



FMF-900

OPERATOR'S MANUAL

Cutting-edge technology

Both engineering and the development of new technologies have been applied for the creation of an trustful echosounder, capable of working in extreme conditions. FMF Series is a an equipment product line designed for the present challenges that professional fisheries has to face.

The echosounder presents a brand new software, that includes a friendly graphic interface and helps to simplify its own use. These new graphic equipment applied to the software development allows to reflect a screen resolution that achieve even 4K.

The union of the Split beam technology with the chirp pulse technique allows to identify smaller measurable echoes with a better resolution, resulting in a better size statistics. Trawl mid water fishing and purse-seine fishing are specially improved with these features.

FMF Series also includes '+Power' echosounder, which allows to combine different channels in one transducer helping to achieve a high transmission capability. It also includes the '+Mixer', this new concept brings to the user the possibility of creating new mixes of different frequencies and different frequency ranges.

Furthermore, the new '+Acoustic Sign' tool helps to understand the way that every echo develops in different frequency ranges, showing the results as a distinctive curve, this tool in conjunction with the echogram and environment data helps to identify user's own objective. It is apparent that the echosounder is a key implement, created for professional fishers, that focus on sustainability through different methods oriented towards selectivity.

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Echosounder window

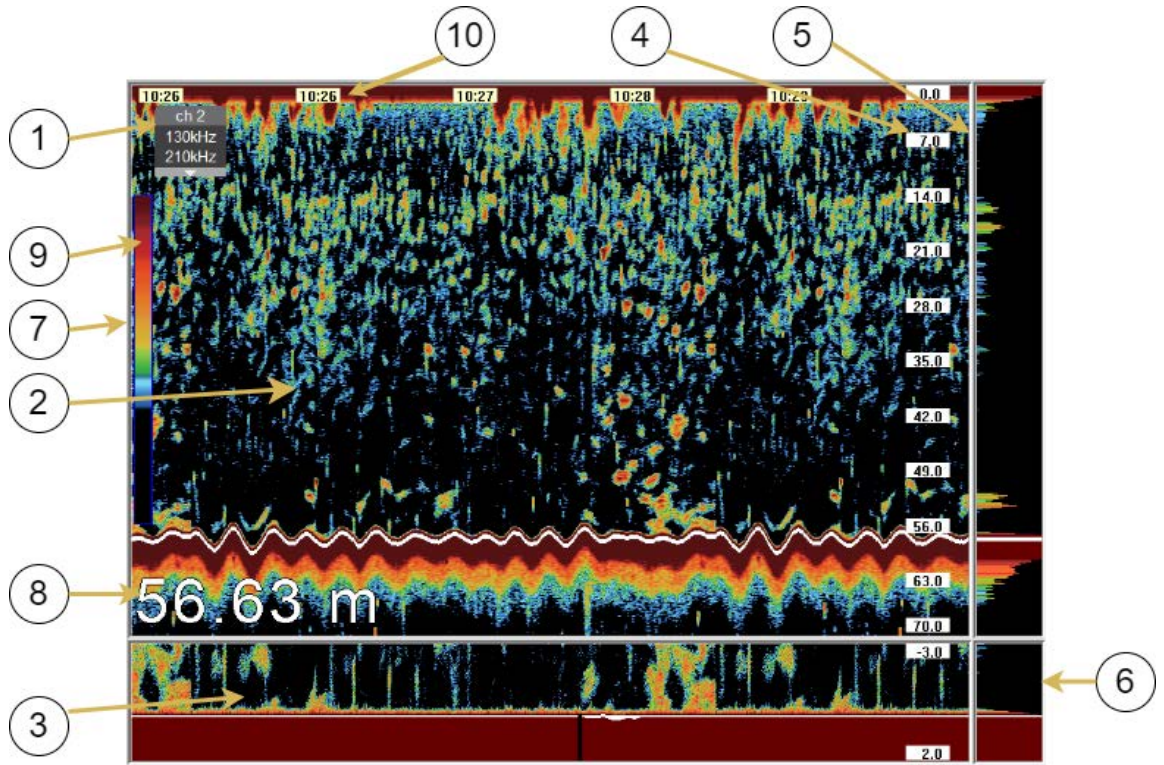


Figure 1: Echosounder window

Each of the components of this window (see [Figure 1](#)) is explained in each of the following sections:

1 Echosounder settings menu



Figure 2: Echosounder settings channel 1 CW

When clicking the menu button, the next window will show up:

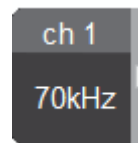


Figure 3: Echosounder settings menu

In this menu you can perform all graphic and functional adjustments of the echosounder. Clicking on the button "more", the second part of the menu will be opened. The change of each control can be done by clicking the buttons < and > or by rotating the mouse wheel up and down. In some cases, depending on the area of the button where you spin the wheel, the action will correspond to the tens, hundreds or thousands units.

1.1 Level



Figure 4: Level menu

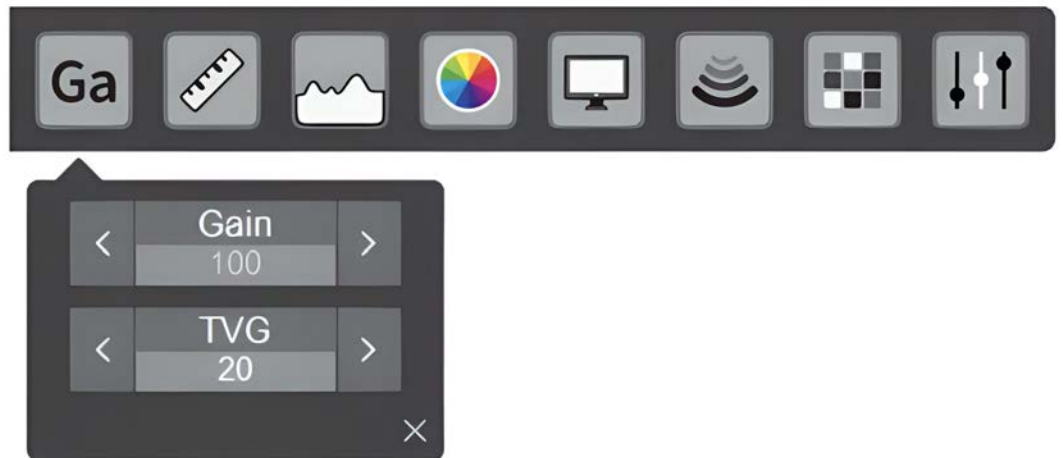


Figure 5: Level submenu

1.1.1 Gain



Figure 6: Gain view from the menu

Gain can be adjusted over a range of 0-240. This highest value corresponds to the higher sensitivity of the echosounder. By varying this control, all data shown on the screen is modified, allowing the user to reprocess acquired data in the past with the new gain setting. The same control can be adjusted by turning the mouse wheel on the plotted screen.

1.1.2 TVG



Figure 7: TVG view from the menu

The TVG is signal compensation that removes transmission loss effects from echosounder data. Transmission loss is two-way and is due to acoustic beam spreading and absorption in the acoustic medium. TVG adjustment is set manually on a 0-40 range dB.

TVG is an attenuation control that varies logarithmically with respect to depth in a dB scale. The adjustment range of this control is between 0-40 dB. The highest value corresponds to the correct value of compensation for an ultrasonic propagated pulse in water. Lower values of TVG can be used when echoes are larger and saturate in excess the image on screen. For example, a big shoal of anchovy..

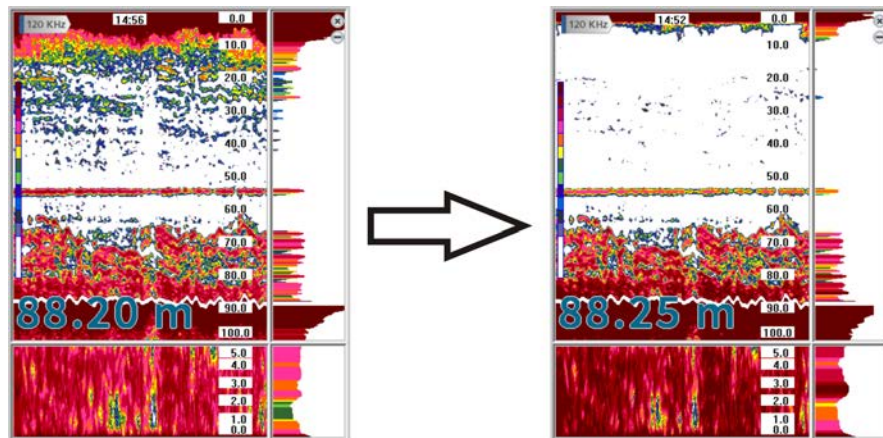


Figure 8: (a)TVG=20

(b) TVG=40

Figure 9: Echosounder's view (a) TVG=20 (b) TVG=40

TVG compensates propagation loss of ultrasonic energy. Similar echoes from the energy perspective, will represent the same colors in the screen. TVG is also useful for superficial noise suppression.

1.2 Scale



Figure 10: Scale menu

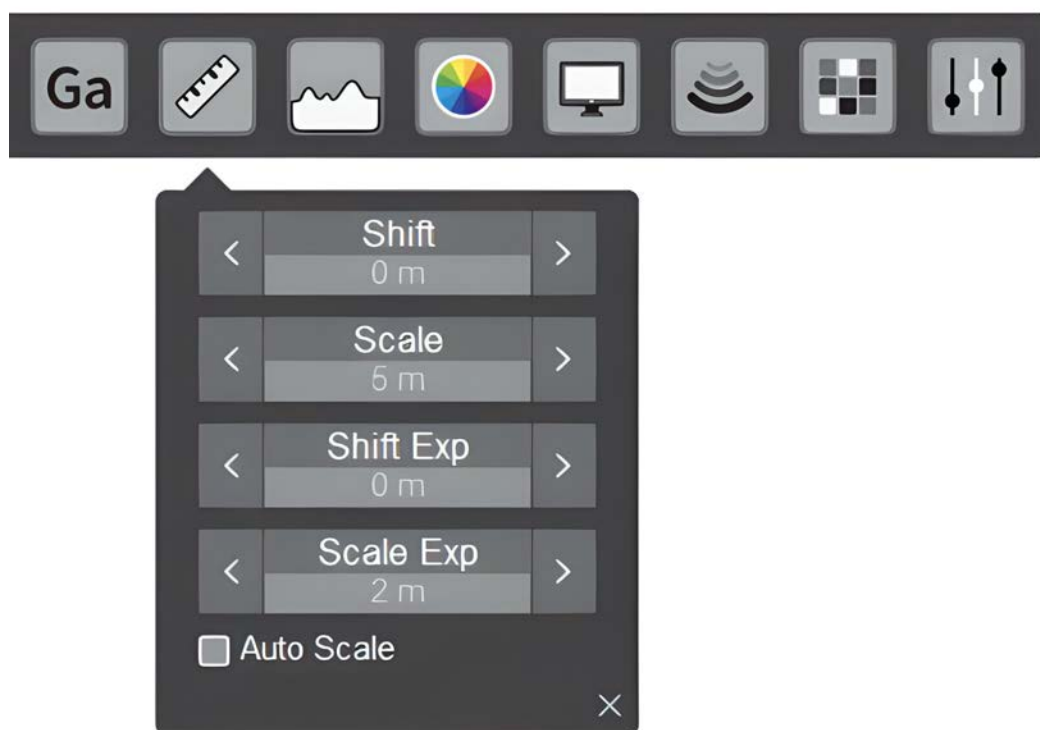


Figure 11: Scale submenu

1.2.1 Zero shift

The zero offset control, sets the beginning of plotting in the vertical scale selected in control unit (see section [1.8.1](#)).

This allows the user to start the plotting area in a different area respect to the surface, such as mid-water.

1.2.2 Scale



Figure 12: Scale's view from the menu

This control adjusts the maximum depth to be represent from a minimum of 5m to 6000m. The selected scale corresponds to the largest depth possible to reach. If there is a zero shift, the scope of the sounder will be equal to the displacement plus the scale. Example: If a zero offset of 10m and a scale of 30m are configured, the maximum range is 40m.

1.2.3 Zero shift expander

The zero-shift expander adjust the beginning of plotting in the measure unit selected (see section [1.8.1](#)).

This allows the user to start the plotting area in a different area from the detected bottom.

1.2.4 Expander scale

This control adjusts the maximum expander scale (see section [1.8.1](#)). If there is any displacement, the expander range will be equal to the scale plus the displacement.

1.2.5 Automatic scale

The automatic scale shown in [Figure 11](#) allows the automatic adjustment of the plotting bottom.

1.3 Bottom



Figure 13: Bottom menu



Figure 14: Bottom submenu

1.3.1 White line



Figure 15: White line view from the menu

White line control allows the user to adjust the point to be taken as sea bottom from the maximum acquired signal. Here the amount of dB signal corresponds to the signal below maximum point.

If the white line is drawn on the transmission pulse it means that there are no echoes that reach minimum power required for considering it as valid bottom. Otherwise, when the white line is mounted on a school, the white line should be decreased until it exceeds such strength signal.

If the white line is not properly draw on the bottom, the depth indicator will show the “-” meaning that the bottom wasn’t found.

Setting values for the white line are:

- WL No Draw: white line it is not shown on screen, but bottom depth could be found automatically
- WL Auto: white line works in automatic mode and it is shown on screen.
- 2-200: white line works in manual mode and it is shown on screen

1.3.2 Bottom search

From the echosounder menu is possible to set up a determined region for a faster bottom search, this function can be enabled going to the window's box on bottom search settings (see [Figure 16](#)). It is also necessary to set up the minimum and maximum depth value. The minimum difference between both of them is the echosounder minimum scale (5 m). The maximum scale of the echosounder will be the result of the maximum value between the graphic scale on the screen and the bottom search setting, in case the last one is already enabled.

If the mentioned function is not enabled, the bottom search will be done as it is shown on the echosounder scale. For scale value until 50 m, the beginning of the search is considered starting on a 10% value of the currently using scale. For a scale value over 50 m, the beginning of the bottom search is considered starting on 6m (20 ft or 3.3 ftm approximately). This tool is especially appropriate in cases where it is required to midwater fishing without losing the location of the bottom. If we do not enable this option, the bottom will only be searched in the scale shown on the screen.

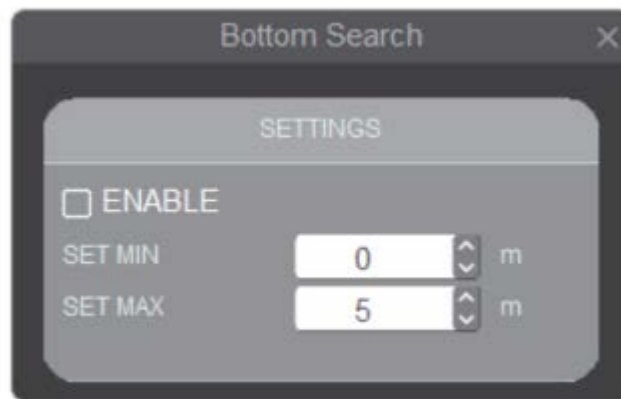


Figure 16: Bottom search settings window

1.3.3 Bottom expander

The bottom echo expander will be enabled clicking the option seen on [Figure 14](#) (see section [3.1](#)), with this option the echoes that are above from the bottom line will be draw according to the bottom expander scale that it is adjusted.

1.3.4 Variable Expander

As choosing the option seen in [Figure 14](#) the bottom expander will be replaced for the scale section that the user wants to enlarge, for example Mid-water (see section [3.2](#)).

1.3.5 Depth indicator

As clicking the depth indicator option of [Figure 14](#) this indicator will be shown on the left inferior corner of the canal screen. This indicator has three different sizes that will be changeable if you click on it.

