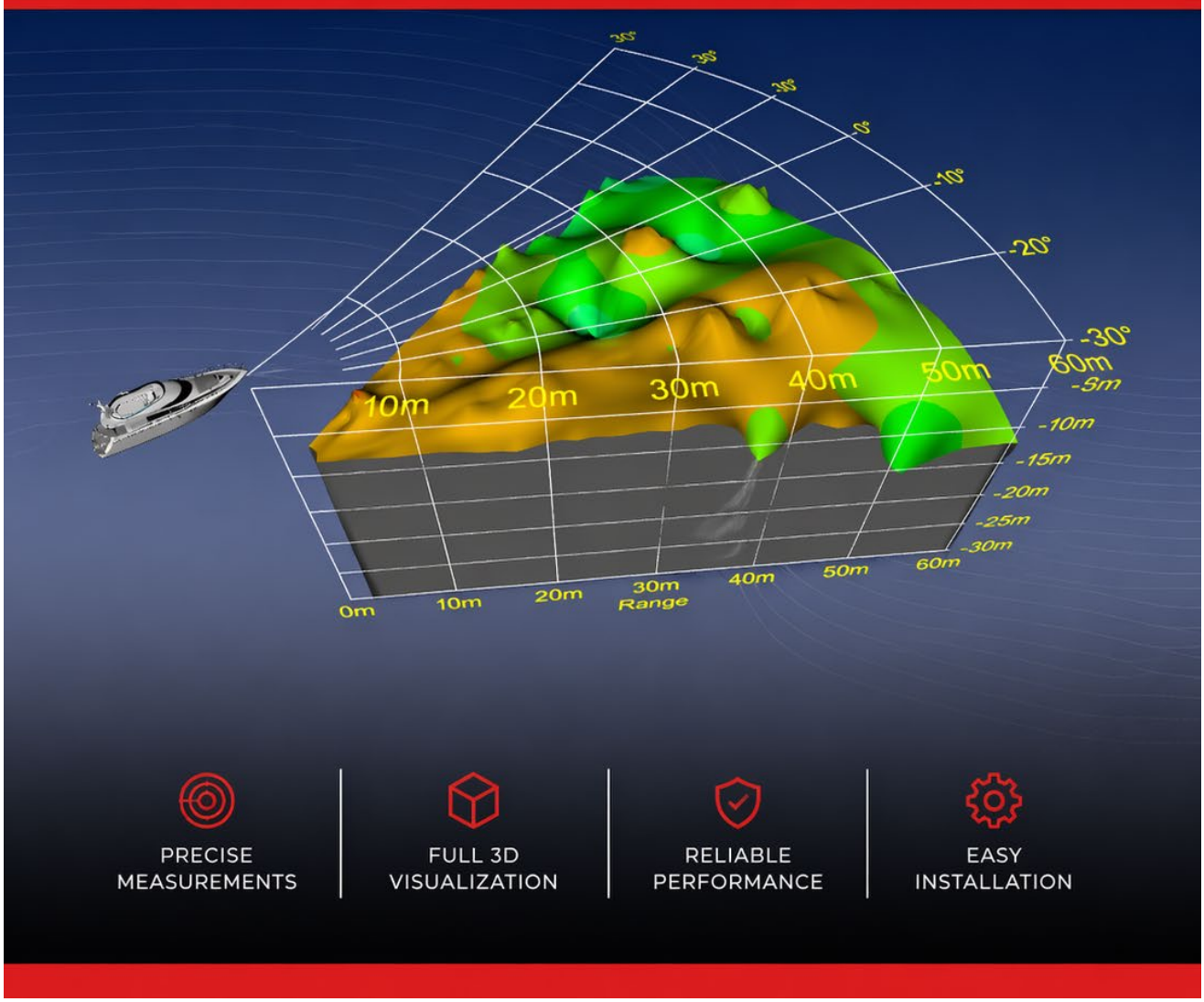
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ECHOPILOT

FLS 3D
INSTALLATION MANUAL



PRECISE MEASUREMENTS | FULL 3D VISUALIZATION | RELIABLE PERFORMANCE | EASY INSTALLATION

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INTRO

Thank you for purchasing the EchoPilot FLS 3D Forward Looking Sonar.

Your new EchoPilot instrument has been manufactured to the highest standards by the dedicated staff of a company with many years of experience in marine electronics. You have invested in the most up to date technology available and in a product rigorously tested in the laboratory and at sea.

All goods manufactured by us are backed by a 2-year warranty. Expert advice and guidance are always available by Telephone or mail - just ask for an Echopilot representative.

Nobody enjoys reading manuals, but please continue to read this one! Installing your instrument correctly is vital to get the best possible performance, pleasure and safety from your equipment, so please take the time to read the instructions.

Please observe the following warnings:

DO NOT CUT THE CABLES.

It is advised to disconnect power before connecting or disconnecting cables.

Please do not cut the transducer cables - they are fine multi-core cable matched to the transducer.

Please do not remove the transducer plug from its cable - if a hole is too small make the hole bigger! Any splice in the cable will reduce sensitivity / performance.

Disclaimer:

Echopilot makes no warranty as to the accuracy or completeness of data that is included or may be downloaded or used in connection with this product, and EchoPilot disclaims any and all express, implied or statutory warranties including the implied warranty of merchantability and implied warranty of fitness for a particular purpose. It is the user's responsibility to use this product prudently. This product is intended to be used only as a secondary aid to navigation and must not be used for any purpose requiring precise measurement of distance, depth, location, or topography.

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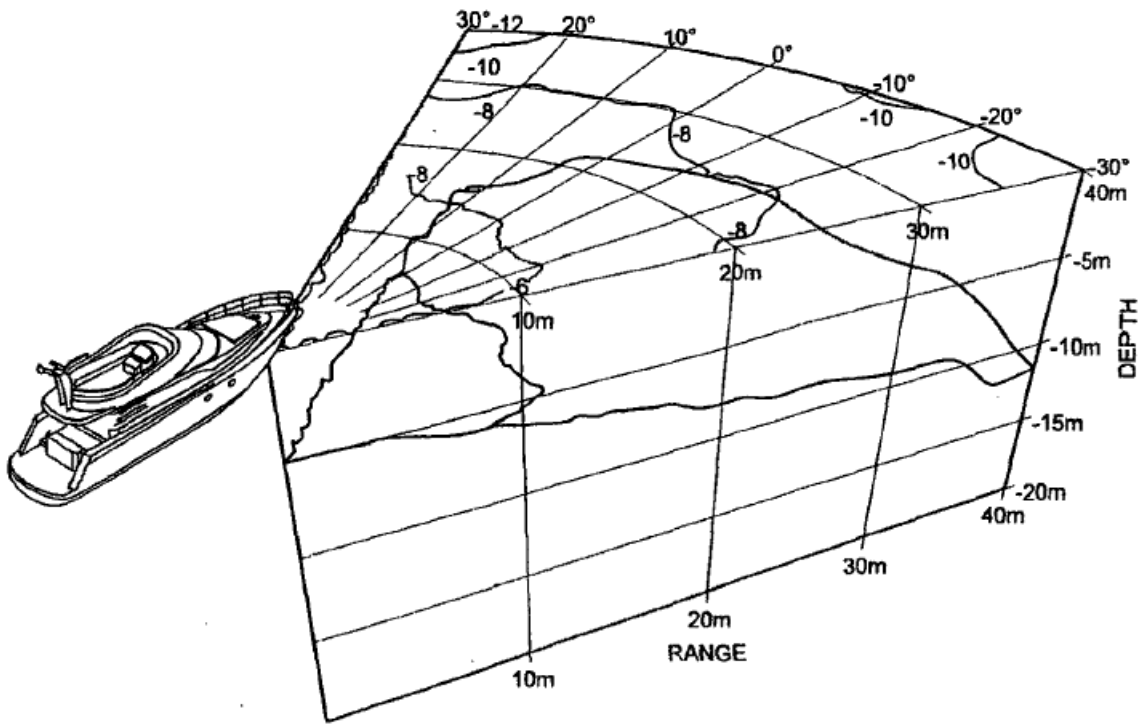
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1. How FLS Technology Works

1.1 Sonar Beam

The EchoPilot 3D is a unique and patented invention. It can see through a full arc of 90 degrees, from straight ahead to straight down.

