Winch length (port)
	# MA DD	Winch	1.2.0.0	Marelec winch length and tensions (port, starboard, middle)
	\$NMATW	Winch	1.2.0.0	NaustMartine Winch control (tension + length)

Standard	Sentence	Logical sensor	First version compliant	Extracted data
	\$xxCON	SILECMAR	1.2.6.0	Consumption, attitude of vessel
	\$xxWCT	SILECMAR	1.2.6.0	Warp length and tension
	\$xxWDA	DVL	1.4.0.0	Watch depth below keel alarm
	\$xxSDA	DVL	1.4.0.0	Watch depth below keel alarm
	@TAWWL	Winch	1.4.4.0	RappHydema - PTS Pentagon warp length
			1.4.4.0	RappHydema - PTS Pentagon warp tension

NMEA Outputs

Scala can output data in the following format.

Marport NMEA sentences format

Typical NMEA sentences for Marport sensor data:

\$MPMSD, X, YY, ZZZ, TTT, u, V*<chk>

The first character of each sentence will always be a dollar sign \$.

After the dollar-sign character, **MP** is the sentence talker, then **MSD** (for Marport Sensor Data) is the sentence identifier.

After the header, all fields are separated by commas, except the final field, preceded by an asterisk. These fields contain data related to the sensor (see below).

The final field **<chk>** is the checksum, preceded by an asterisk *. It is simply a security measure to help ensure that the sentence is transmitted accurately. The checksum follows the NMEA specifications (IEC 61162-1 Ed.4).

Sensor location

X, YY, ZZZ specifies the location of the emitting sensor on the trawl gear.

X is useful only for twin trawl or triple trawl gears and is 1 or 2 letters that code on which gear the sensor is installed.

YY is a 2 letters code that specifies the part of the gear where the sensor is installed.

ZZZ is a numerical code that is a Marport sensor node identifier related to the M4 receiver configuration. it is used in Scala to position the sensors in the 3D views.

X and **YY** can be deduced from **ZZZ**, but are easier to use.

Type of gear	Gear position	X
Single		T

Type of gear	Gear position	X
Twin trawl	Starboard	ST
Twin trawl	Port	PT
Triple trawl	Starboard	ST
Triple trawl	Middle	MT
Triple trawl	Port	PT
Unknown		<Empty>

Trawl gear part	YY
Port Door	PD
Starboard Door	SD
Port Wing	PW
Starboard Wing	SW
Headrope	HR
Footrope	FR
Body	BO
Cod-end	CE

Clumps in twin or triple gears are coded as the starboard door of the trawl at its port side:

Clump	X, YY	Description
Twin trawl	P, SD	Port trawl, starboard door
Triple trawl, starboard clump	M, SD	Middle trawl, starboard door
Triple trawl, port clump	P, SD	Port trawl, starboard door

Sensor data types and values

TTT, **u**, **VV.VVV** contain the type, unit and value of sensor data. **TTT** is a 3 letter code corresponding to the type of data. **u** is the acronym of the unit and **VV.VVV** is a decimal value.

Data type	TTT	Unit	u	Description
Depth	DPT	meters	m	Depth of sensor (distance from surface)
Catch	CAT	%		Currently 0 (sensor OFF) or 100 (sensor ON), unit field is empty
Pitch	PIT	degrees	d	From -90 to 90

Data type	TTT	Unit	u	Description
Roll	ROL	degrees	d	From -180 to 180
Temperature	TMP	Celsius degrees	c	
Spread starboard	XST	meters	m	Distance between the master spread sensor and the slave. If the field is empty, it means "slave lost".
Spread clump	XCL			
Spread port	XPT			
Battery	BAT	%		From 0 to 100. Unit field is empty.
Speed along	SPL	m/s	ms	
Speed across	SPX	m/s	ms	
Distance to bottom	DTB	meters	m	Distance from the sensor to the sea floor
Opening	OPN	meters	m	Distance from the headrope to the footrope or from the top to the bottom of the trawl body
Clearance	CLR	meters	m	Distance from the footrope or the bottom of the trawl body to the sea floor
Slant Distance	SLD	meters	m	Distance from the sensor to the hydrophone
Relative Bearing	RBR	degrees	d	Bearing from the ownship to the sensor relative to ownship heading
True Bearing	TBR	degrees	d	Bearing from the ownship to the sensor relative to north

For spread data, the data is located on the master sensor.

Type of gear	X, YY, ZZ, TTT	
Single (the master is on the port door)	,PD,23,XST	Distance between doors
Twin trawl (the master is on the port door)	P,PD,23,XST	Distance between doors
	P,PD,23,XCL	Distance between port door and clump
Triple trawl (the masters are on the doors)	P,PD,23,XST	Distance between port door and starboard clump

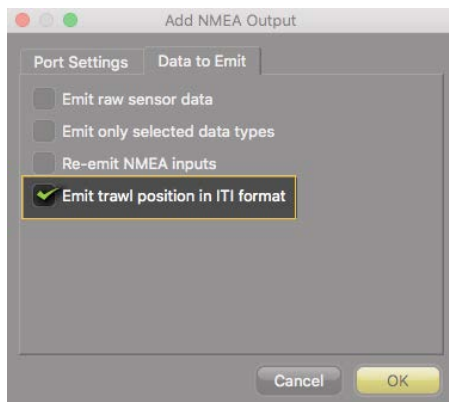
Type of gear	X, YY, ZZZ, TTT	
	P,PD,23,XCL	Distance between port door and port clump
	S,SD,223,XST	Distance between starboard door and starboard clump
Triple trawl with port (the master is on the port clump)	P,SD,78,XST	Distance between port clump and starboard door
	P,SD,78,XCL	Distance between port clump and starboard clump
	P,SD,78,XPT	Distance between port clump and port door

Positioning sentences

Scala can output NMEA data for positioning with the following sentences:

- \$PSIMS
- @IITPT

To configure the output, select **Emit trawl position in ITI format** in the output settings:



For example:

\$PSIMSn,xxxx,M,xxxx,M,yyy.y,T,xxx.x,M,hhmmss*hh<cr><lf>

n=1 Spread1 (port trawl door when Twin Rig)

n=2 Spread2 (starboard trawl door when Twin Rig)

xxx,M slant range in meters to sensor

– filtered values

– decimals not used.

xxx,M horizontal range in meters to sensor

- unfiltered values

- nullfields if depth-sensor not activated (will calculate horizontal range with manual set depth)

- decimals not used

yyy.y,T true bearing (deg.rel.north) to sensor

- requires gyro input for reliable data.

xxx.x,M spread measurement in meters (door to door or door to middle weight)

- if invalid values null fields will be transmitted

- filtered values if sensor filter is on

hhmmss time of transmission (time of Spread interrogation)

- requires ZDA input from GPS for accurate timestamp

@IITPT,xxxx,M,y,P,zzzz.z,M<cr><lf> Trawl Position True vessel

TPT represents the True Trawl Position relative to the vessel.

xxxx,M is the horizontal range in meters to the target (0 - 4000 m).

- requires an active depth sensor on the trawl or manual set depth, if not the slant range will be presented.

yyy,P Is the true bearing to the target (i.e. relative to north).(Resolution 1A#°.)

- requires gyro input for reliable data.

zzzz.z,M is the depth in meters of trawl below the surface (0 -2000 m).

- requires an active depth sensor on the trawl or manual set depth, if not the depth field will be empty

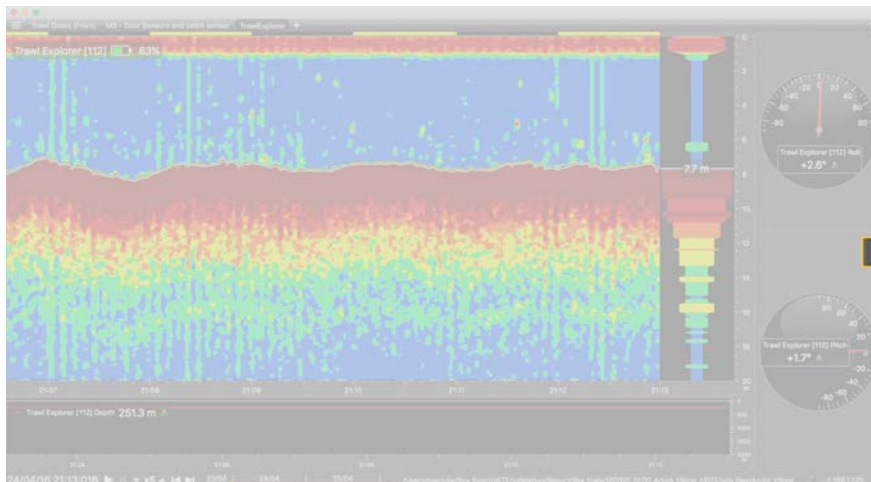
Display Configuration

This section explains how to manage the display of data in Scala.

Control Panels

Control panels are displayed on the right side of the screen.

They can be hidden. When they are hidden, you can see a grey rectangle at the right side of the screen.

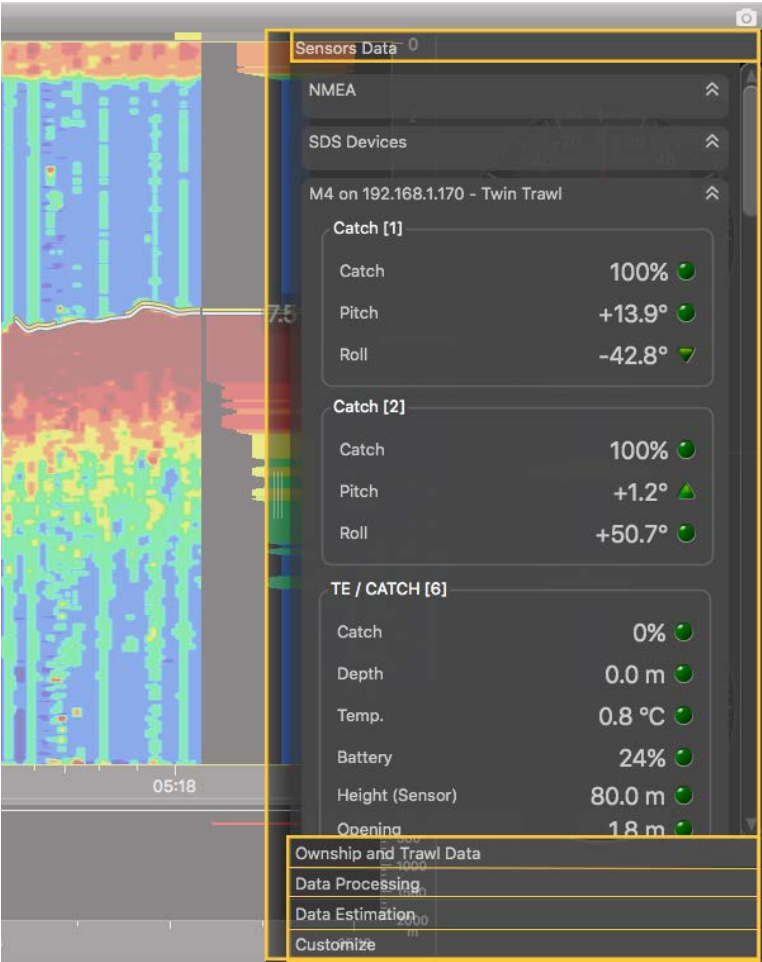



To open them, click the grey rectangle.

Control panels are the following:

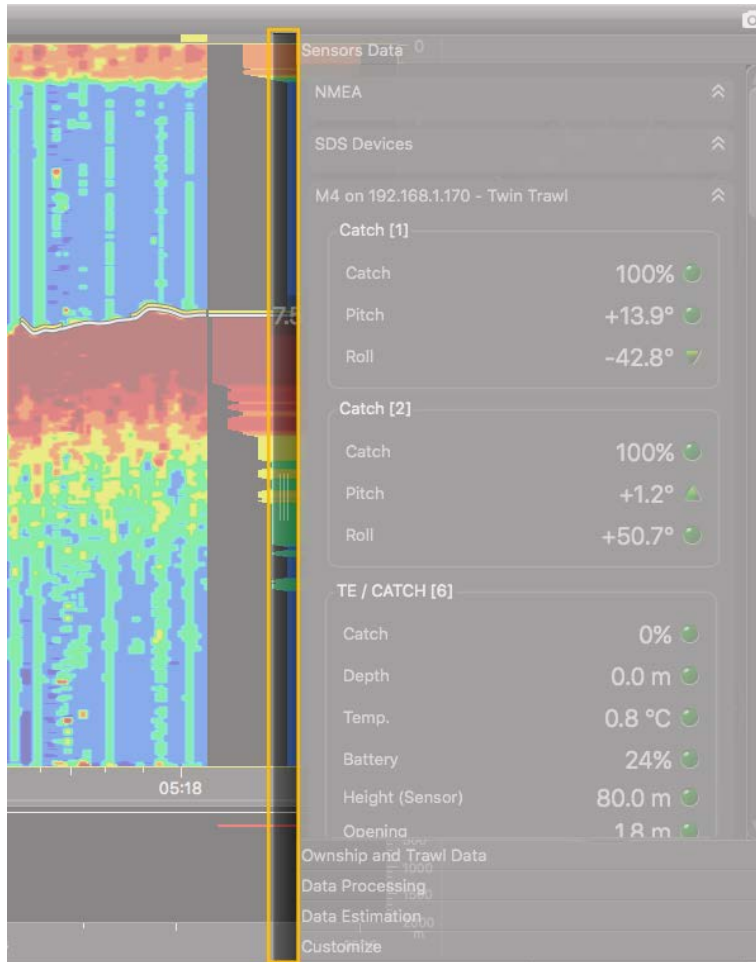
- Sensors Data
- Ownship and Trawl Data
- Data Processing
- Data Estimation
- Customize (only in Customize mode)

Click their title (framed in yellow on picture below) to show them.



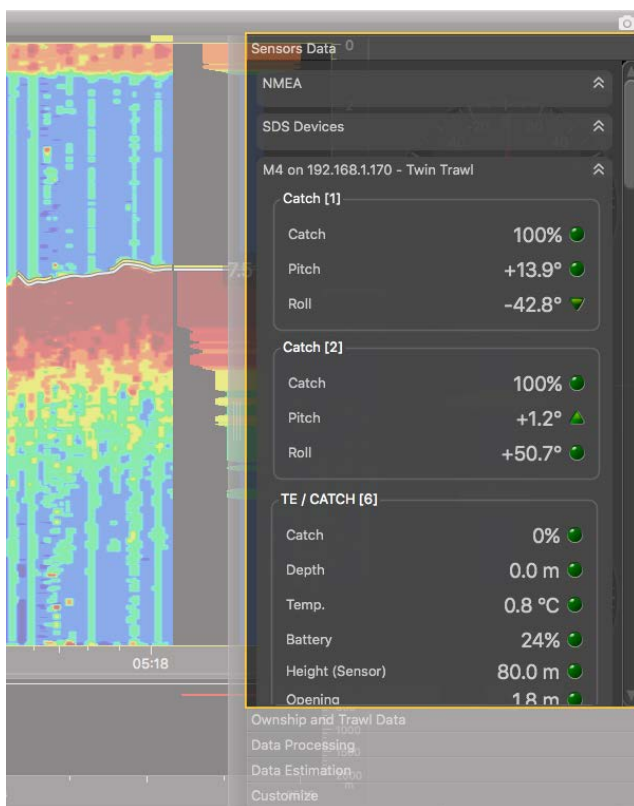
Contents of control panels can be hidden or shown when clicking .

To hide all the control panels, click the left border of the control panels.



Sensors Data

Sensors data are displayed in the **Control Panels** on the right side of the screen. These data are raw or filtered data received from the sensors.



By default, the location of the sensor on the trawl gear is written between brackets next to the sensor type. To know to which location the number corresponds, refer to the pictures in [Sensor Nodes](#).

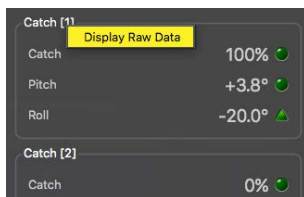
A LED next to data names indicates the status of data received:

- Blinking green: data are received.
- Orange: communication with the receiver has been lost for a few seconds. A connection problem has just occurred.
- Red: there is no more communication with the receiver.

The LED shape changes according to data received:

- ●: data are stable
- ▲: data value is increasing
- ▼: data value is decreasing

To display raw data, right-click on the title and select **Display Raw Data**:



You can also deactivate the reception of data. It can be useful if for example you have two different sensors sending the same data. Right-click incoming data and select **Deactivate Data**.