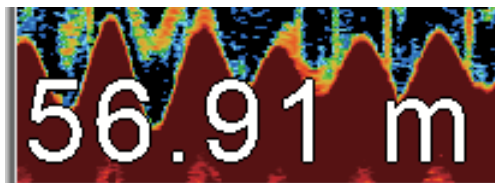


Figure 17: Depth indicator visualization

1.4 Colors



Figure 18: Color menu

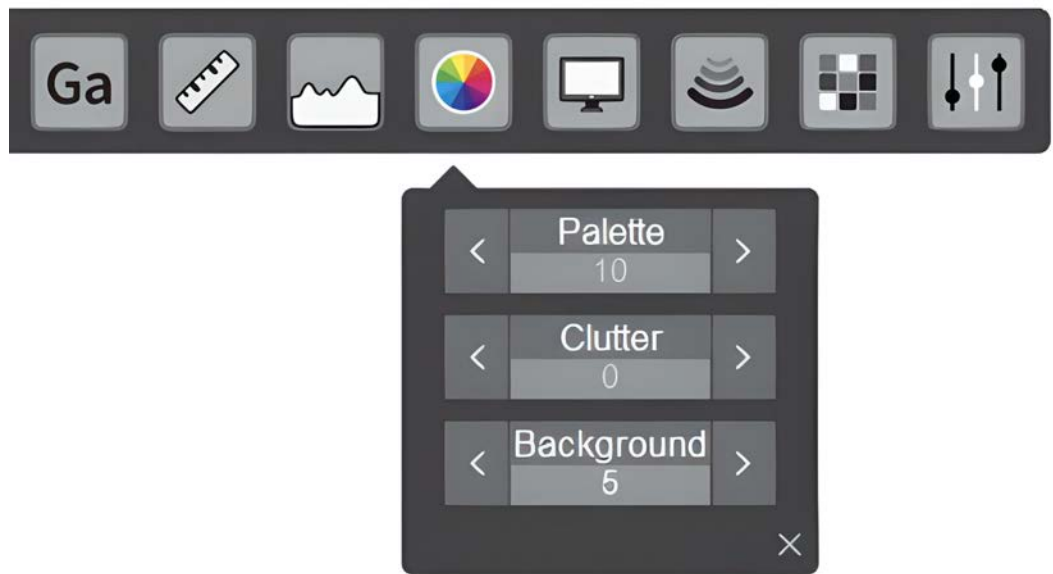


Figure 19: Color submenu

1.4.1 Palette



Figure 20: Colors palette visualization from the menu

The echosounder allows ten different color palettes: 12 colors (3 dB per color), 7 colors (6 dB per color), 12 shades of grey (3 dB per color), 15 colors (2 dB per color), 15

colors (1 dB per color), 7 colors (6 dB per color), 7 colors (3dB per color), two palettes of 51 colors (0.5 dB per color) y one palette of 63 colors (0.5 dB per color)

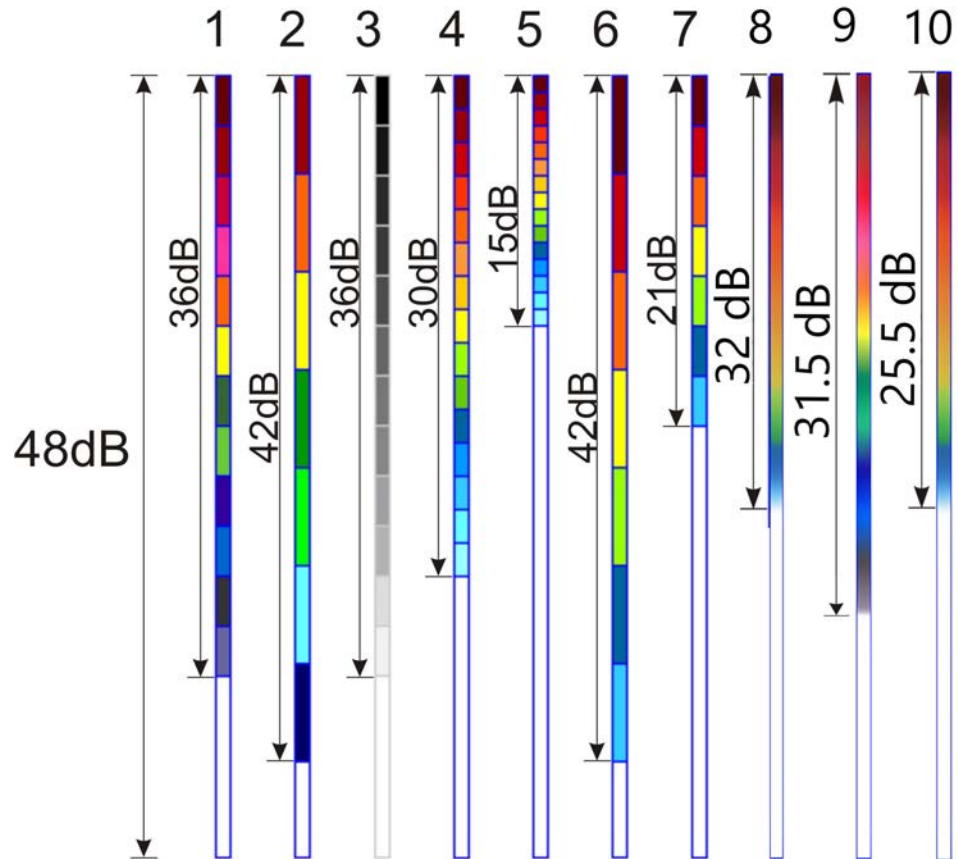


Figure 21: Available variety of colors palette

The 7 colors palette (2 and 6) allows, unlike the others, a greater range of data representation, that is to say, to be displayed on screen 42 dB below the adjusted gain value. Instead, the other palettes can represent less data on the screen, thus obtaining cleaner images, highlighting higher level echoes, when the palette has fewer dB. To use the third pallet (12 grey levels) it must be set the background ([see section 1.4.3](#))

in any other color than black, because it corresponds to the highest level echo.

1.4.2 Clutter



Figure 22: Clutter visualization from the menu

Control “Clutter” eliminates the lowest palette colors, being the number indicated in the control the amount of removed color. This is mainly used to clear the small disturbances that occur due to water pollution.

1.4.3 Background

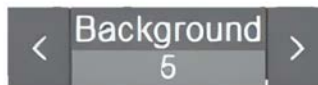


Figure 23: Background submenu

The echosounder background can be switched between five possible colors: white, blue, grey, blue and black.



Figure 24: Background colors

The black background color is not recommended for the grey color palette ([see section 1.4.1](#)) because this one corresponds to the highest-level echo for this palette.

1.5 Screen settings



Figure 25: Screen settings menu



Figure 26: Screen submenu

1.5.1 Graphical speed



Figure 27: Graphical speed visualization from the menu

This control adjusts the movement speed of the screen relative to the ping amount. It could be set for the following values: 4/1, 2/1, stopped, 1/1, 1/2, 1/4, 1/8, 1/16, 1/32 and 1/64. Fractions indicate vertical lines scanning transmission; so, "1/2" means a vertical line every two transmissions. When selecting the forward speed of the image, high speeds lengthen the echoes horizontally and low speeds contract them. This must be taken into account.

Graphic speed adjustment is useful when the vessel is traveling at low speed. In this case a screen will proceed showing essentially the same information.

When the echosounder is also used jointly with other lower resolution screens, speeds 2/1 or 4/1 must be selected. Representations will then be similar in time.

1.5.2 Depth lines

By clicking the option seen on [Figure 26](#), horizontal dotted lines on each value scale will appear on the screen with each other.

1.5.3 Fish lupe

By activating this option, a graph with amplitudes and proportional colors to their intensities, will show up the echoes with each transmission, is obtained on the right side of the screen. This presentation is useful for detailed observation of fish in mid-water depth and near the bottom. Depending on the set width, a graph as the one in [Figure 28](#) or [Figure 29](#) can be observed. This last one, has a wider window than the previous one.

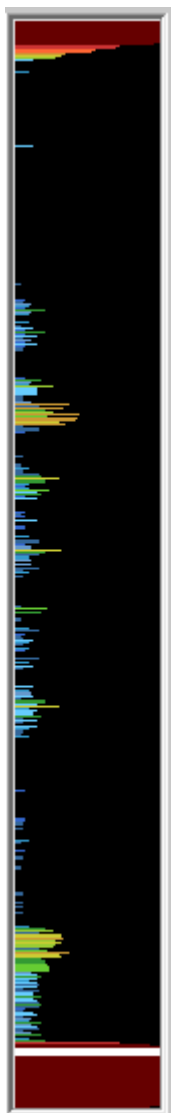


Figure 28: Simple Fish lupe

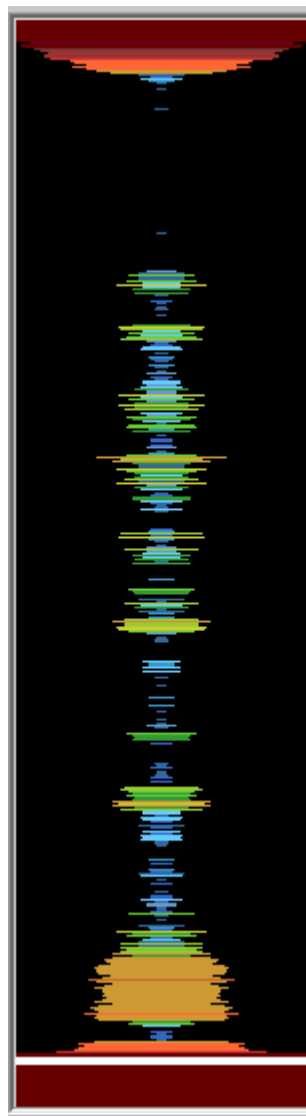


Figure 29: Double Fish lupe

1.6 Pulse



Figure 30: Pulse menu

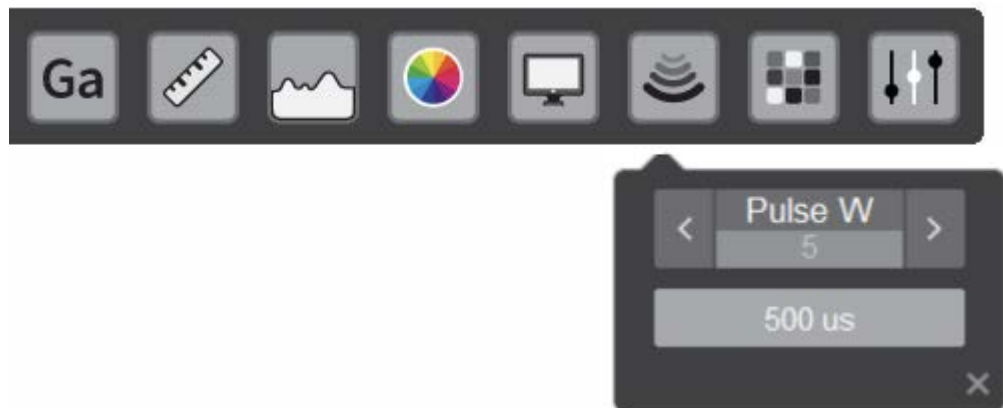


Figure 31: Pulse submenu

1.6.1 Pulse width



Figure 32: Pulse width visualization from the menu

This control allows the user to select from different types of pulse-width values. The equipment transmits with the same power independent of pulse width, which can vary the speed of repetition.

- some pulse-widths preconfigured by the user on the general setting's window of the RXTX submenu ([see section 1.8.4](#))
- automatic pulse which adapts according to the selected scale

Note: on split beam mode, the used pulse-width will be the number 2. On the single beam mode, the used pulse-width will be the automatic mode.

1.7 Applications



Figure 33: Applications menu



Figure 34: Applications submenu

1.7.1 Zoom



Figure 35: Zoom visualization from the menu

By clicking this button, a zoom window will be opened. This window shows a direct representation in a scaled version of the selection area from the echogram. In split beam mode, such selection corresponds to the area 1 from the histogram. Zoom window dimensions can be modified by clicking and keeping pressed left mouse click from the bottom right corner from the window. The selection can be moved around trough the whole echogram.

On the other side, in single beam mode, the selection is taken from a fixed dimension area and only can be moved around the whole echogram section as desired.

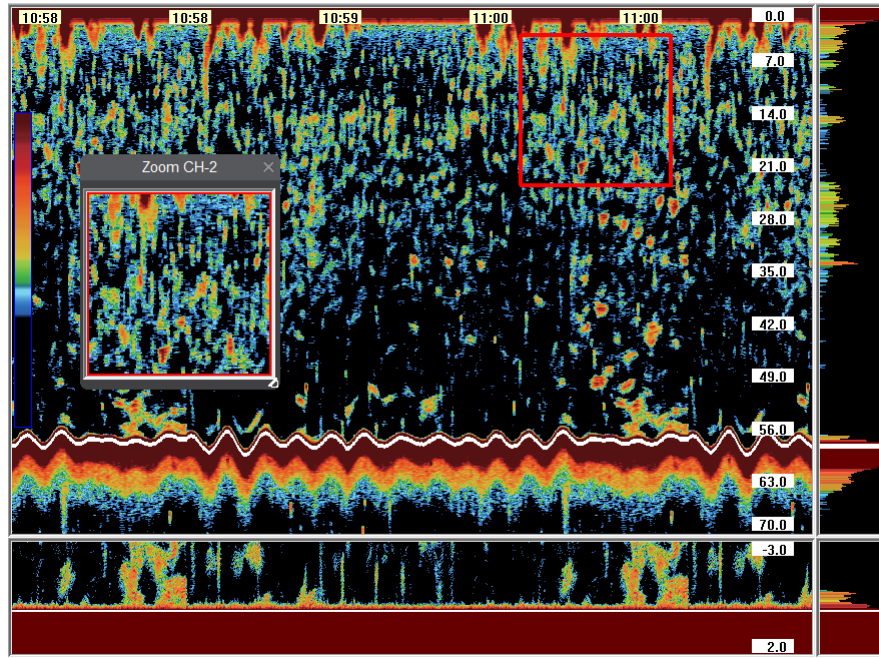


Figure 36: Zoom window visualization from the echogram selection

1.7.2 Hardness and roughness



Figure 37: Hardness and roughness visualization from the menu

In this window, a representation of the hardness and roughness of the detected bottom are shown.

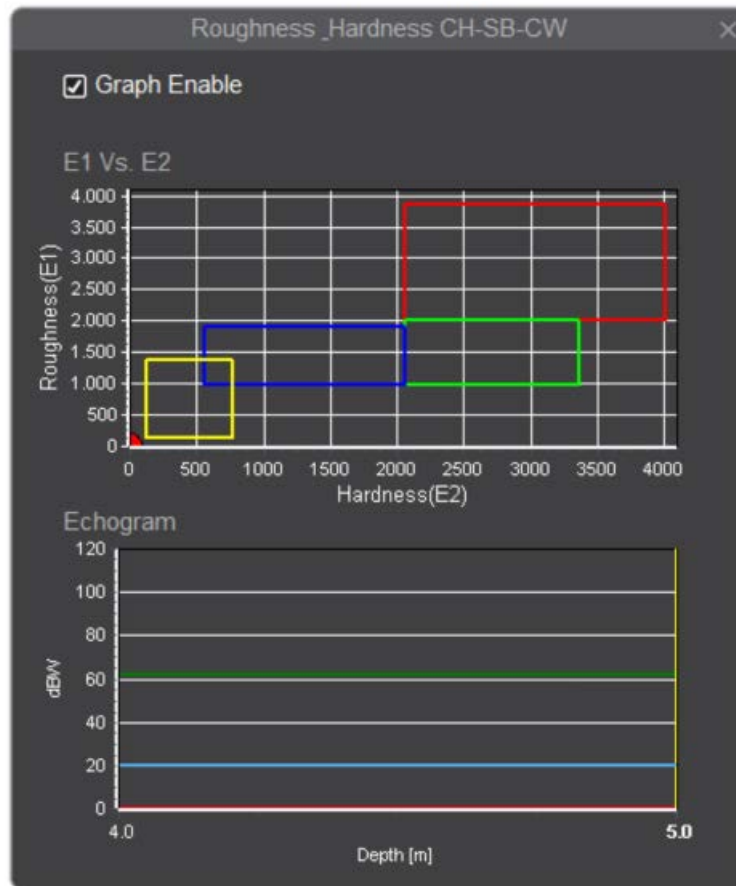


Figure 38: Hardness and roughness setting window

In order to get a proper indicator, the white line (see section 1.3.1) should be correctly adjusted. It is the same that the depth gauge (see section 8) is other than "-."

