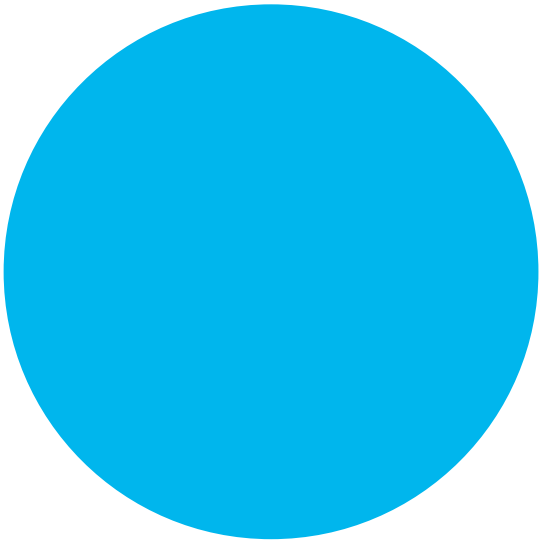

SeapiX

Operation Manual

iXblue

Revision History

Edition	Date	Comments
A	01/2020	Creation

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- By dedicated e-mail box: support@ixblue.com
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iXblue's liability is excluded in case of misuse of the software or any use in contradiction with iXblue's instructions. This application program is only to be used in order to help optimize fishing and shall not exempt the skipper of his responsibilities in terms of navigation security and respect for law enforcement.

Dongles

iXblue will not replace lost dongles free of charge, neither offer discounted pricing terms for replacement dongles.

iXblue strongly recommends that you insure your iXblue products against loss, theft or damage where applicable.

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The following export control guidelines shall apply as related to French rules and regulations.

Free export This product or service can be freely exported.

Manual Overview

This manual is the Operation Manual for SeapiX manufactured by iXblue. It must be read and understood prior to using SeapiX. The manufacturer shall in no case be held liable for any application or use that does not comply with the stipulations in this manual.
It is divided into several chapters:

- Part 1: Introduction

This part contains a general description of SeapiX and provides information about the theory of operation.

- Part 2: Technical Characteristics

This part gives details on mechanical, acoustic and electrical characteristics of the SeapiX components.

- Part 3: SeapiX Pack

This part details a typical SeapiX pack and its contents; it also gives some recommendations.

- Part 4: SeapiX Installation Overview

This part provides an overview of SeapiX Installation – detailed seapiX installation being described in *SeapiX Installation Manual*.

- Part 5: SeapiX Graphical User Interface (GUI)

This part describes SeapiX operation via its Graphical User Interface (GUI).

- Part 6: Preventive Maintenance

This part provides a table with SeapiX preventive maintenance tasks.

- Part 7: Troubleshooting

This part provides a table helping to solve minor problems encoutered while using SeapiX.

- Part 8: Support through TeamViewer

This part provides support contacting information through TeamViewer.

- Appendices

It contains some useful tips.

Warning: SeapiX is NOT a navigation tool. SeapiX is a fishing tool and it must be used as such.

The abbreviations and acronyms used in this manual are listed hereafter.

Abbreviations and Acronyms

BFU	Beam Former Processor Unit
CSV	Plain text format file
ETA	Estimated Time of Arrival
FEBL	Tool showing the Range Bearing Line
GNSS	Global Navigation Satellite System (including GPS, ...)
GUI	Graphical Interface Unit
ITU	Interface Unit
MRU	Motion Reference Unit
RX	Reception
SAT	Sonar Axial Tiltable mode
SATA	Data transfer format
SAU	Sonar Antenna Unit
SAV	Sonar Axial Volumetric mode
SED	Single Echo Detection
SLI	Sonar Lateral Imaging mode
STT	Sonar Transverse Tiltable mode
STV	Sonar Transverse Vertical mode
SV	Scattered Volume; in acoustics, fish shoal measurement mode (in dB)
TS	Target Strength; in acoustics, single fish measurement mode (in dB)
TX	Transmission
VPU	Viewer Processor Unit

Text Usage

Bold	Bold text is used for items you must select or click in the software. It is also used for the field names used into the dialog box.
`Courier`	Text in this font denotes text or characters that you should enter from the keyboard, the proper names of disk Drives, paths, directories, programs, functions, filenames and extensions.
Italic	Italic text is the result of an action in the procedures. It is also used for referencing to other document titles.

Icons

The **Note** icon indicates that the following information is of particular interest and should be read with care.

Important

The **Important** mention indicates that the following information should be read to forbid or prevent a product dysfunction or a faulty operation of the equipment.

The **Caution** icon indicates that the following information should be read to forbid or prevent product damage.

The **Warning** icon indicates that possible personal injury or death could result from failure to follow the provided recommendation.

The **Advanced/Expert** icon indicates that the described procedure/action is reserved to advanced level of operation.

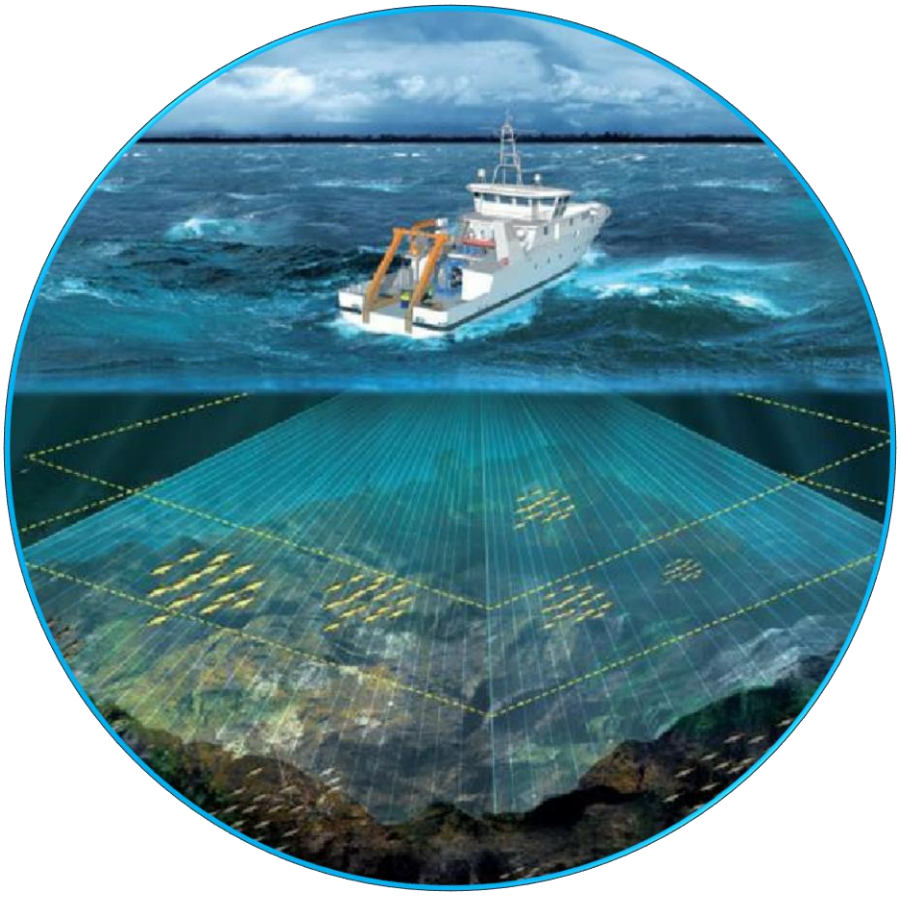
Table of Contents

1 Introduction

1.1 SeapiX System Overview

SeapiX is a volumetric 3D Sonar dedicated to the fishing industry. It provides a realistic fish evaluation together with a full ecosystem description. Composed of a dual Mills Cross multibeam sonar array, this compact system is able to generate one or more scan swaths along or across a vessel axis. The result is a total three-dimensional coverage of the water column; it also provides a bathymetric profile of the seabed and the identification of the sediment type.

SeapiX is connected to the vessel navigation system for real-time geo-referenced data generation. it is used with SeapiX Surface Software for configuration, control and visualization of data.



1.2 SeapiX Principle

SeapiX is a volumetric multibeam echosounder which can operate:

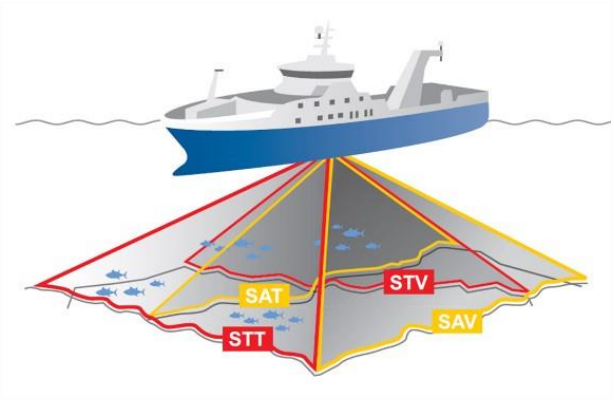
- downward-looking,
- forward-looking,
- side-looking.

Each multibeam swath is proposed along and across the vessel track (is either “axial” or “transverse”). Swaths are tiltable to control the biomass all around the vessel. For each swath, 3 echogram sectors are formed from 1° to 120° beam aperture.

On board a fishery vessel, the skipper watches the shoal behavior and steers the vessel to perform catches.

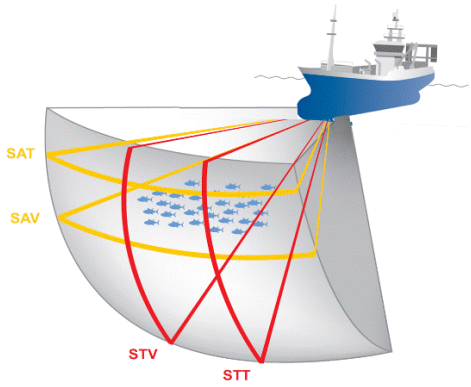
Warning: SeapiX is NOT a navigation tool. **SeapiX is a fishing tool** and it must be used as such.

1.2.1 DOWNWARD-LOOKING SWATH



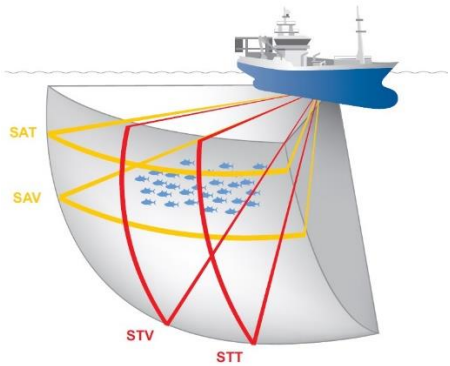
Downward-looking swath (axial & transverse)

1.2.2 FORWARD-LOOKING SWATH



Forward-looking swath (axial & transverse)

1.2.3 SIDE-LOOKING SWATH



Side-looking swath (axial & transverse)

Axial swaths correspond to **SAT** or **SAV** sonar modes.

Transverse swaths correspond to **STT** or **STV** sonar modes.

For explanation about sonar modes, see Toolbars & Buttons Standard Display.

2 Technical Characteristics

Seapix is available in 3 versions:

- SeapiX-F for fishery
- SeapiX-R for fishery research
- SeapiX-L for marine science and fish farming

2.1 SeapiX-F

SeapiX-F is dedicated to the fish industry and is installed on fishery vessels.

SeapiX-F SAU

Applications	Fishery
Frequency	150kHz
Modulation	CW and Chirp
Across-track multibeam swath	64 channels, stabilized
Along-track multibeam swath	64 channels, stabilized
Beam stabilization	TX + RX, built-in MRU
Beam resolution	1.6° angular / 7.5 cm radial
Triple echograms from all swaths	Adjustable from 1° to 120° each
Typical range	Biomass 400 m, Bathymetry 600 m
Volume resolution	0,6 m^3 @100 m
Volume coverage	120° X 120°
Signal processing	SV, TS, NORMALIZED
SED fish extraction	Up to 200.000 single fish detection
Transmission power	2 kW (4 kW as an option)
Scientific pack	(option)
Sonar Antenna Unit (SAU) cable	20 m
SAU weight	61.5 kg

2.2 SeapiX-R

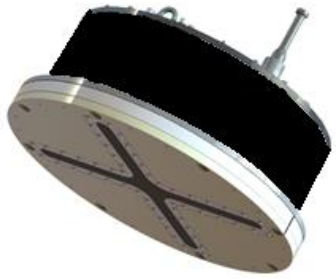
SeapiX-R is dedicated to fishery research and is installed on large fishery research vessels.

SeapiX-R SAU

Applications	Fishery research
Frequency	150 kHz
Modulation	CW and Chirp
Across-track multibeam swath	64 channels, stabilized
Along-track multibeam swath	64 channels, stabilized
Beam stabilization	TX + RX, built-in MRU
Beam resolution	1.6° angular / 7.5 cm radial
Triple echograms from all swaths	Adjustable from 1° to 120° each
Typical range	Biomass 400 m, Bathymetry 600 m
Volume resolution	0,6 m^3 @100 m
Volume coverage	120° X 120°
Signal processing	SV, TS, NORMALIZED
SED fish extraction	Up to 200.000 single fish detection
Transmission power	4 kW
Scientific pack	yes
Sonar Antenna Unit (SAU) cable	20 m
SAU weight	61.5 kg

2.3 SeapiX-L

SeapiX-L is a mobile research version dedicated to marine Science and fish Farming; it can be mounted on a pole and used on an “opportunity vessel”.



SeapiX-L SAU

Applications	Marine science and fish farming
Frequency	150 kHz
Modulation	CW and Chirp
Across-track multibeam swath	64 channels, stabilized
Along-track multibeam swath	64 channels, stabilized
Beam stabilization	TX + RX, built-in MRU
Beam resolution	1.6° angular / 7.5 cm radial
Triple echograms from all swaths	Adjustable from 1° to 120° each
Typical range	Biomass 400 m, Bathymetry 600 m
Volume resolution	0,6 m^3 @100 m
Volume coverage	120° X 120°
Signal processing	SV, TS, NORMALIZED
SED fish extraction	Up to 200.000 single fish detection
Transmission power	2 kW (4 kW as an option)
Scientific pack	yes
Sonar Antenna Unit (SAU) cable	20 m
SAU weight	24 kg, floating

3 SeapiX Pack

3.1 Pack Contents

The shipping pack contains a Packing List detailing all delivered items. This Packing List has been completed and checked for by iXblue shortly before shipment and should match the content of the pack that you have received.

CAUTION: PACK NON-CONFORMITY OR DAMAGE

It is recommended to check the content of the pack and all equipment items immediately after reception. Specifically, you should check that all items referred to in the Packing List are present and that none has sustained damage.

If you observe any non-conformity or damage, please inform the carrier and iXblue without delay by certified mail describing in detail the problem encoutered.

iXblue | SEAPIX | KAA00493 PACKING LIST | N° : Edition : Date :

Confidentiel iXBlue

		Requested	Checked
Box #1 : ANTENNA CONTAINER			
➢	SONAR ANTENNA UNIT S/N° :	X	
➢	INTERFACE PLATE	X	
➢	20M SUBSEA CABLE S/N :	X	
➢	DNV CABLE GLAND	X	
➢	INTERFACE UNIT S/N :	X	
➢	ITU AC POWER CABLE	X	
➢	RJ45 CONNECTOR	X	
➢	BFU-VPU 10M ETHERNET CABLE	X	
➢	ITU-BFU 30M ETHERNET CABLE	X	
➢	ITU-BFU 30M CONTROL COMMAND CABLE	X	
➢	CE DECLARATION OF CONFORMITY	X	
➢	CERTIFICATE OF WARRANTY	X	
➢	QUICK START GUIDE ED N° :	X	
➢	CUSTOMER SATISFACTION SURVEY	X	
Box #2 : ACCESSORIES CONTAINER			
BEAM FORMER PROCESSOR UNIT BOX			
➢	BEAM FORMER PROCESSOR UNIT S/N :	X	
➢	BFU AC POWER CABLE	X	
➢	BFU CD & USER'S MANUALS	X	
➢	BFU KEYS	X	
VIEWER PROCESSOR UNIT BOX			
➢	VIEWER PROCESSOR UNIT S/N :	X	
➢	VPU AC POWER CABLE	X	
➢	VPU USER'S MANUALS	X	
➢	SOFTWARE PROTECTION KEY S/N :	X	
➢	KEYBOARD	X	
➢	TRACKBALL	X	

Auteur	Guillaume BANGHALA	Approbateur & visa		Etat du document	~~Draft~~ / Approuvé
Ce document est la propriété d'iXBlue. Il ne peut être communiqué à des tiers sans autorisation écrite préalable This document is iXBlue property. It cannot be disclosed to any party without previous written authorization					Page 1 / 1

N° GIX-M-FO-QUAL-105A

Example of a SeapiX Packing List

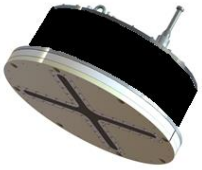
CAUTION: DO NOT LOSE ANY SMALL PACK ITEM

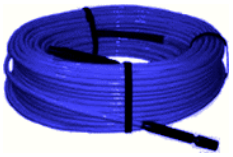
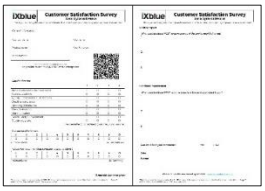
Before disposing of the packaging, carefully check that no small pack item - such as a key or a dongle – has been left; otherwise, it would prevent the system from working.

If any part is lost at that stage, you will have to order and pay for it.

3.2 Description of the Pack Items

Item	Reference	Designation
either 	SMI01628	Sonar Antenna Unit (SAU) for SeapiX-F and SeapiX-R
 including	MDI04776	SAU ring (interface plate)

 or	SMI04796	Sonar Antenna Unit (SAU) for SeapiX-L
 optional	MDI07607	Mounting flange
	SMI01632	Interface Unit (ITU) + AC power cable
	SEL00140	Beam Former Processor Unit (BFU) + 2 sets of keys (front door & disk lock-up) + USB to RS-232 converter cable + AC power cable
	SMI02373	Viewer Processor Unit (VPU) + AC power cable

		Wireless QWERTY Keyboard (for VPU)
		Wireless Trackball (for VPU)
	SCA00162206-A (former ref: SCA00130)	Transducer Cable (20 m)
	SME00573	Cable Gland
	SCA00132	ITU-BFU Ethernet Cable (30 m)
	SCA00131	ITU-BFU Control Command Cable (30 m)
	IOP00122	SeapiX VPU Dongle
	FCO00212	BFU-VPU Ethernet Cable (10 m)
		CE Declaration of Conformity
		Certificate of Warranty
		Customer Satisfaction Survey

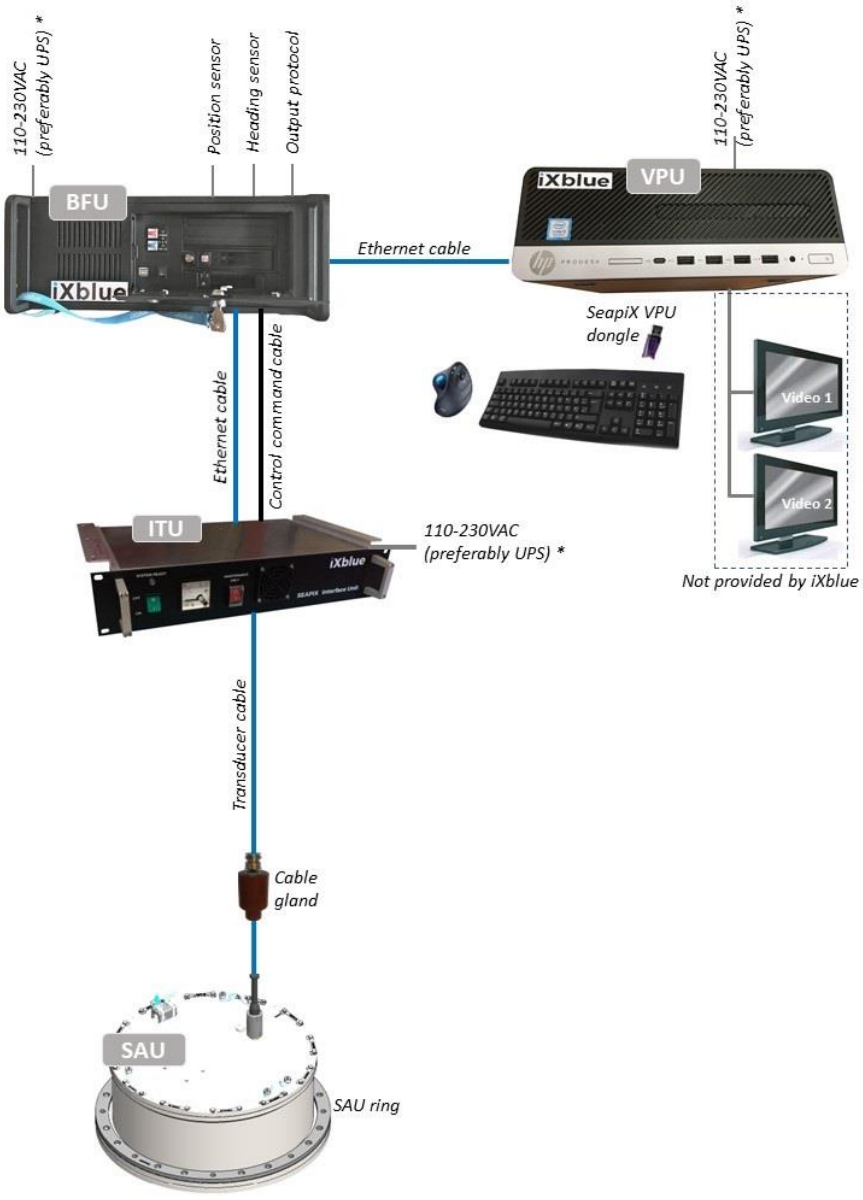
4 SeapiX Installation Overview

This chapter gives a brief overview of the SeapiX architecture but does not explain how to connect the different units together and how to interface with the vessel ancillaries and servitudes.