Ownship & Trawl Data

Ownship and trawl data are displayed in the **Control Panels** on the right side of the screen. They are always written in *italic*.



Ownship and trawl data are used for 3D (like 3D door view, 3D trawl speed view and 3D system view) and positioning. They are data extracted and treated from sensors data.

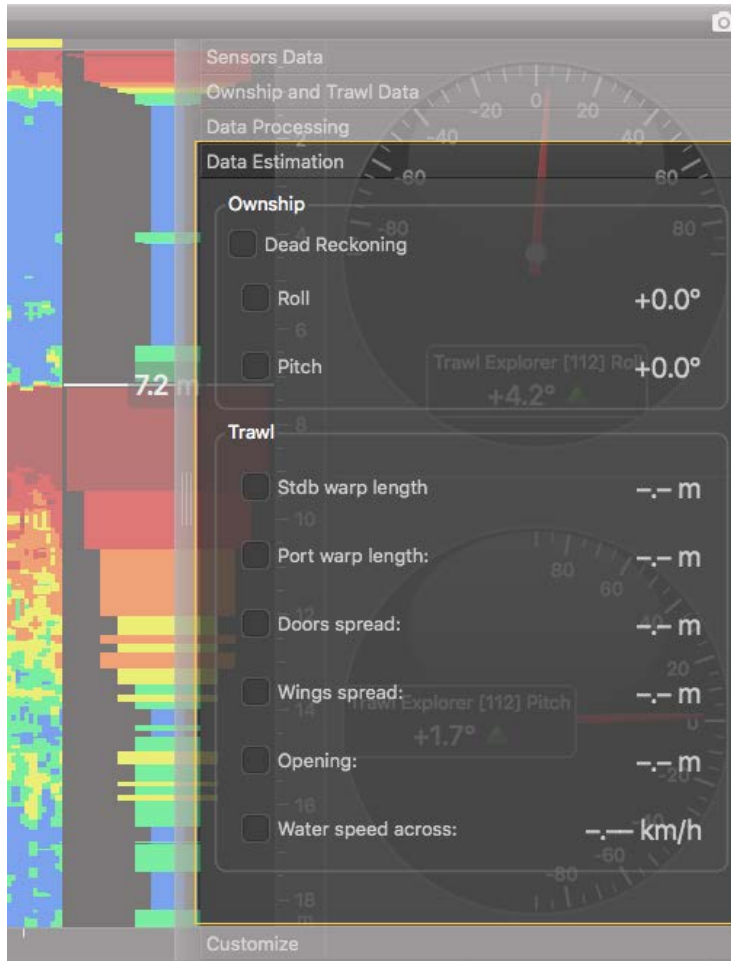
Only use these data if sensor locations are configured on the correct nodes.

Like sensor data, a LED next to data names indicates the status of data received:

- Blinking green: data are received
- Orange: communication with the receiver has just been lost
- Red: there is no communication

Data Estimation

Data estimation control panel is displayed in the **Control Panels** on the right side of the screen.



You can enter here estimation of measures if they are not received from incoming NMEA data.







If you have a positioning system and no warp length in incoming NMEA data, you need to manually enter the warp length. From the **Trawl** section, select and fill in **Stb warp length** and **Port warp length** fields:




Receiver Data

Receiver activity and its IP address is displayed on the bottom right corner of the screen.

A dot next to the receiver name indicates its activity:

-  M3 on 192.168.10.177 : the receiver is detected.
-  M3 on 192.168.10.177 : the receiver is active.
-  M3 on 192.168.10.177 : the receiver is in Spectrum mode.
-  M3 on 192.168.10.177 : the receiver is in audio recording mode.
-  M3 on 192.168.10.177 : the communication with the receiver has just been lost. There is a connection problem.
-  M3 on 192.168.10.177 : the communication with the receiver has been lost for at least 20 seconds.

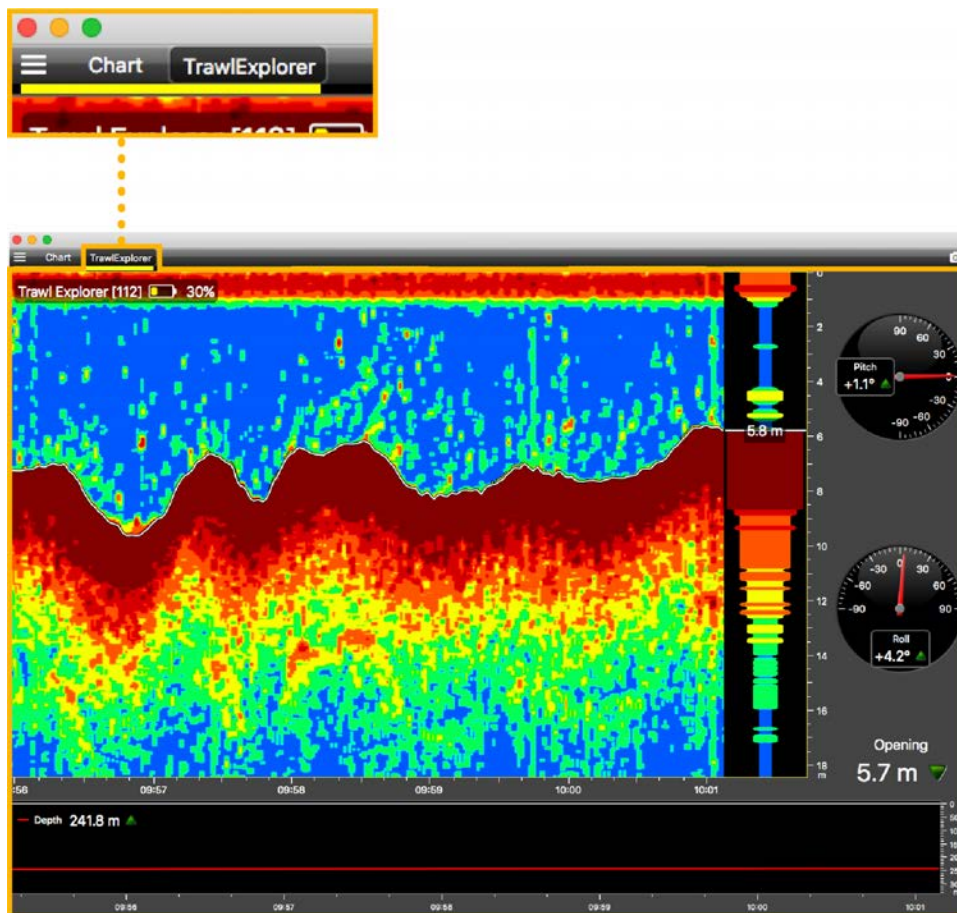
 **Note:** Receiver IP adress may change according to equipment.

Creating Data Pages

In Scala, data received from sensors can be displayed on pages. Pages are organized in tabs on the top toolbar.

Click one tab to display the corresponding page.

You can create specific pages according to your needs, for example one page for door spread sensor data, one for trawl explorer data,...

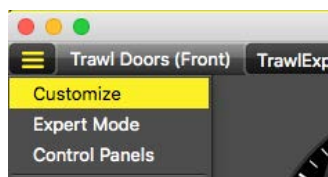


Creating a New Page

You can create a new page based on pages that already display data or from an empty page.


Procedure

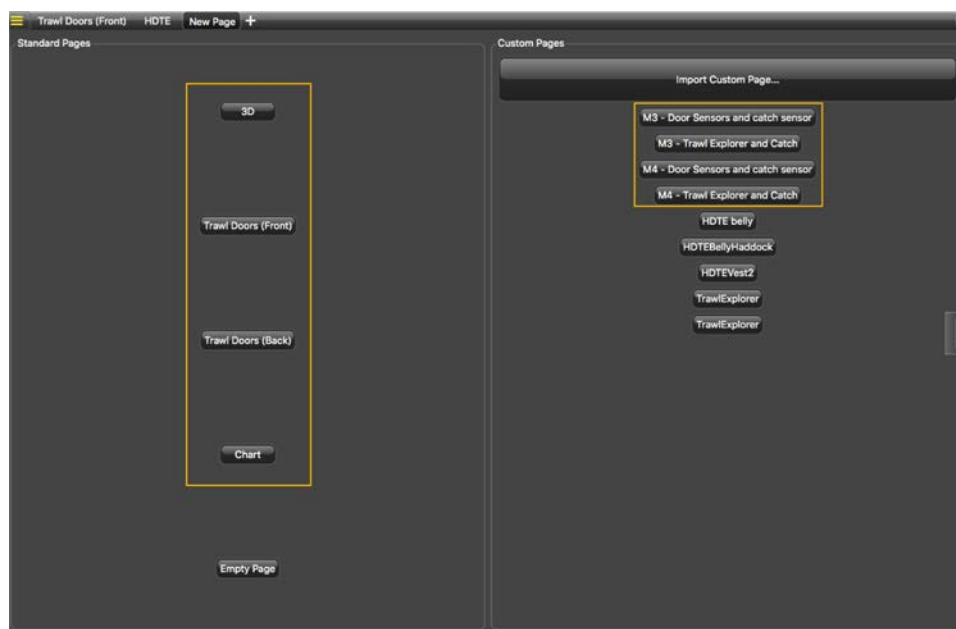
1. From the top left corner, click the menu icon and select **Customize**.



2. Enter the password eureka.

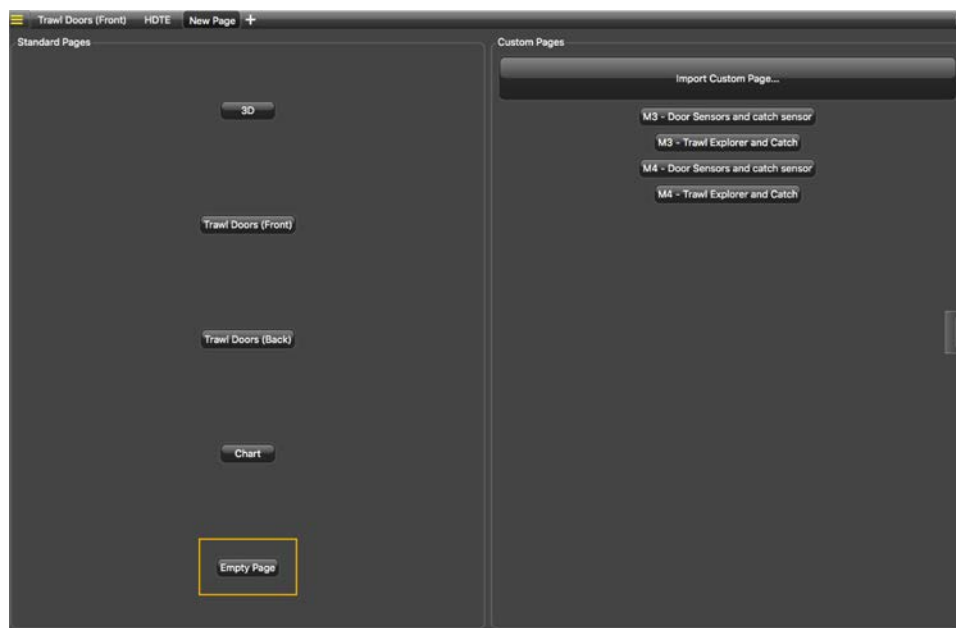


3. From the top toolbar, click the add icon . **Standard Pages** and **Custom Pages** panels are displayed.
4. Select a type of page.
 - To select a page with data already displayed, select a page from the **Standard Pages** or **Custom Pages** panels.



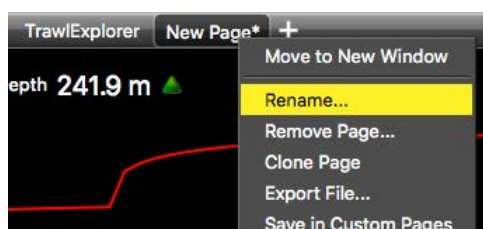
 **Tip:** You can use these pages as a basis and add other data.

- To select an empty page, select **Empty Page** from the **Standard Pages** panel.




The new page appears in a new tab.

- Right-click the new page tab and select **Rename**.



- Type a name and press Enter.
The new page name appears.

What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Adding Data to a Page

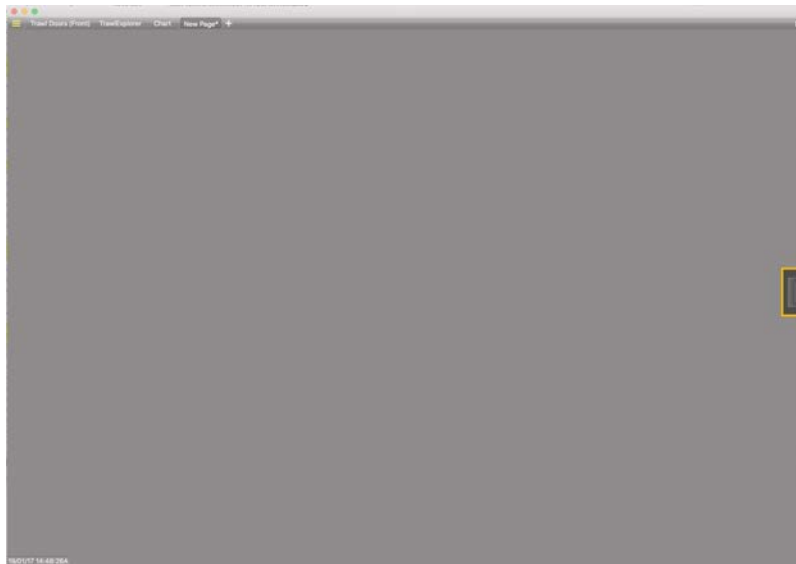
You can choose data that will appear on the screen.

Before you begin

You must be in **Customize** mode to complete this task.

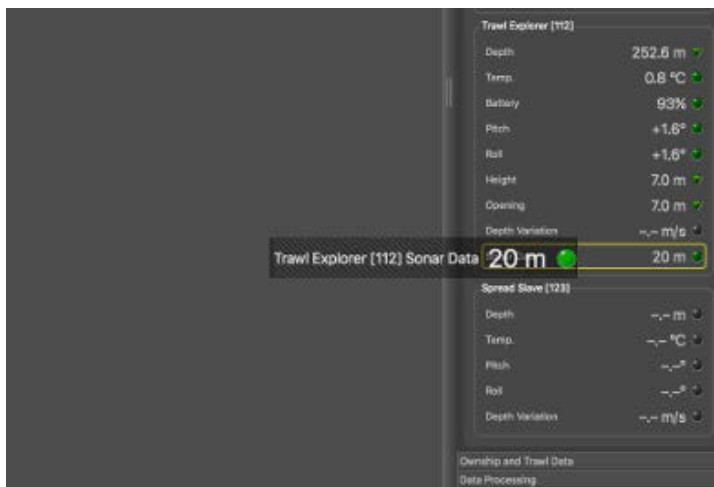
Procedure

1. To open the control panels, click the grey rectangle at the right side of the screen.

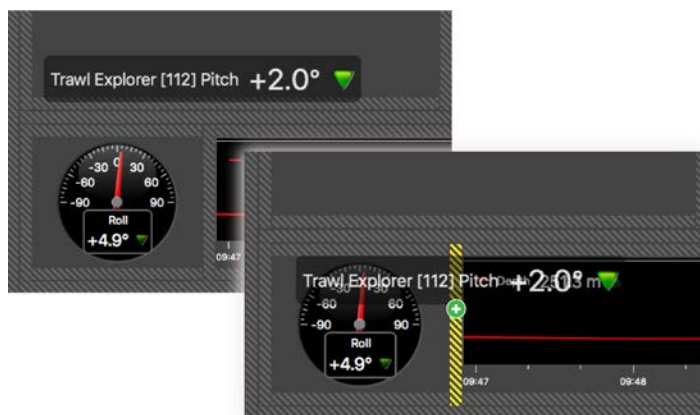


The control panels appear.

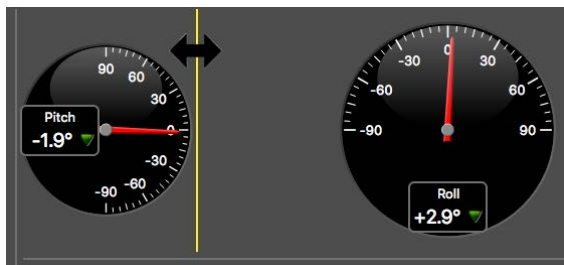
2. From **Sensors Data** tab, choose data and click + hold for 3 seconds until a rectangle with data appears.



3. Hold + drag the rectangle to the middle of the screen, above grey stripped areas. The area becomes yellow when you can place data.