The first graph shows quantitatively RoxAnn hardness parameters.

The second graph plots the profile of the bottom, indicating the position of the white line and its percentage of hardness and roughness. Parallel to this graph there is a vertical scroll bar that lets the user change the value of the white line.

Note: for a correct calculation of the parameters it is necessary to set the angle of the transducer properly (see section 11.1.)

1.7.3 Temperature



Figure 39: Temperature visualization from the menu

In this window, internal temperature, external temperature of the equipment and its historical graph are shown. Additionally, the user can select the measurement unit: °C or °F.

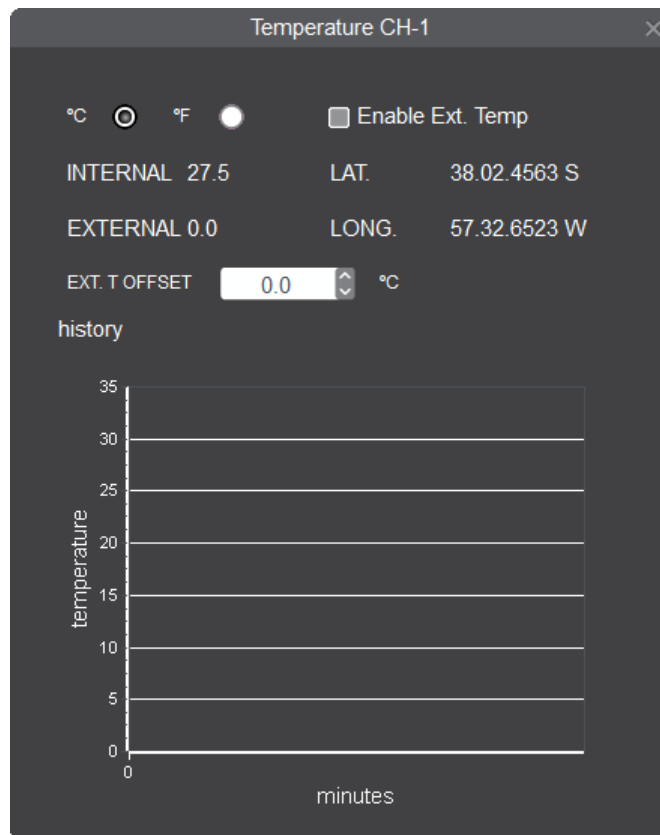


Figure 40: Temperature graphical visualization window

If an external temperature sensor is connected, the user should first enable it in the program settings window (see section 16.3). After this, the user can make a correction to the measurement using the adjustment control below the actual external

temperature indicator. It can only be enabled if the license is obtained.

The historical graph stores every minute of the temperature and position data, being the latest value on the right of the graph. To visualize the data, simply move the pointer over the chart, and they will appear in the numerical indicators in the upper right side of the window.

1.7.4 Biomass



Figure 41: Biomass visualization from the menu.

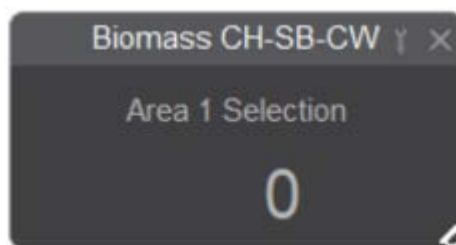


Figure 42: Biomass window

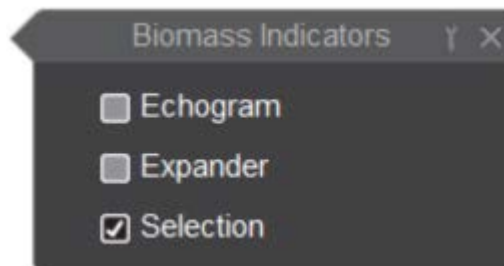


Figure 43: Window selection of biomass sources data

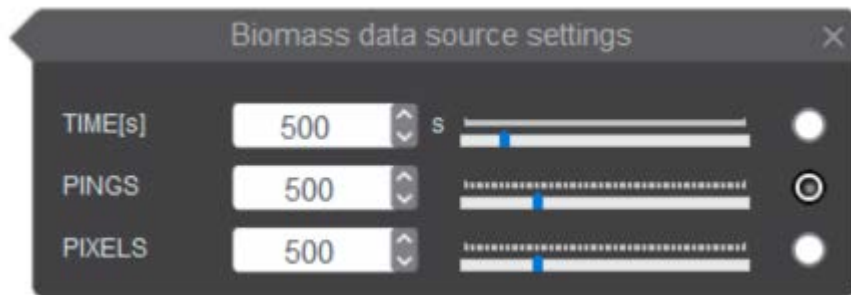


Figure 44: Source data settings for the biomass

By clicking on the biomass button from menu shown in [Figure 34](#), a window with the biomass index information is displayed. The available options for the biomass index calculations can be set in the tools icon in the upper right corner of the window shown in [Figure 43](#). The data source can be selected for echogram and expander cases. The following settings for these mentioned options should be set:

- Time: definition for the amount of seconds for a complete screen statistics
- Ping: definition of pings amount previously to the current ping
- Pixels: definition of pixels amount for the echogram

Note: in single beam mode, for the biomass index calculation, it should be considered making a transducer calibration.

1.8 General settings



Figure 45: General settings menu



Figure 46: General settings submenu

1.8.1 Measure Unit



Figure 47: Unit visualization from the menu

This control allows the user to select between three possible measurement units: meter [m], feet [ft] and fathom [FTM]. When switching between them, the scales and the depth indicator will be recalculated ([see section 8](#)).

1.8.2 Filters

By clicking on the filters button [Figure 46](#), the following window will open.

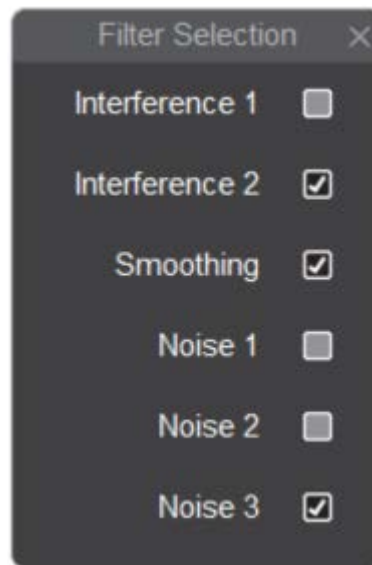


Figure 48: Filter settings menu

In this window you can select the filters that are applied to the data acquired by the echosounder, generating the following graphic effects.

1. **Interference 1:** this filter type is useful when the noise is synchronous. For example, if there is a presence of other shots of the echosounder which are not synchronously with this one (usually a noise produced by the 50 Hz or 60Hz frequencies from mains)
2. **Interference 2:** this filter operates similar to the Interference 1 filter but this one additionally eliminates noises of higher intensity
3. **Smoothing:** this filter type improves fish mark representation among echosounder pings
4. **Noise 1:** this filter limits the bandwidth of the echosounder by softening the data in the vertical direction
5. **Noise 2:** this filter operates similar to "Noise 1", but softens the image further in the vertical direction
6. **Noise 3:** this filter operates similar to the previous two, but it softens even more the image vertically

Because of the generated effects by each filter, the first two are mutually exclusive like the last three. Thus, only one can be selected at the same time from of the first two along with the third and only one from of the last three.

Note: by default, interference 2 and noise 1 filters are set.

1.8.3 Indicators

By clicking on the indicator button seen on [Figure 46](#) the next window will open:

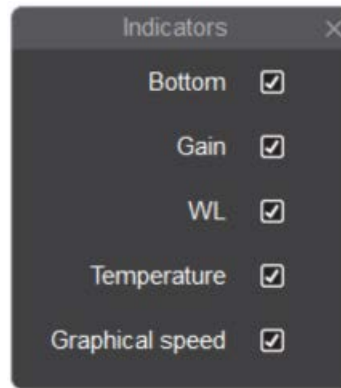


Figure 49: Indicators window visualization

By selecting the different options, the selected indicators will appear on the screen



Figure 50: Bottom indicator visualization

The bottom indicator shows on the screen the depth of the bottom. In case the bottom echo is not detected, the indicator will show zero. This indicator has two variants, the left option enabled the box shown on [Figure 50](#). This box can change its size and can be put in any place that the user prefers. The right option enabled the bottom indicator shown on [Figure 17](#).

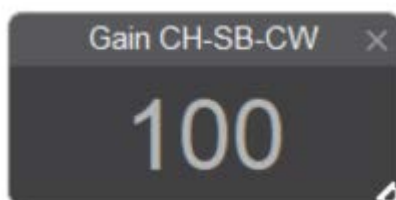


Figure 51: Gain indicator visualization

Indicator seen on [Figure 51](#) shows the gain value of the current channel.



Figure 52: Temperature indicator visualization

Indicator seen on [Figure 52](#) shows the external temperature value of the equipment.

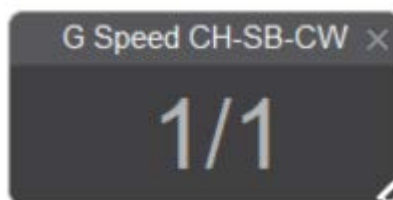


Figure 53: Graphical speed indicator visualization

Indicator seen on [Figure 53](#) shows the graphical speed relative to the amount of soundings that were made.



Figure 54: WL indicator visualization

Indicator seen on [Figure 54](#) shows the WL current value.

1.8.4 RX/TX

By clicking the RX/TX button shown on [Figure 46](#) the window seen on [Figure 56](#) (Chirp Mode) or the one seen on [Figure 55](#) (CW Mode) will open

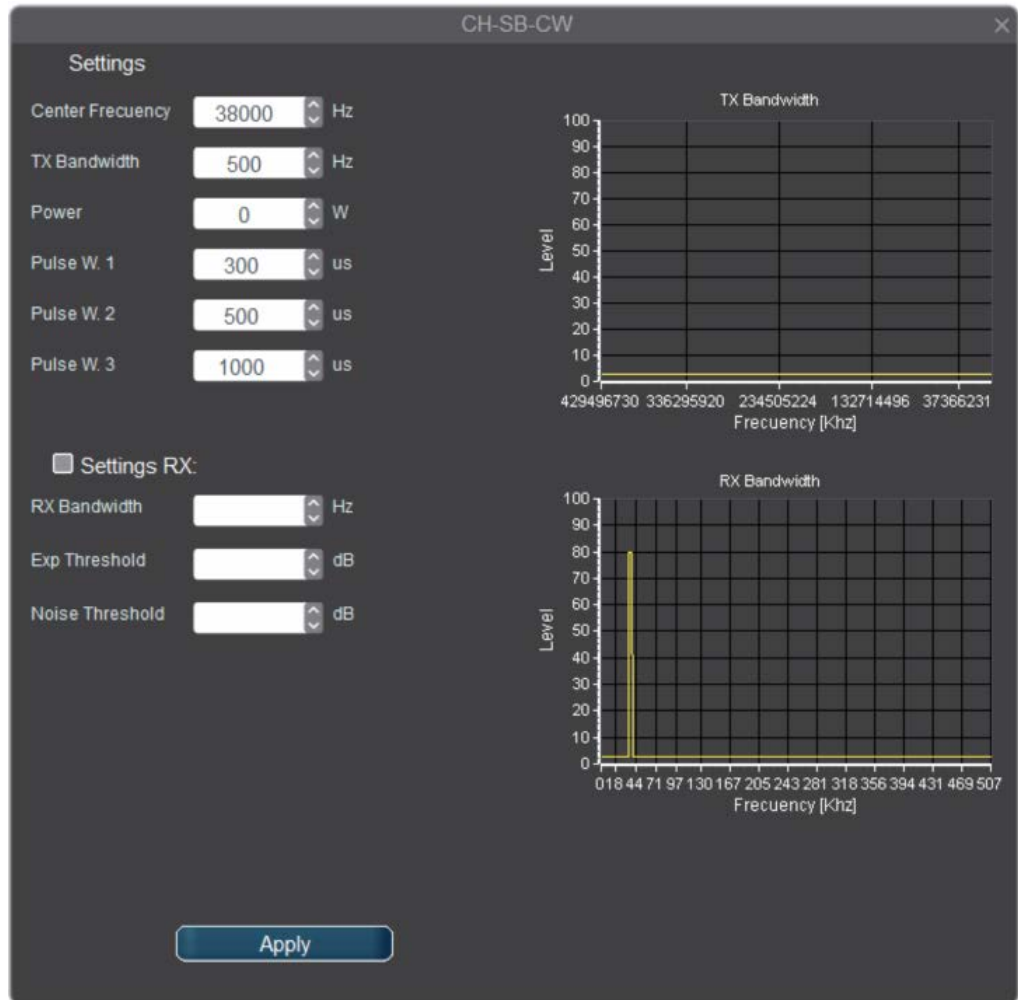


Figure 55: RX/TX submenu visualization on CW mode

This submenu allows to adjust the parameters of transmission and receiving operation on CW mode.

The following transmission adjustment will be found on the left side:

- **Pulse width (1-2-3):** Pulse width pre-adjustment that can be choose from the echosounder menu (see section 1.6)

After the transmission adjustment the following parameters of the receiver are shown:

- **Frequency filter:** define the bandwidth of the reception filter.

- **Noise floor:** the number of samples that are discard affecting the echo sounder receptor sensibility. This samples are taken after its conversion on the A/D.

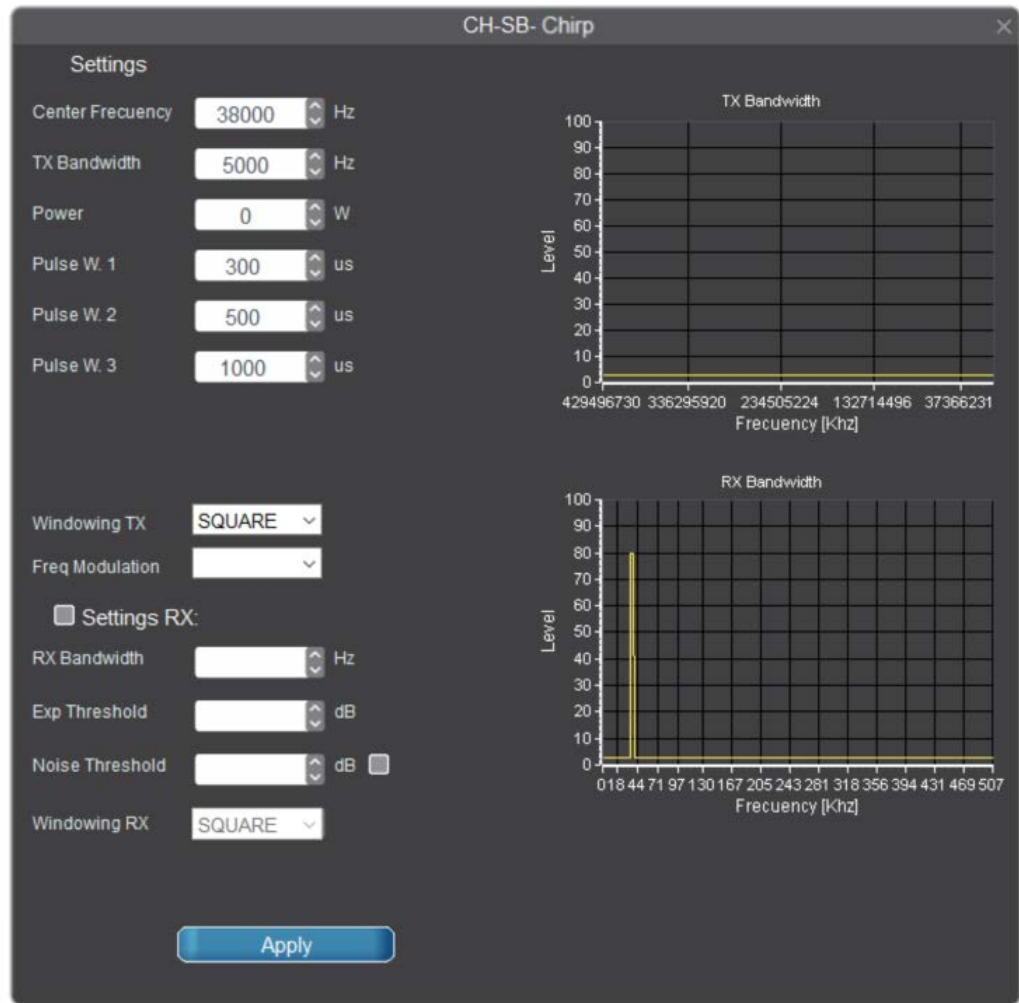


Figure 56: RX/TX submenu visualization on Chirp mode

On the window seen on [Figure 56](#) the parameters of transmission and reception on Chirp mode are shown. These are the only adjustments shown on Chirp mode:

- **Chirp limit:** defines the attenuation filtering in the bottom sea
- **Chirp noise:** The number of samples that are discarded

1.8.5 Transducer

By clicking the transducer button seen on [Figure 46](#) the following menu will show up

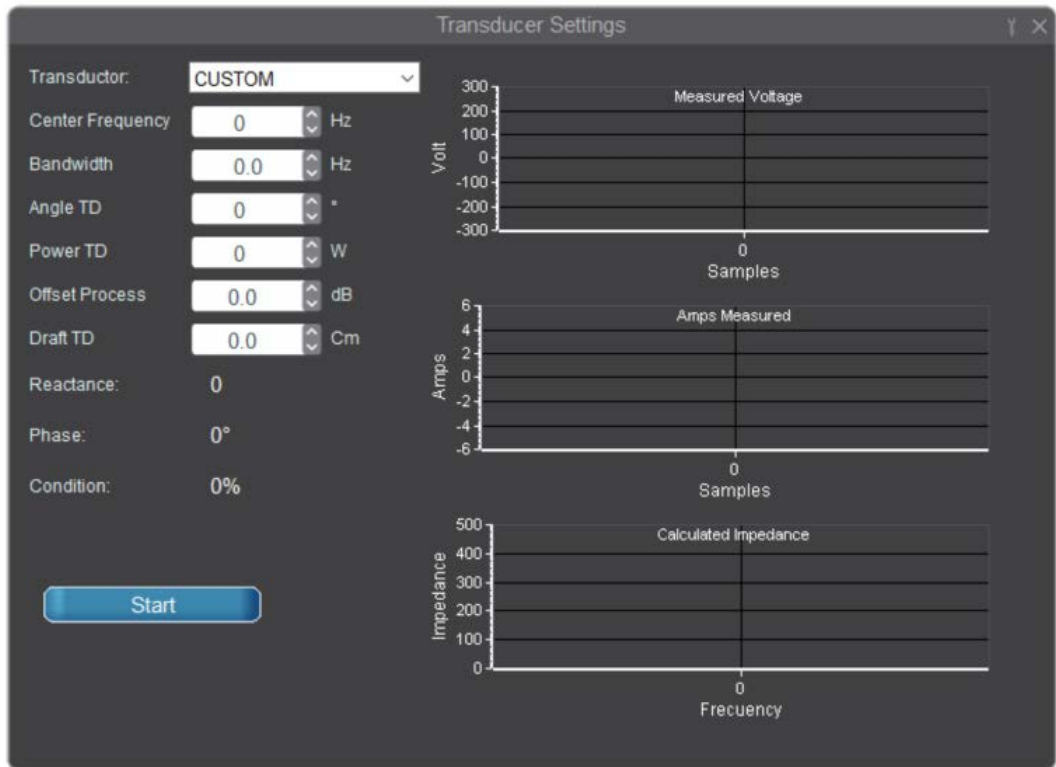


Figure 57: Transducer visualization from the menu

On this window it is shown the type of transducer that it is connected to the channel, the center frequency and the bandwidth.

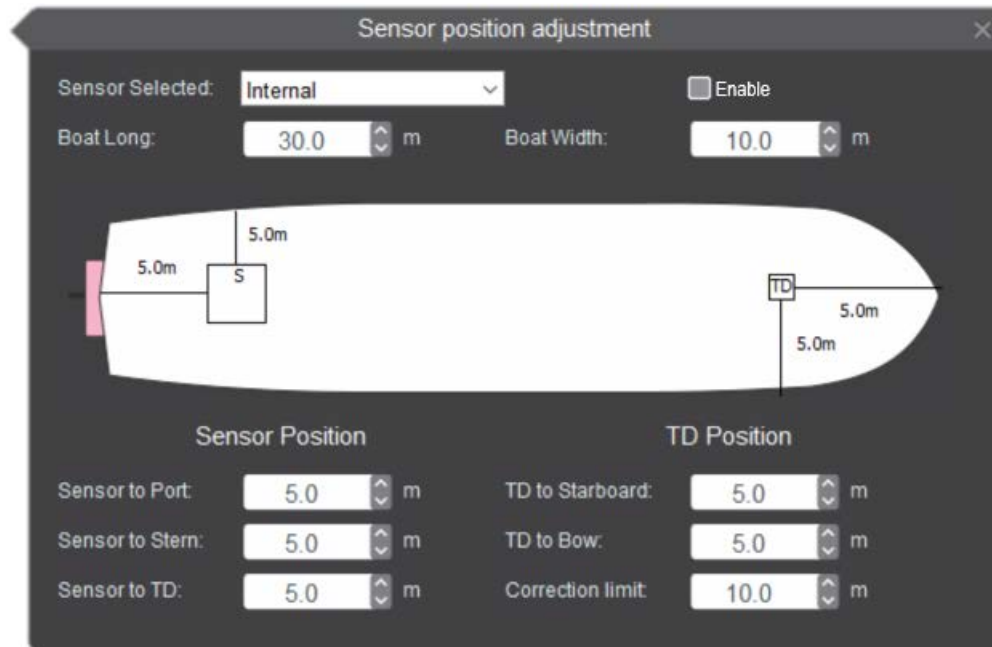


Figure 58: Transducer settings visualization

By clicking on the adjustments button inside the [Figure 57](#) will show up the [Figure 58](#). On this window is possible to assign the installation transducer position to each channel. In essence, the physical location of the transducer in the vessel. This allows to make an external heaving compensation from the configured NMEA data, for example from a satellite compass or gyro or an internal compensation of the accelerometer. A detailed description for each field is given as follows:

- **Enable:** enable or disable the compensation
- **Data source:** indicate the compensation data source
- **Boat long:** associated measurement of the long of the boat
- **Boat width:** associated measurement of the width of the boat
- **TD to bow:** associated measurement from the transducer to the bow of the vessel
- **TD to Starboard:** associated measurement from the transducer to starboard
- **Sensor to Port:** associated measurement from the sensor to port
- **Sensor to Stern:** associated measurement from the sensor to the stern of the vessel

- **Sensor to TD:** associated distance from the sensor towards the transducer in the vertical direction, perpendicular to the vessel deck
- **Correction limit:** maximum possible compensation value

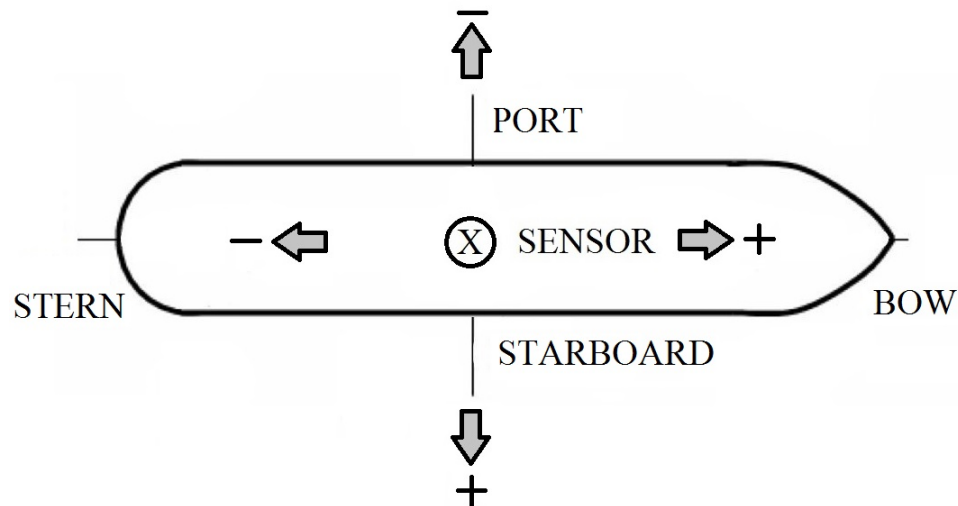


Figure 59: Sense reference for installed sensor position respect to the transducer in the vessel hull

From the shown scheme in [Figure 59](#) it can be seen that exist 4 possible quadrants positions for the transducer installation respect to the sensor. The indicated position of the sensor in the middle of the vessel is only defined as an example. The sensor location it could be anywhere in the vessel.

1.8.6 Mode

By pressing on the transmission button mode seen on [Figure 46](#) the selection menu will show up, allowing the user to choose between CW mode or Chirp mode.

CW mode will transmit a determined fixed frequency. On Chirp mode the transducer will issue pulses in the frequency range chosen by the user. This frequency range has a maximum limit determined by the transducer manufacturer. Chirp mode give a better resolution, allowing to differentiate objects that are close to one another. The Chirp mode only can be activated if the transducer can handle it and its feature is licensed.

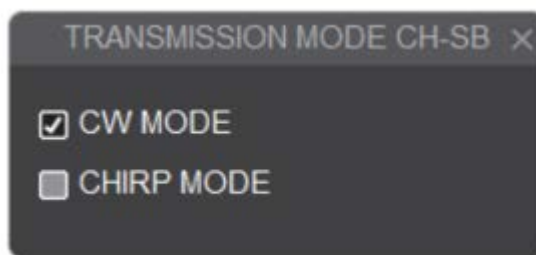


Figure 60: Transmission mode screen visualization

2 Echosounder graphic area

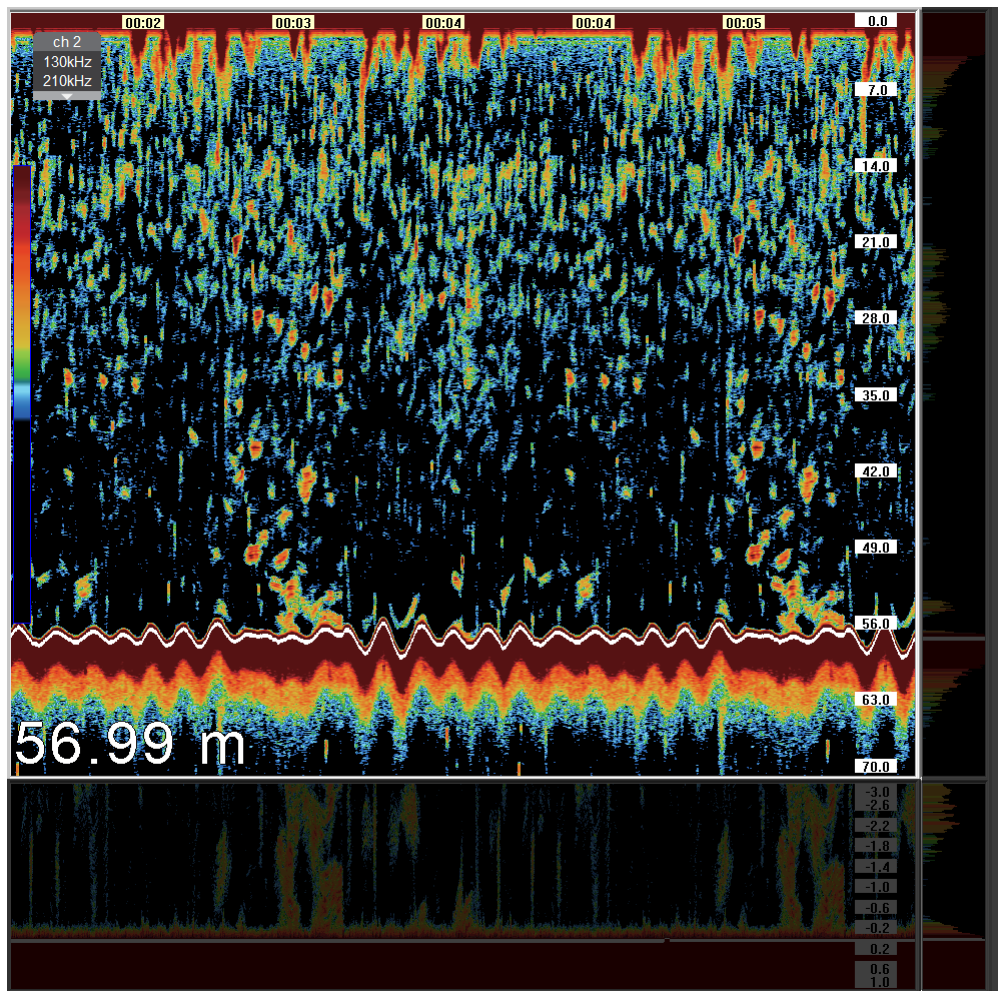


Figure 61: Graphic screen visualization

Inside the plotted area, the corresponding echoes from the shoals and the bottom will be displayed.

- **Left click:** the quick settings menu is shown, where you can control the gain (see section 1.1.1), the TVG (see section 1.1.2), the graph speed (see section 1.5.1) and the scale (see section 1.2.2) will be opened
- **Right click:** the instantaneous menu view (see section 2.1) will be opened

- **Central rotation of the wheel:** while rotating the wheel, it will increase or decrease the gain accordingly
- **Central wheel click:** a vertical line, used to mark the echoes of interest, is drawn

2.1 Instantaneous view

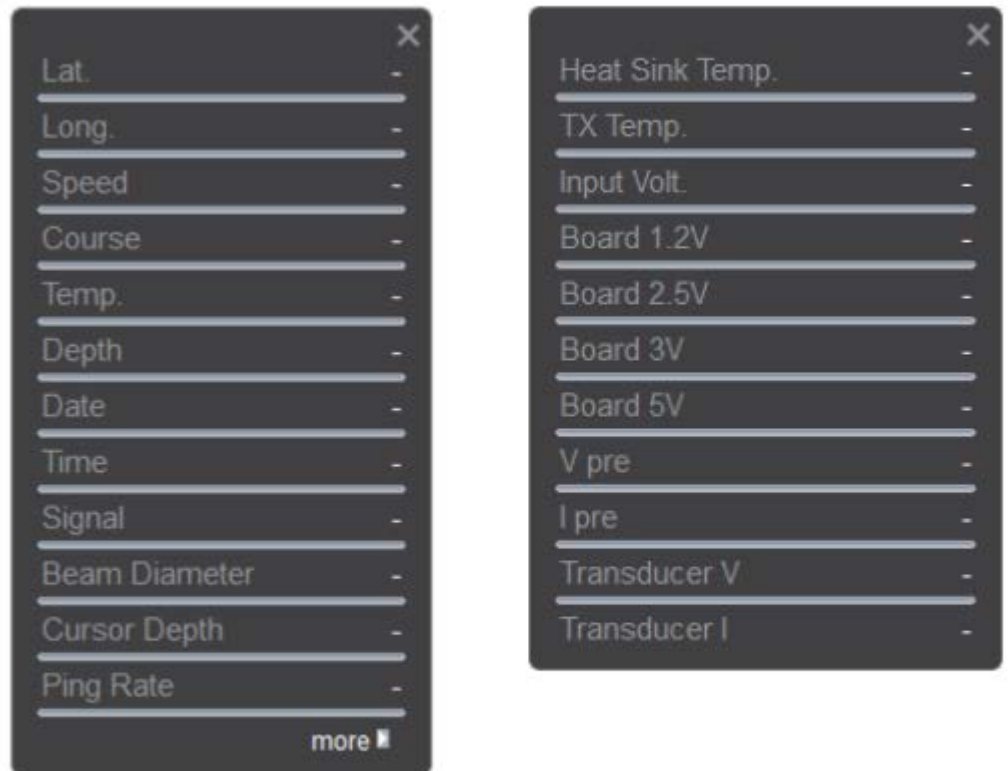


Figure 62: Instant visualization window from ping data corresponding to the current cursor position

The snapshot allows you to visualize historical data presented on the screen. It is possible to open this visualization by the usage of the mouse: right click over the

echogram for single beam mode and scroll mouse click for split beam mode. For this purpose, after opening the window, just move the cursor to the desired area and the data will be updated. After opening the instantaneous window over the echogram, it is possible to move the pointer to the zone under interest and the shown data will be updated automatically.