For any information about SeapiX system installation, see ***SeapiX Installation Manual*** *(can be opened from SeapiX software, ? menu)*.

4.1 Architecture and Connections

The simplified architecture of the SeapiX system is as follows:



Simplified SeapiX architecture

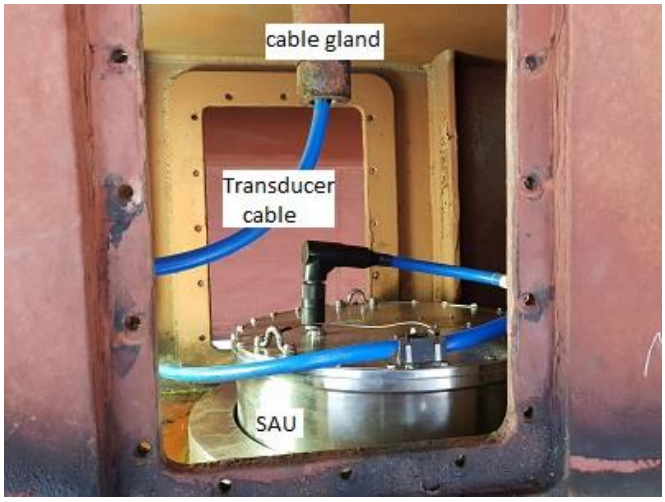
** UPS is recommended to protect electronic devices. The UPS model must have a 'pure sine' output. Other output wave forms are not SeapiX compatible.*

4.1.1 SEAPIX ANTENNA UNIT (SAU) AND TRANSDUCER CABLE

The SAU has been installed on the vessel hull and the transducer cable (also called “subsea cable”) has been connected to it. A cable gland has been used to tighten the transducer when passing it through the hull.

The transducer cable insures the powering and the synchronization between the SAU and the ITU, and the data communication between the SAU and the BFU - through the ITU.

Example of an SAU fixed onto a ships’ hull: outside view of a side-looking installation



Example of the inside view of a downward-looking SAU

Example of transducer cable attachment with tie-wraps

4.1.1.1 Cooling Down the SAU

Please note that the SAU must always be fully immersed.

CAUTION: DAMAGE TO THE ANTENNA (SAU)

When using SeapiX, as the SAU is cooled down by thermal dissipation on its rear face, it is mandatory to have the SAU completely immersed all the time and to insure enough water flow.

There is a risk the SAU electronics could be damaged because of overheating - which would not be covered by iXblue warrantee.

4.1.1.2 Corrosion Protection of the SAU

SeapiX SAU is made of marine grade stainless steel (SAE 316 L). When immersed, it shall be protected against corrosion by anodes:

- an anode is positioned on the SAU rear face,
- a witness anode is positioned on the SAU front face, oriented to the back to avoid turbulences.

CAUTION: SAU CORROSION IF WORN ANODES

The customer must ensure the anode protection efficiency and its maintainance over time.

Lack of protection may result in severe damage to the SAU and would not be covered by iXblue warranty.

4.1.1.3 Cable Gland and Watertightness

CAUTION: CABLE GLAND MUST ENSURE WATERTIGHTNESS

The installation of the cable gland and its qualification are under the shipyard/customer responsability. The cable gland delivered has been designed for steel hull configuration.

4.1.1.4 Transducer Bending and Attachment

CAUTION: DAMAGE TO THE TRANSDUCER CABLE IF EXCESSIVE STRESS OR TENSION OR IF NOT PROPERLY SECURED

No excessive stress or tension shall apply on the transducer cable.

It shall be secured in such a way that it does not get damaged during cruise in rough conditions.

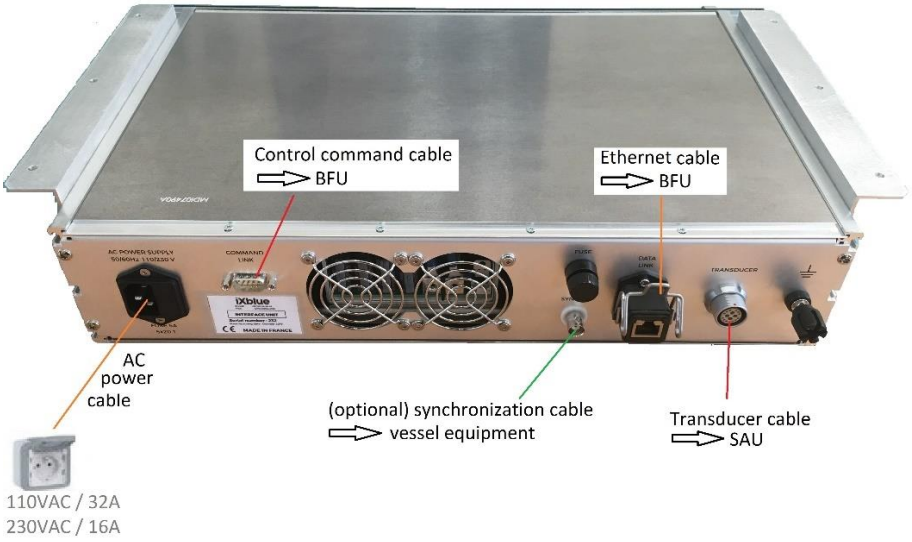
4.1.2 TRANSDUCER CABLE AND INTERFACE UNIT (ITU)

Once connected to the SAU, passed through the hull and tightened by a cable gland, the transducer cable has been connected to the Interface Unit (ITU).

Location

The ITU is installed either in a dedicated sonar room or into a technical room, fairly close to the SAU (transducer cable length = 20 m).

The connectors are located at the back of the ITU:



ITU back face and connections

- The ITU power cable is plugged into a 110 VAC or 230 VAC electrical outlet.
- The ITU-BFU control command cable - with DE-9 female termination on ITU side - is connected to the DE-9 male port *(labeled COMMAND LINK)*.
- The ITU-BFU Ethernet cable is connected to the RJ45 port *(labeled DATA LINK)*.
  The transducer cable from the SAU is connected to the Fischer port (labeled TRANSDUCER) – both red dots, on cable and on port, matching upwards.

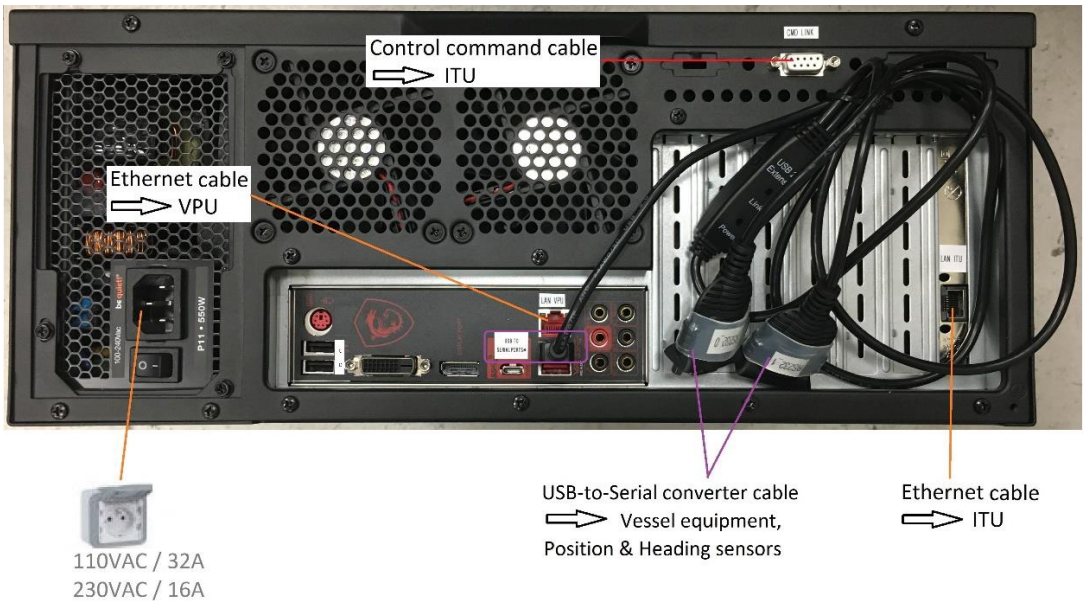
4.1.3 BEAM FORMER UNIT (BFU)

Once connected to the ITU, the control command and Ethernet cables have been connected to the Beam Former Unit (BFU).

Location

The BFU is installed on the bridge, often close to the VPU.

The connectors are located at the back of the BFU:



BFU back face and connections

- The BFU power cable is plugged into a 110 VAC or 230 VAC electrical outlet.
- The ITU-BFU control command cable - with DE-9 male termination on BFU side - is connected to the DE-9 female port *(labeled CMD LINK)*.
- The ITU-BFU Ethernet cable is connected to the Ethernet port *(labeled LAN ITU)*.
- The USB-to-RS-232 converter cable - linked to vessel equipment for navigation: e. g. GPS and Heading sensor - is connected to a USB port *(labeled USB TO SERIAL PORTS)*.
- The BFU-VPU Ethernet cable is connected to the Ethernet port *(labeled LAN VPU).*

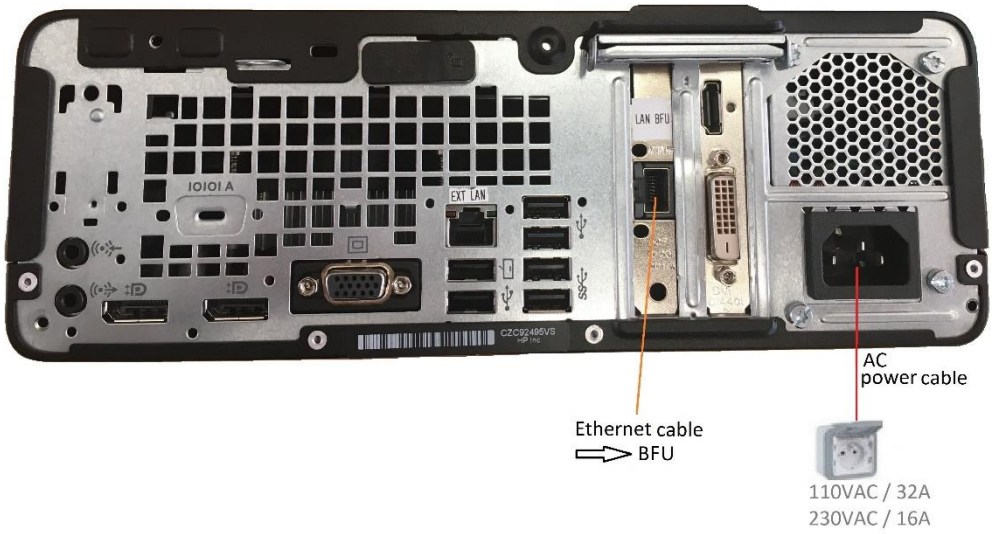
4.1.4 VIEWER PROCESSOR UNIT (VPU)

Once connected to the BPU, the Ethernet cable has been connected to the Viewer Processor unit (VPU).

Location

The VPU is installed on the bridge.

The connectors are located at the back of the VPU:



VPU back face and connections

- The VPU power cable is plugged into a 110 VAC or 230 VAC electrical outlet.
- The BFU-VPU Ethernet cable is connected to the RJ45 port *(labeled LAN BFU).*
- An Ethernet cable to connect to the vessel network is inserted into the RJ45 port *(labeled EXT LAN)*.
- 2 USB keys for the wireless keyboard and trackball are inserted into 2 USB ports – or just 1 USB key for both is inserted into either port.
- The SeapiX VPU dongle is inserted into any USB port.

In case the VPU back face would not be easy to reach, please note that ports are available on its front face.

5 SeapiX Graphical User Interface (GUI)

5.1 Basics to SeapiX GUI

SeapiX GUI consists of a Windows®-based interface. The system is entirely configured through the software. Most of the controls are accessed via toolbars.

5.1.1 PREREQUISITE

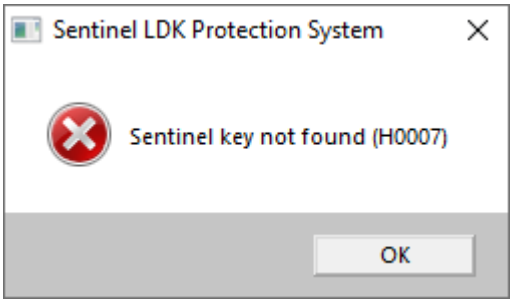
Before starting SeapiX GUI on the VPU, please check that all system units are correctly connected and have been powered on. If you have to power on the system units:

- On the BFU front face, open the door and press the **Start** button.
- On the ITU front face, press the **Start** button.
- On the VPU front face, press the **Start** button.

CAUTION: DAMAGE TO THE ANTENNA (SAU)

You must never power up the SeapiX when the ship is in dry dock: the antenna (SAU) could be damaged. To prevent inadvertent use of the SeapiX, always pull out the power supply mains plug from the ITU – located in the sonar/technical room - whenever your vessel is in dry dock. Additional protective measures should be considered.

SeapiX software cannot start without SeapiX VPU dongle. Please check that the dongle is correctly inserted into the USB port on the VPU; otherwise, you will get an error message:



5.1.2 USING THE TRACKBALL

The wireless trackball has been preconfigured for SeapiX.

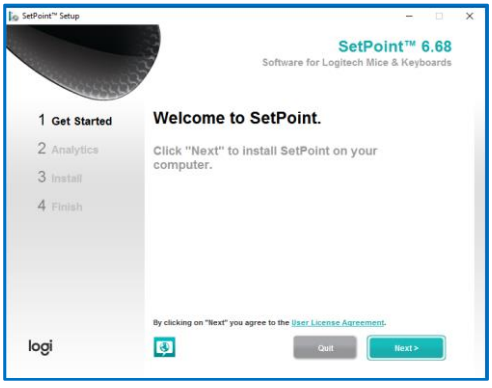
Start or stop it using the On/Off button placed on its back.

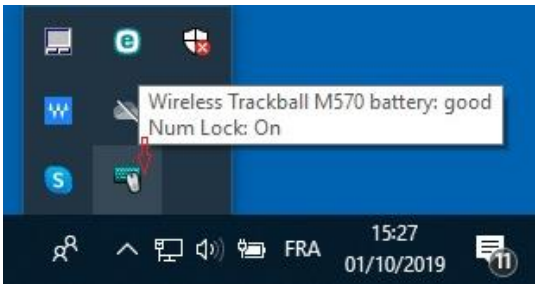
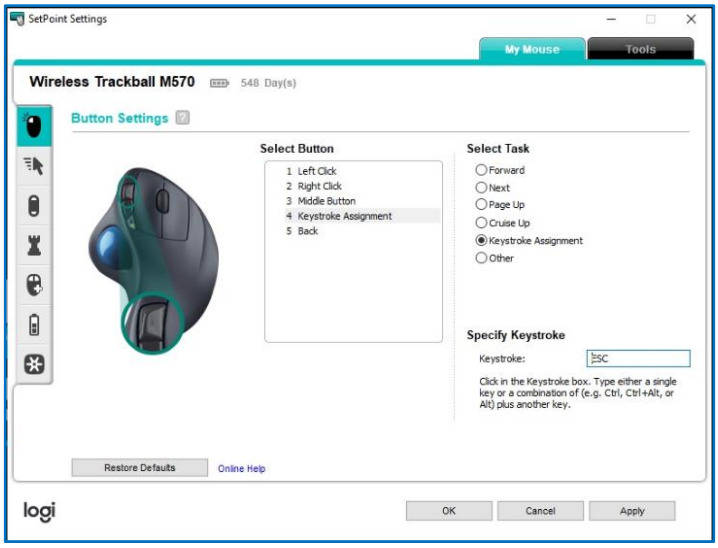
How to use this customized trackball:

Button nb	
1	Use the ball to move the cursor throughout menus and charts
2	**Customized**: Ctrl +
3	**Customized**: Escape
4	Left click to stop, to close, ...
5	**Customized**: middle button
6	Right click to select, to enable, ...

If needed, here is the customizing process (steps 1 to 6).

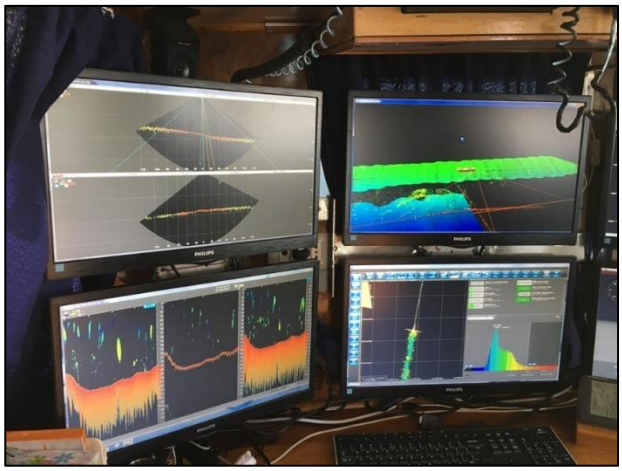
How to customize this trackball:

1	Install Logitech program **SetPoint 6.68.250_64.exe** on your VPU. 
2	Follow the installation process to the end. 

3	Connect the trackball key to a USB port.
4	Once the mouse has been detected, double-click its icon:  *The mouse program opens on **SetPoint Settings** menu, **My Mouse** tab.*
5	Select the button that you want to customize, assign it a task then press **OK** to confirm: 
6	When all buttons have been customized, click **Apply**.

5.1.3 DISPLAYING THE INFORMATION

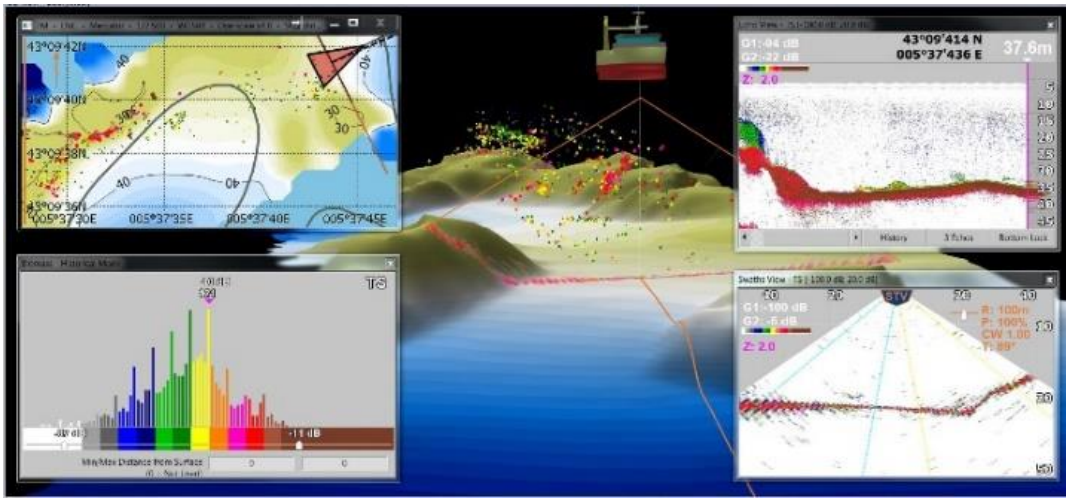
All of SeapiX software information can be seen on 1 display unit, but it is recommended to operate 2 to 4 display units.



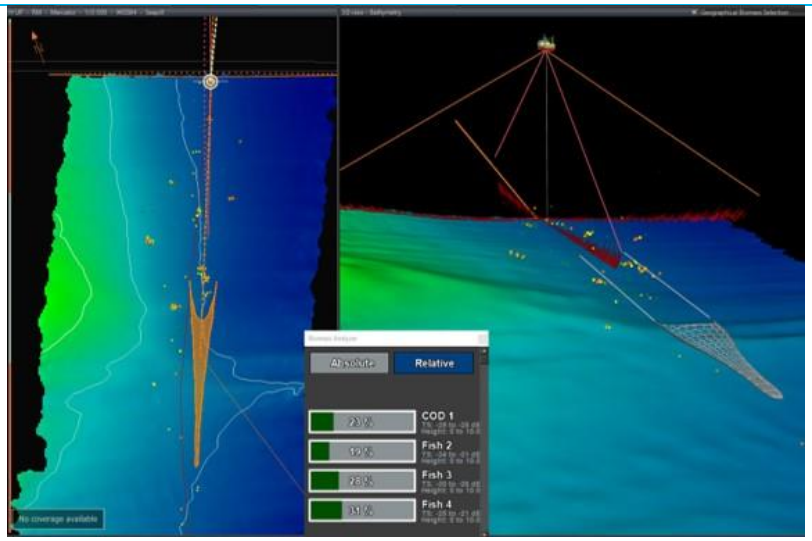
Example of a SeapiX system with 4 display units on a vessel's bridge

Display layout depends on the type of application.

Each window can be docked in a quarter corner of the main display or can be moved to an extended display unit. Windows layout can be changed by dragging and dropping.