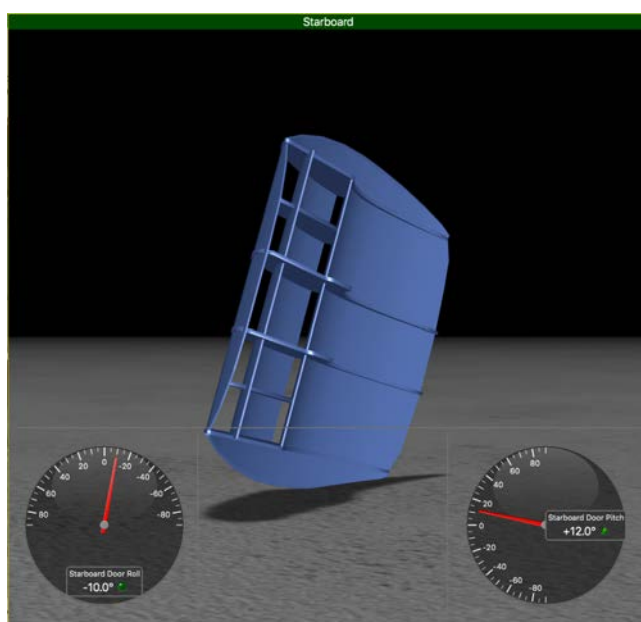
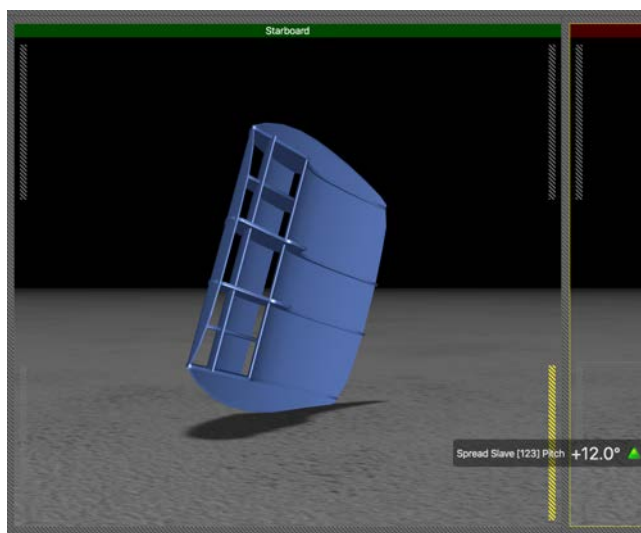


4. Stop holding the mouse button to place data at the chosen area.
5. From the **Choose new Gauge Type** dialog box that appears, select the desired type of display for the corresponding data. See [Display Types](#) on page 70 for more information about the types of display. Data are displayed on the screen.
6. Drag the lines around data to resize them.



- Tip:** To place data (e.g. dial, gauge, text) on top of previously placed echogram or 3D views, select data and drag them on the echogram or 3D. Locations where

you can drop data are situated on the corners of the views. They appear as yellow stripes when data are dragged above the location.




- Tip:** You can add multiple data in one history plot in order to easily compare different data at the same time:
1. Drag data, for example Depth from a Trawl Explorer, to a yellow area.
 2. From the **Choose new Gauge Type** dialog box, select **History Plot**.
 3. Drag other data, for example Depth from a Spread Master, to the first Depth history plot.

4. The second data appear in the history plot in another color.



What to do next

- To add other data, repeat the steps.
- When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

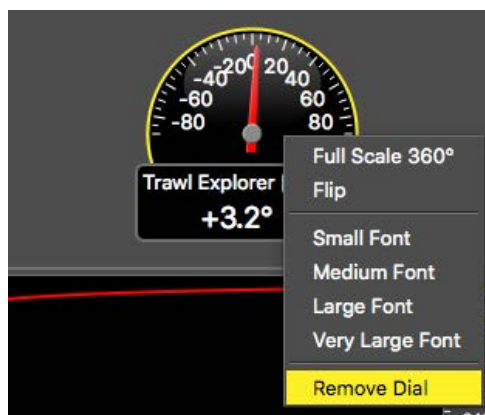
Removing Data from a Page

Before you begin

You must be in **Customize** mode to complete this task.

Procedure


1. Right-click the data.
2. Select **Remove**.



Results

The selected data are removed from the page.

What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Saving a Page

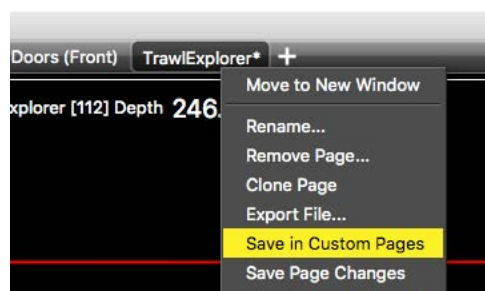
You can save pages you created in **Custom Pages** to be able to find them later.

Before you begin

You must be in **Customize** mode to complete this task.

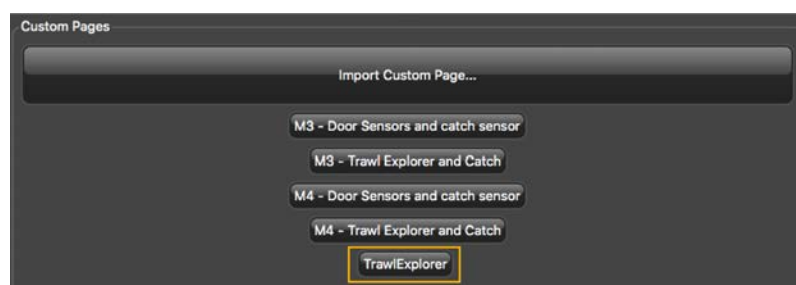
Procedure

1. Right-click the page tab and select **Save in Custom Pages**.

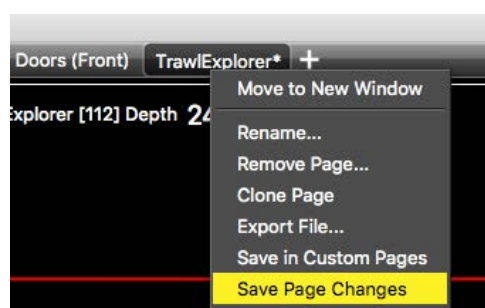


Note: Saving your page in the **Custom Pages** enables you to recover the page if you remove it from the tabs.


2. From the **Save page template as** dialog box that appears, click **Save**. The page is added to the **Custom Pages** panel.



3. Right-click the page tab again and select **Save Page Changes**.



What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Exporting a Page

You can export pages you created, for example if you want to reuse them for other configurations.

Before you begin

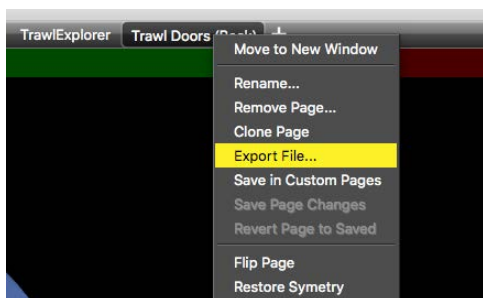
- You must be in **Customize** mode to complete this task.
- You need to save your page as a custom page to be able to export it.

About this task

By default, all pages you saved as custom pages are stored in **Documents/Marport/Scala/Pages**.


Procedure

1. Right-click the page tab.
2. Select **Export File**.



3. Choose where you want to save the page.

What to do next


When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Deleting a Page

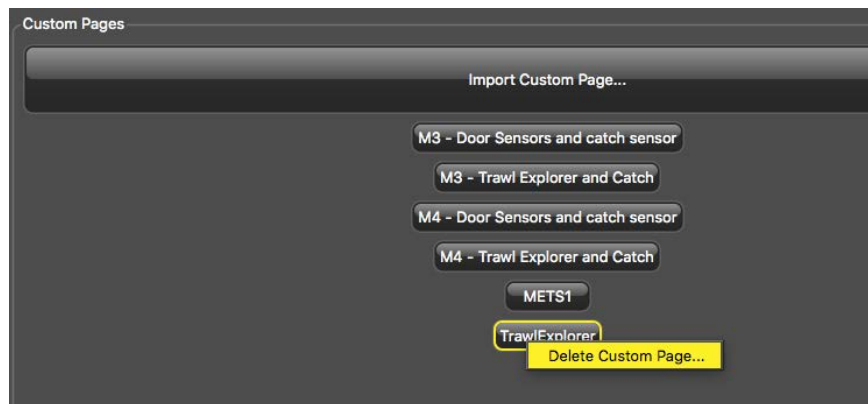
Before you begin

You must be in **Customize** mode to complete this task.


Procedure

1. To remove a page from the tabs, right-click the page tab and select **Remove Page**.
 - ❗ **Important:** If your page has not been saved in the **Custom Pages**, it will be permanently deleted.
2. If your page was already saved in the **Custom Pages**, click **No** in the dialog box asking you to save the page as custom page template.
3. To permanently delete a custom page from Scala:
 - a) From the top toolbar, click the add icon .

- b) From the **Custom Pages** panel, right-click the page name and select **Delete Custom Page**.



What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.


Opening a Saved Page

If you removed a page from the top toolbar, you can recover it if you saved it in **Custom Pages**.

Before you begin

- You must be in **Customize** mode to complete this task.
- You have pages saved as **Custom Pages**.


Procedure

1. From the top toolbar, click the add icon .
2. From the **Custom Pages** panel, click the name of the page.

Results

The page opens with its name displayed in the top toolbar.

What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Managing Windows

When you have several screens, you can open pages in different windows to be able to place one window on each screen.



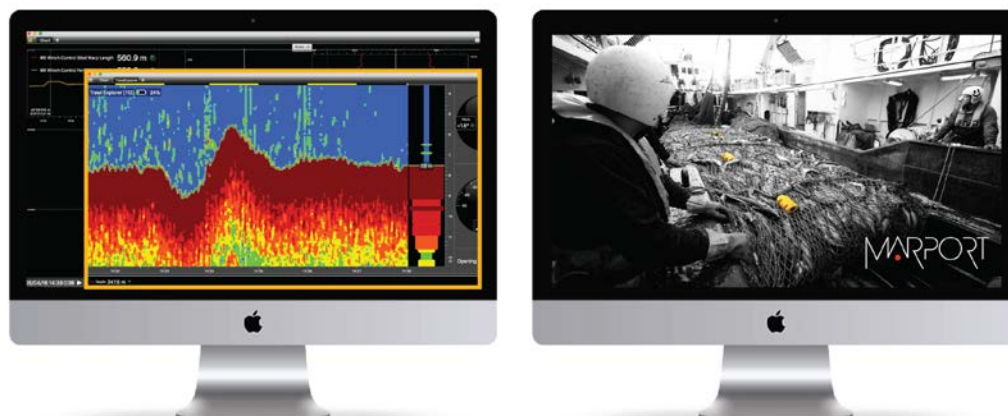
Opening a Page in a New Window

Procedure

1. From the top toolbar, right-click a page name and select **Move to New Window**.



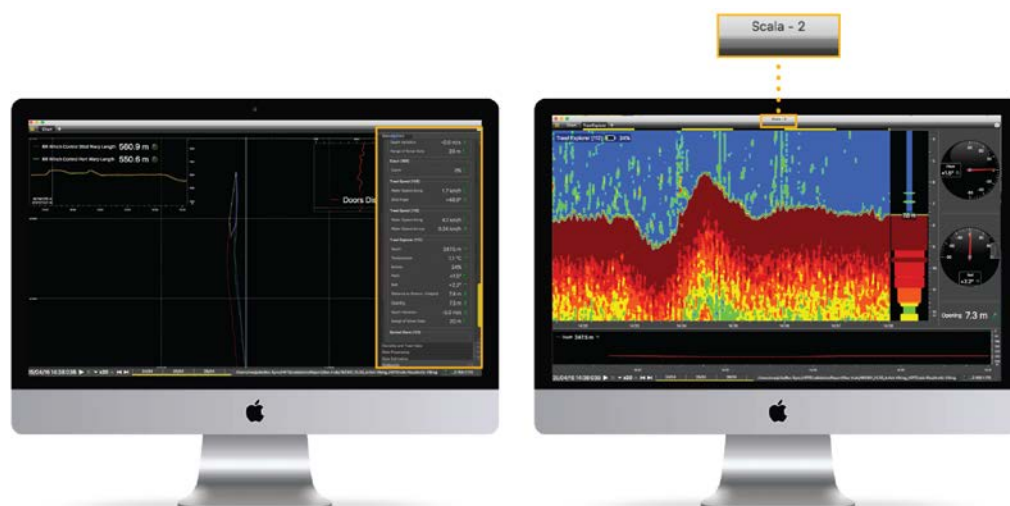
A new window containing the page opens.



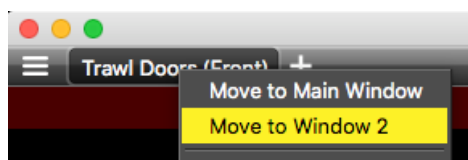
2. Drag the new window to another screen.



The initial window is considered as **Main Window** and it has the control panels. The window you created is named **Scala - 2**. Its name is displayed on the top of the window.



When moving pages between windows, the window you created is named **Window 2** in the menu.



3. To create additional windows, right-click a page name and select **Move to New Window**. Each additional window you create has a number.

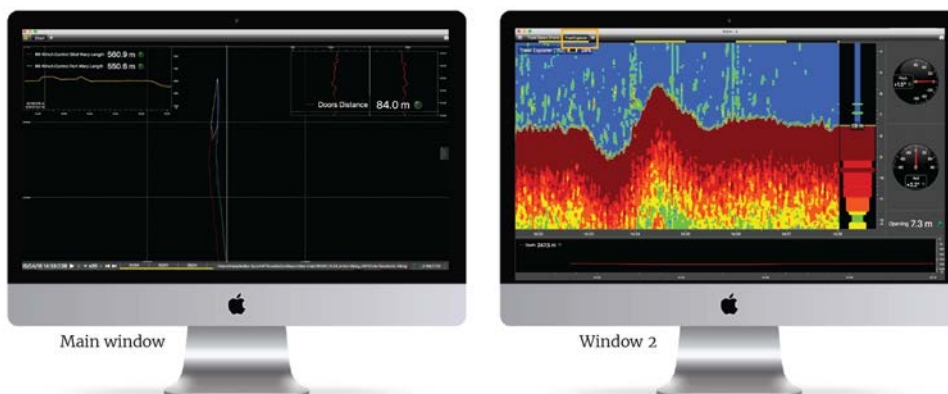
Moving Pages Between Windows

Procedure

1. From the top toolbar of the main window, right-click a page name and select for example **Move to Window 2**.



The page is moved from the main window to window 2.





2. Check that the page name appears in the top toolbar of window 2.
3. To move back a page to the main window, right-click the page name from window 2 and select **Move to Main Window**.
4. When you have several pages, in the same way, allocate pages between the main window and window 2, 3, 4...


Closing and Reopening Windows

You can close all windows at once or close only some windows. If you close some windows, you can find them back or choose to delete them.

Procedure

1. To close Scala and all the windows:
 - Click close  from the main window.
 - Or click close  from a secondary window and click **Quit** from the dialog box that appears.

All windows are closed and will be reopened the next time you open Scala.

2. To close only one secondary window, click close  from the secondary window and click **Close** in the dialog box that appears.

3. To reopen a secondary window that has been closed, click **Menu > Open Window X**.
4. To permanently delete a window, you first need to remove all pages from this window:
 - You can move pages to another window: right-click page tabs and select **Move to Window X**.
 - Or you can completely remove pages: right-click page tabs and select **Remove Page**.

 **Important:** If you choose **Remove Page**, make sure the page is saved as a custom page or it will be lost.

The window disappears when all pages are removed.

Customizing the Display of Data

Echograms

In Scala, control panels list all the sensor data. From the sensor data, **Sonar Data** correspond to echograms.

Echograms are a representation of what is detected by the sensors with the acoustic signals. The strength of a detected target is expressed in Decibels (dB), that correspond to specific colors on the echogram. Blue usually represents the lowest target strengths and red the highest target strengths. The distribution of the color on the Decibels scale can be configured with the color palettes.