Data from the instantaneous windows belong to the current mouse position and are detailed as follows:

- Latitude: corresponding value to the ship for the selected ping
- Longitude: corresponding value to the ship for the selected ping
- Speed: corresponding value to the ship for the selected ping
- Course: corresponding value to the ship for the selected ping
- Temperature: corresponding value to the exterior temperature in case a sensor was previously configured
- Depth: corresponding detected bottom value for the selected ping
- Date: corresponding value to the selected ping
- Time: corresponding value to the selected ping
- Signal: signal level corresponding to the selected ping at the cursor position
- Beam diameter: corresponding level to the ping at the cursor position
- Cursor depth: corresponding level to the ping at the cursor position
- Ping rate: pings per seconds rate at the cursor position
- Pulse width: corresponding value at the cursor position

Note: it is not possible to move the mouse pointer out from the echogram area until this window is closed.

3 Echo expander

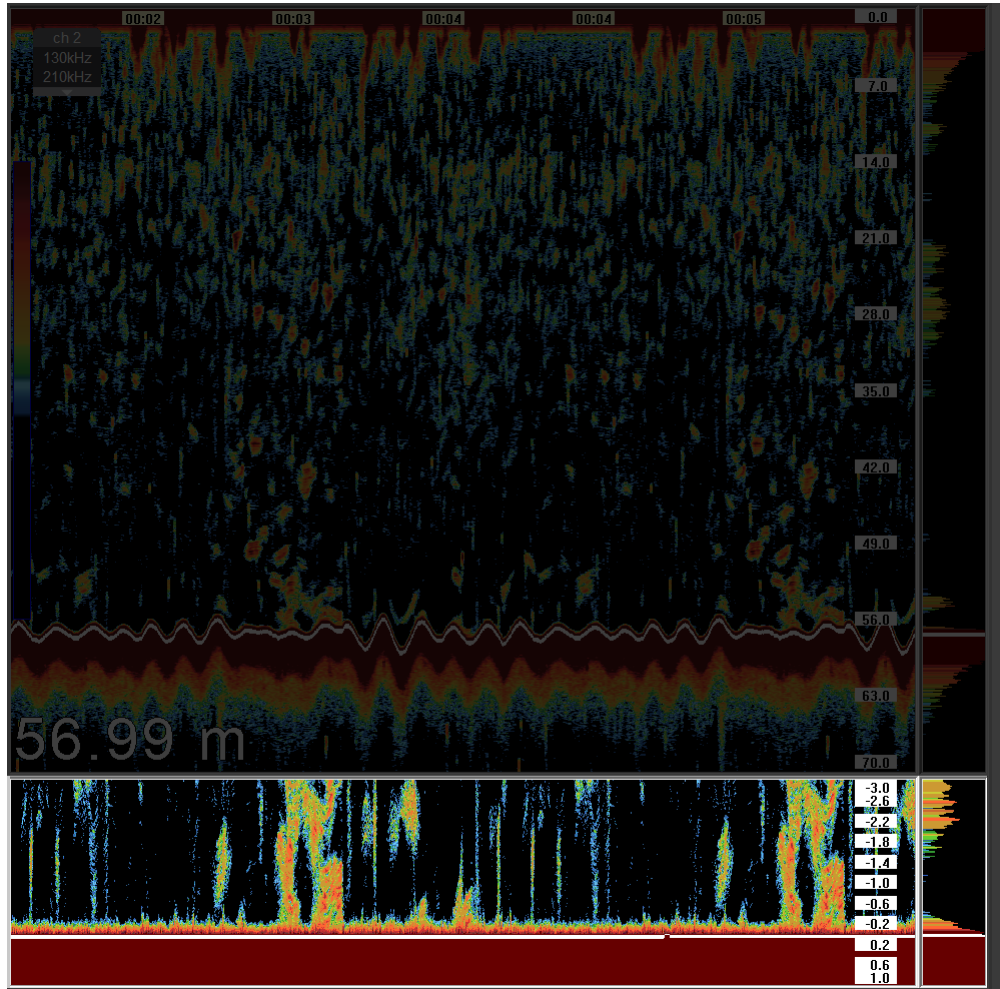


Figure 63: Echo expander window

The echosounder expander is available from the menu of the echosounder (see section 1.3.3) and (see section 1.3.4). Two different types of visualizations can be made: bottom echo expander and variable expander.

3.1 Bottom echo expander

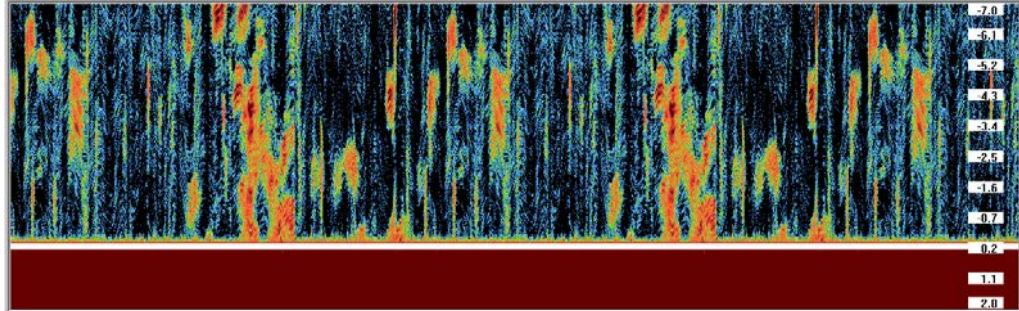


Figure 64: Bottom echo expander window

Bottom echo expander from this echosounder allows identify two scales next to the detected bottom.

- Above bottom echo expander: on this window it is possible to visualize echoes from the bottom to the surface direction. There is a "flat" graphical effect between the echoes and it allows visualize the produced echoes by the fishes that swim closer to the bottom. Its scale can be adjusted by turning the mouse wheel on the scale area or or by opening a shortcut menu. The scale value corresponds to the number of meters, feet or fathoms detected from the bottom to the surface. For this data to be valid, it is necessary that the bottom is detected correctly. For this purpose, it is very important to adjust the white line properly ([see section 1.3.1](#)).
- Under bottom echo expander: additionally, several power levels can be detected from the backscattering echoes from the bottom towards deeper direction. Scale is possible to be adjusted placing the mouse cursor over the zero value and turning the wheel.

3.2 Mid-water depth expander

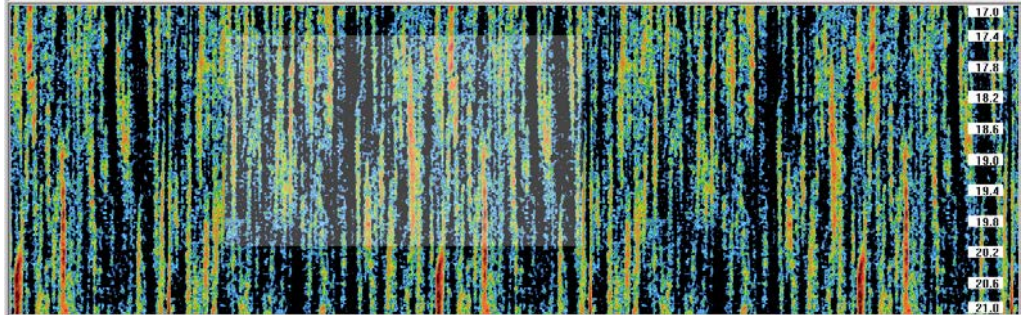


Figure 65: Middle water echo expander window

This type of window allows the user to make an "expanded" plotted area that can be adjusted as the window of the echosounder with an offset of zero and an independent scale.

Both the scale and the zero displacement can be adjusted by turning the mouse wheel on the scale area or by opening a shortcut menu by clicking the left button.

This is very useful when the user wants to display a shoal of mid-water depth fish, without losing sight of the whole range of the echosounder from the surface to the bottom ([see section 2](#)).

4 Echosounder scale area

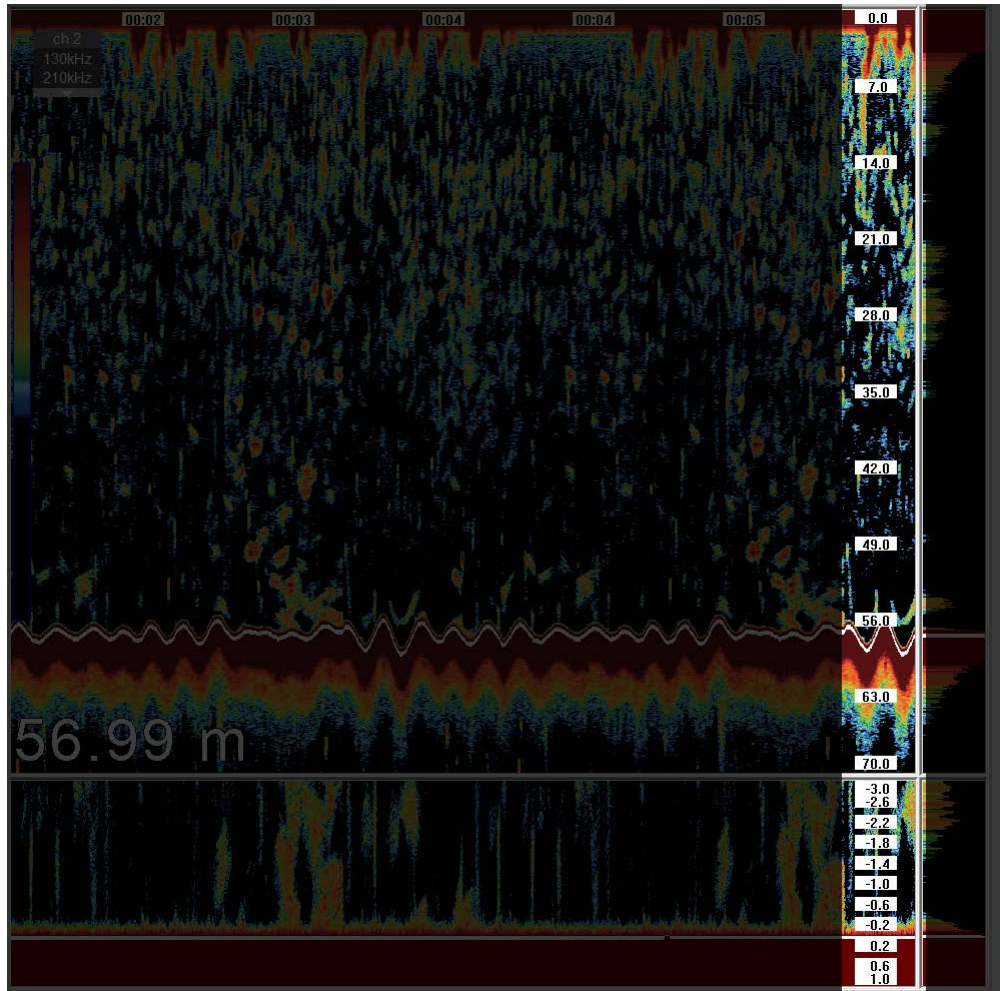


Figure 66: Scale visualization

This area allows the user to perform a quick scaling and displacement of the zero by simply turning the mouse wheel. The zero shift is adjusted by placing the pointer over the lower scale value and the scale value by placing the mouse over any part of the area.

5 Resizing panels

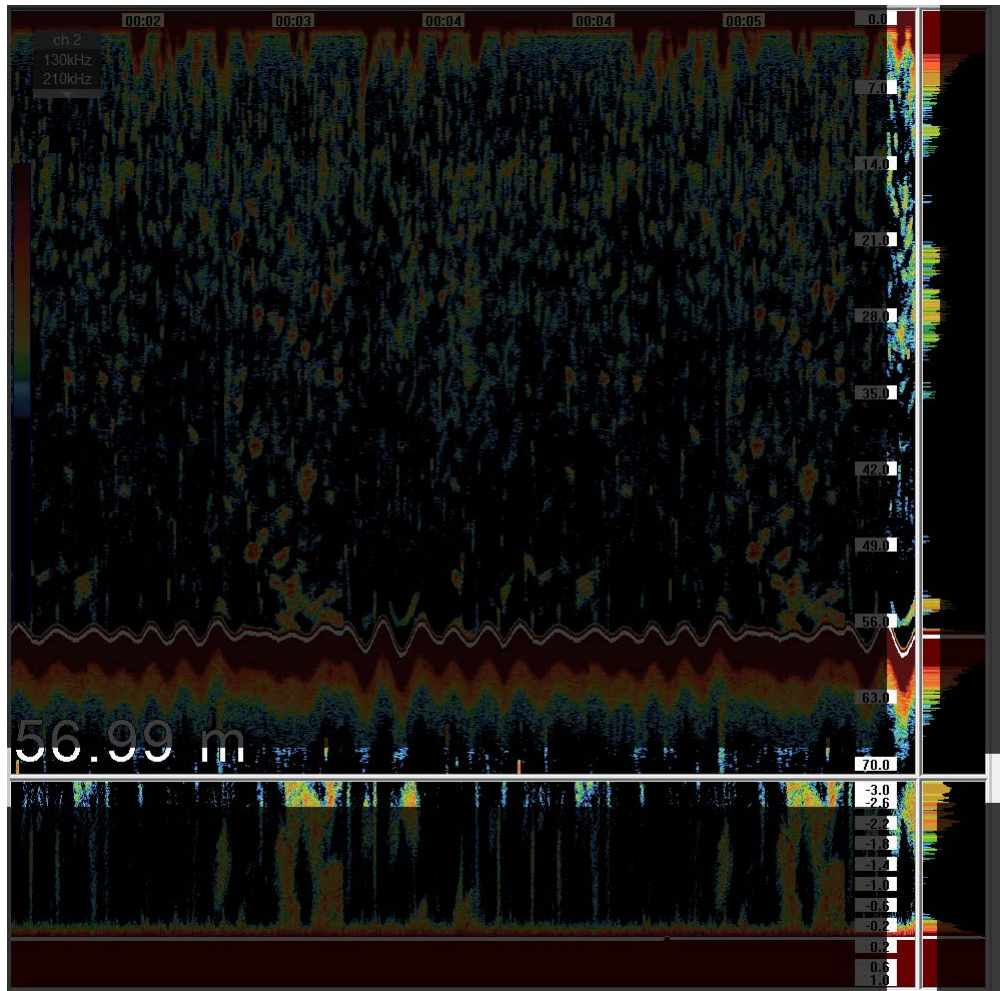


Figure 67: Resizing panels area visualization

Each echosounder has a set of active zones which are identified when the cursor changes (⊞ or ⊞) to go over these. The panels of each echosounder can be resized simply by positioning the cursor on one of the hot spots, pressing without releasing it, move it in the desired direction.