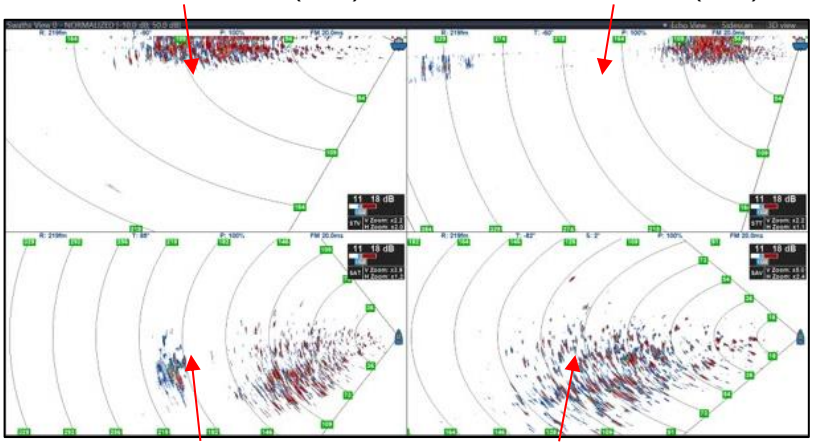


2D / 3D navigation view



Acoustic multibeam side-looking swath view(s) (1 to 4)

Transverse Vertical (STV) Transverse Tiltable (STT)



Axial Tiltable (SAT) Axial Volumetric (SAV)

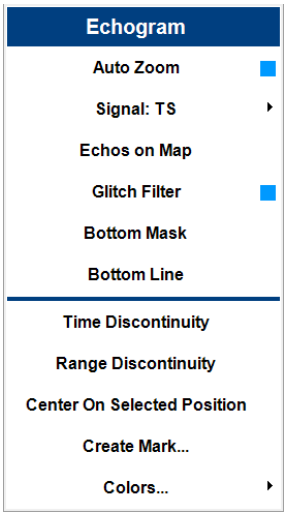
Gain Min. (G1) and Max. (G2), Depth Range, Tilt, Power, Modulation, Pulse are displayed on top of each view.

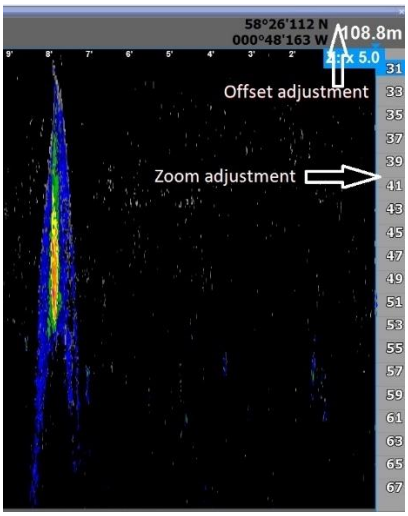
Echogram (1, 2 or 3 sectors)

From any swath view (STV, STT, SAT, SAV), select 

.

Default presentation view is a **surface echogram**, from surface to bottom, with one (1) central beam sector. You can change views clicking one of the 3 tabs located in the lower right side of the view. Also, different parameters can be set from the contextual Echogram menu when you right-click:

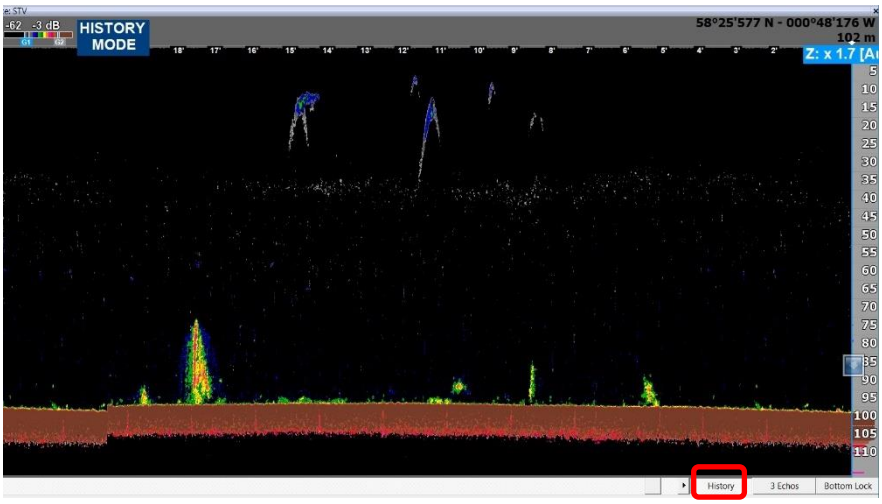




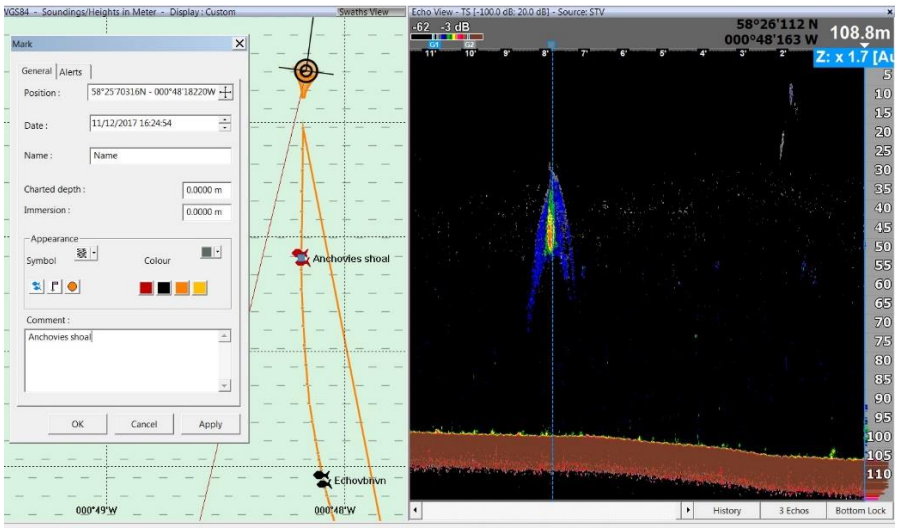
To show more detailed parts of the water column, you can zoom in (manual zoom is 1:1, Auto Zoom is 1:7). You can also set up a range offset with the zoom - from 30 to 67m in the example above – adjusted with the trackball wheel.

History view

When you select **History** tab, depending on the ping rate and range, you can go back from 2 to 6 hours earlier: the central echogram sector is shown and the cursor lets you adjust the time scale and the expected event time to study.

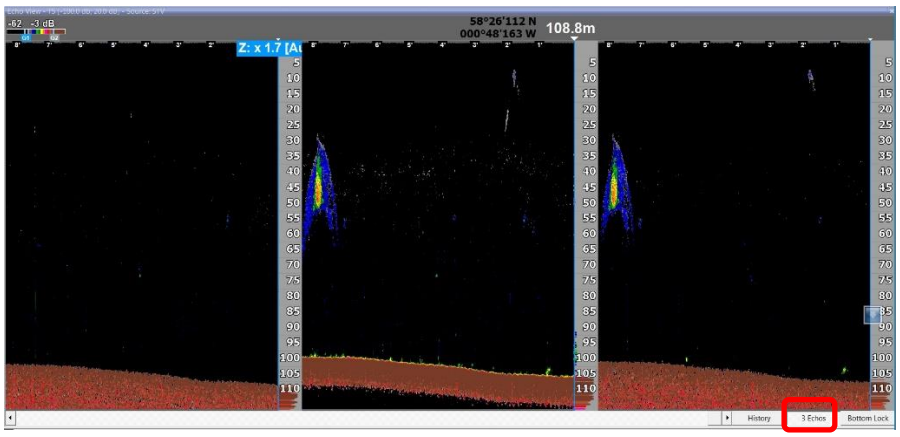


If you right click, you can also place a mark using **Create Mark,** correlate its geographic location on 2D and 3D navigation views then center the view on that location using **Center On Selected Position:**



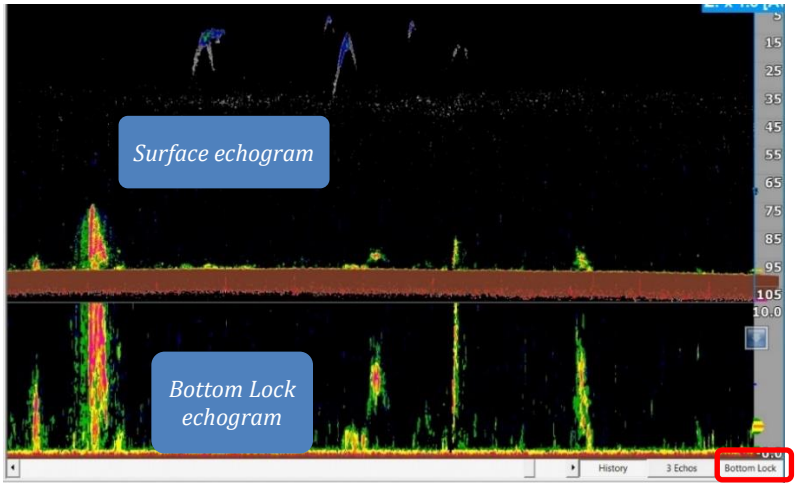
This will help you to better understand the ecosystem.

3 Echoes view



You can see three (3) independant echograms.

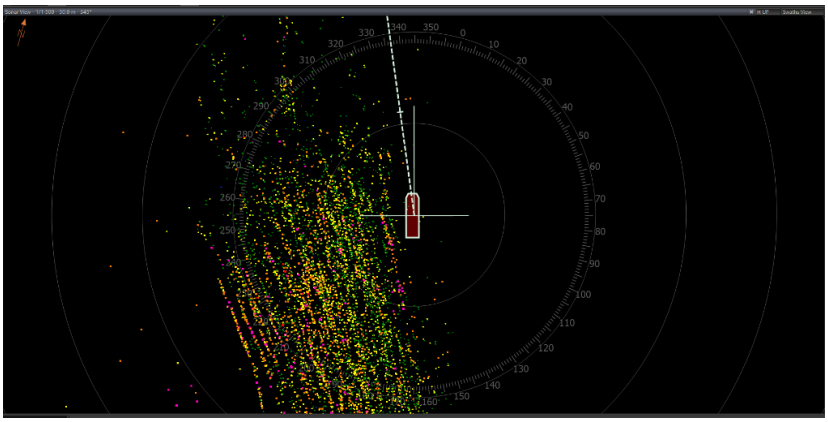
Bottom Lock view



It processes near bottom layer with full resolution: the bottom is flattened, and near bottom fish echoes are more visible.

Omni Sonar

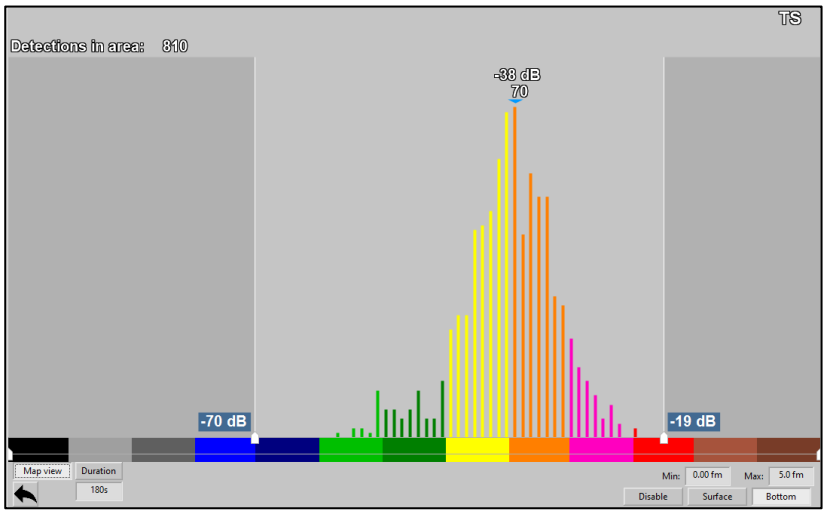
Example of an omnidirectional sonar view:



This type of view is mostly used by seiners.

Biomass

Example of a biomass view:



See explanation in Biomass menu.

5.1.4 TOOLBARS & BUTTONS

5.1.4.1 Toolbars & Buttons Standard Display

There are 2 standard toolbars: **Toolbar 1** and **Toolbar 2**.

If all icons do not fit on the screen – for instance on the vertical toolbar –  shows at the end to let you move up and down along the toolbar.

When a button is selected, its background color changes from grey to light blue:

HORIZONTAL TOOLBAR = **Toolbar 1,** with 16 buttons:

This toolbar provides navigation and layer information. You can use it to enable / disable the different SeapiX-specific functions.

Toolbar 1

	**VIEW 1** *(tooltip: Acoustics view)* Predefines the organization of the views on display, e. g. for acoustics.
	**VIEW 2** *(tooltip: Biomass view)* Predefines the organization of the views on display, e. g. for biomass.
	**OWN SHIP** *(tooltip: Centre on Own Ship)* The view is centered on the ship.
	**3D** *(tooltip: 3D View)* It shows a 3D view.
	**SEAPIX** *(tooltip: Swaths Layer)* It shows 2D/3D swath layers.
	**FEBL** *(tooltip: Bearing Range Line...)* This navigation tool shows the range bearing line on the 2D map.
	**MARK** *(tooltip: Create Mark with Cursor...)* It creates a mark on the 2D map.

	**BATHY** *(tooltip: Surface)* It shows the bathymetry 2D layer.
	**ACQUISITION** *(tooltip: Start Seabed Data Record)* It stores seabed data (bathymetry, hardness) on a temporary basis.
	**BIOMASS** *(tooltip: Show Detections)* It shows the biomass 2D layer.
	**DISTRIBUTION** *(tooltip: Biomass Selection)* It shows the GBA biomass distribution.
	**STATISTIC** *(tooltip: Biomass Analyzer)* It opens the Biomass Analyzer window which shows the GBA class ratio (%).
	**ALL** *(tooltip: ALL Fishes SV)* It shows the Scattered Volume (SV) - the fish shoal measurement - of all types of fish.
	**FISH #1** *(tooltip: PELAGIC Layer SV)* It shows the Scattered Volume (SV) - the fish shoal measurement – of fish in the pelagic layer.
	**FISH #2** *(tooltip: BOTTOM Layer SV)* It shows the Scattered Volume (SV) - the fish shoal measurement – of fish in the bottom layer.
	**SETTINGS** *(tooltip: Settings...)* It is a shortcut which opens the Settings window.

VERTICAL TOOLBAR = **Toolbar 2**, with 14 buttons:

This toolbar provides mode and user settings selection. You can use it to show / hide visualization windows and to call user settings.

Toolbar 2

Sonar modes:	
	**STV** *(tooltip: STV)* This is the **Sonar Transverse Vertical** mode. The STV tilt angle is 90° fixed for a vertical sounding.
	**STT** *(tooltip: STT)* This is the **Sonar Transverse Tiltable** mode. The transverse swath can be tilted forward and stern. The STT tilt angle can be selected from the range of 90° (vertical) to +30° (backward direction) to -30° (forward direction).
	**SAT** *(tooltip: SAT)* This is the **Sonar Axial Tiltable** mode. The along-track section of a water column is visualized. The SAT tilt angle can be selected within the range +30° (port under the surface) to -30° (starboard under the surface), including 90° (vertical).
	**SAV** *(tooltip: SAV)* This is the **Sonar Axial Volumetric** mode. The volume is scanned under the vessel. The SAV min and max tilt angle can be selected with the range +30° (port under the surface) to -30° (starboard under the surface).

Other displays:

ECHO *(tooltip: Echogram)*

The water column echogram shows the content of a 120° swath with a high-contrast image definition.

SLI *(tooltip: Sidescan)*

This is the **Sonar Lateral Imaging** mode (well-known as 'side scan') which uses a port and a starboard STV multibeam swath.

SONAR *(tooltip: Sonar View)*

This shows an omnidirectional sonar picture.

Presets: **Already configured buttons according to fishing mode**

25m *(tooltip: PT_025 or BT_025 or PS_025 or TS_025)*

50m *(tooltip: PT_050 or BT_050 or PS_050 or TS_050)*

100m *(tooltip: PT_100 or BT_100 or PS_100 or TS_100)*

200m *(tooltip: PT_200 or BT_200 or PS_200 or TS_200)*

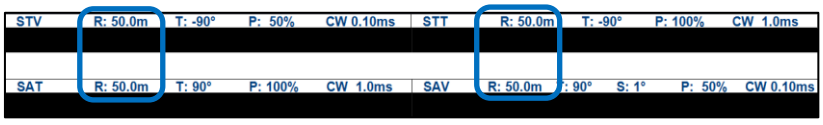
300m *(tooltip: PT_300 or BT_300 or PS_300 or TS_300)*

400m *(tooltip: PT_400 or BT_400 or PS_400 or TS_400)*

You can edit those preset buttons through **SeapiX** > **Mode Presets** > **Manage** (*see SeapiX menu*). You can also create other presets.

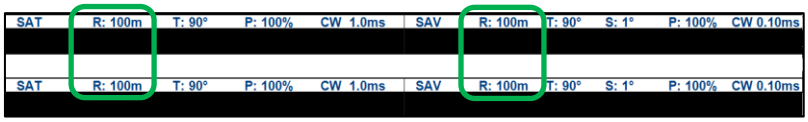
Example 1: STV, STT, SAT, SAV acoustic swath view headers for

(with 50m general range)



Example 2: STV, STT, SAT, SAV acoustic swath view headers for

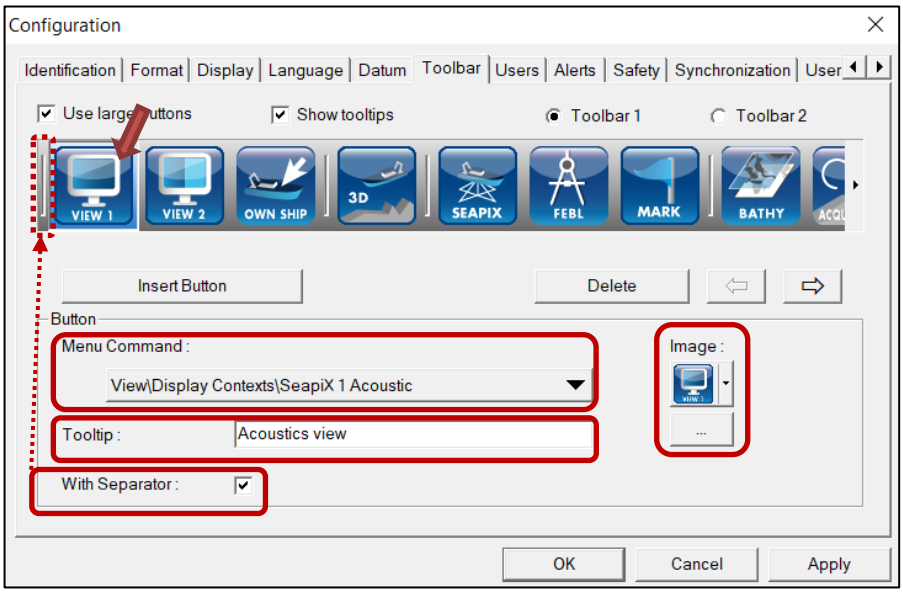
(with 100m general range)



5.1.4.2 Toolbars & Buttons Customization

To customize the toolbars and buttons, either hover the cursor over a button, right-click then press Customize ..., or from **System** menu, select **Settings** > **General Configuration** > **Configuration** window **> Toolbar**.

The **Configuration** window – **Toolbar** tab – opens:



Configuration window, Toolbar tab

From this **Toolbar** window, you can customize the toolbars and buttons. By default, the selected button – the one with a blue background - is the first one to the left.

Toolbar fields:	
To have small or large toolbars, *(applied to both bars)*	check/uncheck Use large buttons
To show the tooltips or not, *(applied to both bars)*	check/uncheck Show tooltips
To show either Toolbar 1 or 2,	click Toolbar 1 Toolbar 2

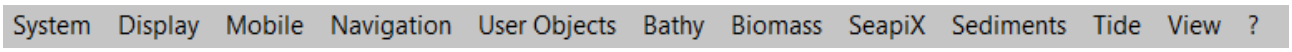
Button fields:	
To insert a new button (to the right of the selected one),	click Insert Button You then have to configure it (assign it an image, a command, a tooltip). The new button will not be created until all necessary information has been entered: otherwise, warning messages – starting with  – will be displayed.
To assign an image to the selected button,	open the image bank and pick up a new one (you can also add up images to the bank).
To assign a command to the selected button,	open the main menu, browse through the different sub-menus then pick up a new command.
To assign a tooltip to the selected button,	delete the text in the Tooltip field – if any – then write one. (*If no Tooltip text is entered, the name of the command will show when the cursor hovers the button.)*
To add or remove a separator just before the selected button,	check/uncheck the box.
To move the selected button along the toolbar, to the left or to the right,	click ⇦ ⇨
To delete the selected button,	click Delete

How do **OK**, **Cancel** and **Apply** buttons work?

OK	validates your choice and leaves the Configuration window.
Cancel	cancels your choice and leaves the Configuration window.
Apply	validates your choice but keeps the Configuration window open, to let you make other actions.

5.1.5 MAIN MENU

SeapiX main menu shows on top of the display:

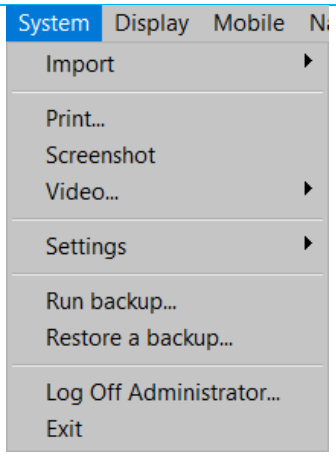


This menu lets you fully configure then use your software.