Adding an Echogram

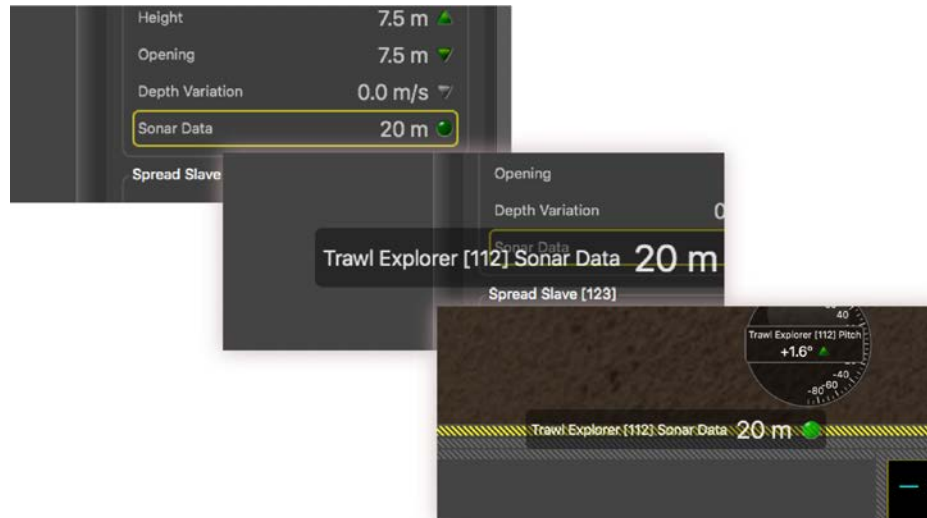
Before you begin

You must be in **Customize** mode to complete this task.

Procedure

1. To open the control panels, click the grey rectangle at the right side of the screen.
2. In the control panels, from **Sensors Data**, click **Sonar Data** + hold for 3 seconds until a rectangle with data appears.


3. Hold + drag the rectangle to a page and drop it where a yellow area appears.



Results

The echogram is displayed.

What to do next

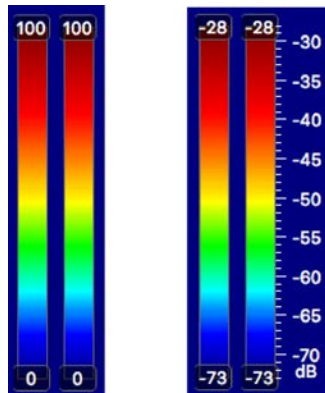
When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Changing the Echogram Colors

You can change the default colors of the echogram. The ability to configure the color palettes is interesting to highlight specific things, for example to clearly distinguish the sea bottom from other targets.

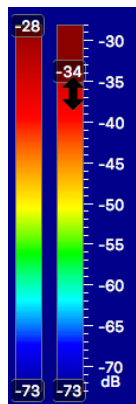
Procedure

1. Right-click the echogram and select **Show Palettes**.
The two color palettes appear on the left side of the echogram. The first palette is for the area underneath the seabed and the second for the water column.
Depending on the type of sensor installed, you can have two types of color palettes. The second one is for latest generation sensors. It displays the target strength.




2. For both types of palettes:
 - a) Drag the top handle down to increase the red color.

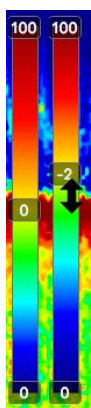
- b) Drag the bottom handle up to eliminate noises and weak echoes.



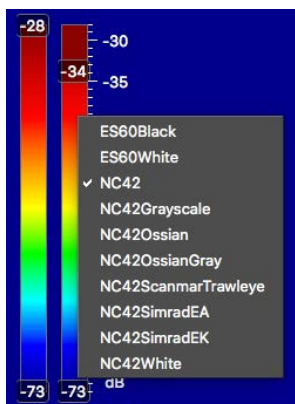
3. With the first type of palette, you can also adjust the level of color intensity, for example to saturate more or less in red or to obtain same colors for different sensors.

Click **Menu**  > **Expert Mode** and enter the password `eureka`.

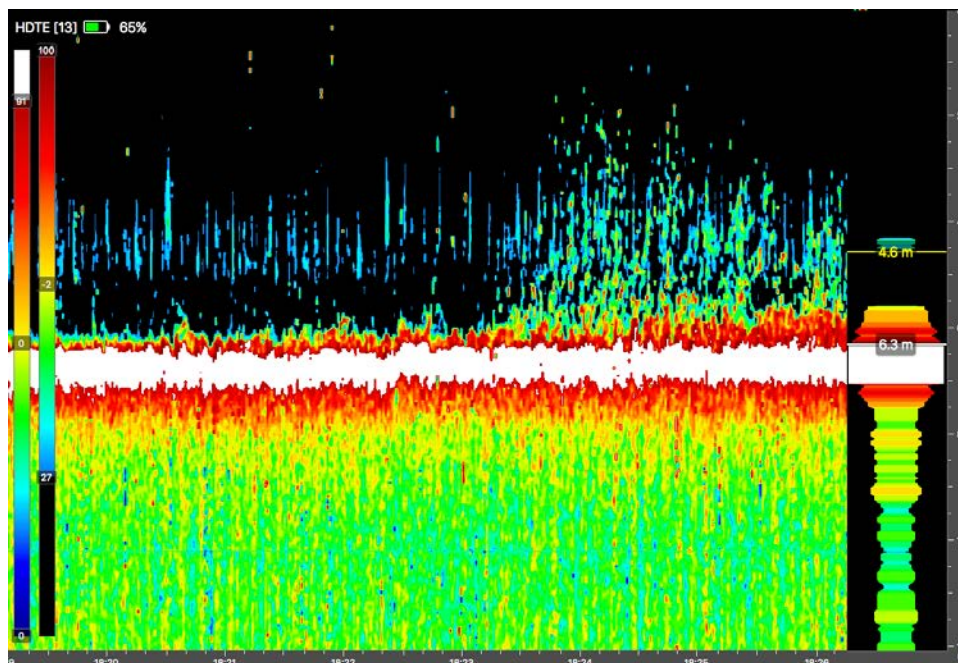
A handle is displayed in the middle of the palette. Drag it to adjust the level.



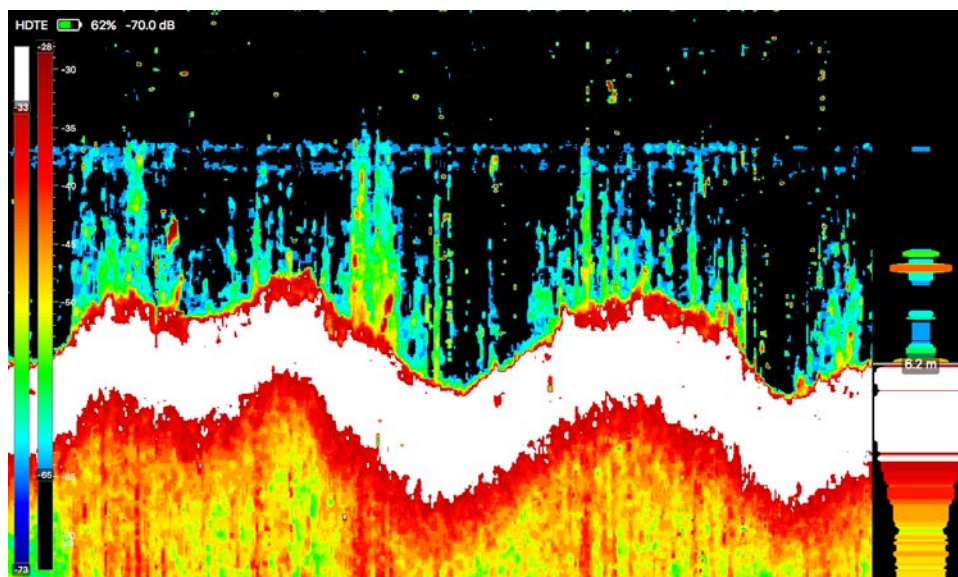
4. To change the color hues, right-click the gauge and select another color palette.



5. For example, to have the following display with the first type of palette:



- Right-click each palette and select NC42White for both.
 - Drag the top handle of the left palette down to 91 to see the sea bottom in white.
 - Drag the bottom handle of the right palette up to 27 to better see fish.
 - Drag the gain handle of the right palette up to -2 to change the color level.
6. To have the following display with the second type of palette:



- Right-click each palette and select NC42White for both.
 - Drag the top handle of the left palette down to -33dB to see the sea bottom in white.
 - Drag the bottom handle of the right palette up to -65dB to better see fish.
7. To have smoother transitions between the colors in the echogram, right-click the echogram and select **Vertical Smoothing** and/or **Horizontal Smoothing**.

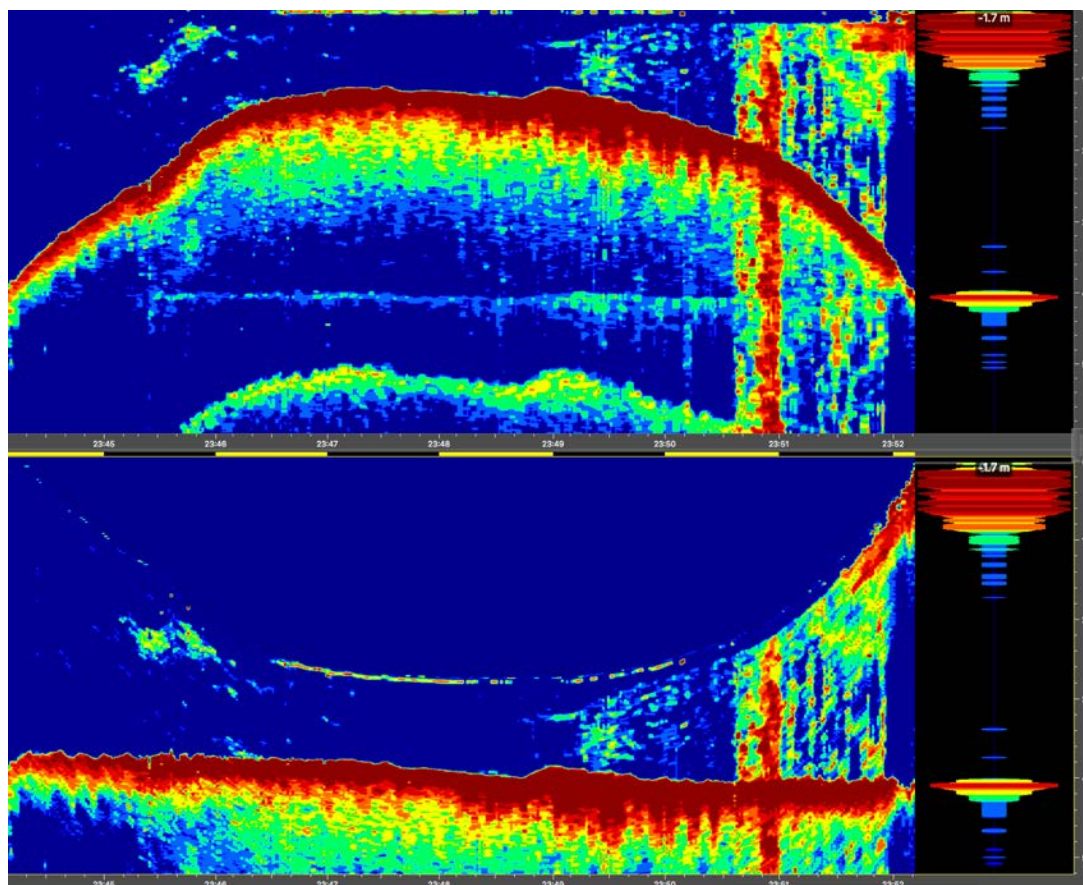
Displaying the View from Surface to Seabed

You can display an echogram view of the area between the sea surface and the seabed. Depending on the type of fishery, this is useful to see the trawl descent from the sea surface to the seabed.

Procedure

1. Right-click the echogram.
2. Select **True Mode**.

Above, the first view is without **True Mode** and the second view with.



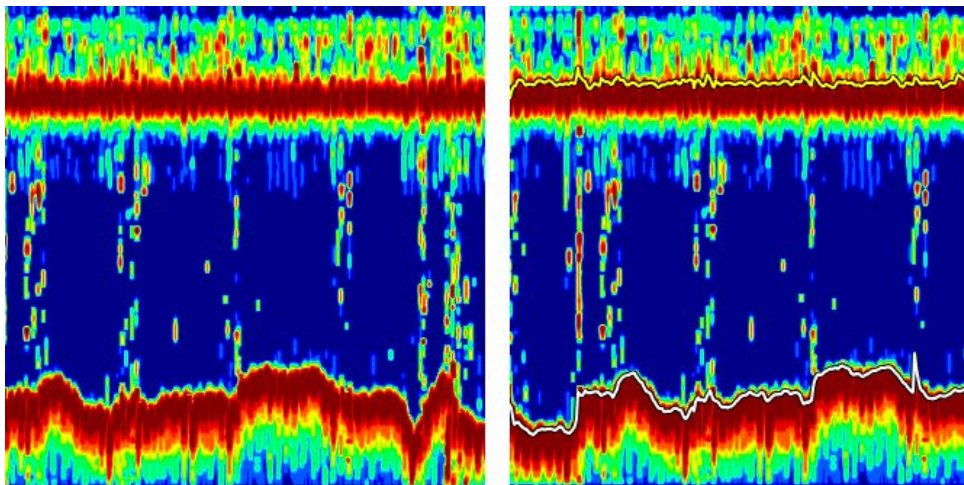
Displaying the Bottom Line

You can display lines on an echogram to mark the bottom of the trawl and the beginning of the seabed.

Procedure

1. Right-click the echogram.
2. Select **Draw Bottom Line**.

A yellow line appears at the bottom of the trawl and a white line appears at the beginning of the seabed. On the example below, the first echogram does not have a bottom line and the second has one.



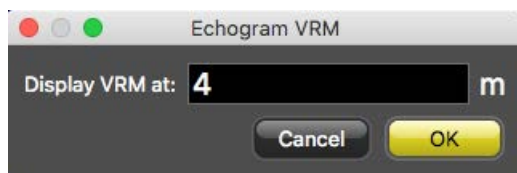
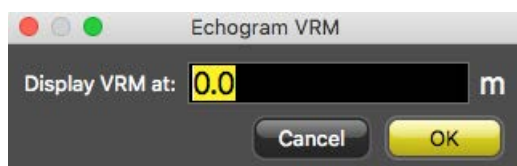
Note: On the sensors data, the opening corresponds to the distance between the sensor and the yellow line and the height to the distance between the sensor and the white line.

Adding a Range Marker

You can set a range marker at a given depth, for example if you need to ensure that your trawl net stays at this depth. It is called a Variable Range Marker (VRM).

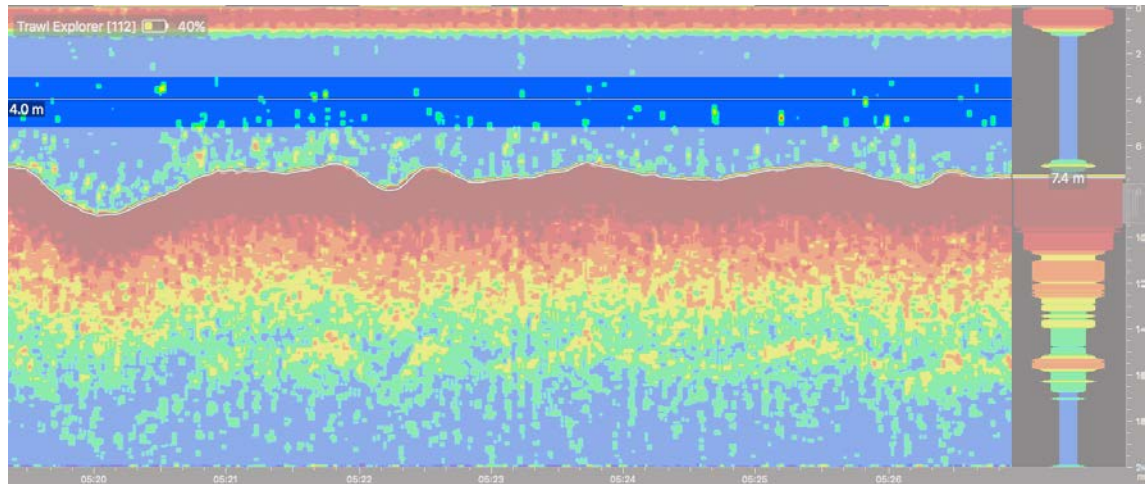
Procedure

1. Right-click the echogram and select **Set VRM**.
2. With the mouse cursor, select 0.0 and directly type the depth.



3. Click **OK**.

The range marker is displayed on the echogram.




4. To remove the range marker:
 - a) Right-click the echogram.
 - b) Select **Set VRM**.
 - c) From the dialog box that appears, select **Remove Marker**.