6 Resizing sounding window

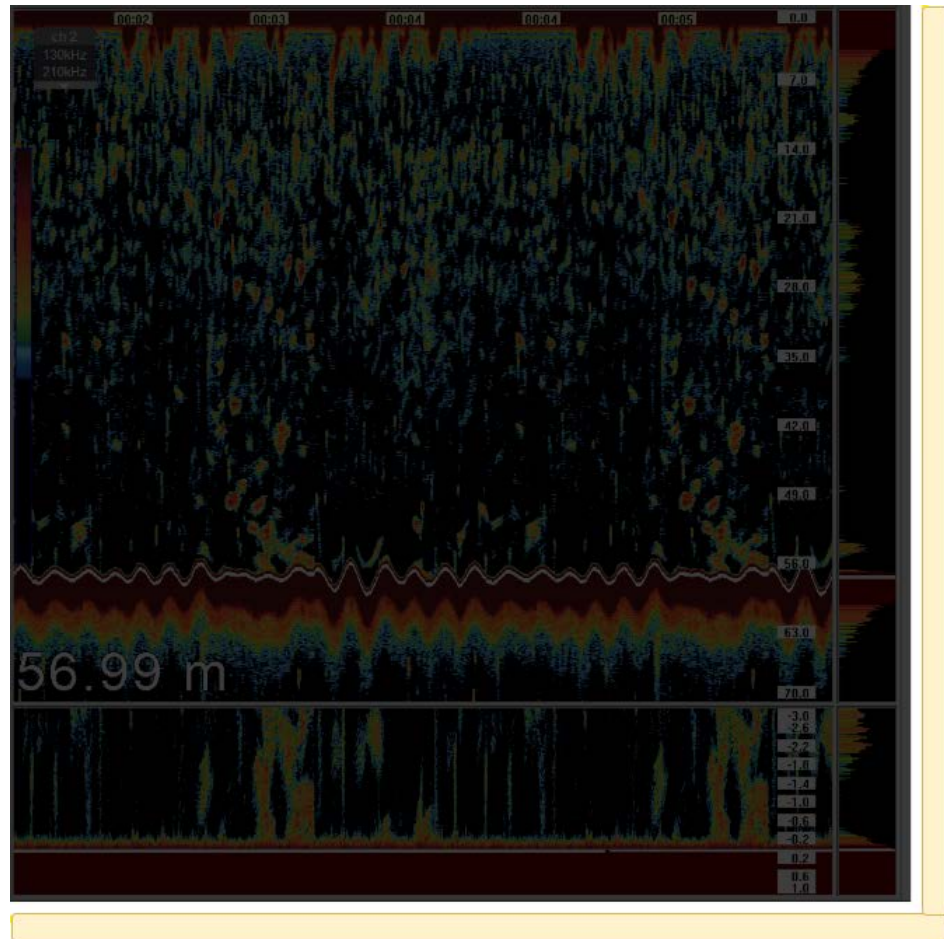


Figure 68: Resizing sounding window visualization

Each echosounder has a set of active zones which are identified when the cursor changes (\updownarrow or $\leftarrow\rightarrow$) to go over these. The panels of each echosounder can be resized simply by positioning the cursor on one of the hot spots, pressing without releasing it, move it in the desired direction.

7 Echosounder window displacement

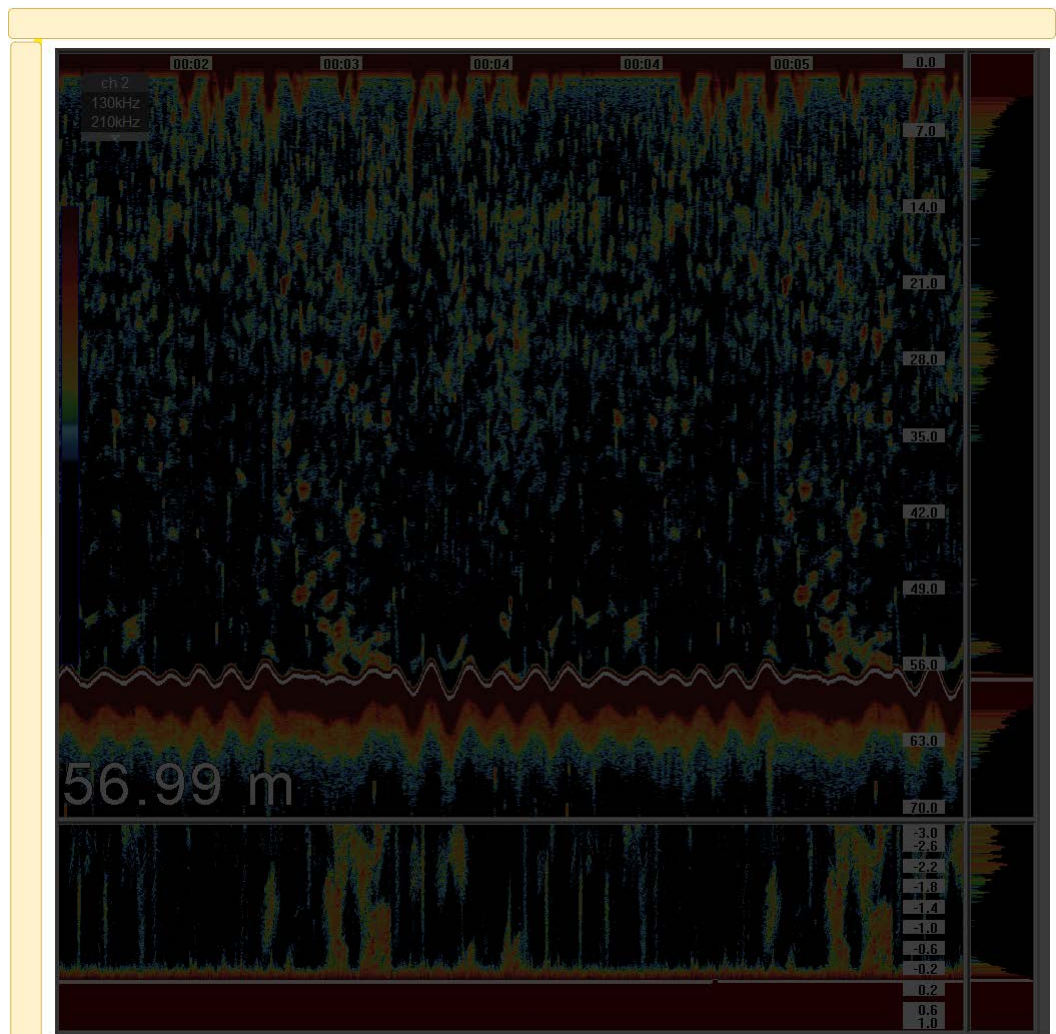


Figure 69: Echosounder window displacement zone visualization

Each echosounder has a set of active zones which are identified when the cursor changes (\leftrightarrow or \updownarrow) to go over these ones. The window of the echosounder can be resized simply by positioning the cursor on one of the active zones, pressing without releasing it, moved it in the desired direction.

8 Depth indicator

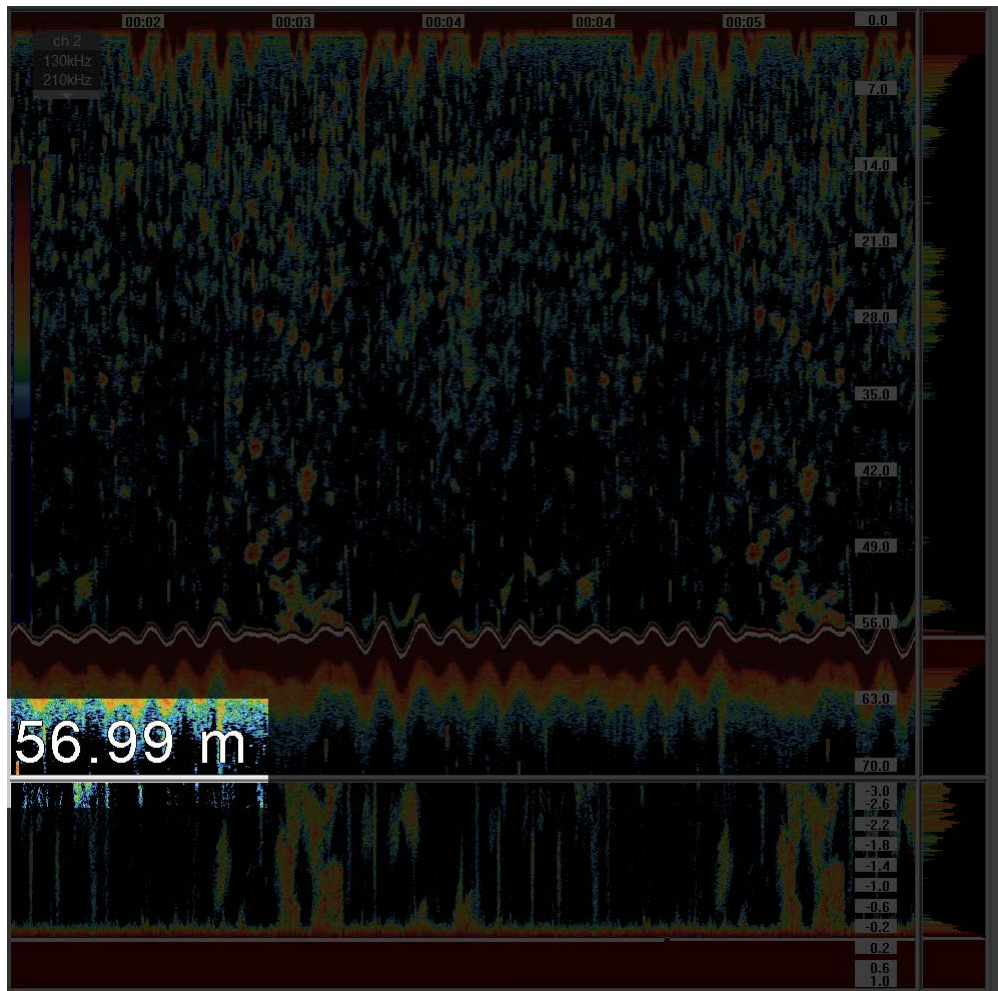


Figure 70: Depth indicator visualization

In the lower left corner of the window of the echosounder, the depth indicator can be seen. It indicates with a number, if the white line is properly adjusted on the bottom ([see section 1.3.1](#)), or the letter “E” if the white line is not on the bottom. The units of measurement correspond to the settings in the menu of the echosounder ([see section 1.8.1](#)).

Note: the size of the indicator can be set by clicking on it with the cursor.

9 Color palette indicator

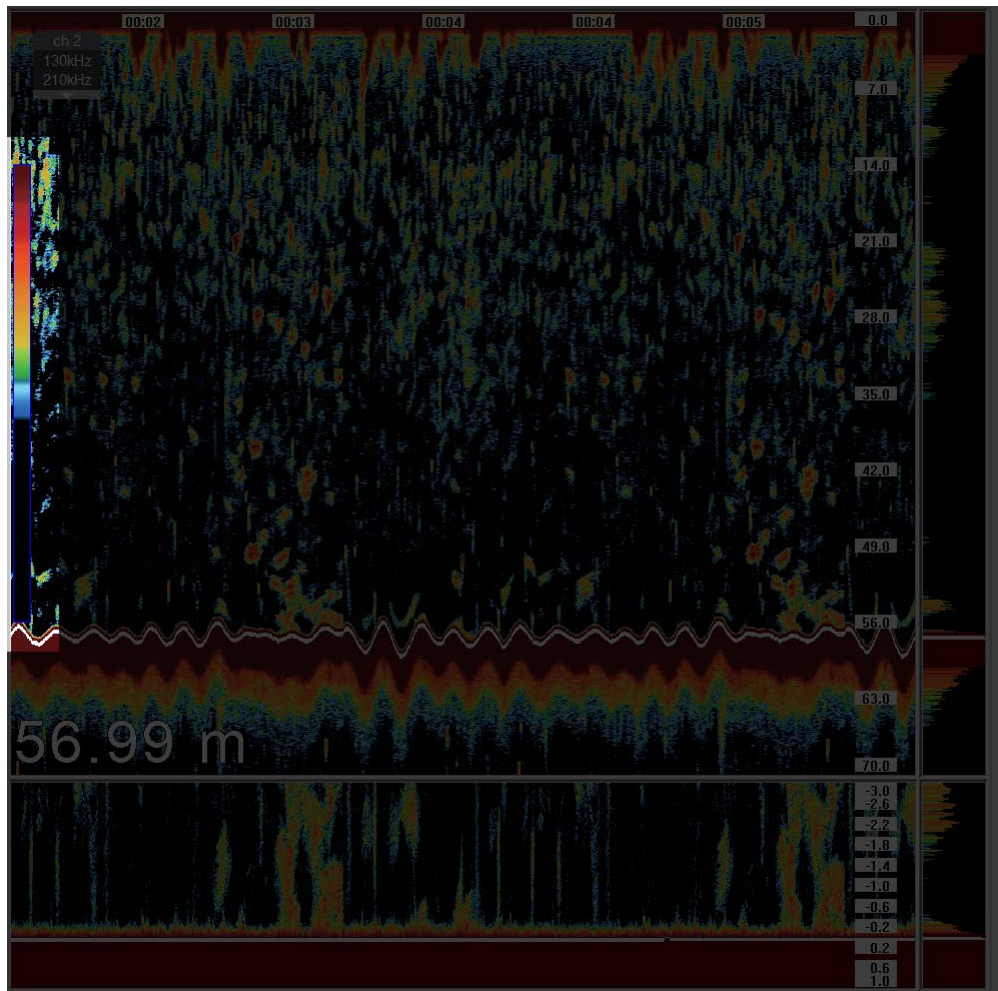


Figure 71: Color palette indicator visualization

On the left side of the echosounder window, a column shows the colors that are being used. This color palette can be changed using the control palette on the menu of the echosounder ([see section 1.4.1](#)).

By removing the colors with the clutter ([see section 1.4.2](#)), they disappear from the palette by becoming transparent.

The size of the indicator corresponds to the maximum amount of information that can be displayed (42 dB). By changing the palettes, the content will change, indicating the amount of information that can display in each one.

10 Time stamps

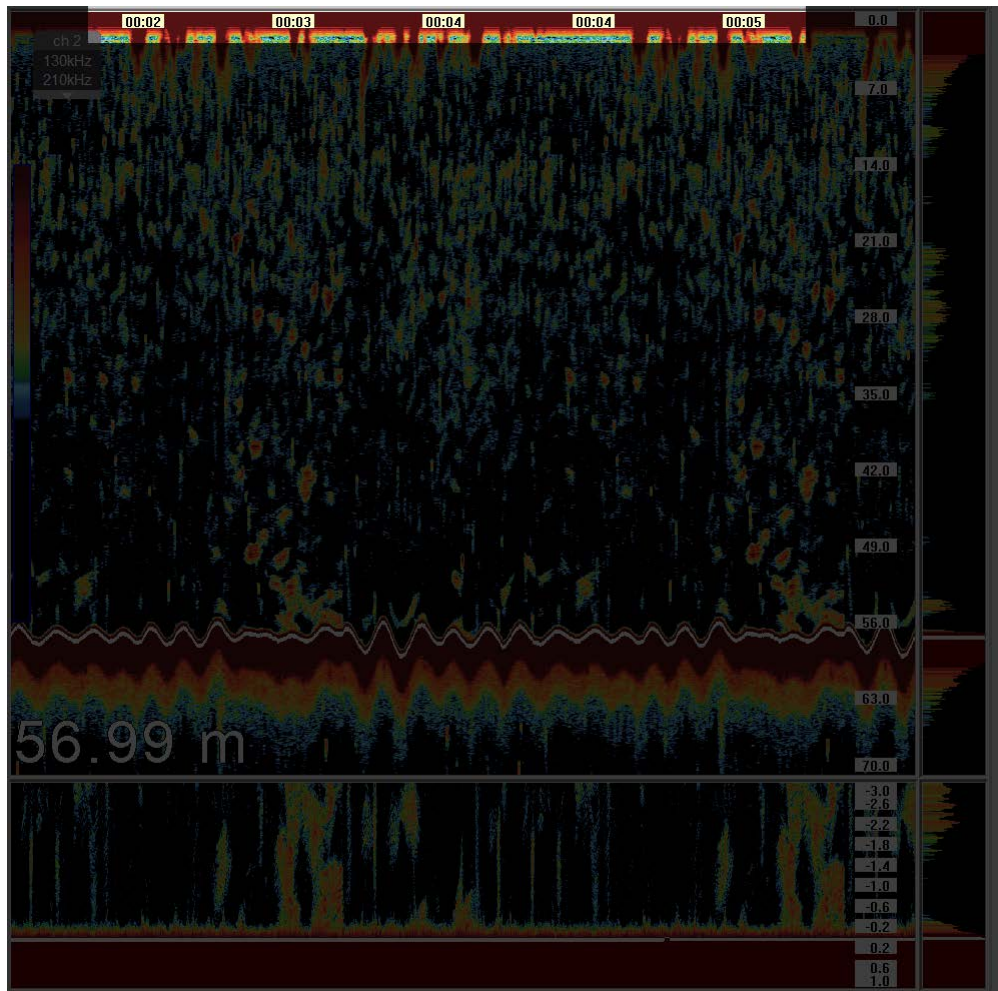


Figure 72: Timestamps visualization

On top of the echosounder window, time stamps are shown. They correspond to the receiving echo time. This allows the user to determine the time difference between events. The user can also add the vertical reference marks ([see section 2](#)), thus helping to determine better the exact time of an event on the screen. Transparency of these indicators can be set in the general settings menu ([see section 16.2](#)).