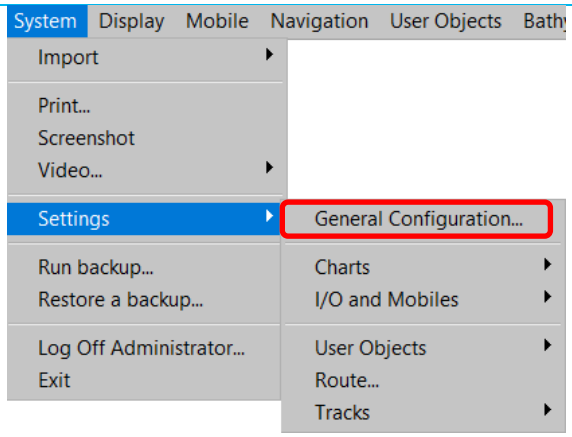
2 modules are specifically dedicated to SeapiX: **Biomass** and **SeapiX**.

5.1.5.1 System menu

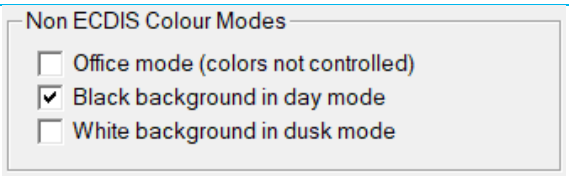
It mainly manages the configuration, print, user changes and exit.

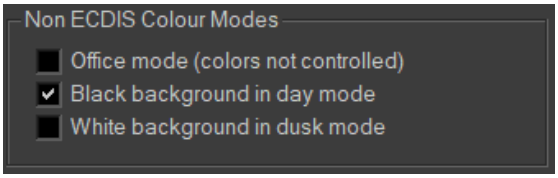


User changes can be done through **Settings** > **General Configuration**

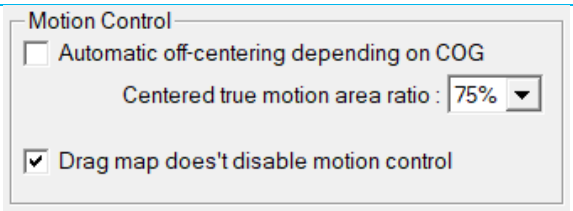


Example 1: if you prefer an overall black-color background, go to **Settings** > **General Configuration**, select the **Display** tab, check **Black background in day mode** then click **Apply**.

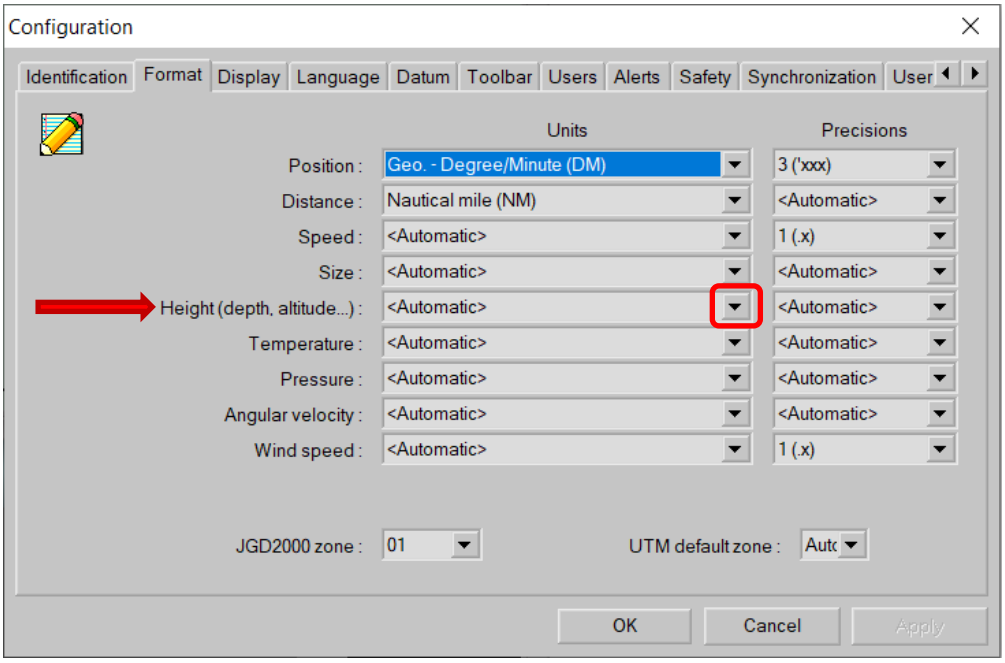




Example 2: still from the **Display** tab, if you want to have all views centered on your ship, check **Drag map doesn't disable motion control** then click **Apply**.



Example 3: from the **Format** tab, you can change parameter units according to your needs, for instance **Height** unit from <Automatic> to Meter (m), Foot (ft) or Fathom (fm).

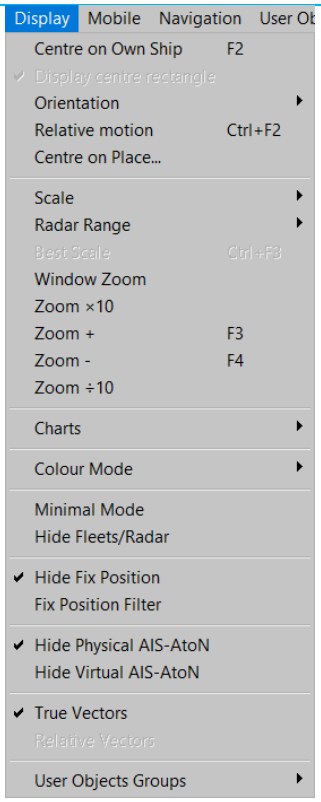


Then click **Apply**.

For any other information about this menu, refer to GECDIS User Manual that you can open from ? menu.

5.1.5.2 Display menu

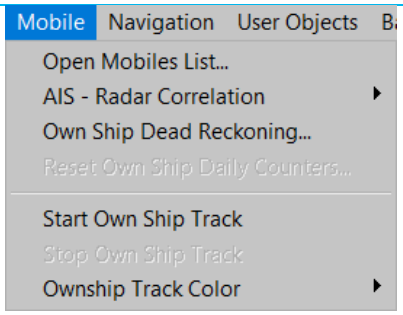
It lets you organize the display according to your needs.



For any other information about this menu, refer to GECDIS User Manual that you can open from ? menu.

5.1.5.3 Mobile menu

You can assign one or several mobiles to your ship.

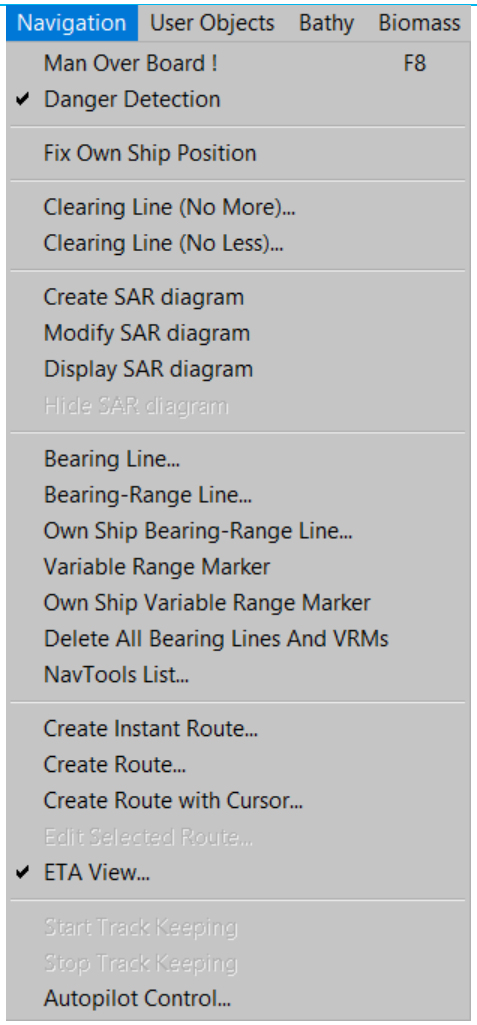


For any other information about this menu, refer to GECDIS User Manual that you can open from ? menu.

5.1.5.4 Navigation menu

Warning

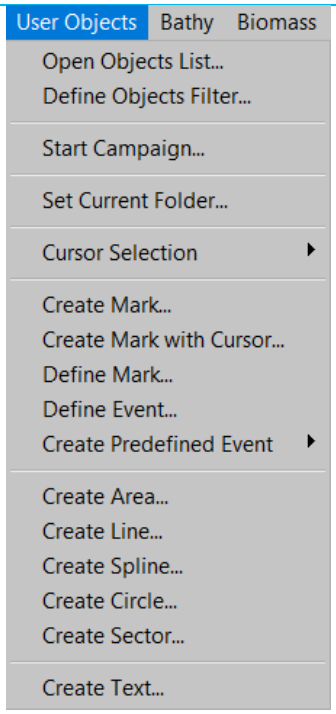
SeapiX is NOT a navigation tool. SeapiX is a fishing tool and it must be used as such.



For any other information about this menu, refer to GECDIS User Manual that you can open from ? menu.

5.1.5.5 User Objects menu

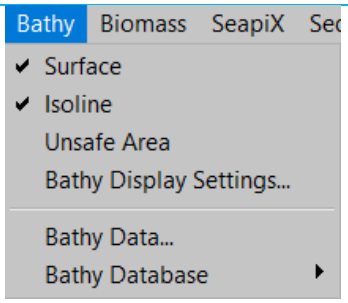
It lets you customize your objects.



For any other information about this menu, refer to GECDIS User Manual that you can open from ? menu.

5.1.5.6 Bathy menu

It is used to represent underwater topography.

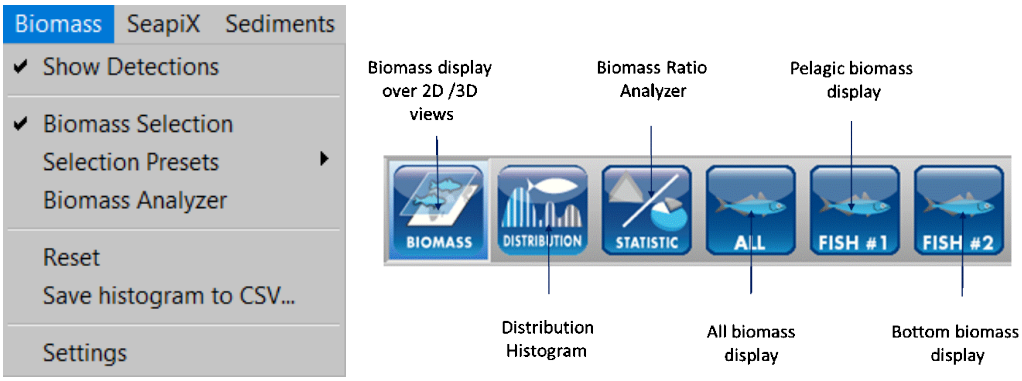


For any other information about this menu, refer to GECDIS User Manual that you can open from ? menu.

5.1.5.7 Biomass menu

The new concept of a “Geographical Biomass Analyzer (GBA) developed by iXblue is a statistical processing tool able to compute fish echoes distribution from an entire water volume. The volumic distribution histogram calculation takes different filtering criteria into account (such as the min. and max. acoustic response levels, the min. and max. depths of the studied water layer, the geography of the selected area, the history of fish detection, ...).

All biomass functionalities are accessed from the menu and from **Toolbar 1** buttons:



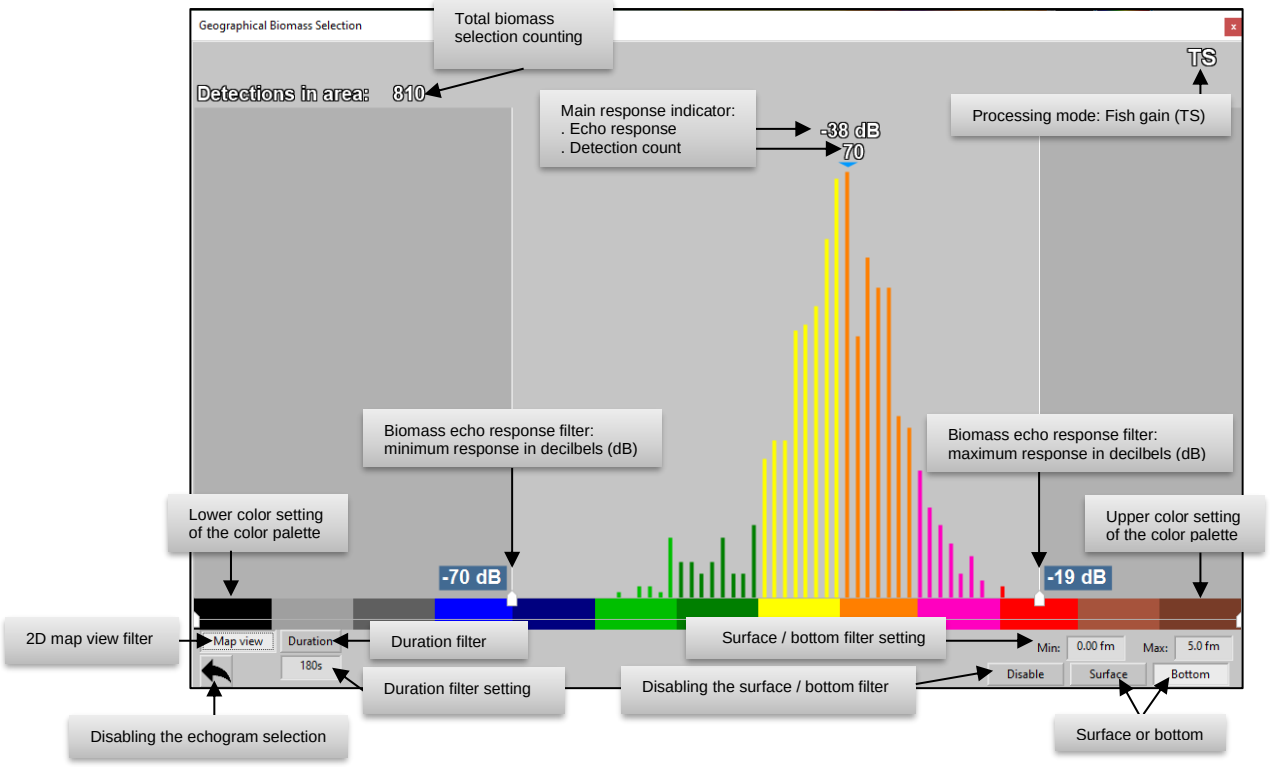
Biomass > Show Detections is checked/unchecked when you click it from the menu or when you press 

.

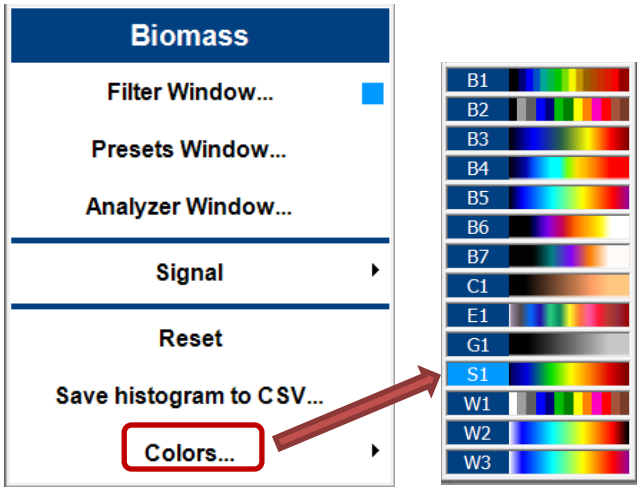
Biomass > **Biomass Selection** is checked/unchecked when you click it from the menu or when you press 

.

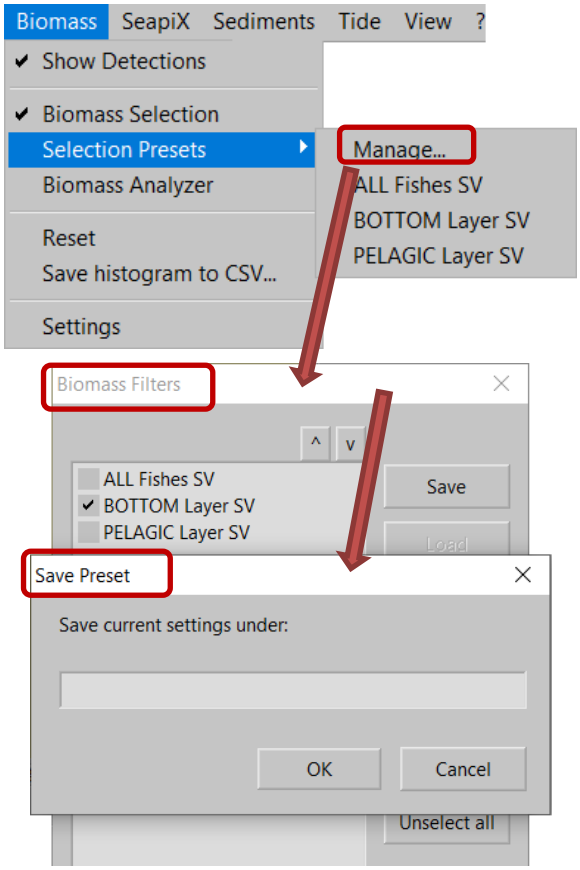
It opens the Histogram view which lets you see the fish distribution calculation at any time, according to selected criteria:



Right-clicking opens a contextual menu where you can set different parameters (filter, preset, analyzer, ...), even the color palette:

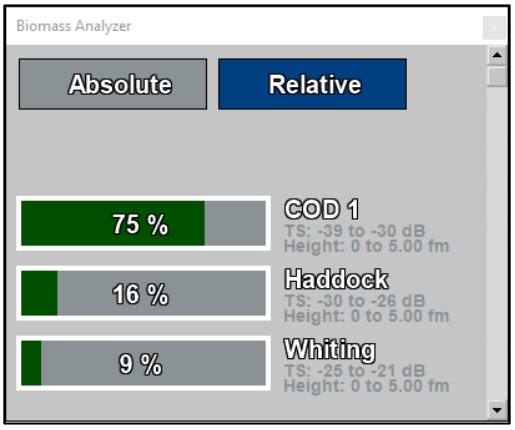


Biomass > **Selection Presets > Manage** lets you create classes:



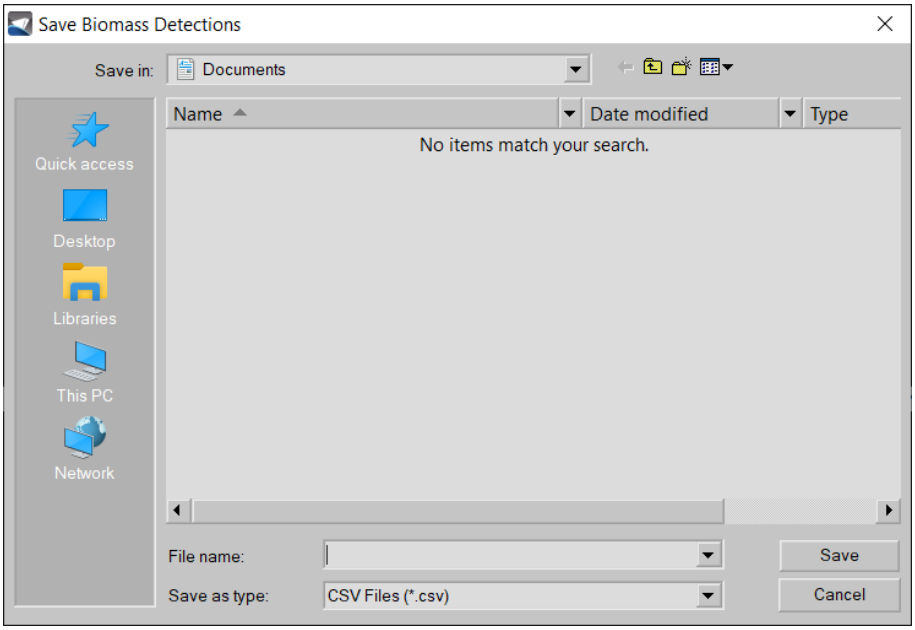
To see an example of fish class creation, go to 5.3.3 Classifying Fish and Using the Classes.

Biomass > **Biomass Analyzer** lets you see the ratio of fish classes:



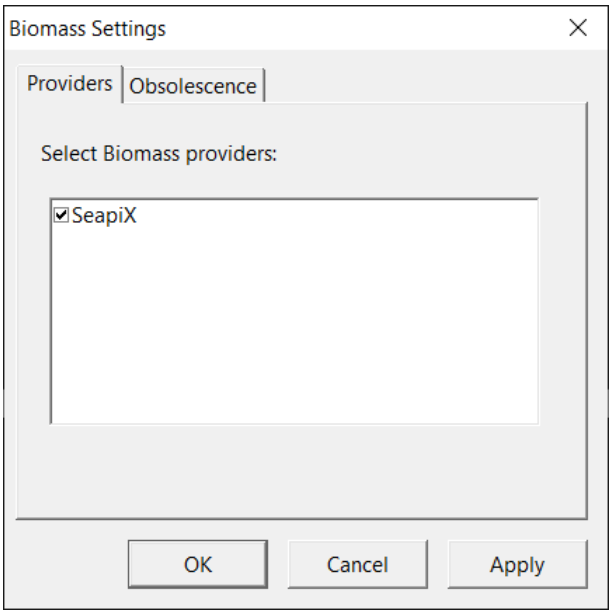
Biomass > **Reset** lets you reset the biomass parameters.

Biomass > **Save Histogram to CSV** lets you save your recording file as a .csv format.