The two transducers have a total horizontal beam of 60 degrees (port to starboard).

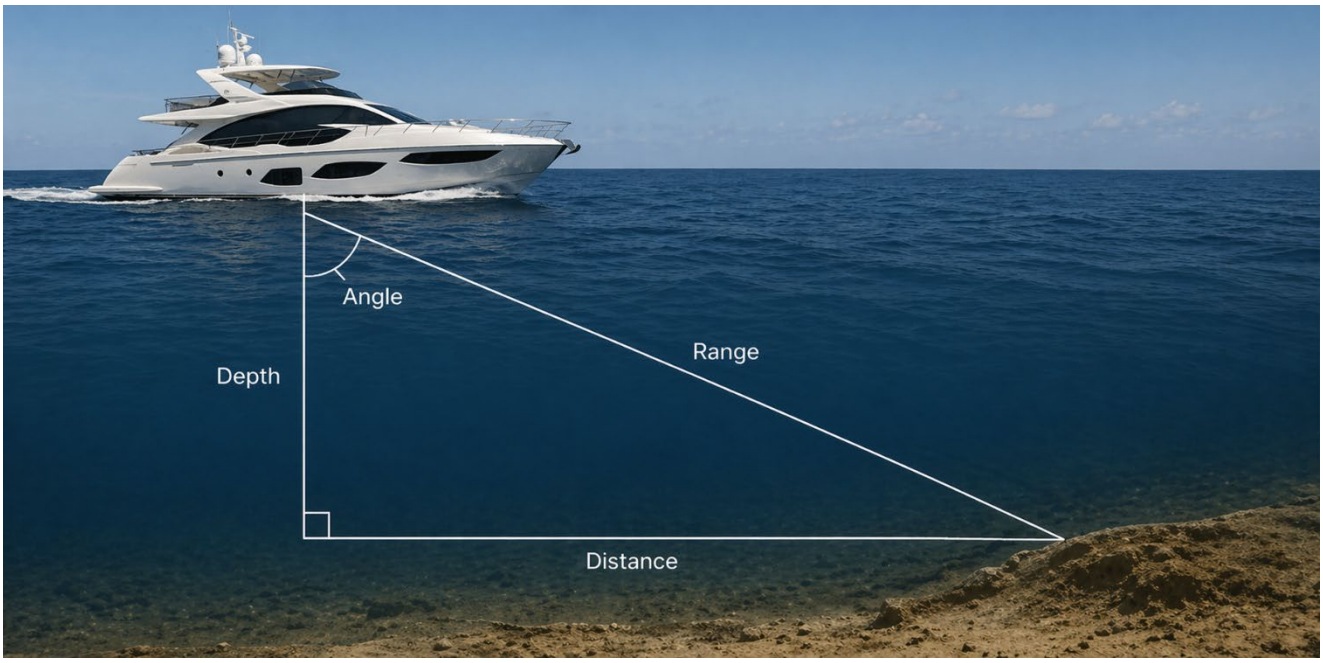


1.2 Distance Ahead

The distance ahead that the FLS 3D can see depends on the depth of water below the vessel, and the laws of physics. The transmit 'ping' radiates at all angles down and out from the vessel, hits the seabed and some of it is returned to the transducer's receivers.

As the 'ping' travels further away from the boat, it hits the seabed at an increasingly acute angle. At a certain point the angle will be so acute that the 'ping' is not returned, and the seabed information is lost - this determines the maximum view ahead.

When on a flat muddy bottom (e.g. river or estuary) the FLS 3D will show the seabed up to ten times the depth away from the boat. This ratio increases if the seabed shoals upward. Rocky bottoms are better targets than muddy ones, and hard vertical surfaces like quay walls, rocks or coral reefs will often be seen at considerable distances.



2. Guidance on use

2.1 Practice

When learning to interpret the screen please read our First Time Usage Guide on our product page: https://echopilot.com/products/fls-3d/. This guide will help you train and interpret the screen to get the best possible experience when using the sonar.

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!!!!! WARNING !!!!!

If you approach a target, select a range longer than you think you need. Most people (including us!) seriously underestimate distances to quays, buoys, walls etc.

Note that going astern can push turbulence past the transducer, reducing sensitivity severely limiting- or completely ruining image quality so take care! Maneuver with the minimum use of astern (reverse) power, especially with the propeller (on twin screw vessels) on the side of the transducer.

Turbulence from other vessels, especially in shallow water, can also adversely affect performance. Algae, Plankton and pollution can all show up as 'noise' on the screen.

2.2 Operating the FLS 3D at Speed

Ultrasonic signals travel well through both solids and liquids but are greatly attenuated in air. It follows that a stream of turbulence and air bubbles will limit the performance of the FLS 3D system, or any depth system for that matter. However, if a place can be found on the hull where there is a clear flow of water, then good results can be obtained even at speed.

2.3 Average Forward Depth

The FLS 3D Forward Looking Sonar is equipped with a new technology called Average Forward Depth. You can see the Average Forward Depth indicator in the top left-hand corner.

The Average Forward Depth is the average depth of the water ahead, based on sonar readings. It gives a quick idea of the underwater terrain in front of the sonar system