Changing the Scale Zoom and Position

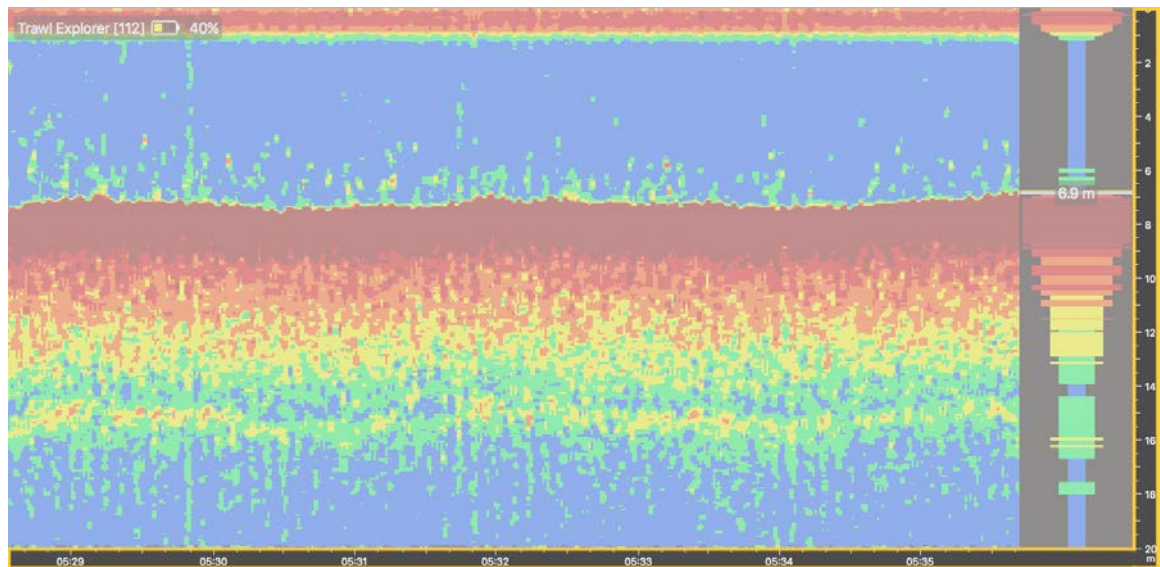
In echograms and history plots, you can zoom in and out on the distance scale and timestamp and move them along.

Procedure

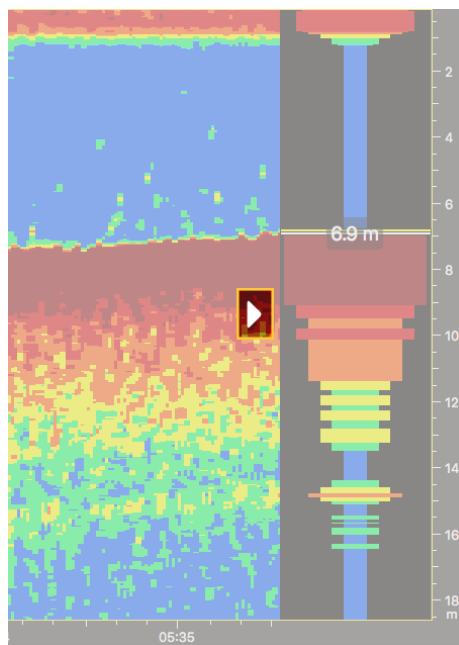
1. To zoom in and out of the distance scale, place your mouse on the echogram or history plot or the vertical axis and scroll.
2. To zoom in and out of the timestamp, place your mouse on the horizontal axis and scroll.

 **Note:** When two echograms or two history plots are displayed one above the other, they have the same timestamp. So if you zoom on one, the other will also zoom.
3. To move along the timestamp, click + drag the scale.

4. To move along the distance scale, click + drag the scale.




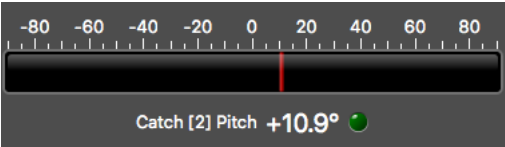
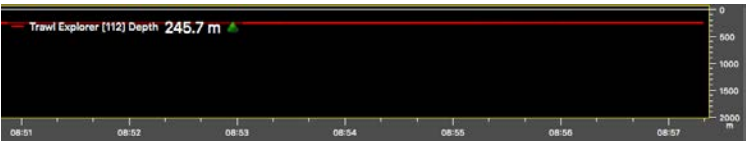
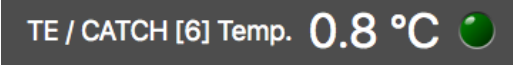
5. To come back in the timestamp to data currently being received, click the arrow on the right.



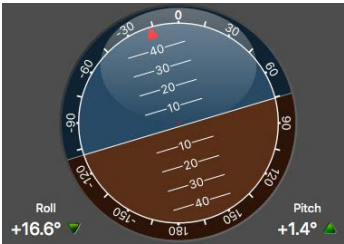

Sensor Numerical Data


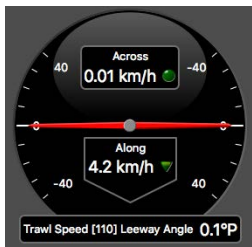

Display Types

You can choose from the following types of display when you drag numerical data to a page.

Dial	
Gauge	
History Plot	
Text Display	

There are also dials specific to certain types of data:

Name	Types of data	Illustration	Display details
Horizon	<ul style="list-style-type: none">• Pitch• Roll		Displays horizon line according to pitch and roll. Red dot in the middle indicates pitch angle and red arrow on top indicates roll angle.
Wind dial	<ul style="list-style-type: none">• True wind speed• True wind direction• True wind angle• Apparent wind angle• Apparent wind speed		Vessel is displayed in the middle in grey. Apparent wind angle is displayed in blue and true wind angle in orange.

Name	Types of data	Illustration	Display details
Heading dial	<ul style="list-style-type: none"> Heading (True) Heading (Magnetic) 		Red arrow displays North. Cardinal points are displayed around.
Trawl Speed Dial	<p>For trawl speed type sensors:</p> <ul style="list-style-type: none"> Water speed along Water speed across 		Leeway angle is displayed for port (P) or starboard (S).
Water Speed (WS) Dial	<p>For speed log type sensors:</p> <ul style="list-style-type: none"> Water speed along Water speed across 		Leeway angle is displayed for port (P) or starboard (S). Vessel is displayed in the middle in grey.

Changing the Display of Page Elements

You can change the title, font, unit of measure and arrangement of data displayed on pages.

Before you begin

You must be in **Customize** mode to complete this task.

About this task

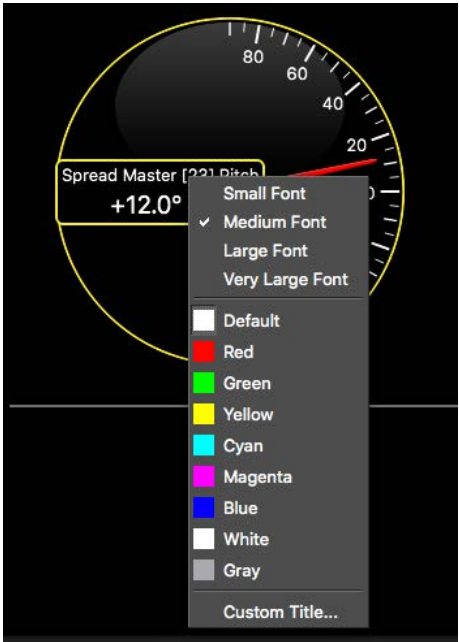
Changing the display of elements can be done on different zones:

- The title of the element
- The element itself (dial, gauge or history plot).

Procedure

- To change the title, right-click the title and choose:
 - Font size
 - Font color: it changes only the color of numerical data, except for history plots where it changes the line color.

- **Custom title** to change the default title.



2. To change the display of plot, gauge or dial, right-click the element and choose:

Option

Description

Dials

- Font size

Gauge

- Rotate
- Font size
- Units

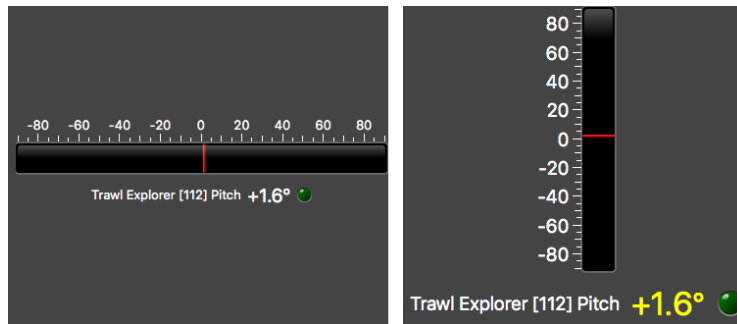
History plot

- Show raw data: useful to check if there are communication problems
- Show points: useful to see the interval of received data
- Show bars: if you use a seiner, useful to identify the different depths
- Vertical/horizontal


Text Display

- Font size
- Font color
- Units

In the example below, the gauge orientation has been changed to vertical, the font size of the units and title have been changed to large fonts and the font color to yellow.



What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Displaying Catch Monitoring

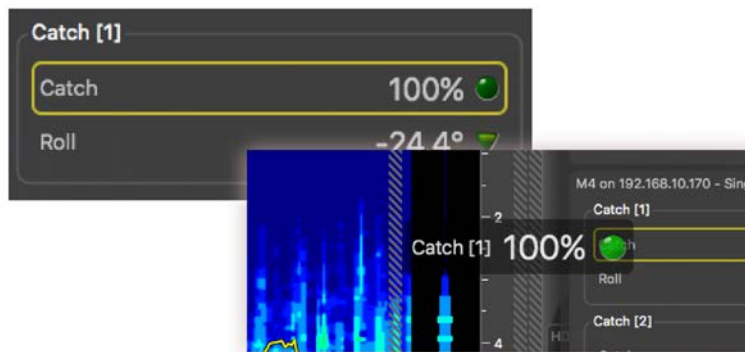
You can be alerted when the codend is full.

Before you begin

You must be in **Customize** mode to complete this task.

Procedure

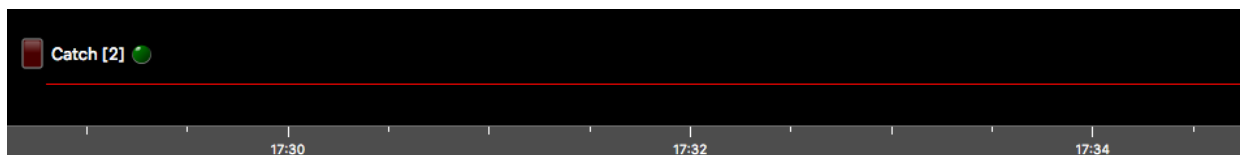
1. From the **Control panels**, click + hold Catch data and drag it to the page display.



2. From the **Choose new Gauge Type** dialog box, select **History Plot**.

Results


When there is no catch the history plot is:



When the codend is full:



What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

3D Views

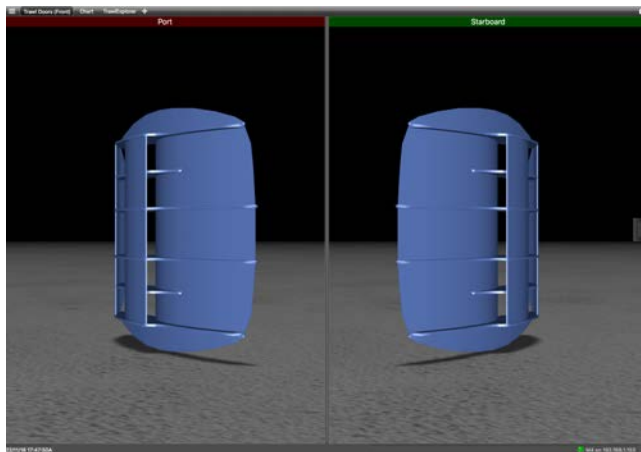
You can display 3D views of different elements from your system, for example the boat or trawl speed sensors.

Displaying Trawl Door 3D View




You can display a 3D view of the port and starboard trawl doors. In this way, you can see the positioning of the two doors.

About this task

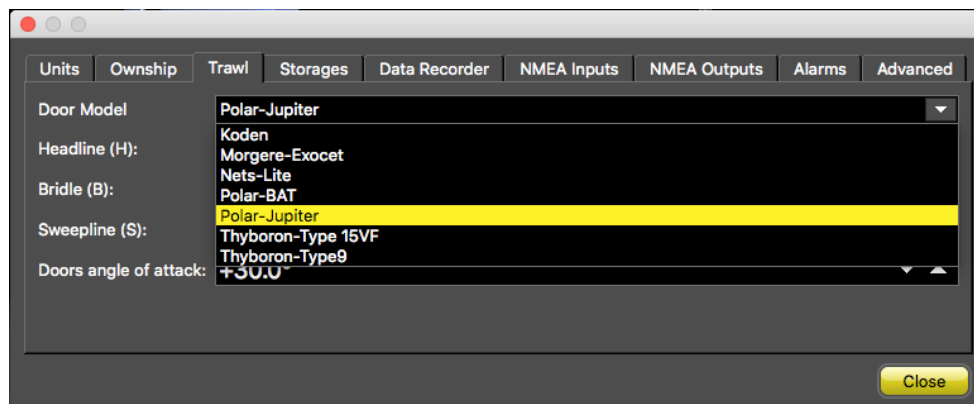
A 3D view of the trawl doors is already added in some default pages, for example **Trawl Doors (Front)/(Back)** and **M3/M4 Door Sensors and catch sensor**.



Procedure

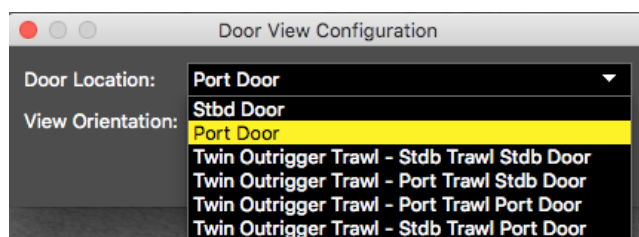
1. From the top toolbar, select a page with a 3D view of the trawl doors, for example **Trawl Doors (Front)**.
2. If you have no page in the top toolbar with a 3D view of the trawl doors:
 - a) From the top left corner, click the menu icon  and select **Customize**.
 - b) Enter the password **eureka**.
 - c) From the top toolbar, click the add icon .
 - d) Select a default page from the **Standard Pages** or **Custom Pages** panel that has a trawl door 3D view.
3. To change the door model:
 - a) From the top left corner, click the menu icon  and select **Settings**.
 - b) Select the tab **Trawl**.

c) From **Door model**, select the door you want.

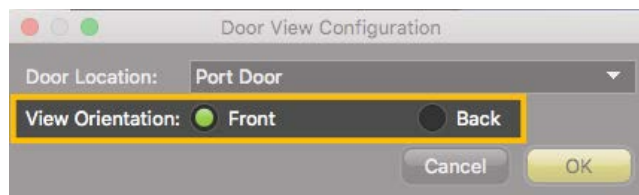


4. To change the door location and orientation, connect in **Customize** mode, then right-click the 3D view and select **Configure**.

a) Select which door (port or starboard) and from which trawl (port or starboard if you have two trawls) to display.

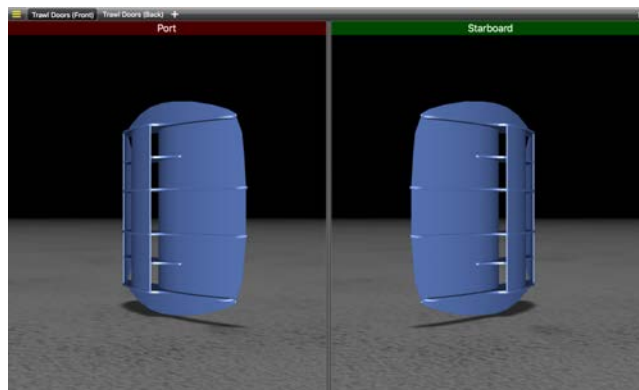


b) Select if you want to see the doors from the front (seen from the vessel) or from the back (seen from the trawl).