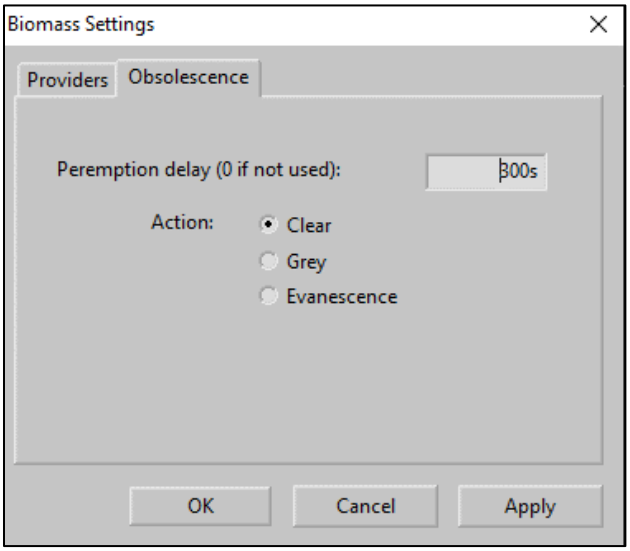
Biomass > **Settings** opens:

- **Providers** tab lets you select SeapiX source:



SeapiX must always be checked, otherwise you will not get any result.

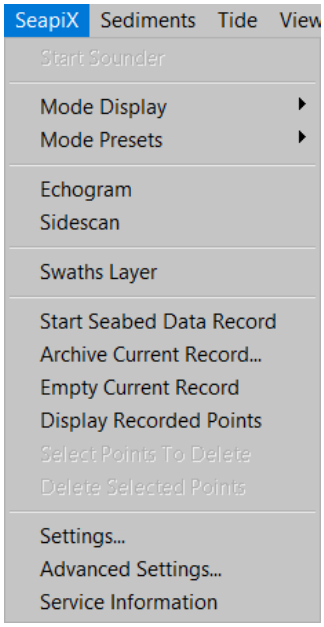
- **Obsolescence** tab lets you decide of a **Peremption delay** (a retention time) for the biomass targets. When the time is up, the 'old' biomass targets either will not show (**Clear**) or will be in a grey color (**Grey**) or will be more transparent (**Evanescence**).



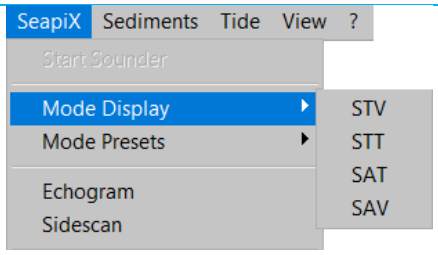
To disable the obsolescence, enter "0s".

5.1.5.8 SeapiX menu

Set your SeapiX through SeapiX menu:



You can select a display mode:

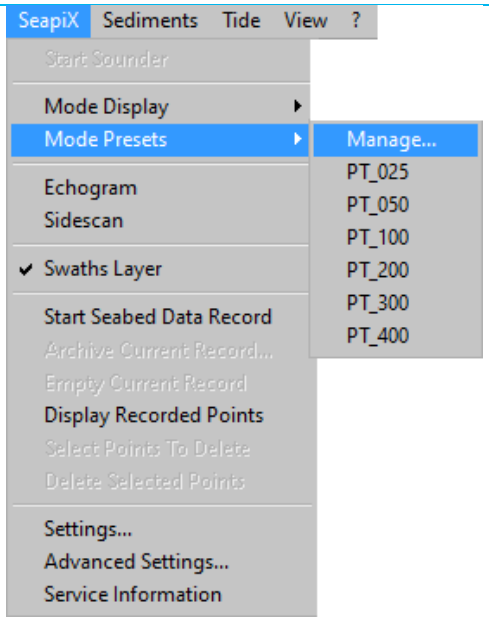


Use **Mode Presets** to prepare

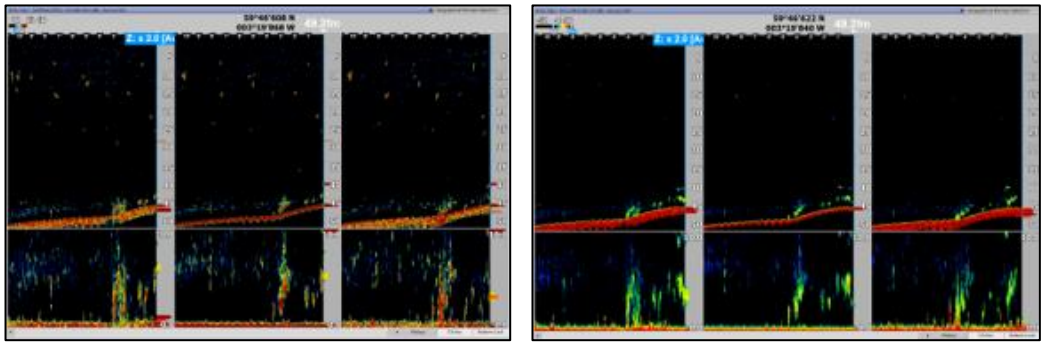
to

presets – or to create new ones.

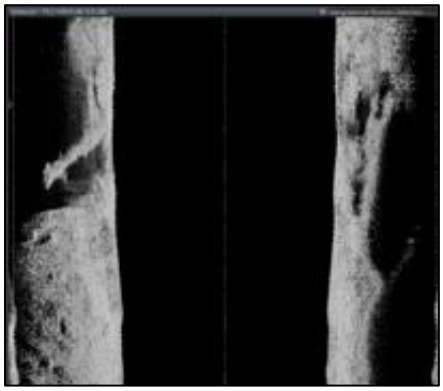
In this example, the fishing technique is Pelagic Trawling (PT).



Normlized and TS views from **SeapiX > Echogram**:

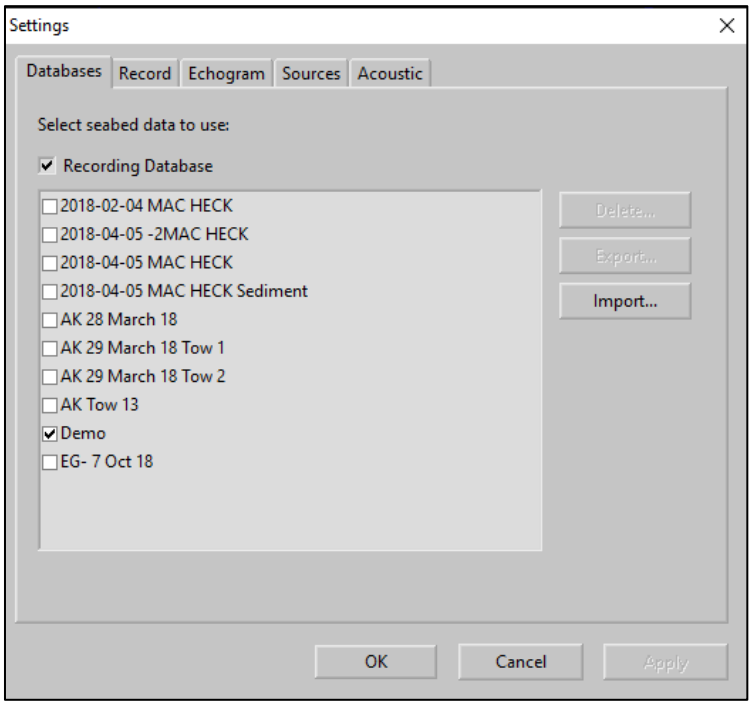


View from **SeapiX > Sidescan**:

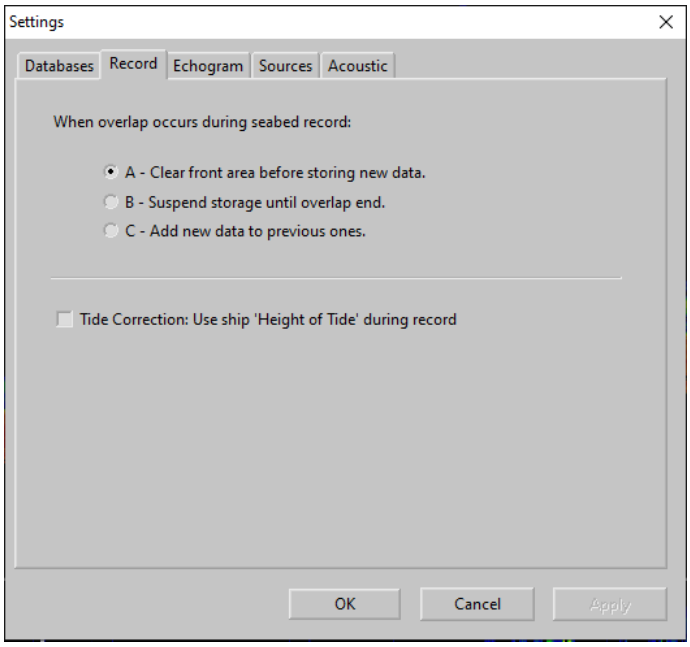


Views from **SeapiX > Settings**:

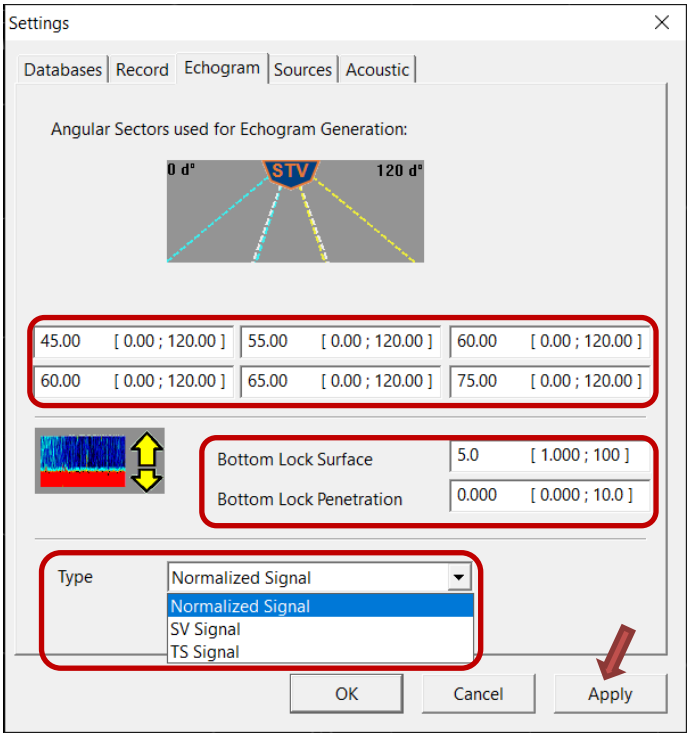
- **Databases** tab



- **Record** tab



- **Echogram** tab



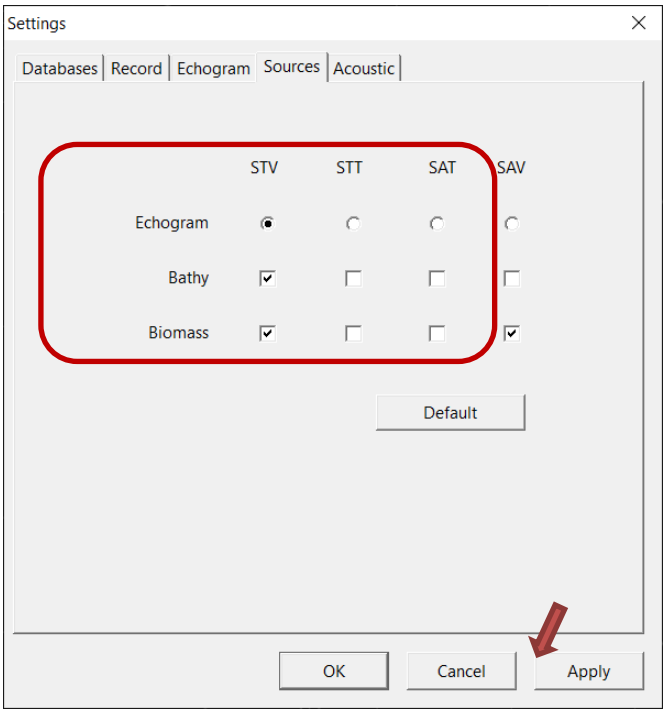
Echogram beam sectors can be adjusted from 1° to 120°; each beam opening angle can be set up individually.

Usually, Bottom Trawler (BT) has **Bottom Lock Surface** = 10 (i.e. 5 to 10m above the sea floor) with a **Bottom Lock Penetration** = 0.

The Processing Signal **Type** (Normalized, SV or TS Signal) can be set here.

Click **Apply**.

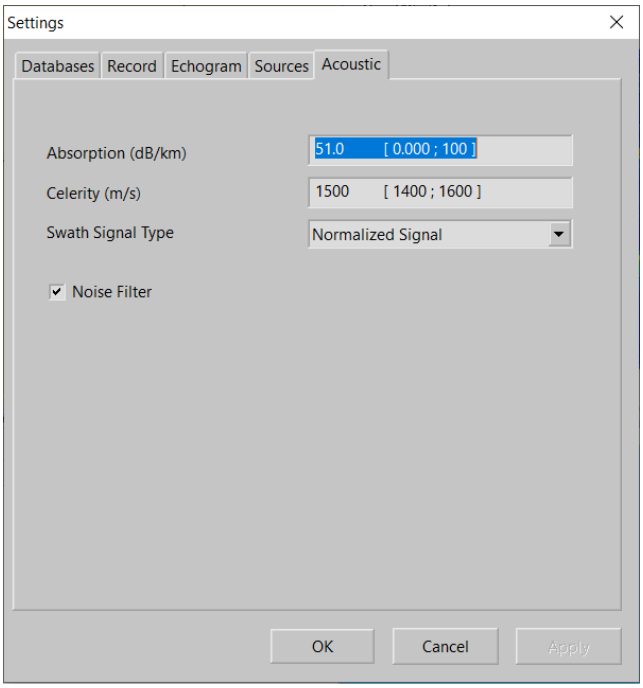
- **Sources** tab



Depending on your purpose, decide if building the echogram from STV, STT, SAT or SAV swath: click the corresponding radiobutton.

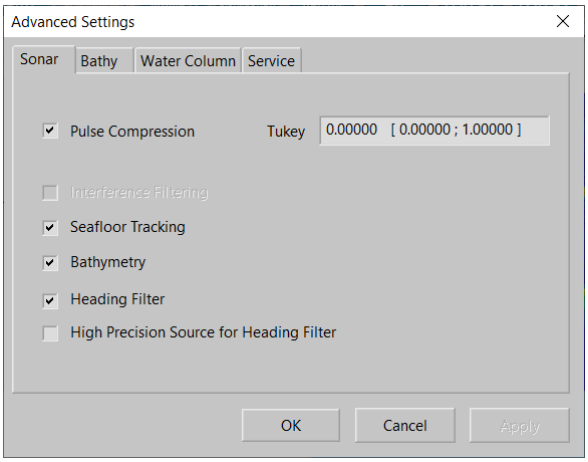
Click **Apply**.

- **Acoustic** tab

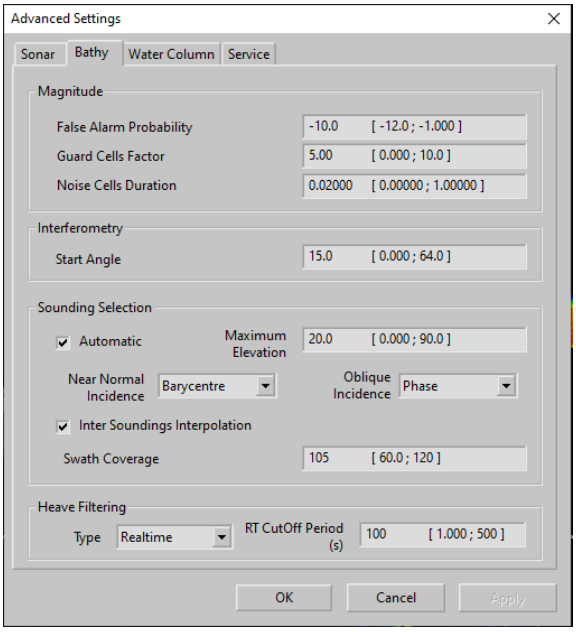


Views from **SeapiX > Advanced Settings...**:

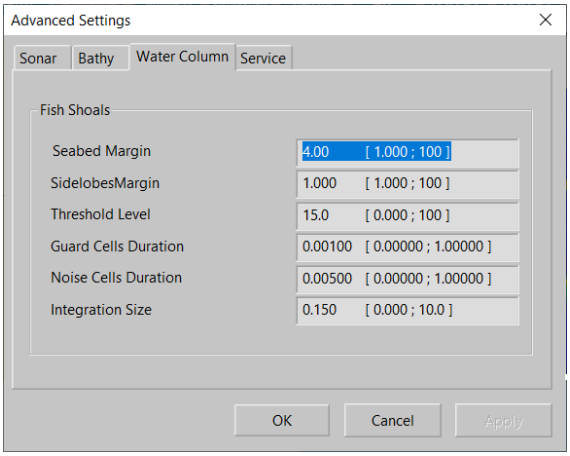
- **Sonar** tab



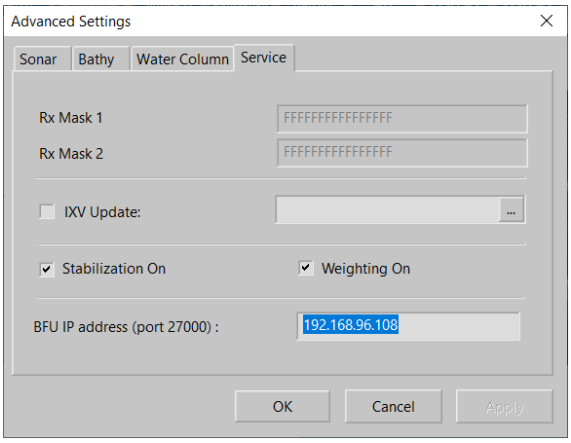
- **Bathy** tab



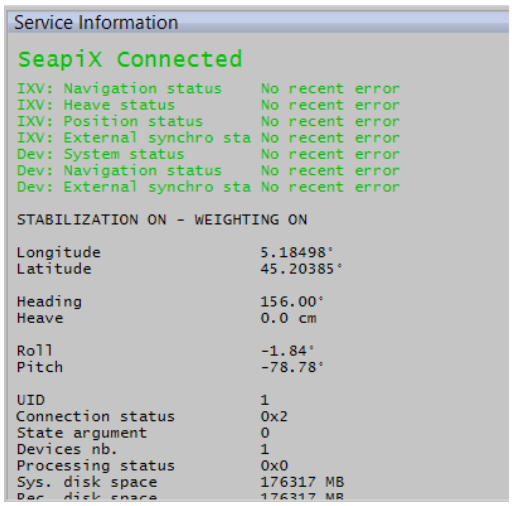
- **Water Column** tab

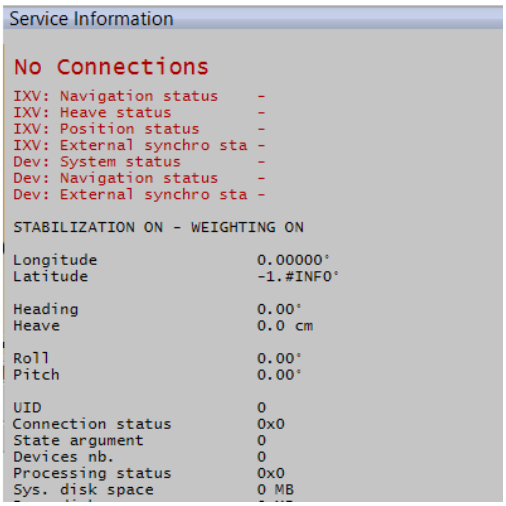


- **Service** tab



View from **SeapiX** > **Service Information**:

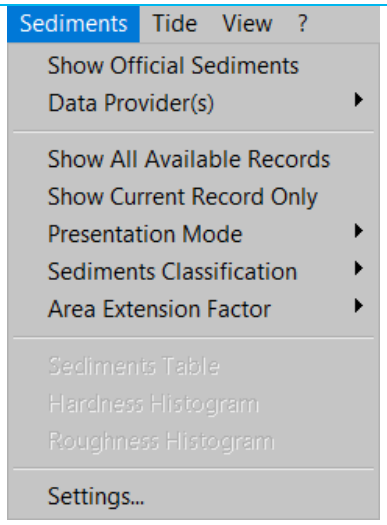




Any **No Connections** part showing in red invites you to check the BFU-VPU connection.

5.1.5.9 Sediments menu

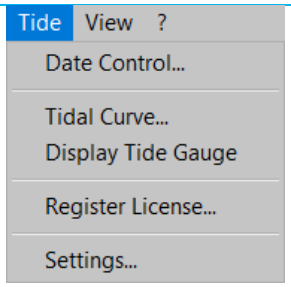
It has been designed to display or hide sedimentary zones (silt, sand, rock, gravel etc.) according to data from official maps or data acquired from the sounder you are using. This data can be displayed in the main 2D view as well as in the 3D view.



For any other information about this menu, refer to GECDIS User Manual that you can open from ? menu.

5.1.5.10 Tide menu

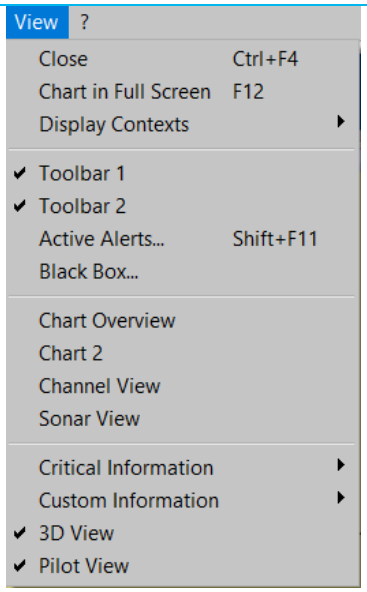
It displays tidal gauges and tidal streams.