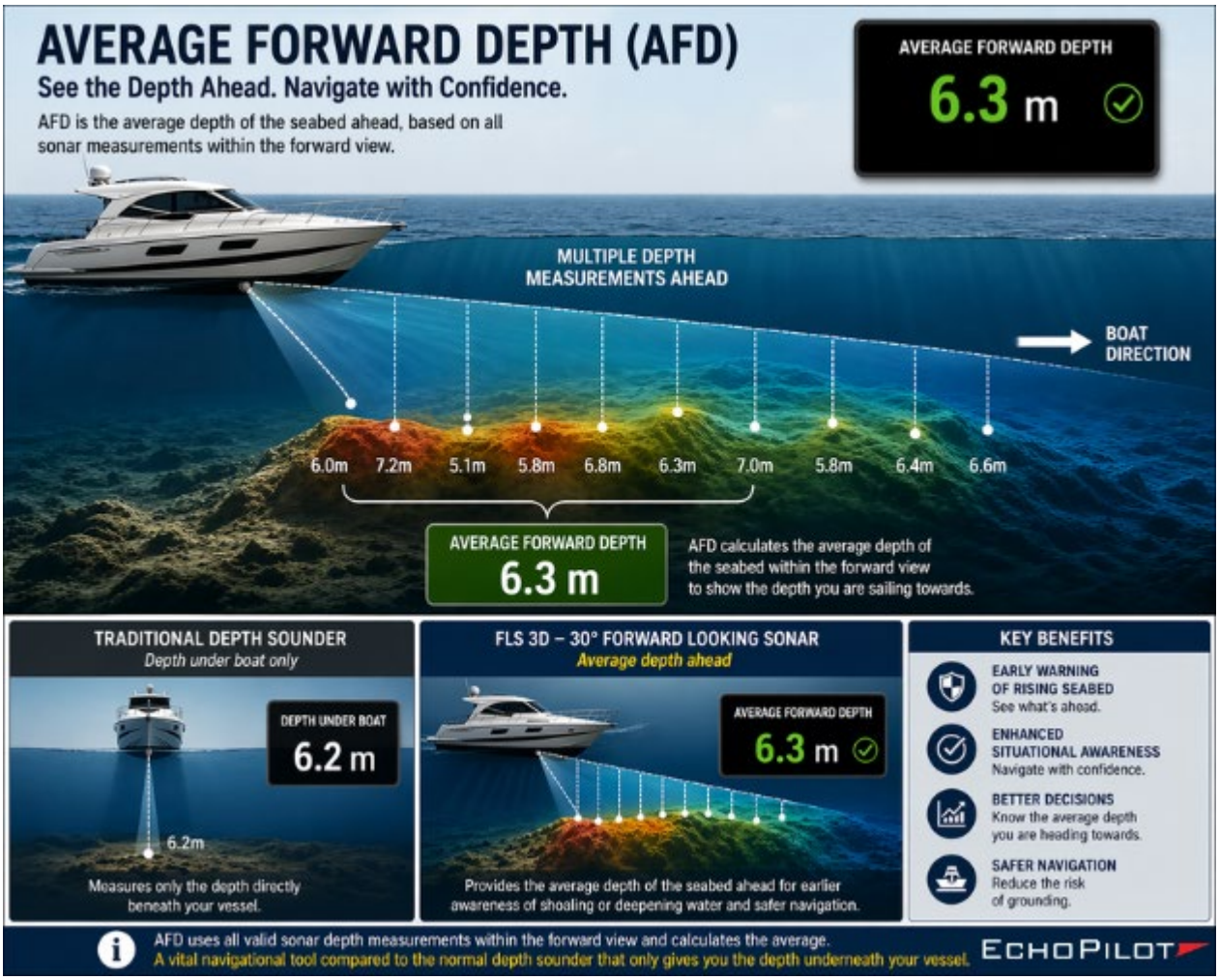
Sonar systems send out sound pulses (called pings) and measure how long it takes for the sound to bounce off underwater surfaces and return. By using the speed of sound in water—which changes with temperature, salt levels, and pressure—the system calculates the water's depth.

The area "scanned" by the Forward Looking Sonar spreads out at an angle on both sides of the sonar's forward direction (for example, 30 degrees to starboard and 30 degrees to port, making a total of 60 degrees). Within this area, the sonar collects depth information from multiple angles.

The maximum distance the sonar can measure is set by the user and controls how far ahead it can 'see.' This setting also affects how detailed the depth data is.

The Average Forward Depth is the average of all valid depth measurements within the sonars view. It smooths out small bumps or dips and gives a clear picture of the general depth ahead of the sonar.

Note: The accuracy of the Average Forward Depth can be affected by things like water conditions, how well the sonar is set up, and the area the sonar covers. For a more detailed view of the underwater terrain, it's better to look at individual depth readings or high-resolution sonar images.



3. Operating Instructions

3.1 Operation

Your EchoPilot 3D forward sonar is designed to be simple to operate and easy to interpret, though practice always helps with understanding any new instrument on a boat. The FLS 3D looks under the water up to 200 meters ahead of the vessel. The distance ahead that the FLS 3D sees depends on the depth of water below the boat and the laws of physics. The transmit 'ping' radiates at all angles down and out from the vessel, hits the seabed and some of it is returned to the transducer's receivers.

As the 'ping' travels further away from the boat, it hits the seabed at an increasingly acute angle. At a certain point the angle will be so acute that the 'ping' is not returned, and the seabed information is lost - this determines the maximum view ahead, though often up to 20 times depth ahead.

In the horizontal plane the 3D covers an overall area of 60 degrees in front of the vessel.

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In the vertical plane the 3D can see from under the transducers to the sea surface ahead. The depth colour scale on the right-hand side of the screen shows red for the shallowest readings, through the colours of the rainbow up to dark blue for the deepest readings.

All depths shown are the depths below the sea surface.

3.2 Powering on the system

To switch on the EchoPilot FLS 3D press the power button on the keypad or power on using the on/off power button. There is a five second delay between pressing the button and the LED on the keypad or power button illuminating. Shortly after the LED is lit the display will show the EchoPilot logo. From this point the system will take approximately 30 seconds to boot.

The first time the FLS 3D is switched on it will boot with the following settings:

Range: 40m

Units: Meter

Bow Offset: 0.0

Depth below waterline: 0.0

Once the settings are changed and saved, they will be the default for future power on.

The system will always boot in the lowest range setting: 40 meters or 119 feet depending on the Units settings chosen.

3.3 Powering off the system

To switch off the EchoPilot FLS 3D press the power button on the keypad or on the on/off power button. The Echopilot logo will appear and a message saying “shutting down” will appear. The shutdown takes approximately 10 seconds. Once the system is off the display will become blank and the LED on the keypad will turn off.

It is also possible to execute a forced shut down of the system by pressing and holding the power button for three seconds. This is bad practice and should only be done in emergency situations where sonar blackout is required immediately.

3.4 How to Change Range

To change range, use the up and down keys on the Keypad. Use the up key to increase the range and the down key to decrease the range. If you press the up or down key several times it will jump instantly to the required range. For example, if you are on the 40m range and you press the up key three times the range will jump instantly to the 100m range.

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3.5 Range settings

In Meters: 40m, 60m, 80m, 100m, 150m, 200m

In Feet: 119ft, 180ft, 239ft, 299ft, 399ft, 600ft

4. Setup Instructions

4.1 Settings Menu

In order to access the settings menu, press the menu button on the keypad. The left/right keys move between the settings. The up/down keys change the values of the current setting. The enter key saves the changes to the settings and closes the settings screen.

4.2 Units

This value can be set to either meters or feet. The standard setting is meters. Once you have chosen your preferred unit setting press enter to save the setting. You will now see that the units on the FLS 3D image changes to the units chosen.

4.3 Bow offset

This value should be set to the distance that the transducer is set back from the bow. The setting can be set between 0 – 10 meters from the bow.

4.4 Depth Below Waterline

This value should be set to depth that the transducer is below the waterline. The setting can be set between 0 – 5 meters.

5. Installation Instructions

5.1 Thru Hull Skin Fitting

The FLS 3D system is supplied with a thru hull skin fitting for each transducer. The transducers are to be mounted in these skin fittings to secure and protect the transducers in the hull.