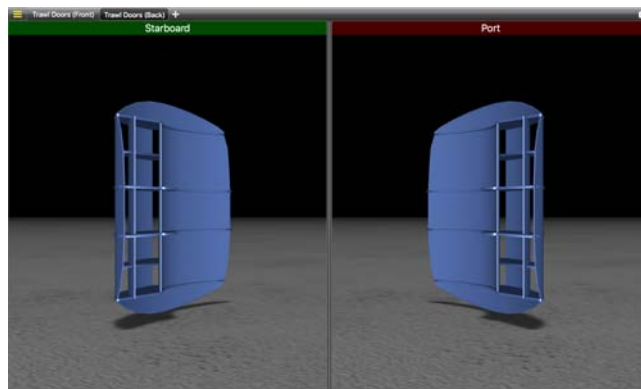


5. To change the view angle of the door, right-click the 3D view and choose:

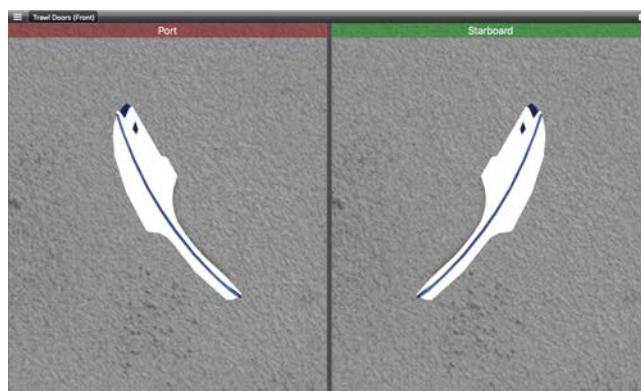
- Horizontal Camera to see the doors from the front:



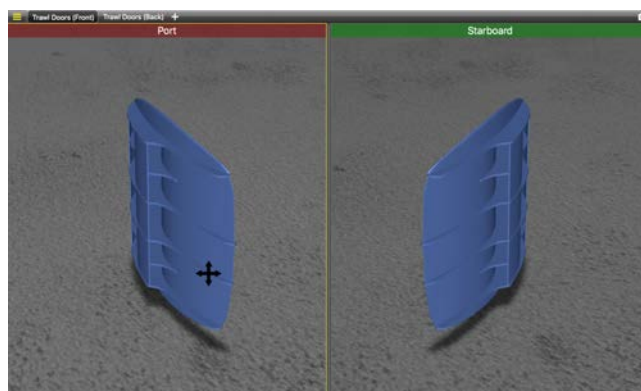
Or back:



- Vertical Camera to see the doors from above.



- Free Camera to adjust the viewing angle yourself, by clicking and dragging the 3D doors.



6. To display or hide the ground, right-click the 3D view and select or not **Display Ground**. You should leave the ground displayed, in order to see if doors are touching it.

Displaying Trawl Speed 3D View

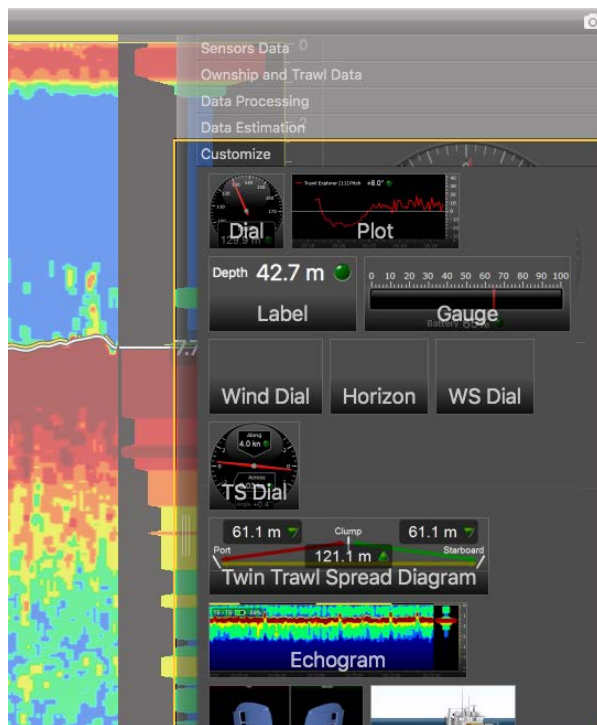
You can display a 3D view of the trawl speed sensor to see the positioning of the trawl and the across and along water speeds. You can use this view instead of the dial display, as this is more intuitive.

Before you begin

You must be in **Customize** mode to complete this task.

Procedure


1. From the lower part of the control panels, click **Customize**. The **Customize** panel appears:



2. Click + drag **TS 3D** to the page.
3. Drop it in a yellow area.
4. From the dialog box that appears, select the location of the trawl speed sensor. The 3D view of the trawl speed sensor is displayed. You can see the along and across speeds and the positioning angle of the trawl.



What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Displaying System 3D View

You can see a 3D view of the vessel system if you have the Scala Full version. To know if you have the 3D enabled, check in **Menu** > **About** Scala.

Before you begin

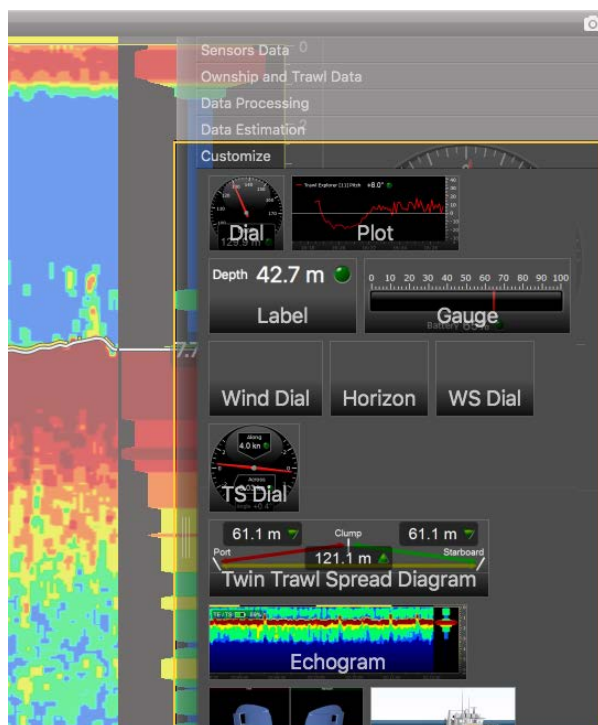
You must be in **Customize** mode to complete this task.

You need to have incoming data from:

- GPS
- Sensors with positioning
- Warp length
- Heading

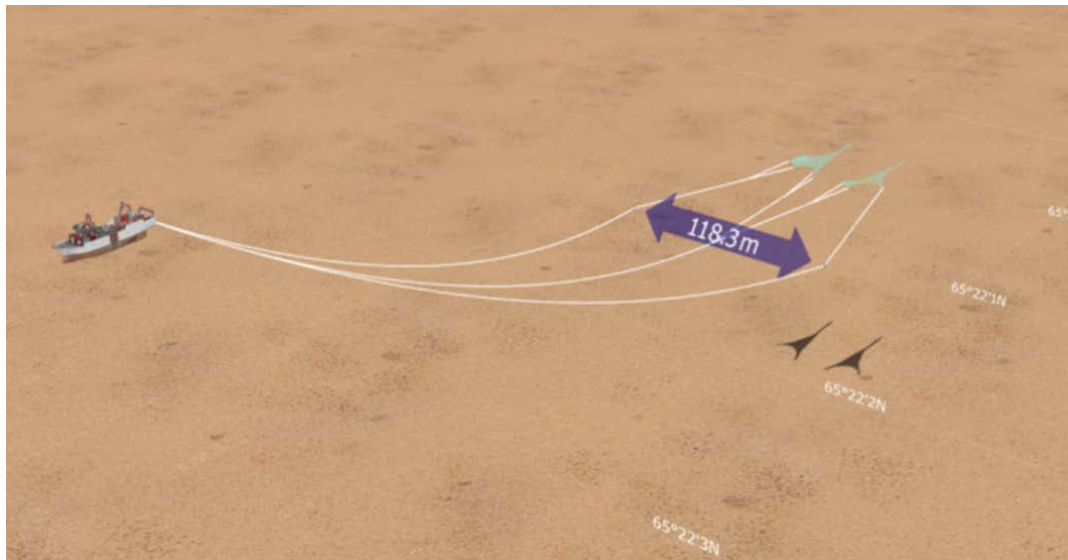
Procedure

1. From the lower part of the control panels, click **Customize**.
The **Customize** panel appears:




2. Click **3D Overview**.

A 3D view of the vessel and trawl is displayed.



3. To change the vessel 3D model, from the upper left corner of the screen click **Menu** > **Settings** and click the tab **Ownship**.
4. To change the view, you can use the numeric keypad: press 5 to see the vessel from above, press the digits around to make the vessel turn accordingly (2 being front view and 8 back view).
5. Or, right-click the 3D view and choose:
 - **Moves Camera with** to select which part of the system the camera follows.
 - **Reset Camera Position** to come back to the default view.
 - **Fix Camera on Ownship** so that the camera moves with the vessel.

What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Displaying Twin Trawl Spread Diagram

You can display a diagram of a twin trawl spread in order to see the distance between the port and starboard doors, and between the clump and port and starboard doors. In this way, you can adjust the trawl if there is a loss of balance.

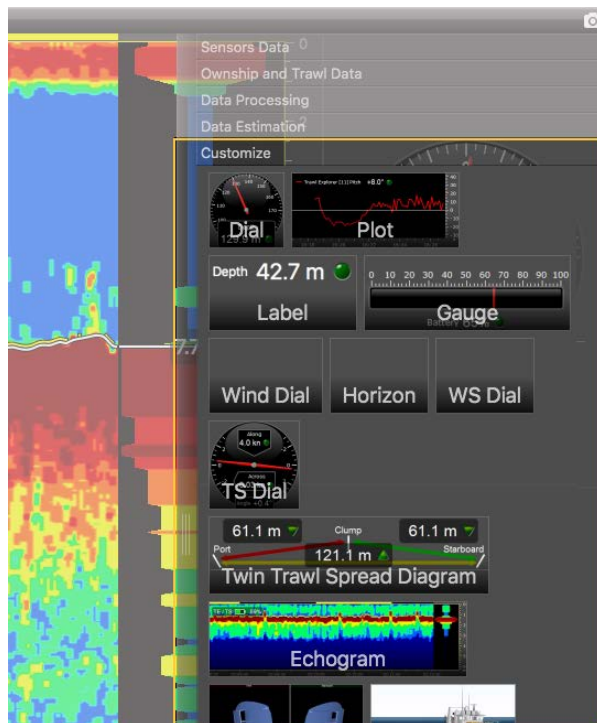
Before you begin

You must be in **Customize** mode to complete this task.

Procedure

1. From the lower part of the control panels, click **Customize**.

The **Customize** panel appears:




2. Click + drag **Twin Trawl Spread Diagram** to the page.
3. Drop it in a yellow area.
The diagram appears.



4. You can also display the diagram by dragging spread master distance to starboard data.

Spread Master [23]	
Depth	89.2 m ▲
Temperature	8.0 °C ▼
Pitch	+15.7° ▲
Roll	+6.4° ▲
Distance to Stbd	76.3 m ▼
Depth Variation	0.0 m/s ▼

What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Displaying the Chart View

You can display the location and trajectory of the trawl behind the vessel if you receive GPS data and have equipment enabling door positioning.

Before you begin

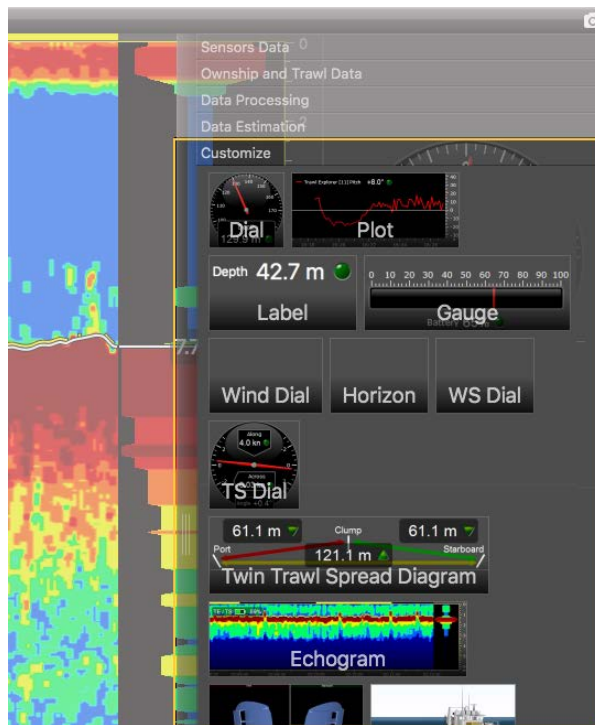
- You must be in **Customize** mode to complete this task.

You must have:

- Incoming GPS data and heading data.
- Door sensors or pingers with bearing measurement
- Pingers sensors giving distance to vessel or warp length

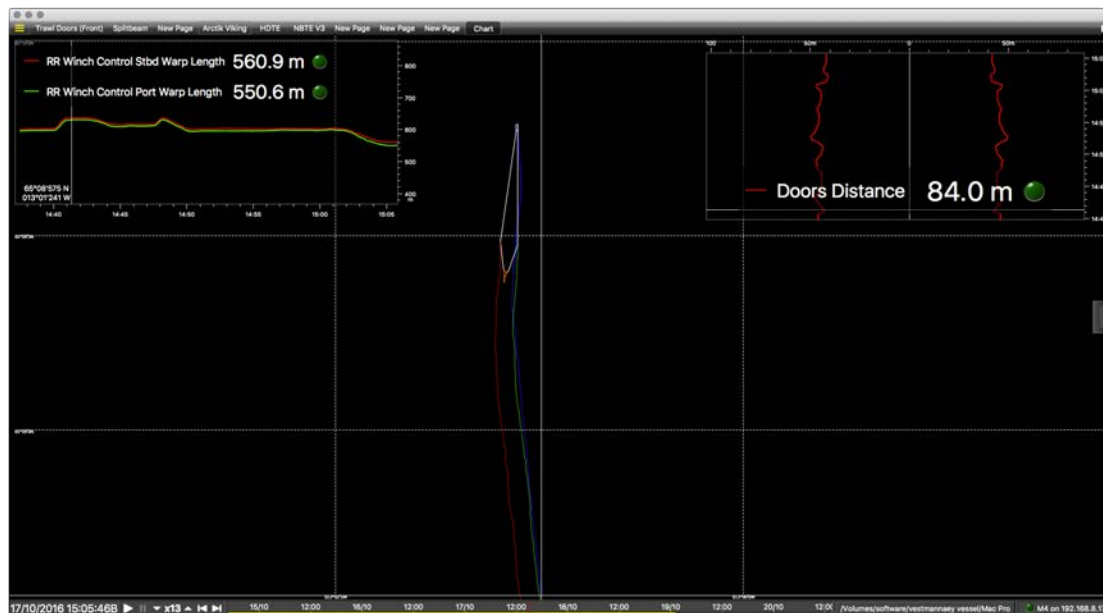
Procedure

- From the lower part of the control panels, click **Customize**.
The **Customize** panel appears:




- Click + drag **Chart** to the page.
- Drop it in a yellow area.

The chart view is displayed.



4. If the view looks empty it might be because the view is not centered on the vessel. Right-click the view and select **Center On: Ownship, Trawl or Doors**.

What to do next

When you have finished customizing pages, you need to deactivate the Customize mode: click **Menu**  > **Customize** again.

Displaying a Position Marker

You can place a marker on plots and echograms to display your current GPS position.

Before you begin

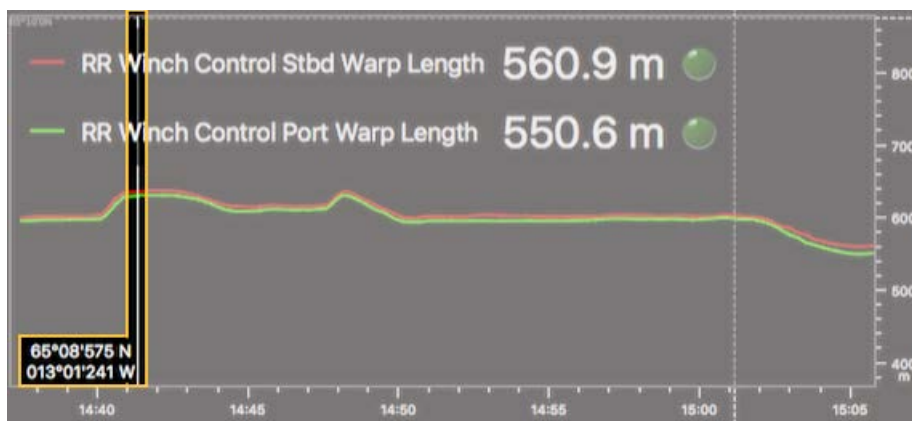
You need incoming GPS data.