For any other information about this menu, refer to GECDIS User Manual that you can open from ? menu.

5.1.5.11 View menu

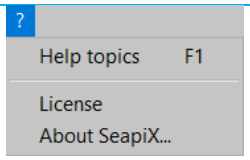
It lets you organize the views according to your needs.



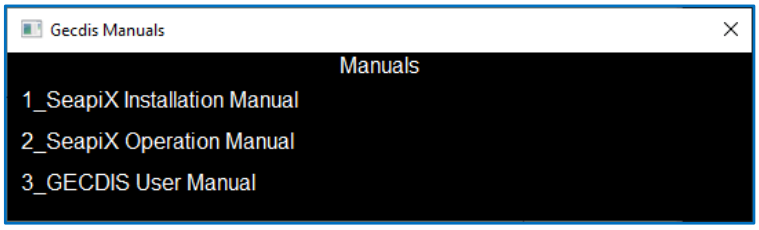
For any other information about this menu, refer to GECDIS User Manual that you can open from ? menu.

5.1.5.12 **?** menu

This is the information menu.



From Help topics F1, you can open **SeapiX Installation Manual** / **SeapiX Operation Manual** / **GECDIS User Manual**:



5.1.6 USEFUL SHORTCUTS

The following keyboard shortcuts can be used with SeapiX to work faster:

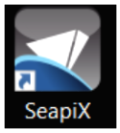
Press	To
F1	Access online help.
F2	Center on Own ship
Ctrl + F2	Skip to relative motion mode.
F3	Zoom up.
Ctrl + F3	Select the best scale.
F4	Zoom down.
Ctrl + F4	Close view that has focus (with the exception of the main view).
F5	Skip to North-up mode.
F6	Skip to Head-up mode.
F8	Create a Man Over Board event.
F9	Select the next color mode.
Shift + F9	Select the previous color mode.
F11	Acknowledge an alert.
Shift + F11	Show/Hide the alert menu.
F12	Maximize or restore the size of the main view.

Press	To
Enter	Validate (left click).
Ctrl	Switch between mouse centre or chart consultation modes.
/	Divide the zoom by 10.
*	Raise the zoom by 10.
-	Zoom down.
+	Zoom up.
Shift	Window zooms.
Shift + -	Reduce the window zoom.
Shift + +	Enlarge the window zoom.
Ctrl + Shift	Inverse the zoom window.
Print Screen SysRq	Print the main view.
← or → or ↑ or ↓	Move the mobile position of the relative motion.

5.2 Launching SeapiX Software then Transmitting

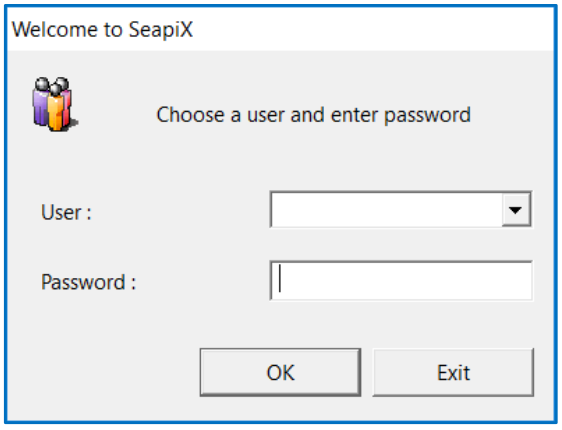
5.2.1 LAUNCHING SEAPIX SOFTWARE

1. From Windows® desktop on the VPU, double-click the **SeapiX** icon:



A start-up splash screen briefly shows (can be seen later on from the **Help** menu):

2. At first start, a **Welcome to SeapiX** window opens:



In the **User** field, select the user you want to log on from the list (Administrator, Captain, Guest, Navigator).
(Optional) In the **Password** field, enter a password.
Then click **OK**.

Note: If a password has been set - if different users can log on - you will go through this identification step each time you log on. In all other cases, this identification step will be ignored.

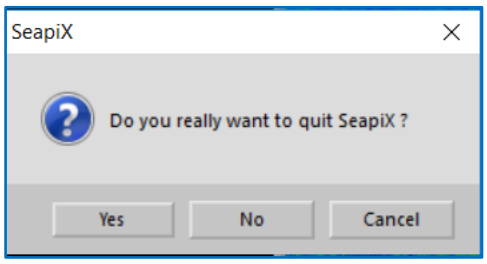
SeapiX program is now open.

5.2.2 STARTING-STOPPING SEAPIX TRANSMISSION

	If the START button is grey, it means that the sonar system is not ready to start – there is no communication with the antenna (SAU).
	If the START button is blue, it means that the sonar system is ready to start: click it to start pinging. If you need to pause, click it again.
	If the START button is blue but with a grey background, it means that the sonar system has been paused; click it to start pinging again (its background turns back light blue).

5.2.3 CLOSING SEAPIX SOFTWARE

1. From the main menu, click **System** and then **Exit**; a confirmation window opens:



2. Click **Yes**.
   Note: Before closing, the software saves all the parameters necessary to restart in the same state.

5.3 Performing Major Settings

5.3.1 Adjusting the Signal Gain in a Swath or an Echogram

SeapiX provides an exclusive Dual Gain control.

- The minimum sensitivity of targets to display can be set by Gain 1 (G1) command – weak signal (in dB).
- The maximum sensitivity of targets to display can be set by Gain 2 (G2) command – strong signal (in dB).

G1 and G2 are managed by fishermen in real time.

1. The following gain box shows:

   The selected gain has a light blue background.

2. Move the cursor in a view (swath or echogram): it has a yellow color and it lets you set G1.
3. Use the scroll wheel to adjust G1 gain (in dB).
4. Click to toggle from G1 to G2: the cursor turns red and lets you set G2.
5. Use the scroll wheel to adjust G2 gain (in dB).

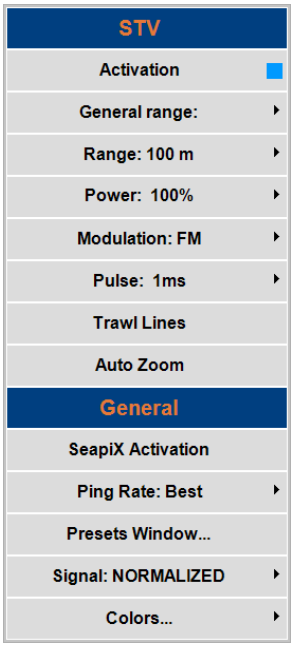
Note: Standard fishery setting range (with Normalized signal type) = 10 to 25 dB.

The last settings are memorized; if you quit SeapiX program then start again, the settings saved are restored.

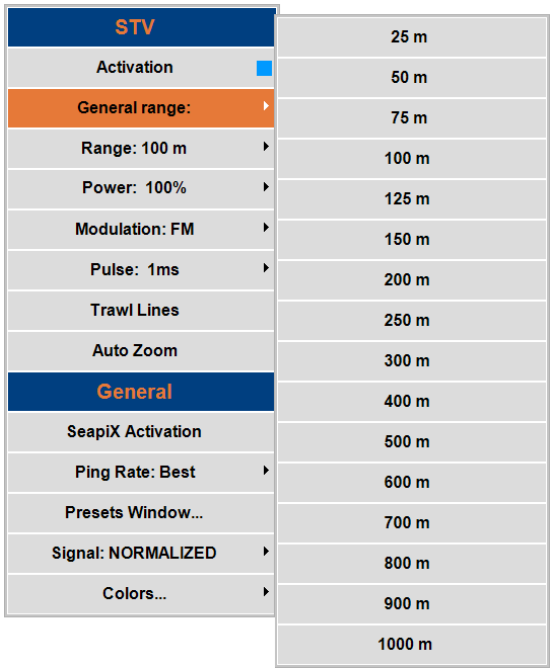
5.3.2 CHOOSING THE RANGE

1. From vertical **Toolbar 2**, click any of the mode buttons (STV, STT, ...).

2. Move the cursor to the swath view and right click; the following menu shows up:



3. Select **General range**: a sub-menu opens to let you select the sonar range to be used for all modes.

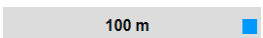


Please note that selecting a range here is different from selecting a button 

to 

which includes a whole set of parameters.

4. The selected range – e.g. 100m – is now visible:

- on the menu 

and in all the views 

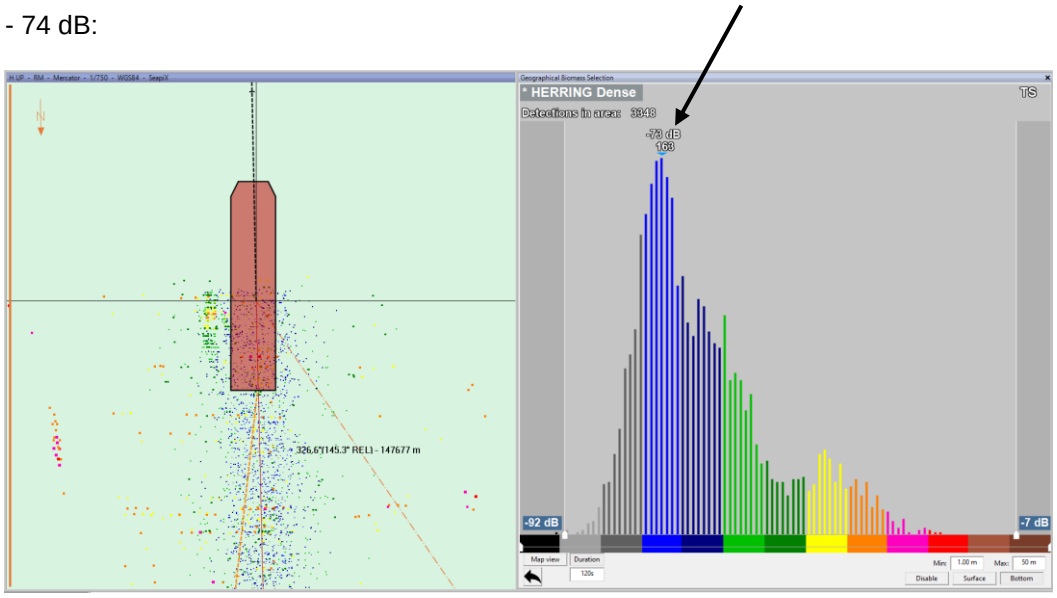
.

5.3.3 CLASSIFYING FISH AND USING THE CLASSES

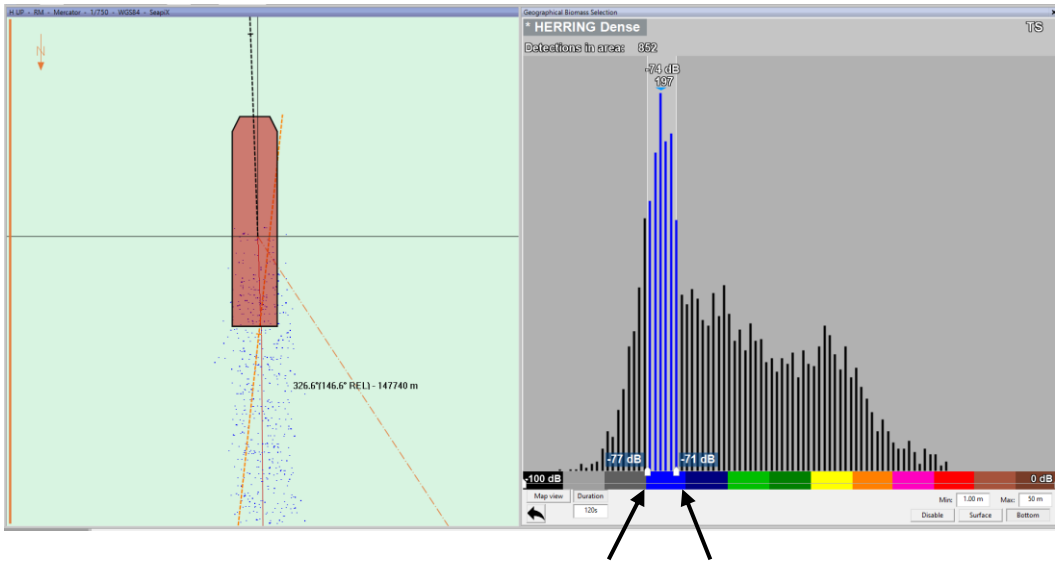
Thanks to its Single Echo Detector SED algorithm, SeapiX extracts water column particles and biomass targets, and displays it in 2D & 3D views. Water column back scatter tool computes the distribution related to the 2D area & layer selection. The operator can map and analyse the water column.

As a prerequisite, set the filters before locating the biomass:

1. From the Histogram box, locate the significant highest peak of biomass.
   In that example, very small pelagic biomass is located close to the surface, responding - 74 dB:

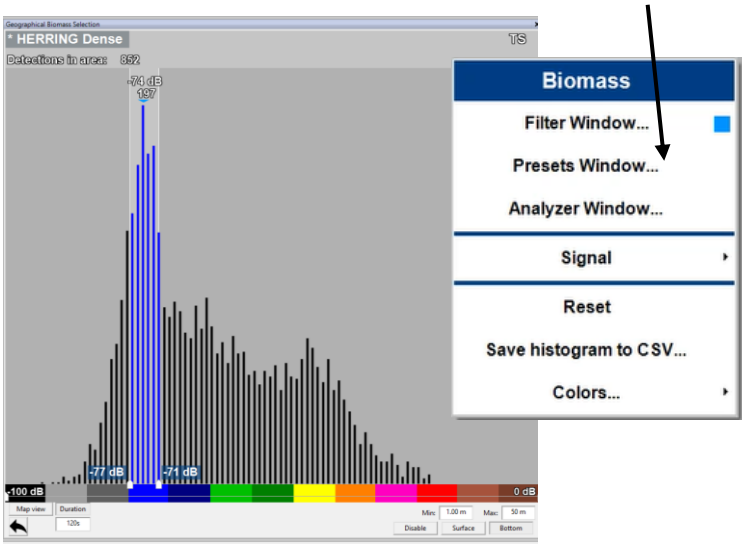


2. Select the mean peak by moving lower/higher threshold cursor:

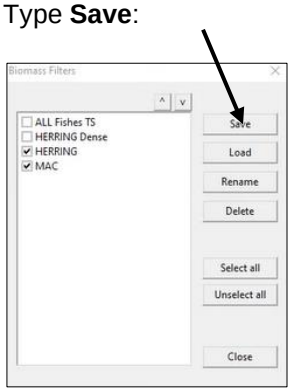


Move the ‘lower limit’ cursor at Peak value minus 3dB and move the ‘higher limit’ cursor at Peak value + 3dB.

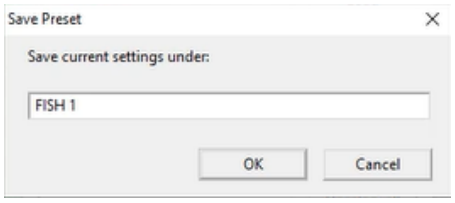
3. Right-click in the Histogram box then click **Presets Window**:



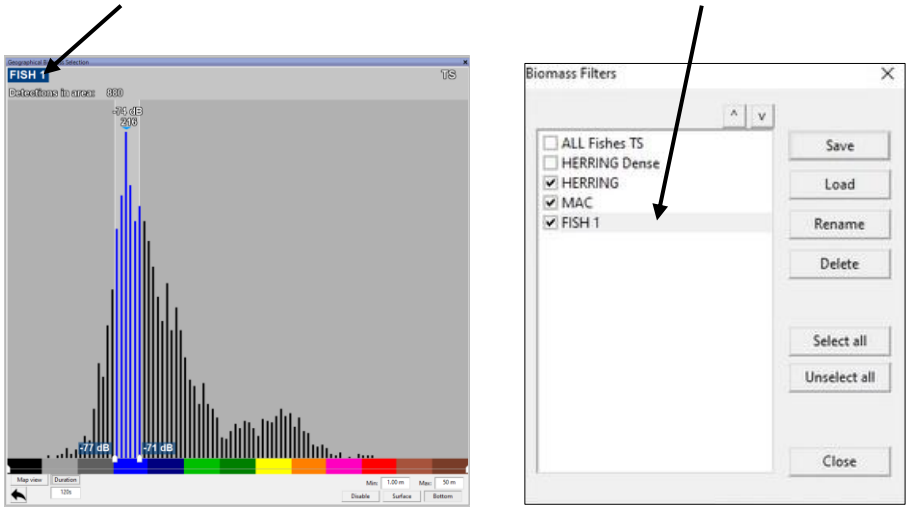
4. Type **Save**:



5. Edit the Fish name:



6. A new fish class is now created and available in the selection box:



Important

Please note that 3 to 4 trawl hits are necessary to classify. You must bring in fish, examine it then record it.

To add a button corresponding to the new class on the horizontal toolbar, follow the process described in 5.1.4.2 Toolbars & Buttons Customization.

5.3.3.1 Calling an existing class

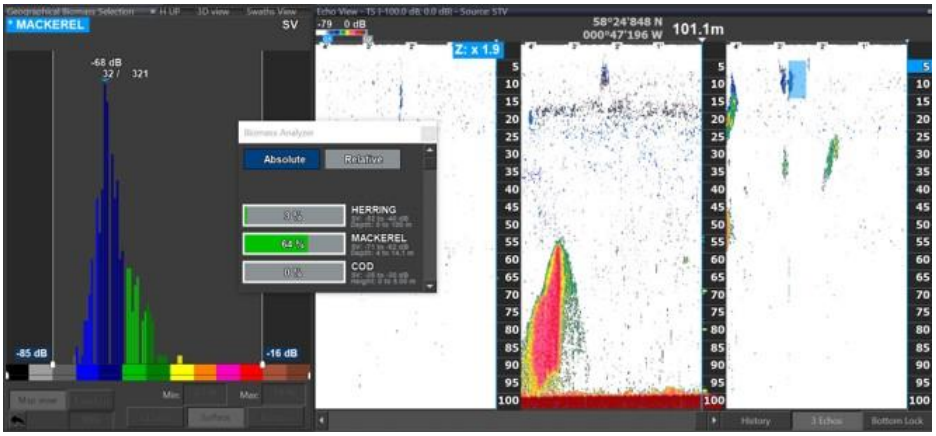
1. Click DISTRIBUTION to open the **Geographical Biomass Selection** view.
2. Click one of the pre-configured classes:

   ALL to display the full spectrum and **all the fish** with their acoustic responses, or

   FISH #1 to display the fish from the **pelagic layer**, or

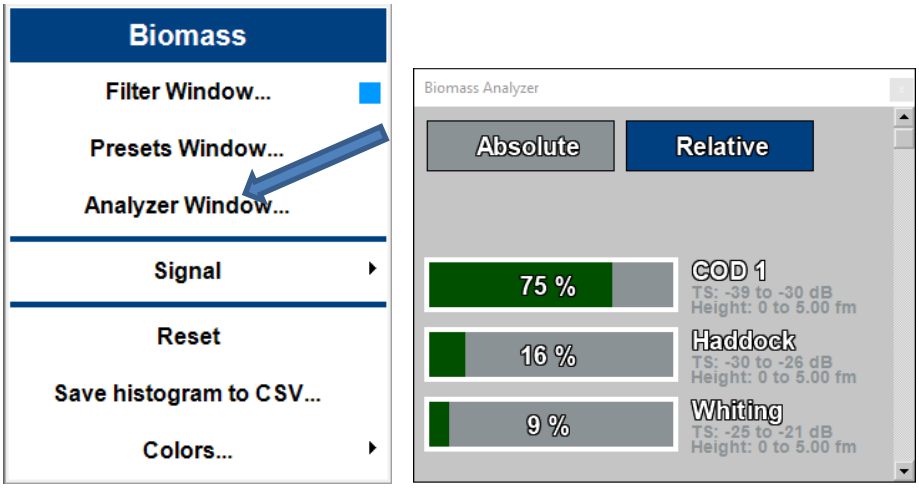
   FISH #2 to display the fish from the **bottom layer**.