Top toolbar



Figure 73: Top Toolbar visualization

The top tool bar of the program interface contains all the buttons to access the various general features of the equipment.

They are detailed below in order of appearance from left to right.

11 Available echosounders

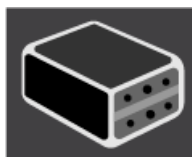


Figure 74: Available echosounders button

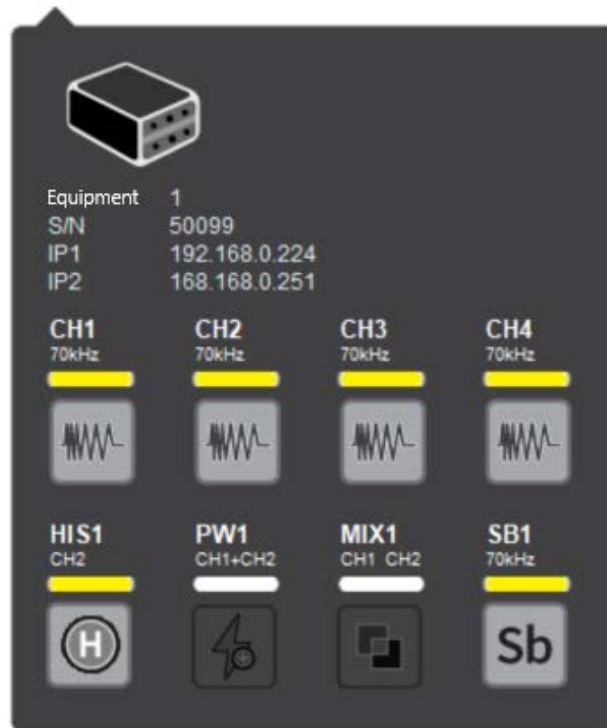


Figure 75: Available echosounders menu

These buttons indicate, according to its color, which echosounders are installed in each channel. Its operational status and if they are enabled by license. The echosounder channel icon that appear can be physical, meaning that the channel is connected to a transducer, (showing the information of a determined transducer) or virtual (showing the information of two or more combined transducers through a post-processing algorithm). This echosounders are set up and licensed on the initial adjustment of installation.

1. **Green:** it is a channel with active echosounder. It can be displayed on the screen and it is currently in use
2. **Yellow:** it is a channel with an available echosounder but it is currently inactive. It does not transmit, it is hidden and cannot be displayed on the screen
3. **White:** it is an echosounder that is not licensed or the power test was not done
4. **Red:** it is a channel with an available echosounder, but due to an error, it was disabled by the system

To enable a channel from the echosounder, the user must click on the button that identifies it (see [Figure 75](#)).

11.1 Compensation and CPU

By clicking the icon of [Figure 74](#) a window will open. The user can configure the operation parameters of the board and set up the position and orientation of the echosounder.

To change the IP, Subnet mask and Gateway numbers, the user must click on each box and a numeric keypad will be opened. Then the user must press "Set IP" button, confirm in a pop-up windows and press "Set IP" again. The software will restart in order to make the changes. The master board will have the IP set and the slave board will have the IP set minus one. For example:

Master board: 192.168.0.218

Slave board: 192.168.0.217

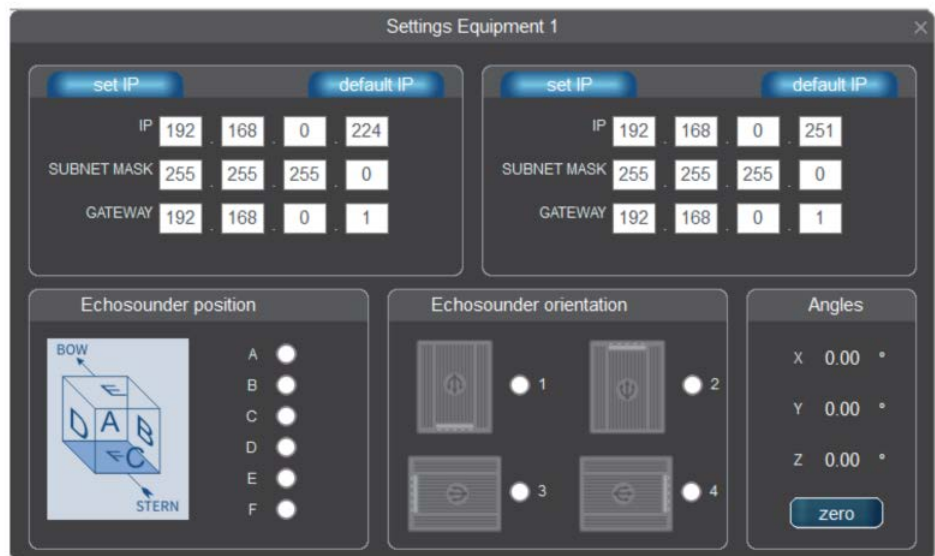


Figure 76: Compensation and CPU menu visualization

The echosounder position and orientation graph is used to adjust the internal accelerometer and thus measures the pitch and roll of the vessel given by surge. Once mounted, the user must press the zero button to correct small angular errors. Equipment orientation options are taken by looking straight ahead at the position in which it was placed.

In case the maximum configured compensation is exceeded, compensation is disabled automatically while notifying the user on the screen. This avoids possible non desired bottom visualization problems. Later, heaving compensation can be configured and enabled again.

12 History

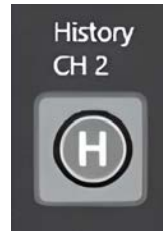


Figure 77: History menu visualization

By clicking this button the history settings window is displayed on the screen along with the history graphic window.



Figure 78: History set up visualization

The first step the user should select, is the source of the data (channel-frequency or mixer) and then select from one of the two modes:

- **Images history:** ([see section 12.1](#)).
- **Playback history:** ([see section 12.2](#)).

Note: when opening this window, the controls over all other echosounders are disabled. The echosounders will keep transmitting and plotting but they will not be adjusted until the setup history window is not closed.

12.1 Images history

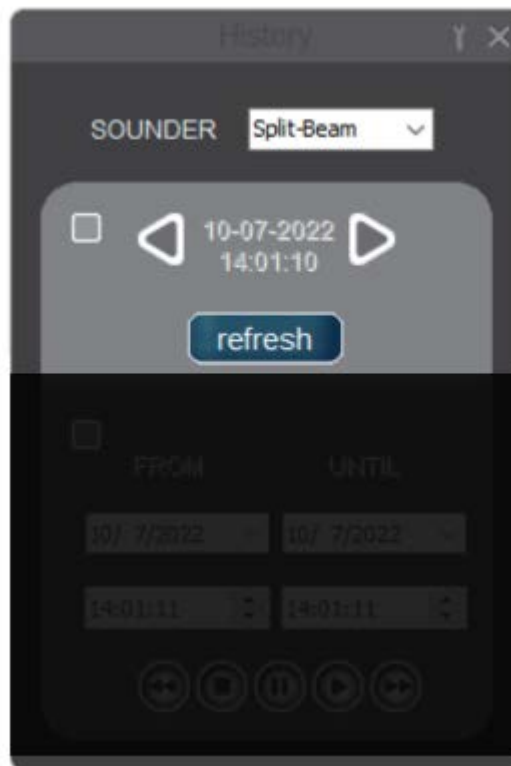


Figure 79: Image history settings window

This playback mode allows the user for a quick view of the stored data by using the settings that were applied at the time of sounding. To move past, the user must click on the left arrow. To move forward, the user must click on the right arrow. The date and time of recording will appear between both controls. If you want to make a chart change, for example: gain ([see section 1.1.1](#)), colors ([see section 1.4.1](#)), background

(see section 1.4.3), among others, it must be done in the conventional manner and then press the button "update".

12.2 Playback history

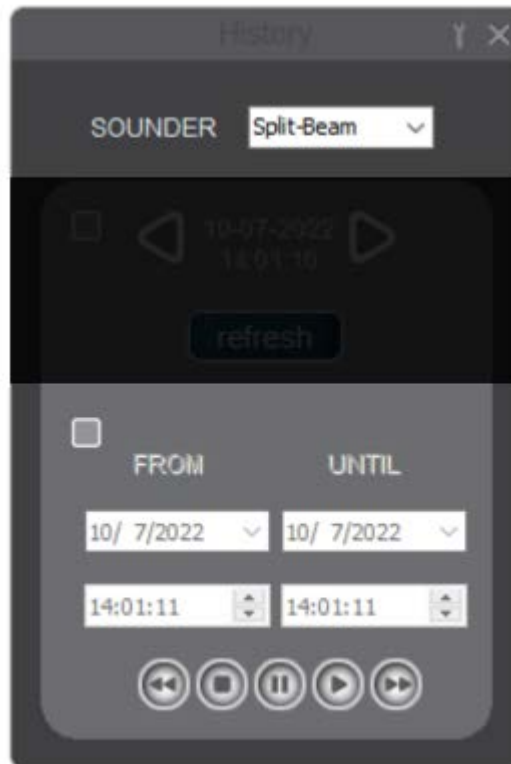







Figure 80: Images history set up window

Playback history allows recreation of a probing by changing all parameters of the echosounder in real time, such as the scale (see section 1.2.2), white line (see section 1.3.1), gain (see section 1.1.1), TVG (see section 1.1.2), etc. For this purpose, first select the date and time of interest, and then click on the button "Play" . This mode allows speeding up  or slowing playback down , also pausing  or stopping it .

12.3 History settings

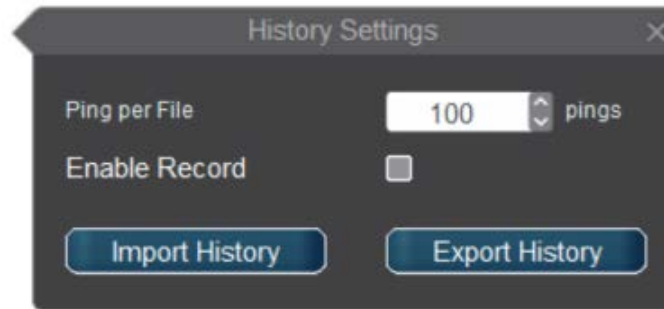


Figure 81: History settings window

Figure 81 shows the history settings window from the echosounder. It is possible to define the ping amount per file to be saved. Additionally, it is possible to define if the history saving function should be deactivated.

13 Snapshot

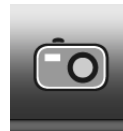


Figure 82: Snapshot button

By clicking on this button, a snapshot of the entire screen will be stored on disk (folder "Captures").

14 Captured Folder



Figure 83: Captured Images button visualization

To visualize the captured images, the user must click on the button (F), which will open a Windows® Explorer, where all the captured images are.

15 Automatic window setting

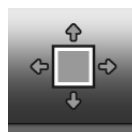


Figure 84: Automatic window setting button

This button performs an automatic adjustment of the echosounder windows that is currently visible, including the mixed ones.

The first time it is pressed, it distributes the windows horizontally, the next time it will distribute it vertically

16 Settings



Figure 85: Settings button

By clicking on this button, the following menu will be displayed:

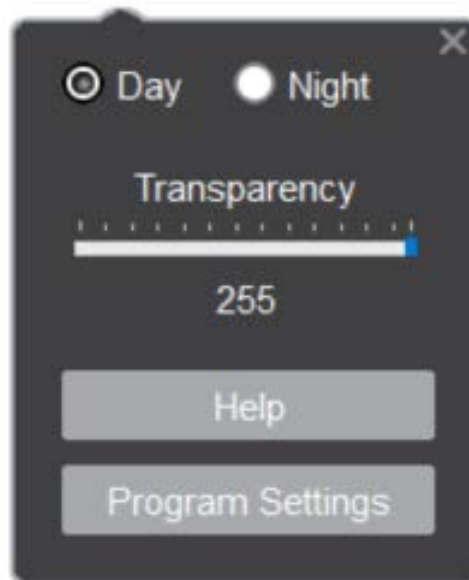


Figure 86: Settings menu window

16.1 Display brightness

First menu item lets the user select between two modes of visualization, day or night. It increases or decreases the brightness of the screen and changes dynamically the color and brightness of some icons on screen.

16.2 Transparency

This control works on the scales and time stamps of the echosounder, changing its transparency respect to the image moving on the background.

16.3 Program settings

Program settings button display a menu that allows to do the most important settings of the equipment.

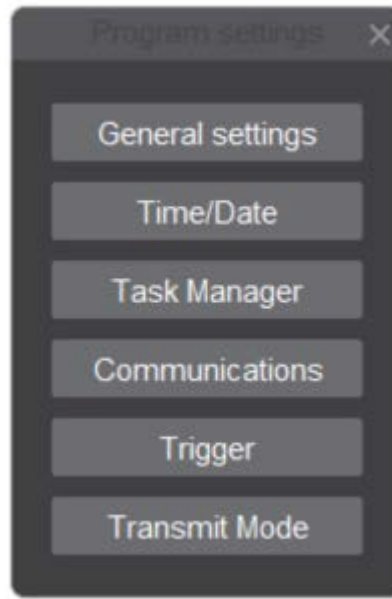


Figure 87: Program settings menu window

16.3.1 General settings

By Clicking on this button the program settings window from [Figure 87](#), where the user can set up the following options:

- Language: it defines software language
- Icons size: it allows to select the size of icon to use
- Sound Speed: speed of sound in the water. It depends on salinity, temperature and pressure. (Salt water \cong 1500 m/s, \cong 1435 m/s)

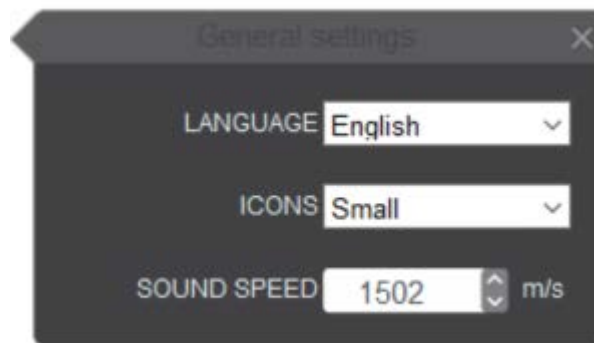


Figure 88: General settings menu window

16.3.2 Time and date

By clicking on the time and date submenu seen on [Figure 87](#) the user will select the current time zone and the source for time update. It is possible to use the time of reference from the input of NMEA or from the set up PC.

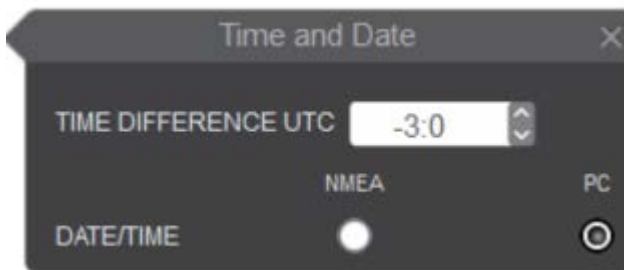


Figure 89: Date and time menu window

16.3.3 Task manager

By clicking on the button seen on [Figure 87](#), the Windows® Task Manager opens. To close the echosounder program without turning off the PC, the user must first stop the "Run.exe" process. For this, the user must select it from the process list and then press "End Process". If, for any reason, the technician does not want the software to start with Windows®, the file "Run.exe" located in the folder "Programs\Start" must be erased .

16.3.4 Communications

By clicking on the communications button seen on [Figure 87](#) a submenu will be display. This submenu allows the user to select the free COM ports that can be used to

NMEA input and NMEA output.

NMEA input: when the port is selected it is possible to change the following parameters:

- Source: it indicates a reference from the NMEA data source. GPS is defined by default
- Baudrate: it indicates the supported data speed for the data reception. 4800 is defined by default
- Bits: it indicates the number of bits for the data. 8 is defined by default
- Parity: bits amount for parity. N es defined by default
- Stop bits: bits amount for stop. 1 is defined by default

NMEA output: used echosounder to send data for NMEA. If the selected channel is not currently active, data output will be empty.