Procedure

1. From the top left corner, click the menu icon  > **Settings**.
2. From the tab **Storages**, select **Display global position cursor on plots and echograms**.

Results


A marker with your position is displayed on plots and echograms.



Setting an Alarm on Incoming Data

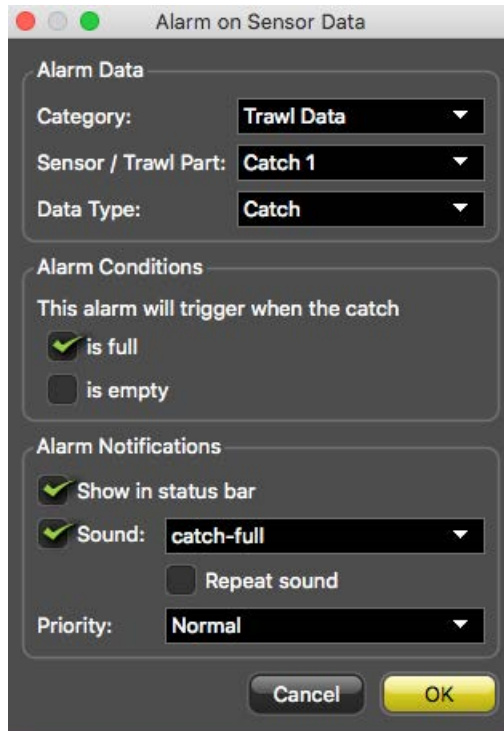
You can be alerted by an alarm when data received have a given value.

Procedure

1. From the top left corner, click the menu icon  > **Settings**.
2. From the **Settings** dialog box, select the tab **Alarms**.
3. Click **Add**.
4. In **Alarm Data**, choose on which category of equipment, part and data type you want to set the alarm.
5. In **Alarm Conditions**, choose the conditions on which the alarm is triggered.
6. In **Alarm Notifications**, choose if you want to display a visual notification in the status bar and a sound.




For example, you can choose these parameters to be alerted when the catch is full:




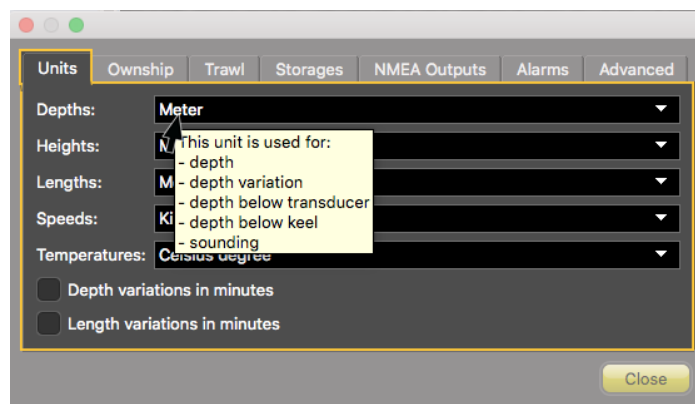
Changing the Default Units

You can change the default units of data displayed in Scala.

Procedure

1. From the top left corner, click the menu icon  > **Settings**.
2. From the tab **Units**, select the units to use in Scala among the following units:
 - For distance data: meter, foot, yard, fathom, cable length (only for lengths)
 - For speed data: kilometer/hour, knot, meter/second, mile/hour
 - For temperature data: celsius or farhenheit

 **Tip:** With the mouse, hover over the units in the menu to see for which data they are used.



Recording and Replaying Data

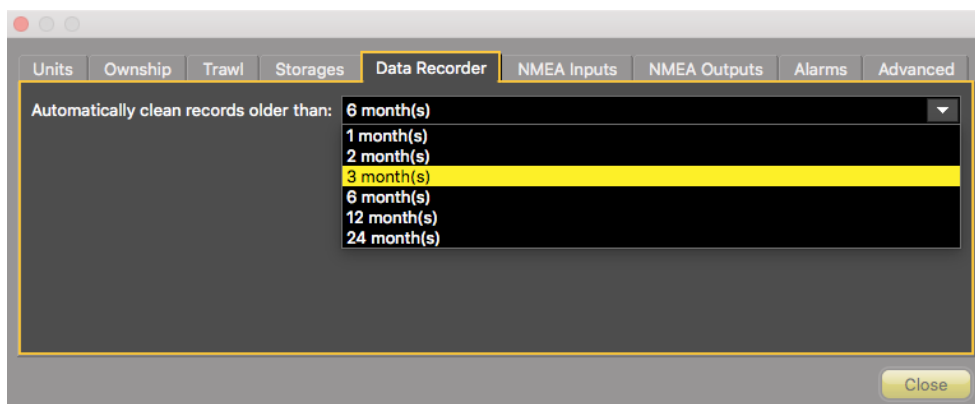
Recording of Incoming Data

All incoming data are by default recorded. They are stored in your computer in SDS files. They are saved in **Documents/Marport/SDSRecord** and named with the recording date.

By default, files older than 6 months are automatically deleted when restarting Scala.

To change the deleting interval, click the menu icon  > **Settings** and select the tab **Data Recorder**.

To configure a deleting interval, you should take into account your hard drive space and type of data received.

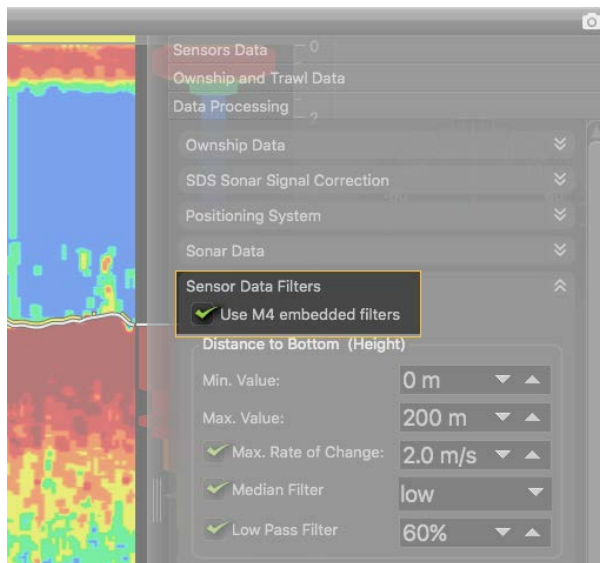


Replaying Data on Scala Replay

You can replay on Scala Replay data you have recorded.

Before you begin

From the control panels, in **Data Processing > Sensor Data Filters**, select **Use embedded filters**.



Procedure

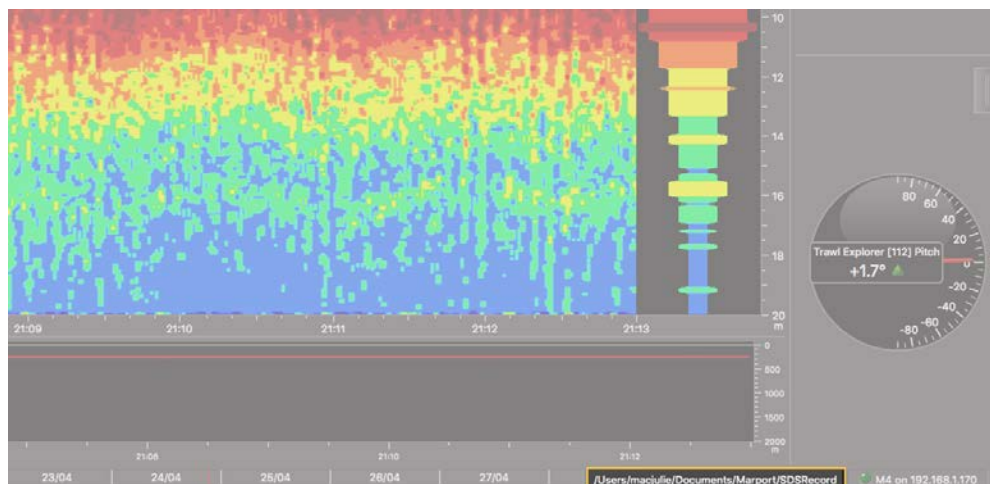
1. From your Mac, go to **Documents/ Marport/ SDSRecord**.
The recorded files are displayed. Their names correspond to the recording date.
2. Copy *.sds and *.idx files corresponding to moments you want to replay.
3. Paste these files in a new folder, for example on your desktop.
4. From the **Launchpad**, click the Scala Replay icon.



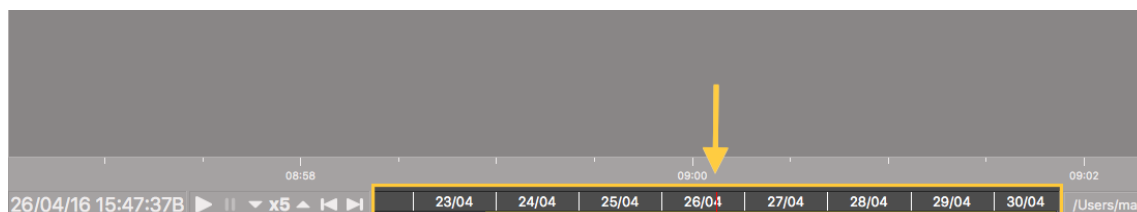
ScalaReplay

Scala Replay opens.

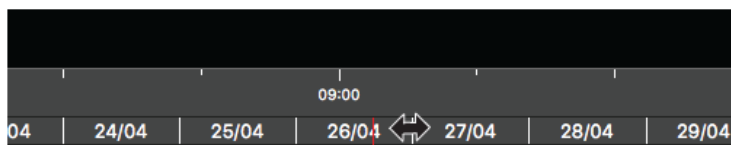
- From Scala Replay, click the file path on the lower right corner of the screen.




- Select the folder you created and click **Open**.
The data from the folder are opened in Scala Replay. At the bottom of the screen, you can see a timeline. Periods containing recorded data are in yellow and your position in the timeline is marked by a red line.



- To zoom in and out on the timeline, place your mouse on the timeline and scroll.
- To move along the timeline, click + drag the timeline.



- Control the playback using the play, pause and speed control buttons at the left of the timeline.

 **Note:** You can change the display of page data only when the playback is paused.

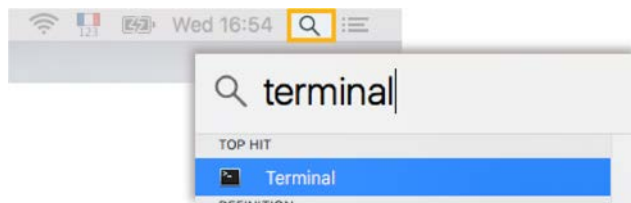


Extracting Data from SDS Files

You can extract data contained in an SDS file and display them as a table on Excel.

Procedure

1. Open a Terminal:
 - a) From the top right corner of the screen, click the magnifying glass and type Terminal.
 - b) Select **Terminal** from the results.



2. The basic command is: `/Applications/Scala.app/Contents/MacOS/sds2txt [options] source destination`. Below is the list of available options:

Usage: `/Applications/Scala.app/Contents/MacOS/sds2txt [options] source destination`
 sds2txt converts sds files into text files.

- Status data (Heartbeats)
- NMEA sentences without formatting
- Sonar data information
- Sensor data (Filtered data)

Options:

<code>-h, --help</code>	Displays this help.
<code>-v, --version</code>	Displays version information.
<code>--folder</code>	Convert all sds files in the folder specified by source argument
<code>--csv</code>	Convert data in CSV format
<code>--no-sonar</code>	Do not convert Sonar data
<code>--no-sensor</code>	Do not convert Sensor data
<code>--no-nmea</code>	Do not extract NMEA sentences
<code>--no-status</code>	Do not extract Heartbeat messages
<code>--nmea-only</code>	Extract ONLY NMEA sentences
<code>--semi</code>	Use semi-colon (instead of comma) as the CSV field delimiter (only with csv option)
<code>--raw</code>	Convert RAW and FILTERED data
<code>--raw-sonar</code>	Extract raw sonar data to a .oui file with specific format
<code>--start <start></code>	Specify a start date with format YYYY-MM-DD
<code>--stop <stop></code>	Specify a stop date with format YYYY-MM-DD

Arguments:

<code>source</code>	Path of sds file to convert.
<code>destination</code>	Destination file.

3. For example, the following command line means you will convert sds files contained in the source folder, starting from January 16, 2016 to January 17, 2016, without sonar data, NMEA data nor heartbeat messages, in *.csv format and with a semi-colon (;) as CSV field delimiter. The source folder and destination file are indicated at the end.

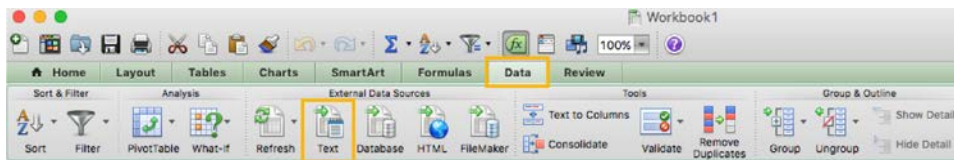
i Tip: If you want NMEA data, you can erase the option `--no-nmea`. The source and destination links (`/Users/marport/Documents/...`) may be different according to your computer settings.

```
/Applications/Scala.app/Contents/MacOS/sds2txt --folder --start
2016-01-16 --stop 2016-01-17 --no-sonar --no-nmea --no-status --csv
--semi /Users/marport/Documents/Marport/SDSRecord /Users/marport/
Documents/SDSExport.csv
```

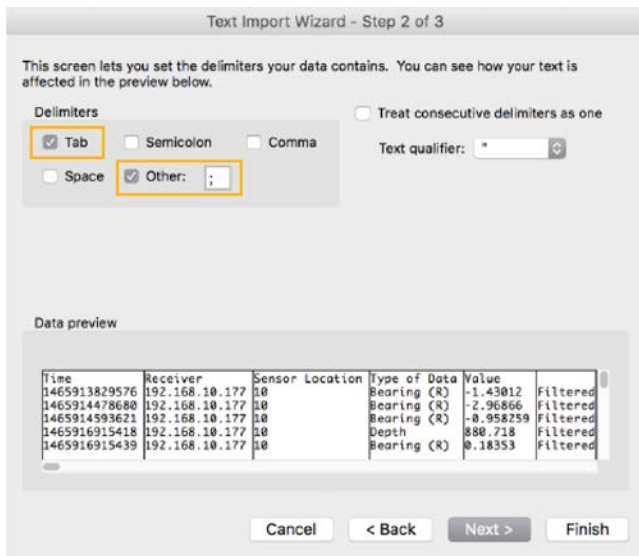
4. Copy and paste the above command or write one yourself, according to the options listed above.
5. Press enter.
You can see the message `Operation done successfully!` when the *.csv file is created.

The *.csv file is created under the Documents folder with the name indicated as destination file (here: SDSExport.csv).

6. To open the file, from Excel select the tab **Data** > **Text** and select the file from your documents.



7. From the Text Import Wizard window, from **Delimiters** select **Tab** and **Other**: semi-colon (;).



Data are displayed on a table.

8. To filter data, click the tab **Data > Filter**. You can for example filter data by location of the sensor on the trawl and by the type of data.