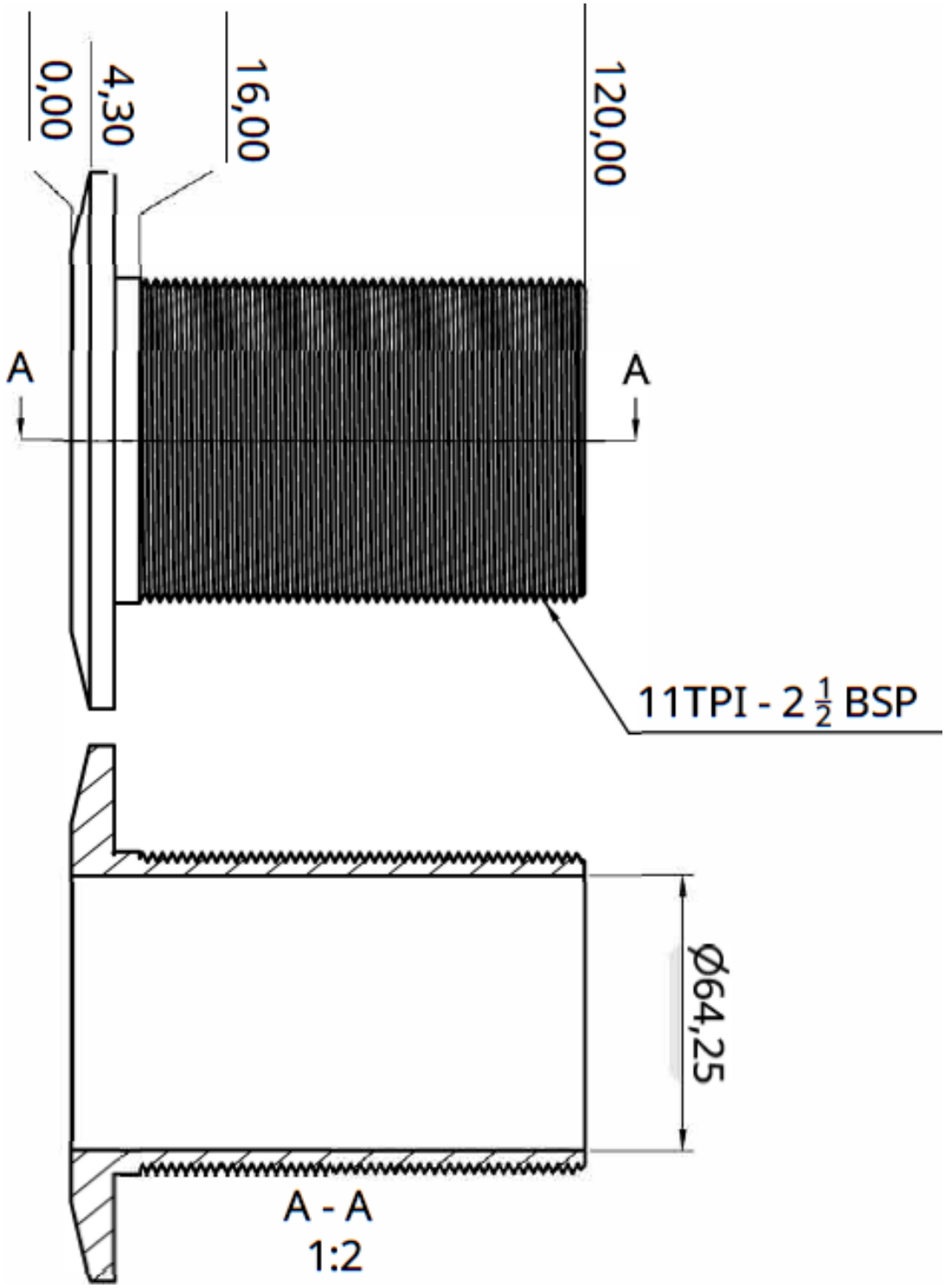
The skin fittings are supplied in three different types of material to match any hull type. They are offered in **Bronze, Aluminum or Steel.**

The skin fittings are also supplied in two different sizes to accommodate different vessel types and the amount of thread needed for a 100% vertical installation in the hull. The sizes are:

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5” Skin Fitting :