   Toggle between all existing classes – the 3 pre-configured ones and any other customized classes.
3. Click BIOMASS to map the biomass – show fish detections - on the 2D/3D view.
4. Below is an example of a **pelagic layer** view with fish distribution in the histogram:



5.3.3.2 Using the Biomass Analyzer

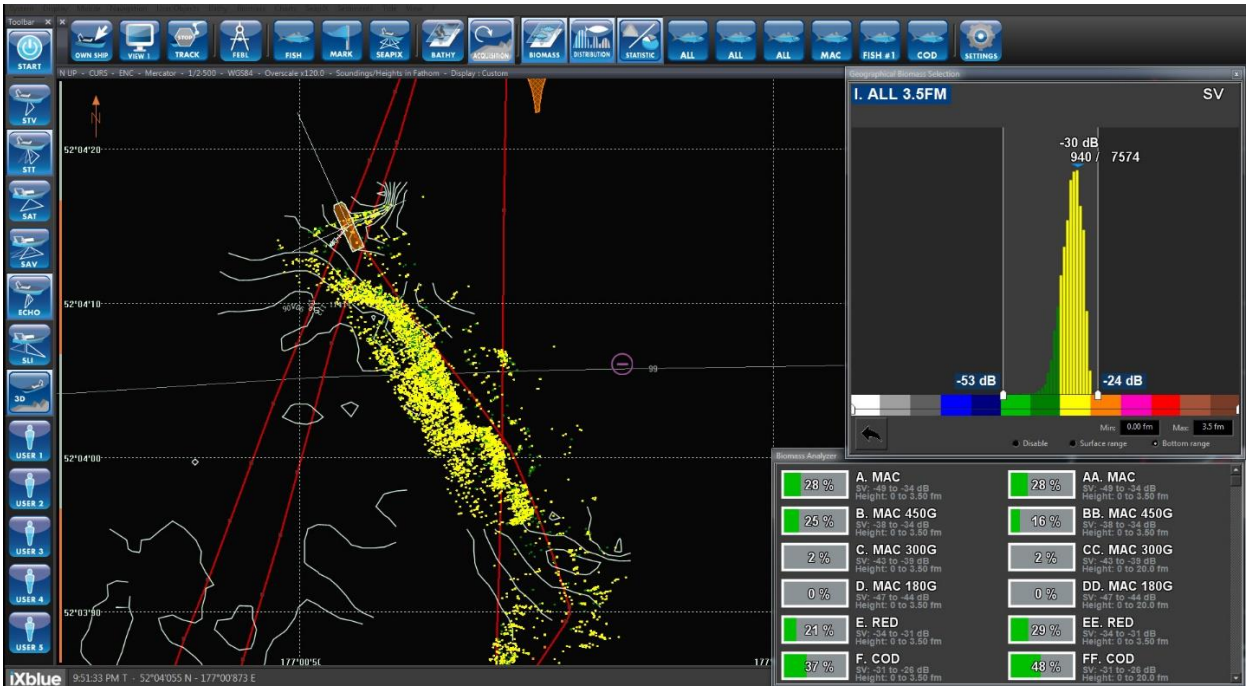
From the **Geographical Biomass Selection** view, right-click to display the **Biomass** menu then click **Analyzer window**:



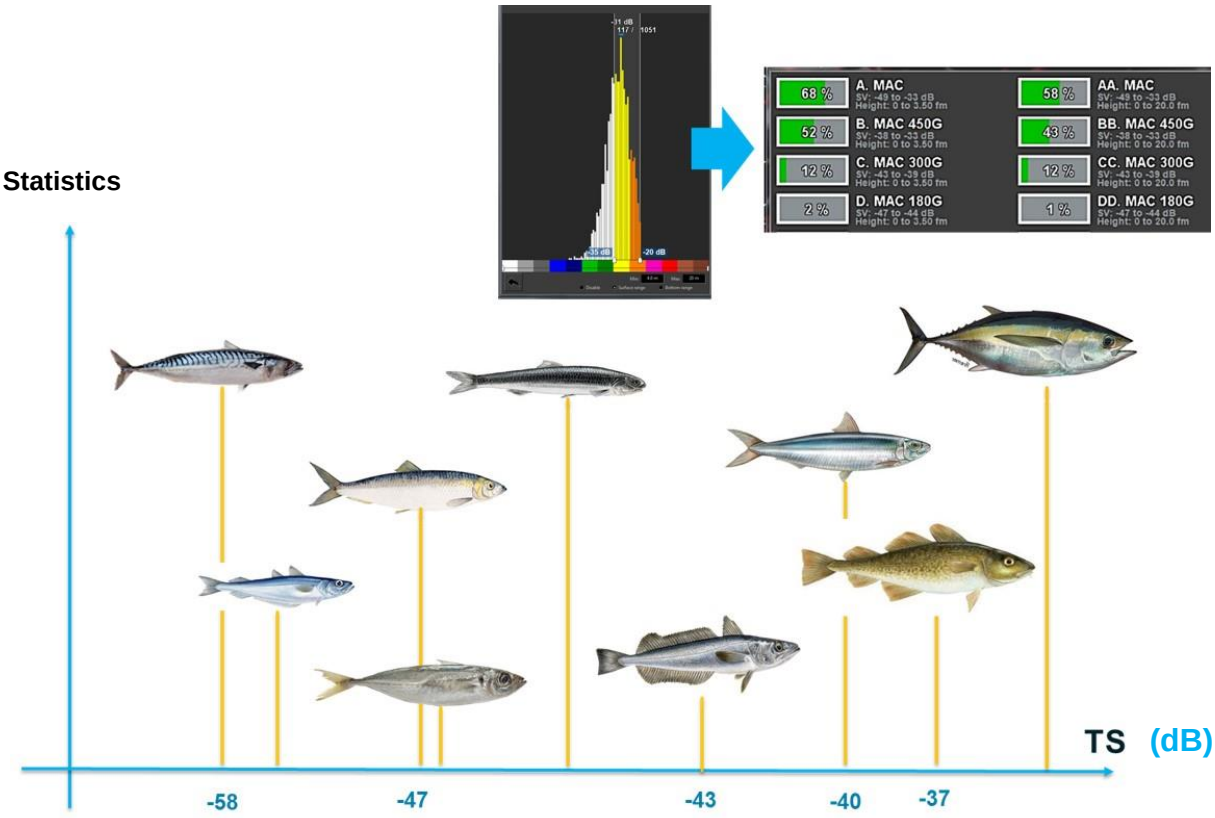
As in the example above, you can see the ratio of each class from the **Biomass Analyzer**.

And you can set class data as absolute or relative: 

.



Example of a view showing the shoal, its histogram and its ratio



Example of a statistic view showing the fish species

5.4 Using SeapiX according to Fishing Technique

This part explains how to use SeapiX software efficiently: select the right settings according to each fishing technique.

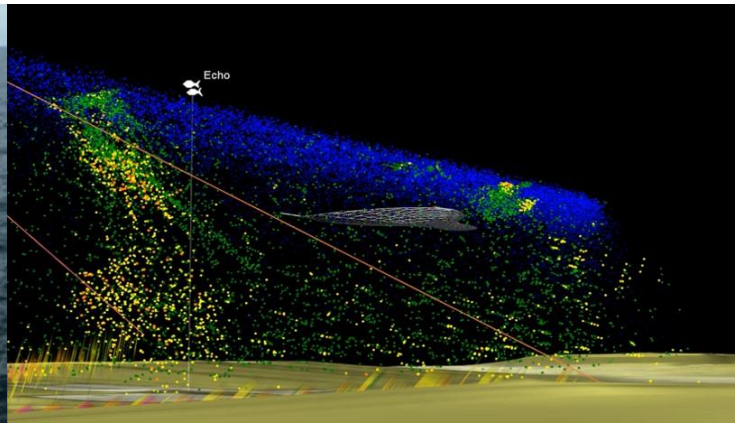
It highligths the correlation between the fishing technique and SeapiX settings (range, modulation, power, tilt angle, min-max-step tilt, echogram sectors, signal type, gain, color palette and bathy).

4 fishing techniques have been chosen:

- Pelagic Trawling (PT) (see 5.4.1)
- Bottom Trawling (BT) (see 5.4.2)
- Purse Seining (PS) (see 5.4.3)
- Tuna Seining (TS) (see 5.4.4).

User settings proposed as default factory have been set up according to your fishing method: see buttons 25m to 400m on vertical **Toolbar 2.**
If you need to change fishing methods, see ***SeapiX Installation Manual***
(can be opened from SeapiX software, ? menu).

5.4.1 How to Set & Use SeapiX for Pelagic Trawling

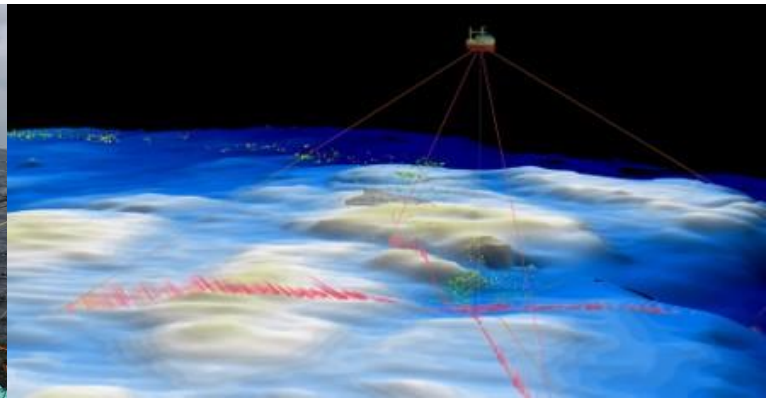


Here is the list of preferred settings to define before starting pelagic trawling fishery.

	Range (m)	Sonar mode	Modulation CW or FM	Pulse length (m)	Power (%)	Tilt angle (°)	Tilt (°) min ; max	Step (°)	Echogram sectors (°)			Sources		
									1 (left)	2 (center)	3 (right)	Echo.	Bathy	Bio.
25m	25	STV	CW	0,1	50	90	-	-	10; 60	50; 70	60; 110	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	CW	0,1	50	-	-85; +85	2	-	-	-			✔
50m	50	STV	CW	0,1	50	90	-	-	10; 60	50; 70	60; 110	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	CW	0,1	50	-	-85; +85	2	-	-	-			✔
100m	100	STV	FM	2	100	90	-	-	10; 60	50; 70	60; 110	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	FM	2	100	-	-85; +85	2	-	-	-			✔
200m	200	STV	FM	2	100	90	-	-	10; 60	50; 70	60; 110	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	FM	2	100	-	-85; +85	2	-	-	-			✔
300m	300	STV	FM	2	100	90	-	-	10; 60	50; 70	60; 110	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	FM	2	100	-	-85; +85	2	-	-	-			✔
400m	400	STV	FM	5	100	90	-	-	10; 60	50; 70	60; 110	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	FM	5	100	-	-85; +85	2	-	-	-			✔

Gain from Swaths (dB)				Gain from Echograms (dB)				**Pelagic Trawling** preferred settings
Signal	G1	G2	Color Palette	Signal	G1	G2	Color Palette	
SV	-80	0	S1	SV	-80	0	S1	

5.4.2 How to Set & Use SeapiX for Bottom Trawling

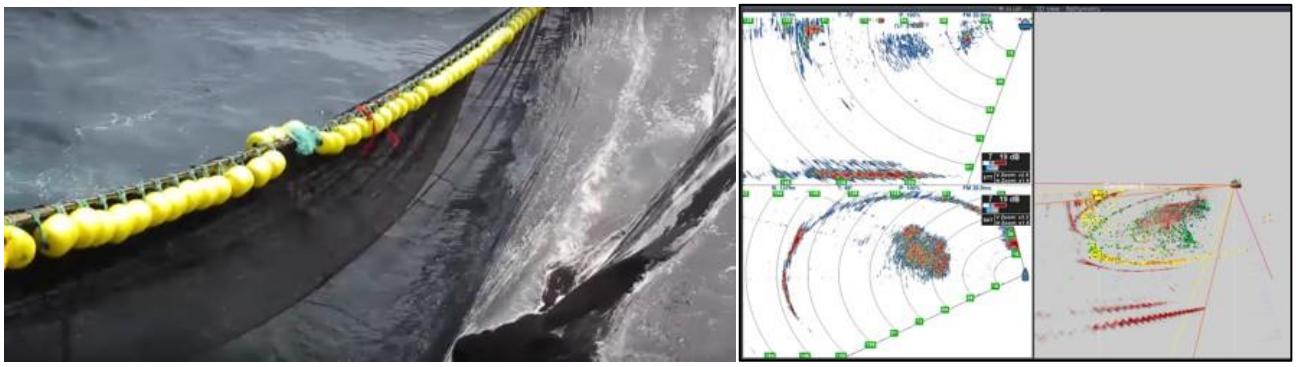



Here is the list of preferred settings for Bottom Trawling fishery.

	Range (m)	Sonar mode	Modulation CW or FM	Pulse length (m)	Power (%)	Tilt angle (°)	Tilt (°) min ; max	Step (°)	Echogram sectors (°)			Sources		
									1 (left)	2 (center)	3 (right)	Echo.	Bathy	Bio.
25m	25	STV	CW	0,1	25	90			45; 60	55; 65	60; 75	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	CW	0,1	25		-87; +87	1	45; 60	55; 65	60; 75			✔
50m	50	STV	CW	0,1	25	90			45; 60	55; 65	60; 75	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	CW	0,1	25		-87; +87	1	45; 60	55; 65	60; 75			✔
100m	100	STV	CW	0,5	50	90			45; 60	55; 65	60; 75	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	CW	0,5	50		-87; +87	1	45; 60	55; 65	60; 75			✔
200m	200	STV	CW	1	100	90			45; 60	55; 65	60; 75	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	CW	1	100		-87; +87	1	45; 60	55; 65	60; 75			✔
300m	300	STV	CW	1	100	90			50; 60	56; 64	60; 70	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV	CW	1	100		-87; +87	1	50; 60	56; 64	60; 70			✔
400m	400	STV	CW	2	100	90			50; 60	56; 64	60; 70	✔	✔	✔
		STT	-	-	-	-	-	-	-	-	-			
		SAT	-	-	-	-	-	-	-	-	-			
		SAV												✔

Gain from Swaths (dB)				Gain from Echograms (dB)				**Bottom Trawling** preferred settings
Signal	G1	G2	Color Palette	Signal	G1	G2	Color Palette	
TS	-65	0	S1	TS	-65	0	S1	

5.4.3 How to Set & Use SeapiX for Purse Seining

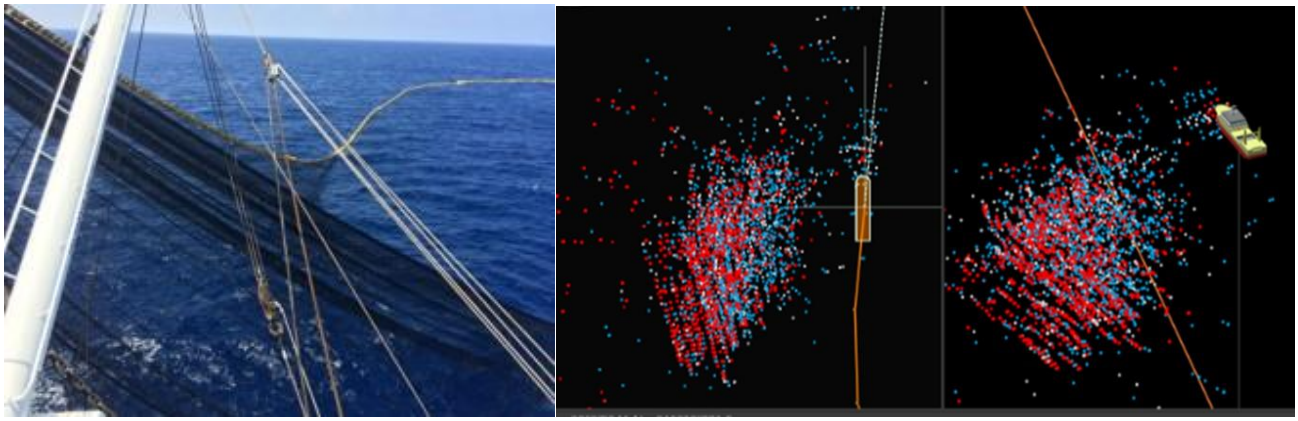


Here is the list of preferred settings to define before starting purse seining fishery.

	Range (m)	Sonar mode	Modulation CW or FM	Pulse length (m)	Power (%)	Tilt angle (°)	Tilt (°) min ; max	Step (°)	Echogram sectors (°)			Sources		
									1 (left)	2 (center)	3 (right)	Echo.	Bathy	Bio.
25m	25	STV	FM	1	25	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	1	25	-80	-	-	-	-	-			✔
		SAT	FM	1	25	+85	-	-	-	-	-			✔
		SAV	FM	1	25	-	-68 ; +83	2	-	-	-			✔
50m	50	STV	FM	2	50	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	2	50	-80	-	-	-	-	-			✔
		SAT	FM	2	50	+85	-	-	-	-	-			✔
		SAV	FM	2	50	-	-68 ; +83	2	-	-	-			✔
100m	100	STV	FM	10	75	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	10	75	-80	-	-	-	-	-			✔
		SAT	FM	10	75	+85	-	-	-	-	-			✔
		SAV	FM	10	75	-	-68 ; +83	2	-	-	-			✔
200m	200	STV	FM	20	100	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	20	100	-80	-	-	-	-	-			✔
		SAT	FM	20	100	+85	-	-	-	-	-			✔
		SAV	FM	20	100	-	-68 ; +83	2	-	-	-			✔
300m	300	STV	FM	20	100	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	20	100	-80	-	-	-	-	-			✔
		SAT	FM	20	100	+85	-	-	-	-	-			✔
		SAV	FM	20	100	-	-68 ; +83	2	-	-	-			✔
400m	400	STV	FM	20	100	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	20	100	-80	-	-	-	-	-			✔
		SAT	FM	20	100	+85	-	-	-	-	-			✔
		SAV	FM	20	100	-	-68 ; +83	2	-	-	-			✔

Gain from Swaths (dB)				Gain from Echograms (dB)				
Signal	G1	G2	Color Palette	Signal	G1	G2	Color Palette	**Purse Seining** preferred settings
Normal-ized	12	22	S1	Normal-ized	12	22	S1	

5.4.4 How to Set & Use SeapiX for Tuna Seining



Here is the list of preferred settings to define before starting tuna seining fishery:

	Range (m)	Sonar mode	Modulation CW or FM	Pulse length (m)	Power (%)	Tilt angle (°)	Tilt (°) min ; max	Step (°)	Echogram sectors (°)			Sources		
									1 (left)	2 (center)	3 (right)	Echo.	Bathy	Bio.
25m	25	STV	FM	1	25	c	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	1	25	-80	-	-	-	-	-			✔
		SAT	FM	1	25	+85	-	-	-	-	-			✔
		SAV	FM	1	25	-	-68 ; +83	2	-	-	-			✔
50m	50	STV	FM	1	50	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	1	50	-80	-	-	-	-	-			✔
		SAT	FM	1	50	+85	-	-	-	-	-			✔
		SAV	FM	1	50	-	-68 ; +83	2	-	-	-			✔
100m	100	STV	FM	10	75	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	10	75	-80	-	-	-	-	-			✔
		SAT	FM	10	75	+85	-	-	-	-	-			✔
		SAV	FM	10	75	-	-68 ; +83	2	-	-	-			✔
200m	200	STV	FM	20	100	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	20	100	-80	-	-	-	-	-			✔
		SAT	FM	20	100	+85	-	-	-	-	-			✔
		SAV	FM	20	100	-	-68 ; +83	2	-	-	-			✔
300m	300	STV	FM	20	100	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	20	100	-80	-	-	-	-	-			✔
		SAT	FM	20	100	+85	-	-	-	-	-			✔
		SAV	FM	20	100	-	-68 ; +83	2	-	-	-			✔
400m	400	STV	FM	20	100	-	-	-	42 / 50	50 / 70	70 / 110	✔	✔	✔
		STT	FM	20	100	-80	-	-	-	-	-			✔
		SAT	FM	20	100	+85	-	-	-	-	-			✔
		SAV	FM	20	100	-	-68 ; +83	2	-	-	-			✔

Gain from Swaths (dB)				Gain from Echograms (dB)				**Tuna Seining** preferred settings
Signal	G1	G2	Color Palette	Signal	G1	G2	Color Palette	
Normal-ized	12	22	S1	Normal-ized	12	22	S1	

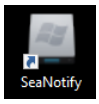
5.5 Recording and Replaying Raw Data

Prerequisite: external disk(s) - USB or SATA format - must have been installed on the BFU and SeaNotify application must have been installed on the VPU.

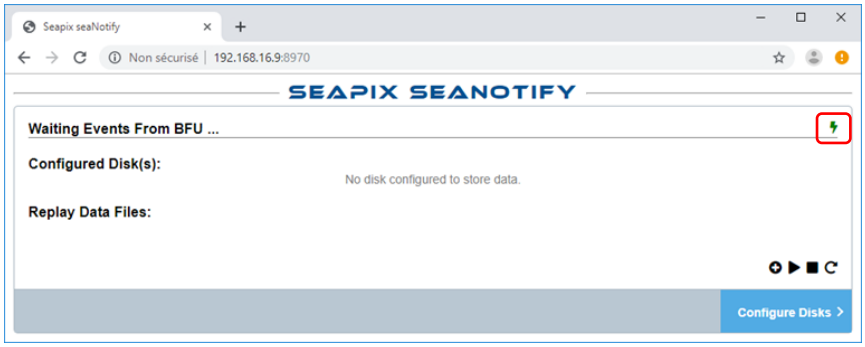
Important

This operating procedure is run outside SeapiX software.
Before Recording or Replaying data on an external disk, you must configure the disk.

5.5.1 CONFIGURING A DISK

1. From Windows® desktop on the VPU, double-click 

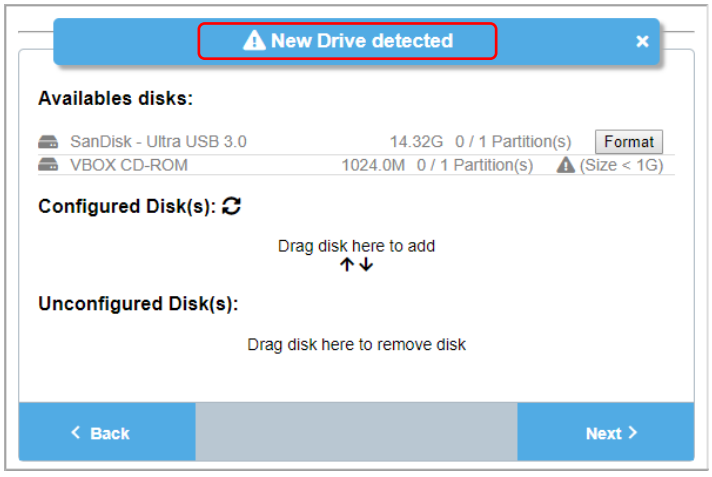
to launch SeaNotify; the following window opens:



Note: The BFU connection status must be  (connected).