	A	B	C	D	E	F	G	H	I
	Time	Receiver	Sensor Location	Type of Data	Value	Filtered data			
2	1,46591E+12	192.168.10.177	10	Bearing (R)	-1.43012	Filtered data			
3	1,46591E+12	192.168.10.177	10	Bearing (R)	-2.96866	Filtered data			
4	1,46591E+12	192.168.10.177	10	Bearing (R)	-0.958259	Filtered data			
5	1,46592E+12	192.168.10.177	10	Depth	880.718	Filtered data			
6	1,46592E+12	192.168.10.177	10	Bearing (R)	0.18353	Filtered data			
7	1,46592E+12	192.168.10.177	10	Bearing (R)	0.10623	Filtered data			
8	1,46592E+12	192.168.10.177	10	Bearing (R)	-0.0881897	Filtered data			
9	1,46592E+12	192.168.10.177	10	Bearing (R)	-1.30706	Filtered data			
10	1,46592E+12	192.168.10.177	10	Bearing (R)	-0.962712	Filtered data			
11	1,46592E+12	192.168.10.177	10	Bearing (R)	-1.52652	Filtered data			
12	1,46593E+12	192.168.10.177	10	Bearing (R)	0.105915	Filtered data			
13	1,46593E+12	192.168.10.177	10	Bearing (R)	-20.5375	Filtered data			
14	1,46593E+12	192.168.10.177	10	Depth	412.639	Filtered data			
15	1,46593E+12	192.168.10.177	10	Bearing (R)	0.320537	Filtered data			
16	1,46593E+12	192.168.10.177	10	Bearing (R)	22.7035	Filtered data			
17	1,46593E+12	192.168.10.177	10	Bearing (R)	21.2495	Filtered data			
18	1,46594E+12	192.168.10.177	11	Roll	-64.9	Filtered data			
19	1,46594E+12	192.168.10.177	11	Height (Sensor)	40	Filtered data			
20	1,46594E+12	192.168.10.177	11	Temperature	22.9556	Filtered data			
21	1,46594E+12	192.168.10.177	11	Depth	0.483436	Filtered data			
22	1,46594E+12	192.168.10.177	11	Battery	100	Filtered data			
23	1,46594E+12	192.168.10.177	11	Pitch	3.1	Filtered data			
24	1,46594E+12	192.168.10.177	11	Roll	-66.8	Filtered data			
25	1,46594E+12	192.168.10.177	11	Height (Sensor)	40	Filtered data			
26	1,46594E+12	192.168.10.177	11	Temperature	22.9778	Filtered data			
27	1,46594E+12	192.168.10.177	11	Depth	0.483436	Filtered data			
28	1,46594E+12	192.168.10.177	11	Battery	100	Filtered data			
29	1,46594E+12	192.168.10.177	11	Pitch	-0.6	Filtered data			
30	1,46594E+12	192.168.10.177	11	Roll	-71.9	Filtered data			
31	1,46594E+12	192.168.10.177	11	Height (Sensor)	40	Filtered data			
32	1,46594E+12	192.168.10.177	11	Temperature	22.9778	Filtered data			
33	1,46594E+12	192.168.10.177	11	Depth	0.483436	Filtered data			
34	1,46594E+12	192.168.10.177	11	Battery	100	Filtered data			
35	1,46594E+12	192.168.10.177	11	Pitch	0.3	Filtered data			
36	1,46594E+12	192.168.10.177	11	Roll	-67.6	Filtered data			
37	1,46594E+12	192.168.10.177	11	Height (Sensor)	40	Filtered data			
38	1,46594E+12	192.168.10.177	11	Temperature	22.9778	Filtered data			

9. You can convert the time displayed to an understandable date. Enter the formula: **=A2/86400000+DATE(1970;1;1)-10/24** (where -10 is the hour delay between GMT and the current location).

	A	B	C	D	E	F	G
	Time	time	Sensor Locat	Type of Data	Value	Filtered data	
2	1,4659E+12	6/14/16 10:28	11	Depth	0,483436	Filtered data	
3	1,4659E+12	6/14/16 10:28	11	Depth	0,483436	Filtered data	
4	1,4659E+12	6/14/16 10:28	11	Depth	0.483436	Filtered data	

Servicing and Maintenance

Installing Updates

You can install new versions of Scala once they are released. Ask your local seller to obtain them.

Procedure




1. Double-click the installation zip file.
2. Follow the installation steps.
3. From the installation window that appears, drag the **Scala** icon to the **Application** icon.

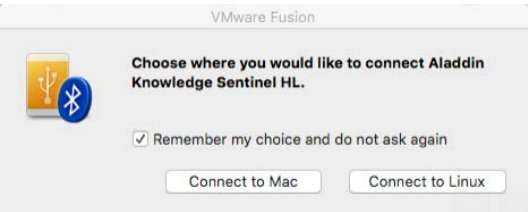

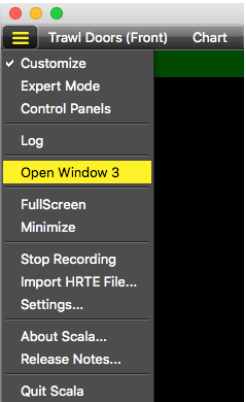

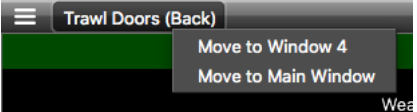


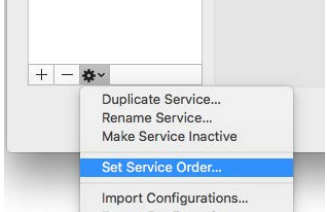
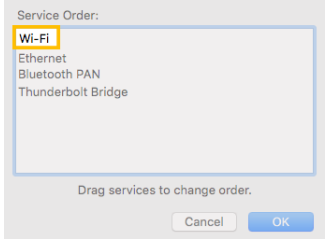
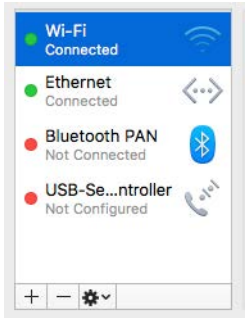
4. Do the same for the Scala Replay icon.

Troubleshooting

Problem	Possible causes	Solution
Scala does not start due to error message saying Scala cannot be opened.	Your Mac security preferences do not allow you to open softwares not downloaded from the App Store.	<ol style="list-style-type: none"> 1. From the upper left corner of the screen, click Apple menu > System Preferences > Security & Privacy 2. From the lower left corner of the Security & Privacy dialog box, click the lock icon and enter your password if you have one. 3. At Allow apps downloaded from, select Anywhere. 4. If you are under OS X Sierra, click Open Anyway or see Installing Scala on page 11 to know how to add the Anywhere option. 5. Close the dialog box.


Problem	Possible causes	Solution
Sensor data are not displayed, LEDs are red or orange.	You may have closed the virtual machine when you started Scala or when you plugged in a device.	<ol style="list-style-type: none"> 1. Check if this icon is in the dock, at the bottom of your screen:  2. If it is not present, restart the system.  Important: A virtual machine starts automatically when starting your computer and is necessary for Scala functioning. The virtual machine window can appear when starting Scala. Do not close it. A message is also displayed when plugging an USB device. For guidance, see after: A VMware Fusion message appears when adding a new USB key.
	Ethernet connection is down.	<ol style="list-style-type: none"> 1. From the menu, click Expert Mode. 2. Again in the menu, click Receivers. 3. From the system information page, check on the schema at the bottom if there are green checks.  4. If there is a red cross, check that the power supply for PoE adapter is connected to the mains supply. 5. From the configuration page, click Hydrophones from the panel on the left. 6. Check the hydrophones current status. If there is no current: <ol style="list-style-type: none"> 1. Check from the configuration page that the correct hydrophone type between passive and active is selected. 2. Check that the wiring in the hydrophone junction box is correctly installed.

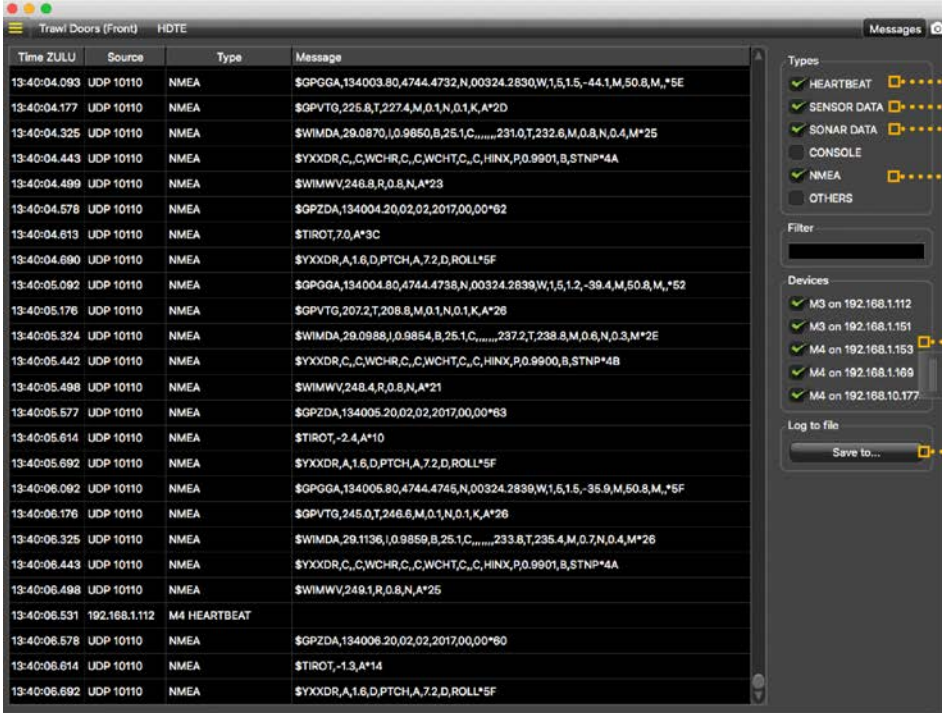
Problem	Possible causes	Solution
A VMware Fusion message appears when adding a new USB key.	This message is due to the virtual machine that is installed on your computer with Scala. It appears when adding external an USB device.	 <ol style="list-style-type: none"> 1. Select Remember my choice and do not ask again. 2. Click Connect to Mac.
The size of Scala window is smaller than before.	Scala window must have lost the full screen display.	Double-click the top of the window to have a full screen window.
I cannot find a window I created.	You may have closed the window.	<p>Click Menu  > Open Window X.</p>  <p>The window opens.</p> <p> Note: If you moved or deleted all the pages contained in a window, this window is permanently deleted.</p>
I cannot see pages I created on the top toolbar.	You may have moved these pages to a new window.	<ol style="list-style-type: none"> 1. Check your other windows to see if your page appears in it. If you created a window and cannot find it, see the previous troubleshooting case. 2. If your page is in another window, right-click the page name and select Move to Main Window to move it to the window with the control panels, or Move to Window X to move it to another window. 

Problem	Possible causes	Solution
	You may have closed this page (Customize mode only)	See Opening a Saved Page on page 59.
I cannot connect to the internet.	Internet network might be too far in the network list.	<ol style="list-style-type: none"> 1. Click Apple Menu > System Preferences > Network. 2. From the bottom of the network list, click the wheel icon and select Set Service Order.  3. Drag the network you use to have internet on top of the list. It can be for example your phone WiFi, your router WiFi, a USB to Ethernet adapter...  

Messages

You can see which messages arrive on Scala according to the configured inputs.

To see messages arriving on Scala, click the menu icon  > **Expert Mode**. Click the menu icon again and select **Messages**.



Annotations in the image:

- Receiver inputs
- Sensors inputs
- Echogram inputs
- NMEA inputs
- Receivers on the system
- Save file

Log

You can see Scala log. This can be useful to know what are the latest actions that happened if you have some issues on Scala.

Scala log displays every action that happens on Scala.

To see the log, click the menu icon  and select **Log**.

Giving Remote Access to the Computer

If you encounter an issue with the system, you may need to give remote access to the computer to the support team thanks to **TeamViewer** software.

Before you begin

You need to have access to a good internet connection.

Procedure

1. From the **Launchpad** , click **TeamViewer**.



2. Check that you have the message **Ready to connect** at the bottom left corner of TeamViewer. If the message is **Not ready** it means you have no internet connection.
3. You can give access to your computer to the support team by giving them the ID and Password displayed under **Allow Remote Control**.

Recording Audio Files

If there are issues with sensors data reception or with noise interferences, the support service may need to record the system noise in order to analyse it.

Procedure

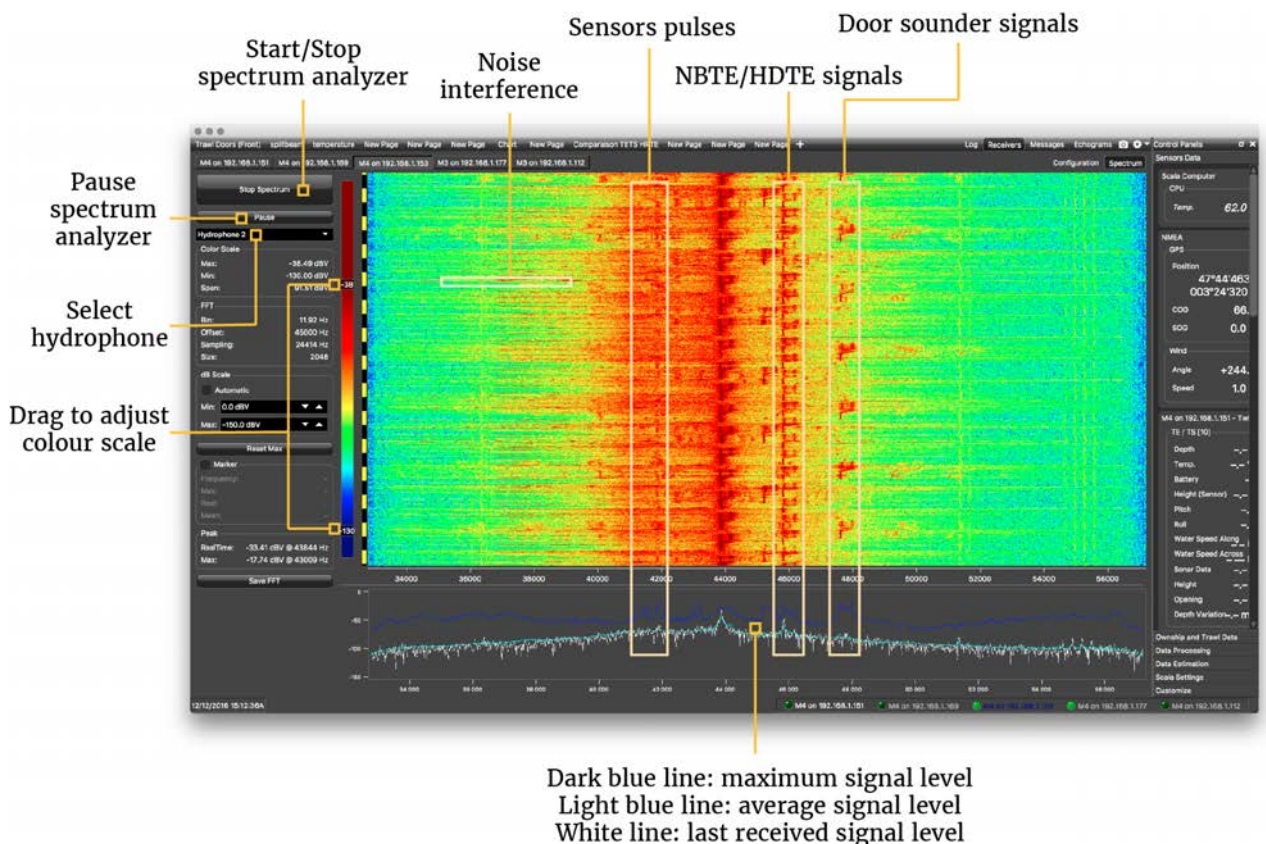
1. From the lower right corner of Scala window, right-click the receiver name.
2. Select **Record WAV Files** and confirm.
The receiver name becomes yellow. The recording lasts 180 seconds.
3. When the recording is finished, click **Yes** to download it.

Results

The audio file is saved in **Documents/Marport/Scala/(ReceiverIPAddress-Date)/Output**

Spectrum Analyzer Display

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




Checking Noise Interference

You can check the noise level of the system and check if there are no interferences thanks to the spectrum analyzer. When checking the noise level, you must be in fishing conditions and not in port.

About this task

See [Spectrum Analyzer Display](#) on page 97 for details about the spectrum analyzer display.

Procedure

1. From the top left corner of Scala window, click menu  > **Expert Mode**.
2. Again in the menu, click **Receivers**.
3. From the top right corner of the screen, click **Spectrum**.
4. From the top left corner of the screen, click **Start Spectrum**.
On the left side, all numerical information is displayed.
5. Check that there is more than 12dB between the dark blue line (maximum signal level) and the light blue line (average signal level).
6. When you have enough data, click **Stop Spectrum**.

Uninstalling Scala

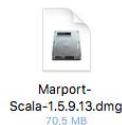
You can uninstall Scala and Scala Replay from your computer.

About this task

 **Important:** Removing completely Scala preferences and settings means all pages and customizations will be lost. Only complete this task if necessary.

Procedure

1. Go in **Applications**.
2. Right-click **Scala** or Scala Replay icon and select **Move to Trash**.
3. To remove all Scala and Scala Replay preferences and settings from the computer:
 - a) Find the *.dmg file that you downloaded when you installed Scala. By default it should be in the **Downloads** folder of the computer.



- b) Double-click the *.dmg file.

The installation panel appears.



c) Double-click **UninstallScala.command**.



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:

FRANCE

Marport France SAS
Parc Technologique de Soye,
Espace MEDIA, 2 Rue Galileee
56270 Ploemeur, France
supportfrance@marport.com

SPAIN

Marport Spain SRL
3 – 5 Chano Pineiro Street
36208 Vigo (Pontevedra), Spain
supportspain@marport.com

ICELAND

Marport EHF
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