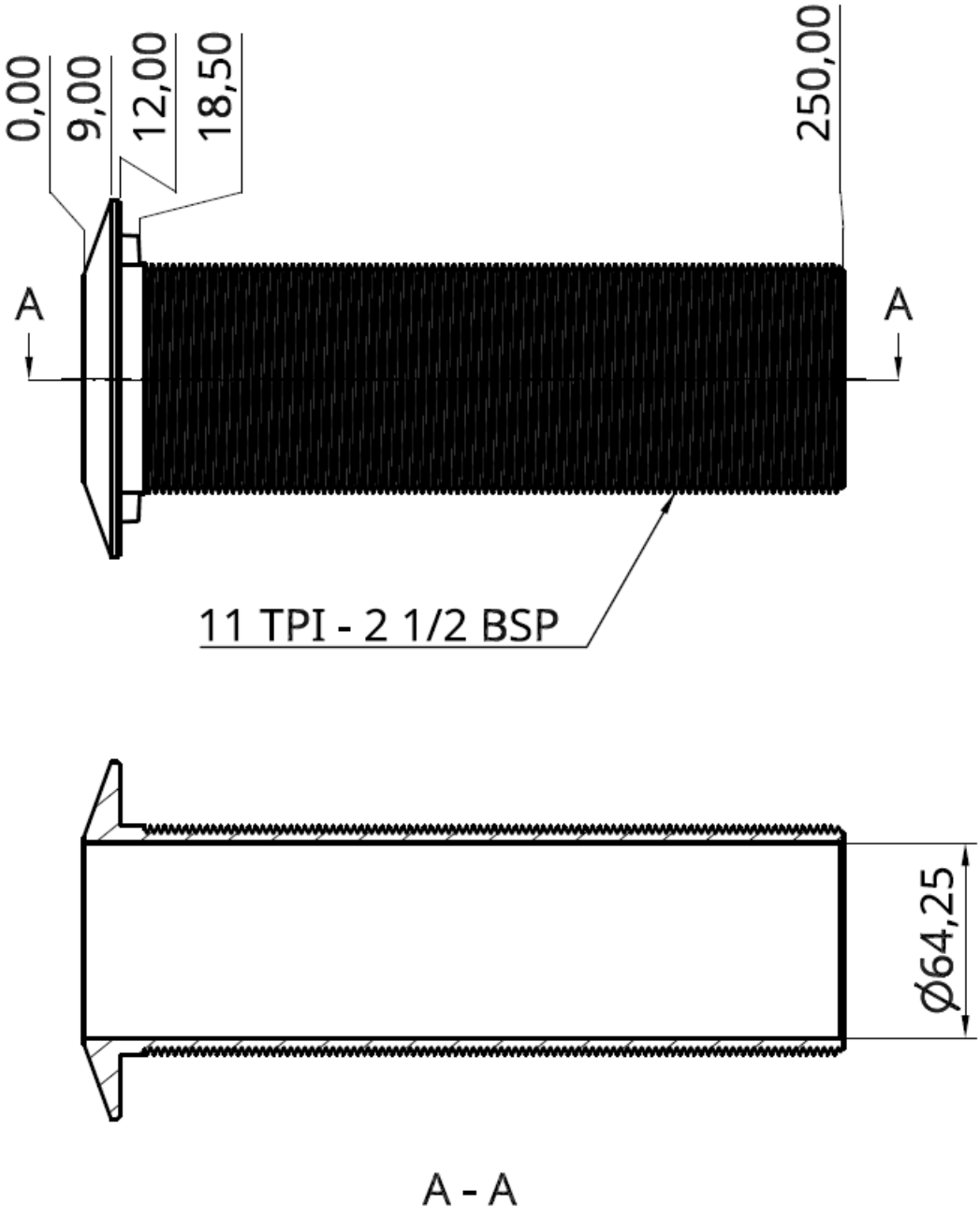


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10” Skin Fitting



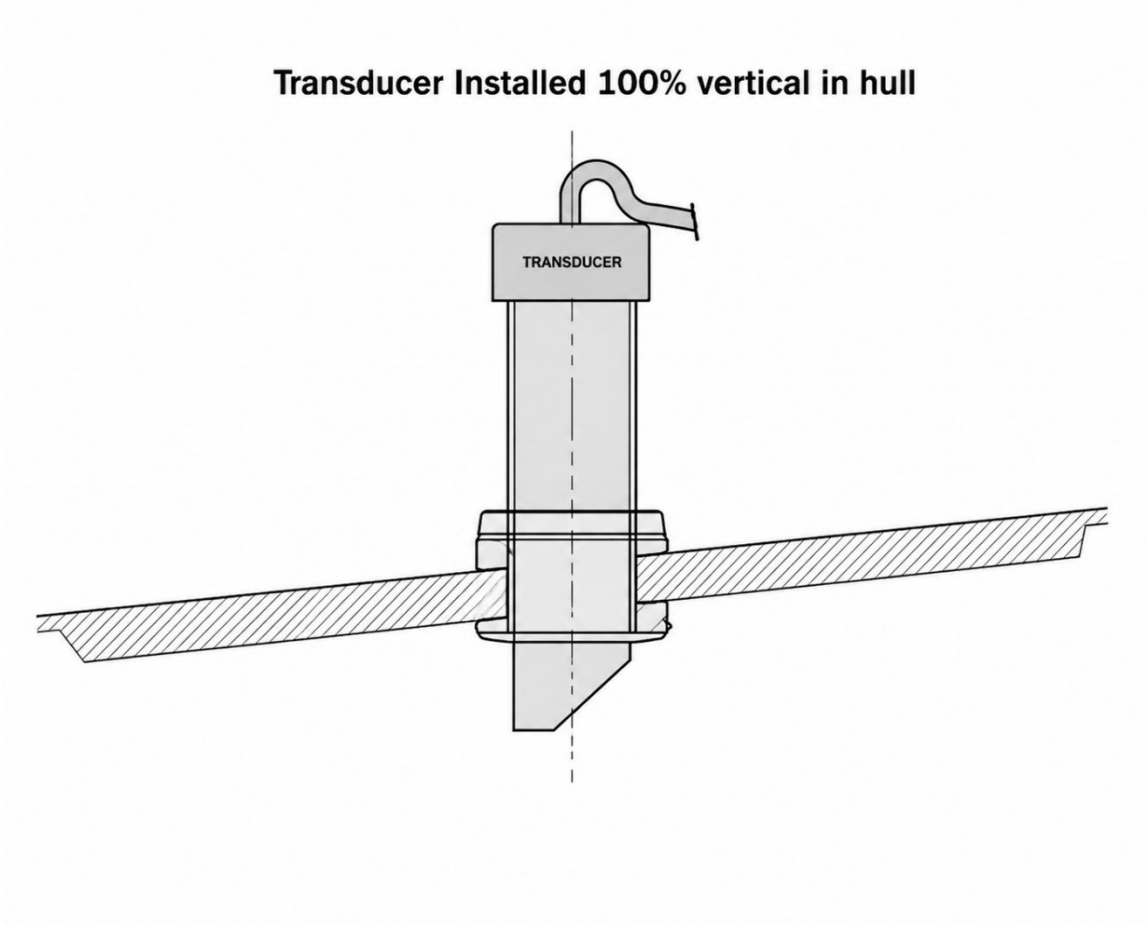
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5.2 Transducer Installation

- The transducer must be 100% vertically installed.
- The transducer should be placed as far forward from other sounders as possible to avoid interference.
- The transducers must have a clear line of sight. Each Transducer has a 30 degree forward view. The transducer should have a clear line of sight in a 30 degree forward angel.
- The transducers must be placed where they will always be submerged in water. Not coming out of water when planning.
- The transducers should be placed in an area with calm water where air bubbles or turbulence are not generated. Bow thrusters and ports can make disturbed water.
- Do not route transducer cables together with other cables.



The choice of transducer position will have a major effect on final performance so please carefully consider all factors and if in any doubt, contact the factory on +45 4737 3800.

There is no minimum distance between transducers, but transducers cannot be placed more than 5 meters apart from each other.

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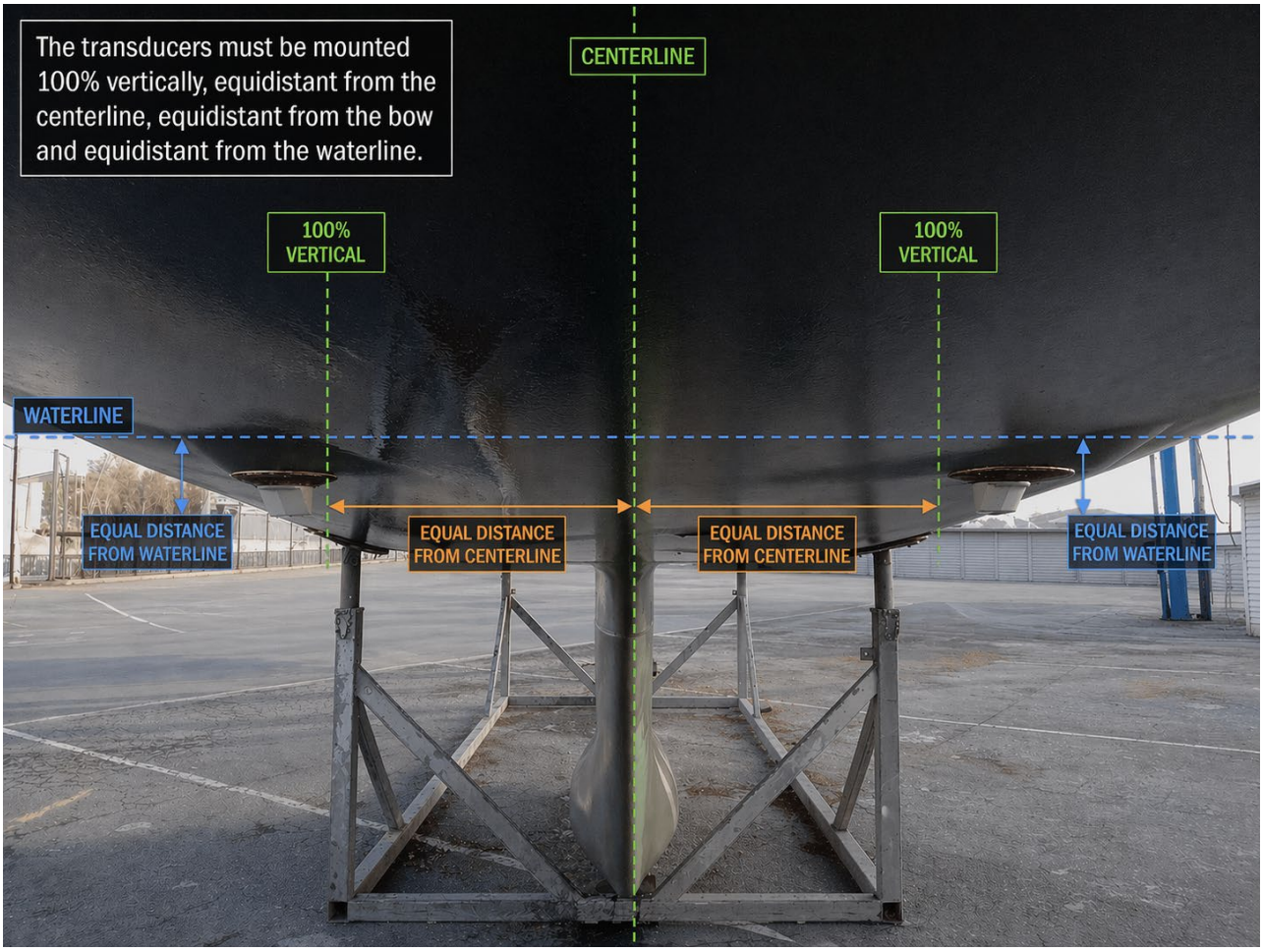
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The following guide will enable you to decide where to install transducers in your hull:

The transducer transmits a “ping” and when the transducer receives the “ping” back, it generates the 3D visualization on the display unit according to the characteristics of the received “ping”. As you can imagine, it is important that the “ping” is returned from the seabed and not the keel of the boat or other disturbances like sounders, air bubbles etc.
When installing the transducer, it is important that the transducer has a clear line of sight in a 90 degree vertical angel and 30 degree horizontal angel on each transducer. Before installing the transducers, stand under the boat with your head near the proposed position and check that you can see from your toes up to above the horizontal ahead.