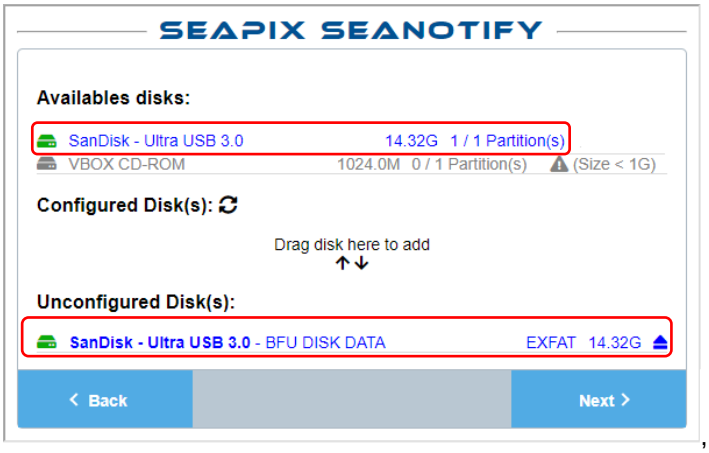
 (not connected) usually indicates an issue in the BFU.

2. When a new disk (USB or SATA format) is detected, you get the following message:

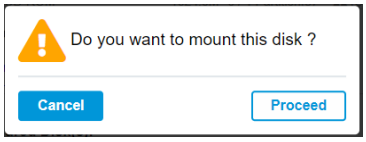


Caution: Do not take the risk to click **Format** in front of a disk!

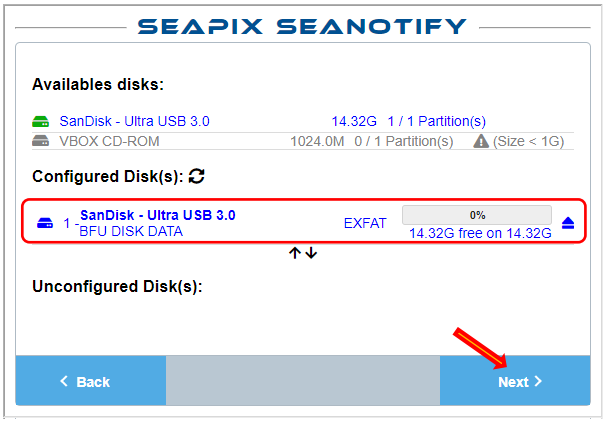
3. When the disk you want to use shows in green and its potential partitions appear in the **Unconfigured Disk(s)** list,



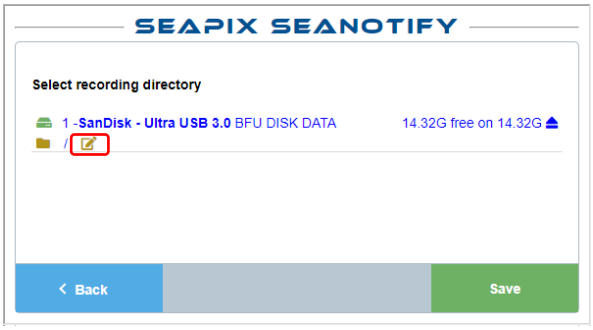
drag and drop the partition to the **Configured Disk(s)** list:

4. Mount the disk by clicking ⏏ and when 

shows up, click **Proceed** to see the mounted disk :



5. Click **Next** and the directory configuration page appears:



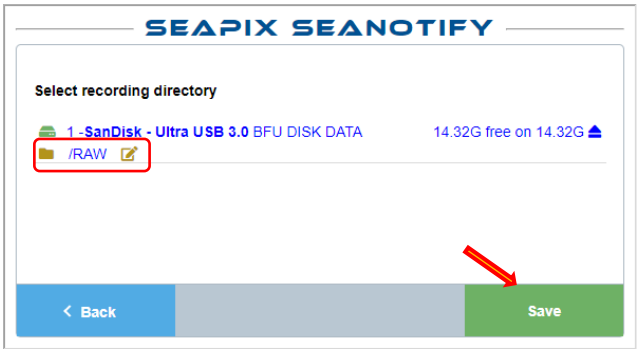
6. Click  to change the default directory (root) ; the configuration window shows up:

7. Click **Add** and give a name to the new directory – e.g. RAW: 

then click **Proceed**.

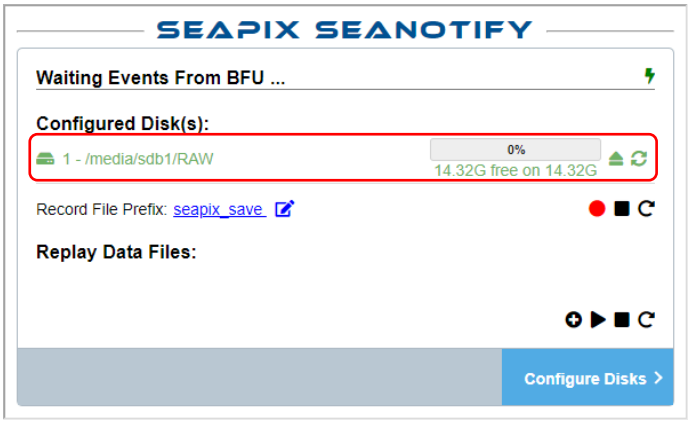
8. **RAW** directory now shows up and you can click **Use selected**:

9. The recording directory on the disk is now **/RAW**; click **Save**:



and confirm: 

10. The main page now shows up: your disk is ready to record SeapiX data



5.5.2 RECORDING RAW DATA

The table below shows necessary information to record Raw Data:

1	Order in the disk list. The disk listed as #1 will be used for the recording
Record File Prefix: myRecordings	Configuration of the recording file name. A timestamp will be added at the end of this name. For example, myRecordings_1561983037.dat
●	Start recording. It blinks when a record is running
■	Stop recording

During a recording, the following display appears instead of the Record File Prefix text:

/media/sdb1/RAW_DATA/myRecordings_1561983037.dat 46.3M

It indicates the Raw Data file path, name and size (its size is growing while recording).

5.5.3 REPLAYING RAW DATA

You can add Raw Data file(s) to be replayed and manage the replay:

The table below shows necessary information to replay Raw Data:

⋮	Moves a recording up and down the list (turns blue when movable)
⬬	Recording not being read

	Recording being read
/media/sdb1/RAW_DATA/myRecordings_1561983267.dat	Recording path
280.4M	Recording size (growing while reading)
	Removes recording from the Replay list
 Apply all	Reading/Not reading all recordings (turns green when reading)
	Opens the browser to add recording files
	Starts replaying files, from the first on the list
	Pauses replaying
	Stops replaying
	Keeps replaying (endless loop)

Important

Before unplugging the disk from the VPU

When configuring or recording or replaying is over, click  to unmount the disk. Once the disk has been unmounted, you can unplug it from the BFU.

6 Preventive Maintenance

The tables below summarize when and how the different items of the SeapiX system shall be maintained – with typical values.

Important

Please note that harsh environmental conditions can increase the maintenance tasks and shorten the periodicity.

Caution: Always perform the maintenance tasks requested. Otherwise, it could impact the SeapiX operation as well as its warranty.

SAU ANTENNA CLEANING

Place	Periodicity	Time needed	Maintenance task
Dry dock	Every year	2 hours needed	Clean the SAU front face using vinegar-type liquid and a scraper: remove seaweeds, shells, ... Caution While scraping the stainless-steel part, be careful when approaching the cross - clean it carefully as the black rubber part is fragile.

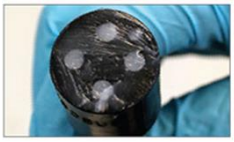
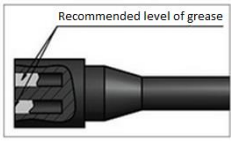
ANODES

Place	Periodicity	Time needed	Maintenance task
Dry dock or Underwater	Every 6 months	5 mn to check, 2 hours to change	Inspect the anodes and change them if necessary Check the witness anode on the SAU front face: • if its integrity is > 30%: no action. • if it is worn out (integrity ≤ 30%), change the witness anode then change the anode located on the rear side of the SAU: > Take new anodes from the spare parts. [witness anode] [main anode] > Unscrew each anode. > Replace it by a new one. > Screw it again.

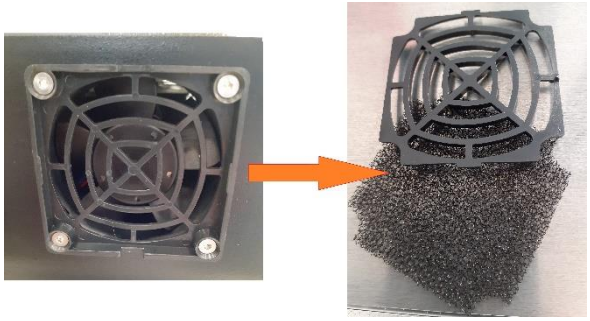
ANTIFOULING

Place	Periodicity	Time needed	Maintenance task
Dry dock	At commissio-ning then at every dry docking		Apply antifouling *Gummipaint A/F 6435*  (.153 white, or .714 grey, or .708 black). • Degrease the SAU surface to be treated with an appropriate solvent or detergent (e.g. *Detersil™*); if necessary, sand down using abrasive paper P150-180 (or G150), apply primer on all the surface then blow with fresh and dry air. • Mix the antifouling for a few minutes to have a complete homogeneity. • Apply the antifouling (4 coats recommended, at least 8h. overcoating interval) by: > Brush. Dilute it with *Thinner 6380* up to 5-10% in volume. Brush it by making horizontal strokes with a uniform and constant thickness. > Spray. Dilute it with *Thinner 6380* between 20-30% in volume. Spray it. Wait at least 24 hours before launching the SAU.

SAU ANTENNA AND TRANSDUCER CABLE

Place	Periodicity	Time needed	Maintenance task
Dry dock or Underwater	Every time the transducer cable is disconnected from the SAU		If SAU maintenance operation with transducer cable disconnection: • Grease the connectors with *Molykote 44 Medium* (or *Novagard Versilube G624*) before mating. A layer of grease corresponding to approximately 1/3 of the socket depth should be applied to the female connector. All sockets should be completely sealed, and a transparent layer of grease left visible on the connector face.   • After greasing, fully mate the male and female connectors and remove any excess grease from the connector joint.

ITU

Place	Periodicity	Time needed	Maintenance task
Aboard the vessel, in a dedicated sonar room or in a technical room	Every 3 months	10 min.	Clean the filter on the ITU front face: • unclip and remove the filter cover.  • Remove the filter and dust it with a brush. • Clip the cover.
		5 min.	Check the control-command DE-9 connection on the ITU rear face: tighten the screws if loosened.

BFU

Place	Periodicity	Time needed	Maintenance task
Aboard the vessel, on the bridge	Every 3 months	10 min.	Clean the filter on the BFU front face: • unclip and slide the filter cover.  • Remove the filter and dust it with a brush. • Slide and clip the cover.
		5 min.	Check the control-command DE-9 connection on the ITU rear face: tighten it if loose screws.

VPU

Place	Periodicity	Time needed	Maintenance task
Aboard the vessel,on the bridge	Every 3 months	5 min.	• Clean the VPU front face with a soft cloth.
		5 min.	• Check the connections on the VPU rear face.

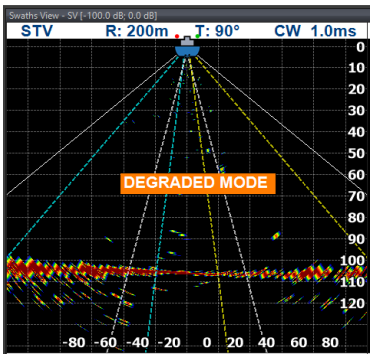
7 Troubleshooting

If you encounter a problem when using SeapiX, please refer to the following table:

Problem	Possible cause	Solution
SeapiX Software does not start correctly.	SeapiX VPU dongle is not connected.	1. Connect SeapiX VPU dongle. It may take a few minutes for the driver to install. 2. If it still doesn't work, try another USB port.
	The license files are not correctly set.	If you updated your software recently, check that you have copied the license files in the new software installation folder.
SeapiX Software **Start** button  is not available (appears in grey and is not clickable).	**BFU-VPU connection problem:**	From **SeapiX** menu, click **Service Information** item: **No Connections** lines show up.
	• The Ethernet link between VPU and BFU is broken.	1. Check that the BFU is powered. 2. Check that the BFU LAN board is connected to the VPU: it shall be blinking. 3. Check that the Ethernet cable between VPU and BFU is connected. 4. Reset the BFU.
	• The BFU system has encountered a fatal error.	1. Reset the BFU. 2. If it is still not working, connect a screen at the rear of the BFU for error and status monitoring.

Problem	Possible cause	Solution
	Problem other than BFU-VPU connection:	From **SeapiX** menu, click **Service Information** item: no **No Connections** lines show up.
	• The Ethernet link between BFU and SAU is broken.	1. Check that the ITU is powered and that the blue LED is ON. 2. Check the Ethernet cable between ITU and BFU. 3. Check the transducer cable connection into the ITU. 4. Reset the BFU.
	• The SAU does not start	1. Check that the ITU is powered and that the blue LED is ON. 2. Check that the current meter is showing a consuming device. If any doubt, restart the ITU – you shall see a 10A peak consumption a few seconds after startup.
SeapiX Software **Start** button is blue but SeapiX is not pinging.	SeapiX is set in slave mode and does not receive TTL signal.	1. If slave mode is expected, check the signal entering the ITU. 2. If slave mode is not desired, refer to **SeapiX Configuration** in the ***Installation Manual***.

Problem	Possible cause	Solution
The ITU (blue) LED does not light up.	The ITU main switch is off.	Turn on the ITU main switch: 
	The BFU is off.	Power on the BFU.
	The control-command cable is not correctly plugged in or wired. This can be tested by switching on the ITU MAINTENANCE ONLY button:  If the ITU (blue) LED lights up, the problem is related to the control-command link.	If the control-command cable is new and has never been tested, check its pinout. If the cable was working before, check its ITU and BFU connections and check its integrity: you should get a +12VDC voltage between pin 9 and pin 1.
	The ITU internal AC/DC power supply is faulty.	Contact iXblue Support.
The Echogram is not showing progression.	The Echogram is set in History mode.	Click the **History** button (it shall be unselected for the echogram to be in real time configuration).
	The selected swath is not pinging.	Open swaths view and activate the swath or change echogram source.
The Bathymetry map is not generated.	The Range setting is not sufficient.	Increase the swath range.
	The Pulse Power setting is too low.	Increase the swath pulse power.
	The selected Bathymetry swaths sources are not pinging.	Check the bathymetry sources in **Seapix** > **Settings** > **Sources**
	The system is in degraded mode - as can be seen on display:	Refer to **SeapiX Configuration** in the ***Installation Manual***.

Problem	Possible cause	Solution
		
	The Bathymetry display is set to OFF.	Click the  button.
	The Acquisition is not selected.	Click the  button.
	The map is not well centered.	Click the  button.
	Bathymetry data from SeapiX is not selected.	Check **SeapiX** box from **Bathy**>**Bathy Data** menu.
	The seabed is too deep.	Verify that the expected depth is not out of SeapiX specifications.
No biomass data is shown.	Biomass data is not selected.	Click the  button.
	The selected Biomass swaths sources are not pinging.	Check the sources of biomass in **Seapix** > **Settings** > **Source**
	The 2D chart is not displaying in the biomass data location.	Center or zoom out the 2D view in order to display the Biomass location.
	The filters are not set correctly.	Check the applied filters in the distribution window accessible by clicking  (TS/SV range, layers depths)

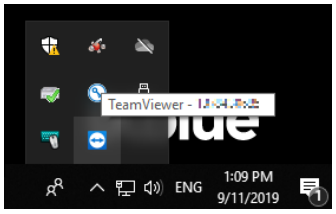
If you cannot solve the problem, please contact either your SeapiX retailer/dealer or IXblue Support – Preferably through TeamViewer (see Support through TeamViewer).

8 Support through TeamViewer

iXblue Support is available through **TeamViewer**. Free of charge, this service has been installed on your SeapiX VPU. Your ID and password have been recorded by iXblue Support.

if you need iXblue support, you can directly use **TeamViewer** interface and follow the process:

1. From Windows® desktop on the VPU, go to the notification area and click the **TeamViewer** icon:



2. The Host interface opens:

As you can see, your ID and password (blurred here for confidentiality reasons) automatically show up.

Have a look at the lower part of the window:

If Ready to connect (secure connection) shows up, as in the example above, click **Help me**.

If Not ready. Please check your connection shows up, it means that no internet connection is available: you will have to fix it. When it is ready, click **Help me**.

3. The **Get help** window opens:

After entering your name (blurred here for confidentiality reasons), fill in the **Description** field as follows:

- Vessel's name / TeamViewer ID
- Email address / Telephone number
- Description of the problem.

4. Click **Request support**.

Important

At step **3**, fill in the **Description** field completely to ensure you will be contacted soon by iXblue support team.

A APPENDIX

A.1 FAO List of species

To see the 924 aquatic species listed by the FAO, go to the FAO website: http://www.fao.org/figis/geoserver/factsheets/species.html

The list starts with:

Acadian redfish - *Sebastes fasciatus - Scorpaenidae - SCORPAENIFORMES - REN*
Actinopyga lecanora - *Actinopyga lecanora - Holothuriidae - HOLOTHUROIDEA - YVV*
Adriatic sturgeon - *Acipenser naccarii - Acipenseridae - ACIPENSERIFORMES - AAA*
Aesop shrimp - *Pandalus montagui - Pandalidae - NATANTIA - AES*
African angelshark - *Squatina africana - Squatinidae - Squatiniformes - SUF*
African blackspot threadfin - *Polydactylus malagasyensis - Polynemidae - PERCOIDEI - QSK*
African cuttlefish - *Sepia bertheloti - Sepiidae - CEPHALOPODA - EJB*
African frilled shark - *Chlamydoselachus africana - Chlamydoselachidae - HEXANCHIFORMES - HWR*
African lanternshark - *Etmopterus polli - Squalidae - SQUALIFORMES - ETT*
African pygmy skate - *Neoraja stehmanni - Rajidae - RAJIFORMES - RNS*
African sawtail catshark - *Galeus polli - Scyliorhinidae - CARCHARHINIFORMES - GAQ*
African spotted catshark - *Holohalaelurus punctatus - Scyliorhinidae - CARCHARHINIFORMES - HOP*
African squid - *Alloteuthis africana - Loliginidae - CEPHALOPODA - OUK*
Akiami paste shrimp - *Acetes japonicus - Sergestidae - NATANTIA - AKS*

and ends with:

Witch flounder - *Glyptocephalus cynoglossus - Pleuronectidae - PLEURONECTIFORMES - WIT*
Yangtze sturgeon - *Acipenser dabryanus - Acipenseridae - ACIPENSERIFORMES - AAD*
Yellow bobo - *Polydactylus opercularis - Polynemidae - PERCOIDEI - ODP*
Yellow croaker - *Larimichthys polyactis - Sciaenidae - PERCOIDEI - CRY*
Yellow striped flounder - *Pseudopleuronectes herzenst. - Pleuronectidae - PLEURONECTIFORMES - YFL*
Yellowfin sole - *Limanda aspera - Pleuronectidae - PLEURONECTIFORMES - YES*
Yellowfin tuna - *Thunnus albacares - Scombridae - SCOMBROIDEI - YFT*
Yellownose skate - *Zearaja chilensis - Rajidae - RAJIFORMES - DPV*
Yellowspotted catshark - *Scyliorhinus capensis - Scyliorhinidae - CARCHARHINIFORMES - SYP*
Yellowstripe scad - *Selaroides leptolepis - Carangidae - PERCOIDEI - TRY*
Yellowthread threadfin - *Filimanus xanthonema - Polynemidae - PERCOIDEI - QRW*
Zanzibar cuttlefish - *Sepia zanzibarica - Sepiidae - CEPHALOPODA - WUZ*
Zebra bullhead shark - *Heterodontus zebra - Heterodontidae - HETERODONTIFORMES - HEZ*
Zebra shark - *Stegostoma fasciatum - Stegostomatidae - ORECTOLOBIFORMES - OSF*

You can scan its QR code:

iXblue CONTACT - SUPPORT

For non-URGENT support:

- by email: support@ixblue.com or ix-support-seapix@ixblue.com
- using the form on the iXblue web site: www.ixblue.com

For 24/7 URGENT SUPPORT:

- North America / NORAM
  +1 617 861 4589
- Europe Middle-East Africa Latin America / EMEA-LATAM
  +33 1 30 08 98 98
- Asia Pacific / APAC
  +65 6747 7027

iXblue CONTACT – SALES

- by email: fishery.sales@ixblue.com
- contacting one of SeapiX authorized retailers and dealers listed on iXblue web site: www.ixblue.com, FISHERY menu

North America / NORAM

- +1 800 727 2828
  iXblue Inc.
  1580 Lincoln Street, Suite 860, Denver, CO 80203, USA

Europe Middle-East Africa Latin-America / EMEA-LATAM

- +33 1 30 08 88 88
  iXblue SAS France
  34, rue de la Croix de Fer, CS 70121, 78100 Saint-Germain-En-Laye Cedex, France

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- +65 6747 4912
  iXblue Pte Limited Singapore
  15A Changi Business Park Central 1 Eightrium #04-02 Singapore 486035