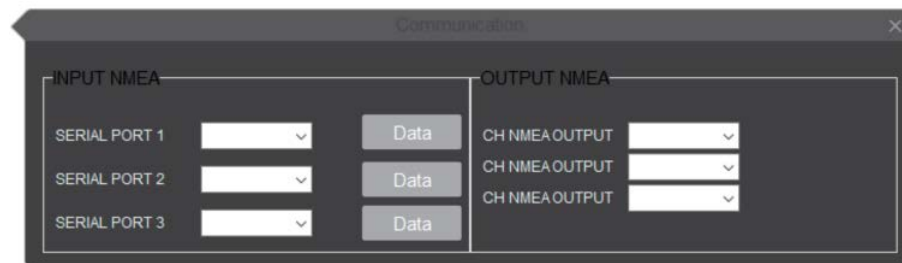


Figure 90: Communications menu window

By clicking on the data button seen on [Figure 90](#) the following window will appear

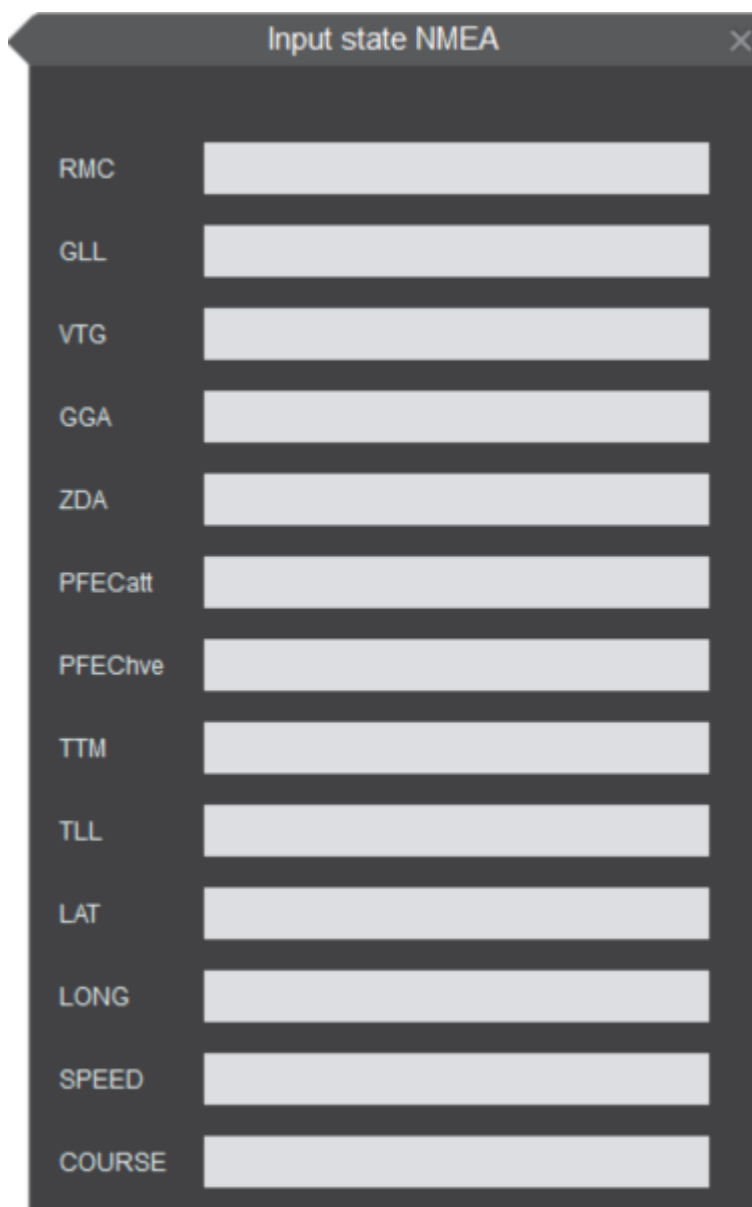


Figure 91: Received sentences menu window

GPS window provides information of incoming data through the serial port of the PC. This allows to determine if incoming data is corrupted or if a sentence is missing. The admitted sentences are RMC, GLL, VTG, GGA, ZDA, PFECatt and PFChve. The obtained data from these sentences are latitude, longitude, speed and course.

16.3.5 Ping rate

Button seen on [Figure 87](#) enables the following window:

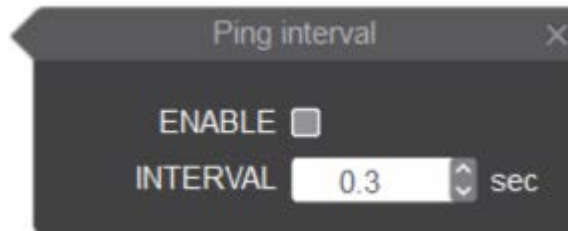


Figure 92: Ping rate setting window

The echosounder can be configured for a determined pulse transmission rate defined by time. It is important to analyze that this time considers as minimum value the sound propagation time from the pulse in the transmission medium (propagation time is defined by the set scale divided the propagation speed).

If the checkbox is set, the configured time is considered between pings. Maximum possible time between pings is 60 seconds.

It is important to understand the physical limitation by the acoustic principle: the transmission pulse from the echosounder travels through the water at its corresponding speed considering the maximum set scale in both go and back directions. Finally, time between pings is defined by the maximum time between the configured one and the propagation time. Propagation time is proportional to the set scale.

16.3.6 Trigger

This menu allows to select an internal or external trigger of the echosounder. If the external trigger is selected it must be indicated if the equipment will expect a high or low level on the input, for a maximum of 2 seconds. If the time passes and the trigger signal is not received, the echosounder transmits anyway. If trigger pulses stop entering, the error is reported in the alert window.

By enabling the internal trigger function, the echosounder acts as master and it must be indicated if a high or low level will be sent to its trigger output.

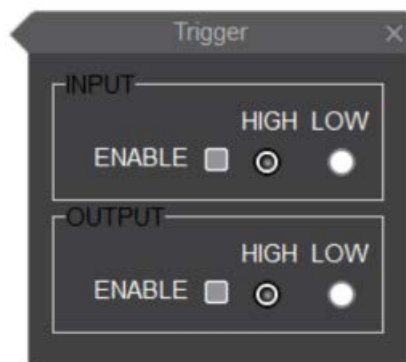


Figure 93: Trigger menu window

17 Help

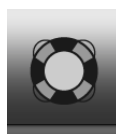


Figure 94: Help button

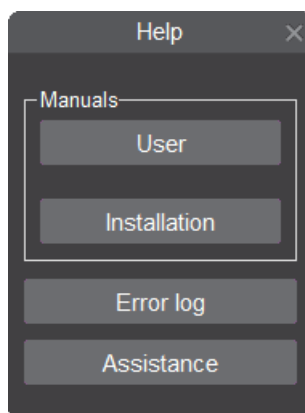


Figure 95: Help window

By clicking on any manual, it will open in PDF format. For this purpose, you must have a pdf reader installed, such as Adobe® Acrobat® Reader®, Foxit® Reader®, or similar.

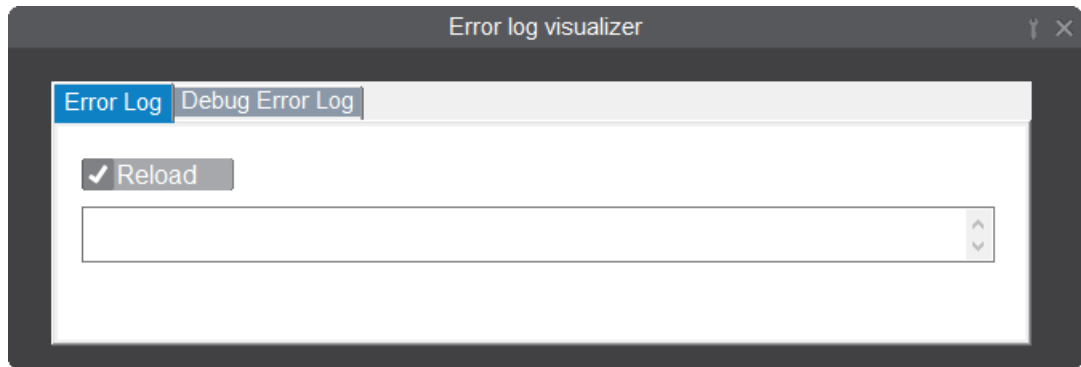


Figure 96: Error log window

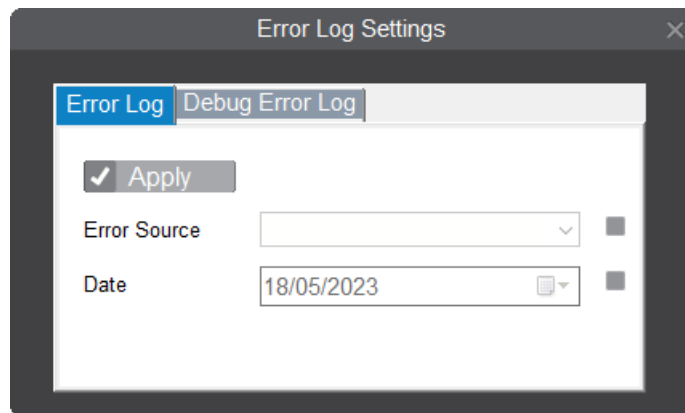


Figure 97: Error log settings window

18 Users



Figure 98: User's selector button

The user's system allows to preconfigured different modes or fishing scenarios to avoid the need to reconfigured the equipment. It is only needed to save the user when it is set up and then load it.



Figure 99: User's menu

By clicking the button seen on [Figure 98](#) the user's menu will open ([Figure 99](#)). This menu presents a dropdown list. To upload the user you have to select it and the press OK.

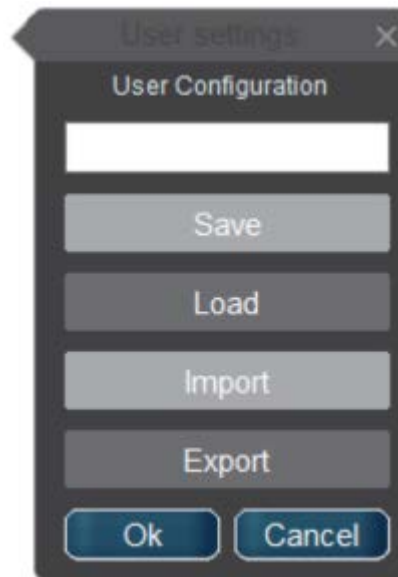


Figure 100: User's adjustment menu

The menu seen on [Figure 100](#) is open when the tool button shown on [Figure 99](#) is press. In this window four options will be show:

- Upload: selecting the user of preference, the saved configurations will be upload
- Save: save the configurations on a determined user.
- Import: upload the user's configuration from an archive, which is acceded through the Windows® explorer
- Export: save the user's configurations on a hard disk

19 Error indicator



Figure 101: Error indicator window

This button appears only if an error in the echosounder was detected and disappears if it is solved. Errors appear in descending order of priority as they occur.

20 Minimize button



Figure 102: Echosounder minimize button

By clicking this button, the sounder can be minimized and can access to the Windows® desktop. By doing this the echo sounder will not stop, and if Windows® is closed in this condition recent changes will be lost.

21 Close button

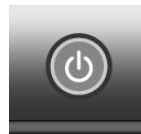


Figure 103: Echosounder close button

By pressing this button, the sounder will close in an orderly way and the Windows® will shut down.

NOTE: We recommend always shutting down the equipment in this way

Bottom Toolbar

```
Lat 38.0000 S Long 57.3300 W Speed 5.00 N Course 180.0° Temp 0.5°C 10-07-2022 14:06:10
```

22 Position and date

The bottom toolbar contains information of the current events of position and date. Starting from the left to the right, the user will find the following indicators:

- **Latitude**
- **Longitude**
- **Speed**
- **Course**
- **Temperature of water**

If they do not contain the navigation data, it will indicate the following error codes:

1. **No FIX:** GPS does not correct the position
2. **Bad NMEA:** NMEA data is present but the data is corrupted
3. **No NMEA:** the port was opened, but no data is entering
4. **Com Error:** the communication port, which is being used, cannot be opened because it does not exist or other application is using it. The user must choose another port in the program settings window ([see section 16.3.4](#))

Besides the navigation indicators, there is an area where minimized windows can be added and finally the date and time are also added. The data for these indicators will be taken from the date and time of the PC, if the GPS does not correct it or there is no NMEA input ([see section 16.3.4](#)). The time difference can be configured in the program settings window ([see section 16.3.2](#)). If the GPS fix it, the date and time of the PC will be automatically updated.

Mixer

23 Features

The echosounder mixer is a channel that results from the combination of different frequencies or different range of frequencies. This sounder helps the user to interpret the reflected echoes allowing the observation on different frequencies.

To enable the echosounder mixer the corresponding license is needed. The button to access the channel mixer is on the top tool bar ([see section 11](#)).



Figure 104: Mixer submenu



Figure 105: Echosounder submenu visualization

Once the echosounder started, an additional submenu will appear on the echosounder adjustment bar. On this submenu the user can select the echosounders to mix by clicking on them.



Figure 106: Mixer channel setting window

On this window the mixes will only appear that are configured on the initial installation adjustment. After selecting the echosounders that will be mixed the window can be closed.

Note: after opening this window it is recommendable to click on the button **autosize** ([see section 15](#)) to organize the screen.

+Power

24 Features

The +Power echosounder is a channel that results from the sum of the transmission of two or more channels. This characteristic is very useful on situations of fishing in big depths or when a big power transducer must be used.

To enable the +Power channel is necessary to have a +Power license. The button that is used to access to this sounder is in the top tool bar ([see section 11](#)).



Figure 107: +Power Submenu



Figure 108: Echosounder submenu visualization

Once the +Power echosounder is enabled, an additional submenu will appear on the adjustments bar of the echosounder. On this submenu the channels that the user wants to add can be selected by clicking on them.

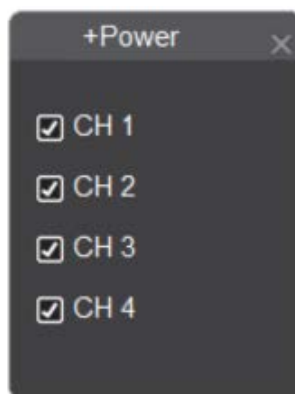


Figure 109: +Power mode configuration window

On this window the channels will only appear that are already set up on the initial installation adjustment. After selecting the channels where the +Power echosounder will be apply, this window can be close.

Features

- Language: SPA / ENG / OTHERS
- Presentation: 1920x1080 Full HD to 3840x2160 4K UltraHD
- Colors: 7/12/15/32/High resolution
- Background: Selectable between five colors
- Echosounder: 1 to 4 channels, mixwer, Split Beam, +Power
- Expander: bottom and mid-water
- Echosounder scale: 5-10000 m
- Graphical speed: 10 steps (4/1, 2/1, detenida, 1/1, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64) [lines/Tx]
- Image and sound multimedia alarms: fish and bottom
- External trigger: High and low level
- Internal trigger: High and low level
- Biomass
- Hardness and roughness graphic
- Water temperature graphic
- Acoustic sign
- History: images history and playback history
- Compatibility:
 - Speed sensor, Winch, salinity indicator, hull temperature, buoys
 - Marport:
 - * Door sensor - Starboard and port
 - * Trawl sensor
 - * Catch sensor
 - TZ
 - Format NMEA :
 - * RMC - Recommended minimum specific GPS / Transit data
 - * GLL - Geographic Position, Latitude / Longitude
 - * VTG - Track made good and ground speed
 - * GGA - Global Positioning System Fix Data
 - * ZDA - Time and Date

- * TTM - Tracked Target Message
 - * TLL - Target Latitude and Longitude
 - * MTW - Temperature of the water
 - * DBT - Depth below transducer
 - * ROXANN - Parameters of roughness and hardness
- Echoview special output

Contact information

- Seaman Electronics
- All rights reserved
- Software version 4.2.2.0
- Firmware FPGA version 3.9
- Firmware PIC version 5.2 // Firmware Bootloader version 2.4
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