The transducers must be mounted 100% vertically, equidistant from the centerline, the bow and the waterline. If it leans forward the seabed will appear to slope up, and if it rakes aft then a degree of surface clutter may show.



Do not fit downstream of any other through hull fittings (for example intakes, log, toilet sea cocks etc.) and choose a location with good access for withdrawing the transducer for cleaning.

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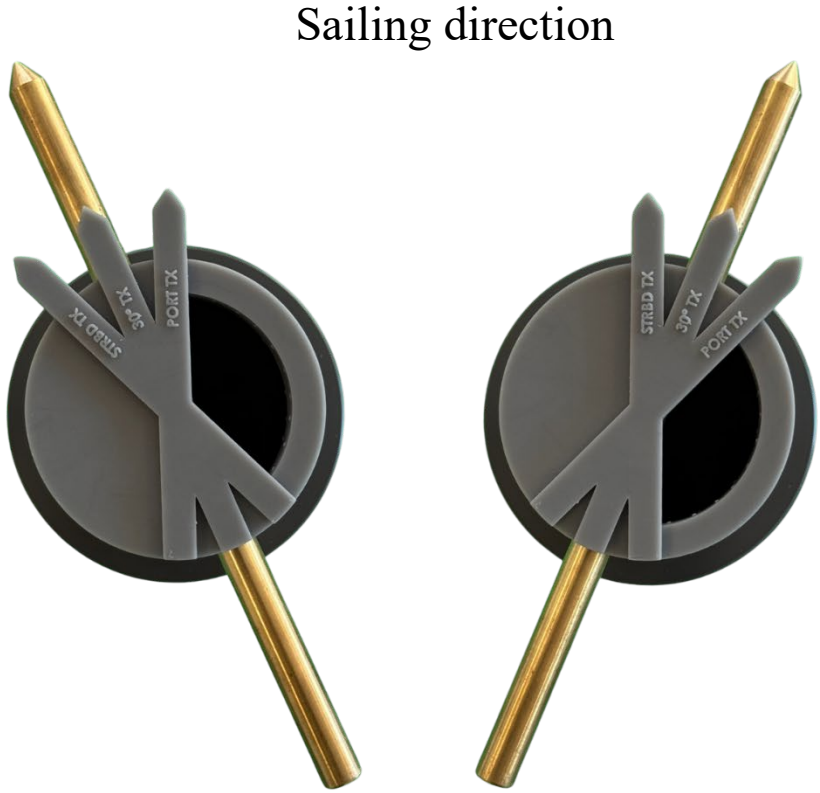
Fairings, pads, tapered washers may be required during the fitting of the transducers to achieve a 100% vertical installation of the transducers. Consideration must also be paid to access for maintenance.

Each transducer is tuned to work with its own cable, as such the cable must not be cut, and the connector must not be removed. If it does not reach, you have the option to extend the transducer cable up to 22 meters. Contact your local supplier/dealer for more info on transducer extension cables.

OBS: When extracting the transducer from the thru hull skin fitting ALLWAYS pull using the bronze pointer, NOT the cable.

OBS: Do not route transducer cables together with other cables.

NEVER CUT THE TRANSDUCER CABLE



Note: The transducer installed on the port side must have the grey PORT TX pointer pointed in the sailing direction. The transducer installed on the starboard side must have the grey STRBD TX pointer in the sailing direction.

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5.3 Transducer Interface Installation

The transducer interface box requires reasonable protection from moisture. Ensure that you mount it within reach of the transducer cables and the data cable.

All the plugs on the transducer interface have a threaded locking ring in order to prevent them from coming loose through vibration, and to protect them from moisture. Be careful not to over tighten the locking rings.

Make sure that the correct transducer is connected to the correct plug. Port side transducer connected to PORT TX connector and Starboard transducer connected to STRBD TX connector.

The data cable only has one socket on the transducer interface that this will plug into, which is clearly marked data.

The power cable plugs into the socket that is marked power. The power cable has two cores, red (positive +12 / 24v), and black (negative 0v).

If the transducer interface box is connected to a 12+ Vdc supply, then the visual processor must also be connected to a 12v supply. The positive of both the transducer interface box and the visual processor must be at the same potential with respect to ground.

If the transducer interface box is connected to a 24v supply, then the visual processor must also be connected to a 24v supply. The positive of both the transducer interface box and the visual processor must be at the same potential with respect to ground.

The grounds (0v connection) for both the transducer interface box and the visual processor must be at the same potential.

The transducer interface will require four mounting screws or bolts which will go through the stainless-steel mounting brackets. We advise the use of stainless-steel fixings.

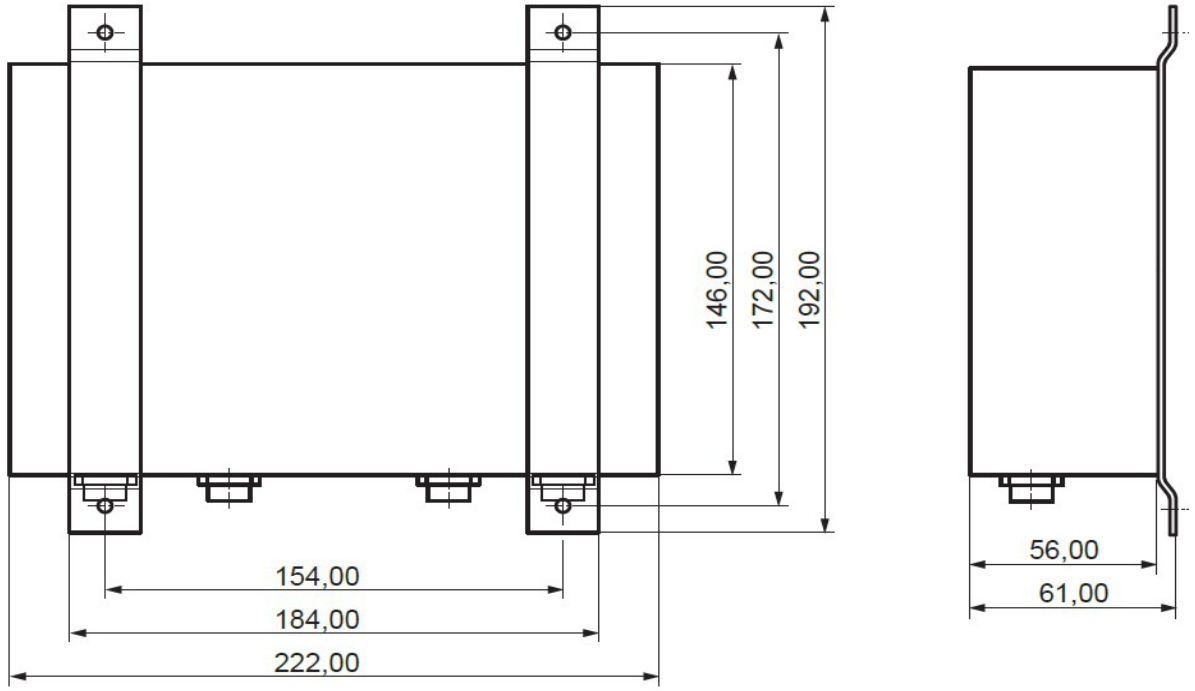
Do under no circumstances unscrew the two mounting brackets on the transducer interface box!

The screws in the mounting brackets are holding the PCBs together inside the transducer interface box. If the mounting brackets are unscrewed the PCB will become loose inside and the warranty will no longer apply.

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As shown on the diagram below the spacing for the fixings is 154 mm x 172mm



5.4 Visual Processor Installation

The power cable plugs into the socket that is marked 12V. The power cable has two cores, red (positive +12 / 24v), and black (negative 0v).

The visual processor is based on a PC. As such it should be mounted in a protected location. However, it should still be accessible for maintenance.

The data cable from the transducer interface box plugs into the socket that is marked data. Please note that there are two identical sockets for the data cable. You must connect to the top socket which is marked DATA as seen below.

If the visual processor is connected to a 12+ Vdc supply, then the transducer interface box must also be connected to a 12v supply. The positive of both the transducer interface box and the visual processor must be at the same potential with respect to ground.

If the visual processor is connected to a 24v supply, then the transducer interface box must also be connected to a 24v supply. The positive of both the transducer interface box and the visual processor must be at the same potential with respect to ground.

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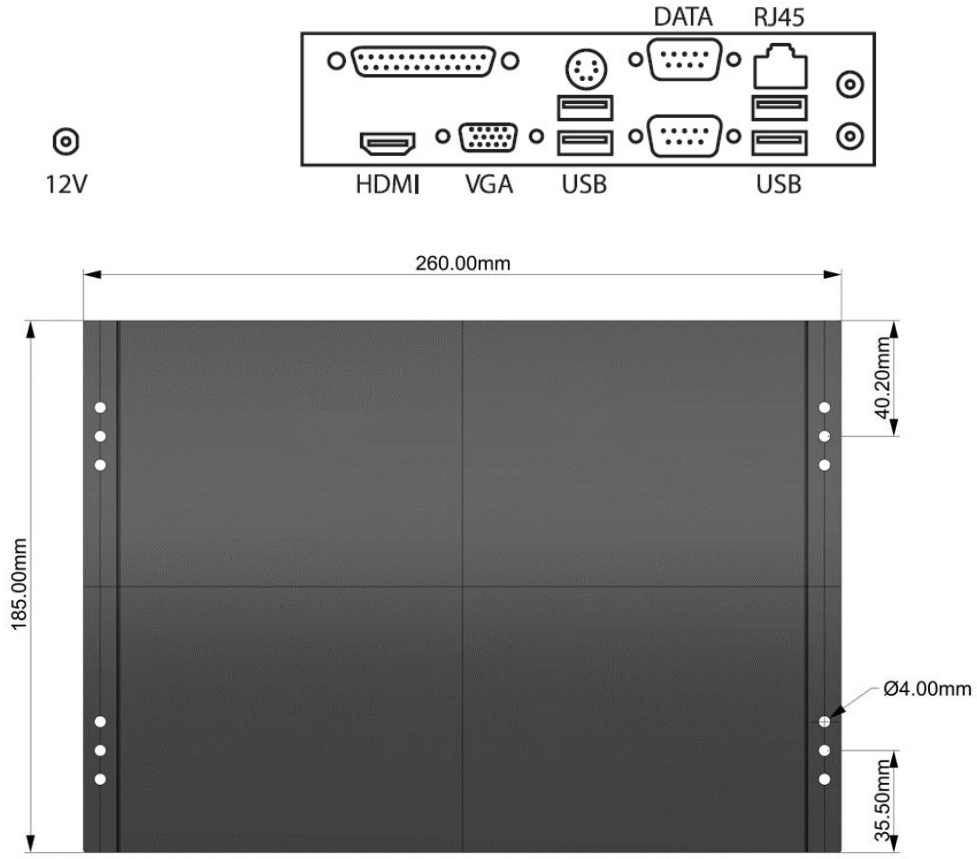
The grounds (0v connection) for both the transducer interface box and the visual processor must be at the same potential.

The keypad cable connects to the socket marked keypad on the visual processor. The plug has a threaded locking ring in order to prevent it from coming loose through vibration, and to protect them from moisture. Be careful not to over tighten the locking ring.

The visual processor has two video output options. These are HDMI and VGA.
The HDMI and the VGA outputs will provide high quality pictures and are the advisable outputs to use.
You can only use one video output at a time. You cannot use both the HDMI and VGA output at the same time. Choose one video output and use only this.
If you need to change the output turn off the visual processor, change the video output, and turn on the visual processor.

The visual processor will require four mounting screws or bolts which will go through the mounting brackets. We advise the use of stainless-steel fixings.

As shown on the diagram below the spacing for the fixings is 260 mm x 185mm.



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5.5 Keypad Installation

The waterproof keypad plugs into the visual processor as explained on the previous page.

The keypad should be mounted as near as possible to the display which the EchoPilot 3D is being shown.

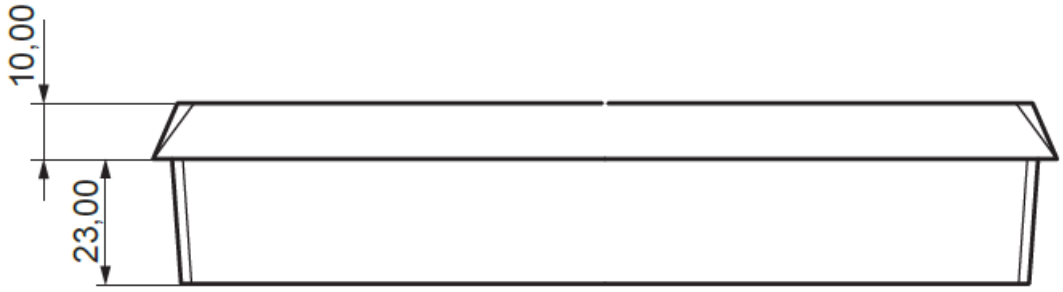
The keypad has been designed for panel mounting. It is provided with a stainless-steel mounting bracket, two plastic m6 studs and two m6 plastic nuts.

Once you have decided on the best position for the keypad (making sure that the cable reaches the visual processor), cut out a rectangular hole measuring 72mm x 112mm. Place the keypad into the cut out with the m6 studs already screwed into the threaded holes in the back of the keypad (you may also wish to seal with a small amount of suitable sealant). Place the stainless-steel bracket on the studs and tighten with plastic nuts. Do not overtighten the mounting nuts.

The Keypad comes with a standard 2-meter cable. If you require additional cable length extension cables can be purchased to achieve 12 or 22 meters of total cable length. Contact your local supplier if additional cable length is needed.

It is possible to connect a second optional keypad to the visual processor for control in two locations. If a second optional keypad is needed please contact your local dealer.

The keypad is supplied only with systems designed for use with a 3rd party display via video output. For systems integrated with compatible MFDs such as Raymarine, Simrad, B&G or Lowrance, all operation is controlled directly through the display and in these cases the On/Off button is supplied (Chapter 5.6).



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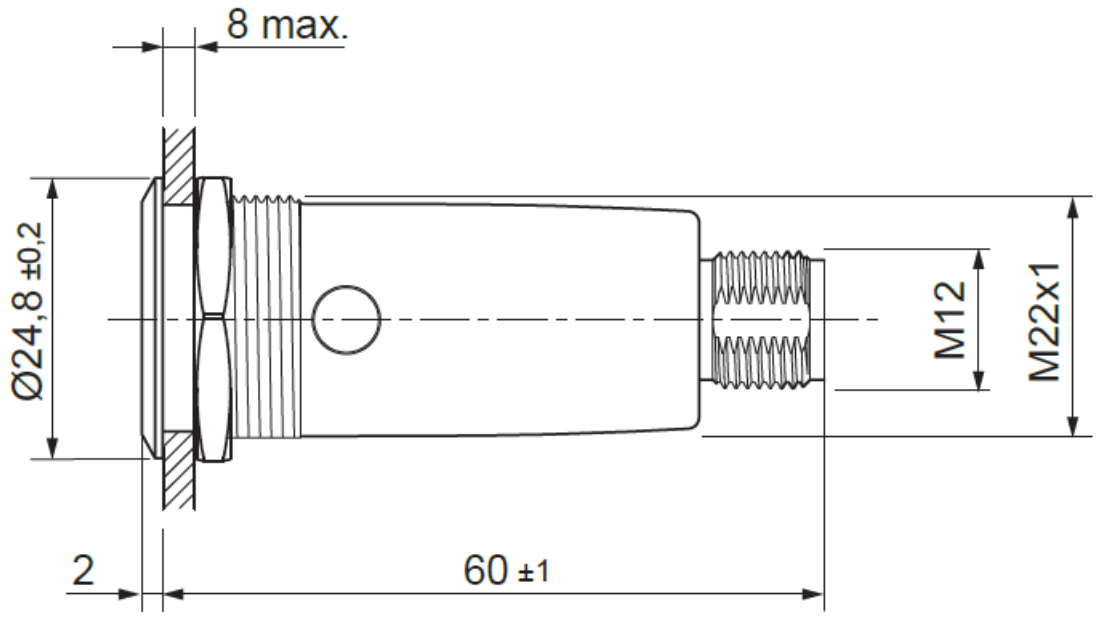
5.6 On/Off Switch Installation

Install On/Off switch in a suitable place and connect it to keypad 1 or keypad 2 connector on Visual Processor.

Once you have decided on the best position for the on/off switch (making sure that the cable reaches the visual processor), cut out a circular hole 22mm diameter

The On/Off switch comes with a standard 2-meter cable. If you require additional cable length extension cables can be purchased to achieve 12 or 22 meters of total cable length. Contact your local supplier if additional cable length is needed.

The on/off switch is supplied only with systems designed for integration with compatible MFDs such as Raymarine, Simrad, B&G or Lowrance. When integrated all operation is controlled directly through the display and the on/off button is supplied to power on/off the system.



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5.6 Product Overview using video output



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5.6 Product Overview Raymarine, Simrad, B&G or Lowrance Integration



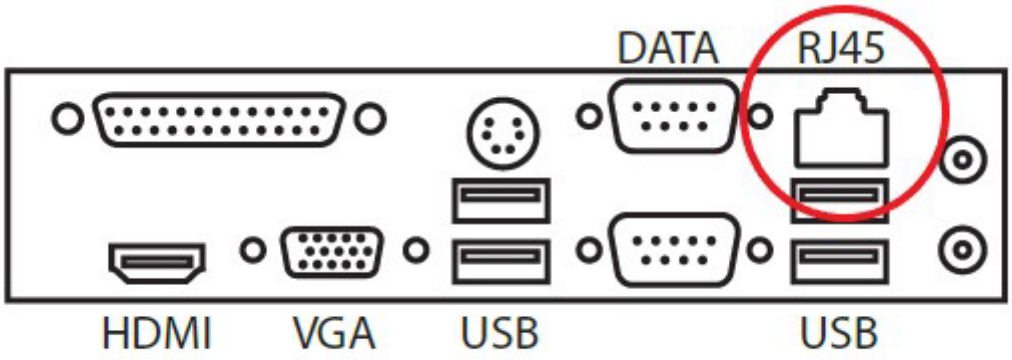
6. Raymarine Integration

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The FLS 3D is fully integrated with all Raymarine Axiom and Axiom 2 models. The integration is made to the Raynet or directly to the Axiom display via a RJ45 to Raynet network cable. The cable is not included in the FLS 3D kit and will need to be purchased separately.

6.1 Connecting The Visual Processor To The Raynet

The Visual Processor can only be connected to the Raynet via the ethernet port on the back of the Visual Processor.



The Visual Processor can be connected several different ways to the axiom displays:

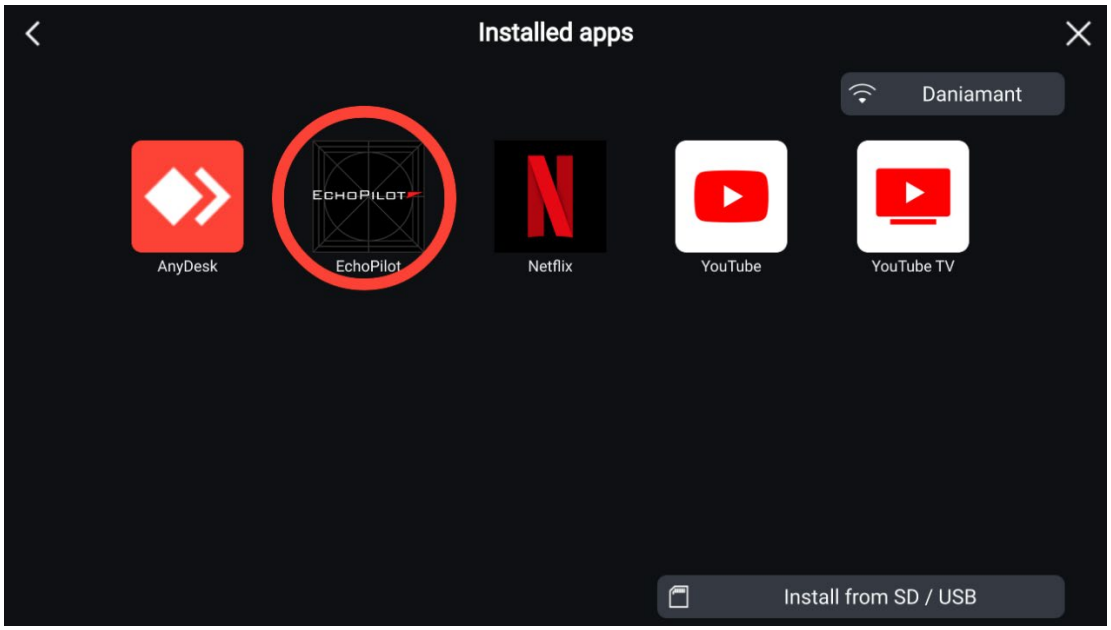
1. Connect directly to the Axiom Display: You can connect the Visual Processor directly with an Axiom display by connecting a RayNet (F) to RJ45 (M) Port. Connect the RJ45 to the ethernet port and the Raynet connector to the network port on the Axiom display.
2. Connect to the Raynet via a Switch Box: You can connect the Visual Processor to the Raynet via a Switch Box. Connect the RayNet (F) to RJ45 (M) Port to the ethernet port on the visual processor and to the Switch Box. It is important that the AXIOM Display is connected to the same switch box to connect.

6.2 Powering on the FLS 3D

When the FLS 3D Visual Processor is connected to the AXIOM display or the Raynet you need to power on the Visual Processor and the Raymarine AXIOM Display.

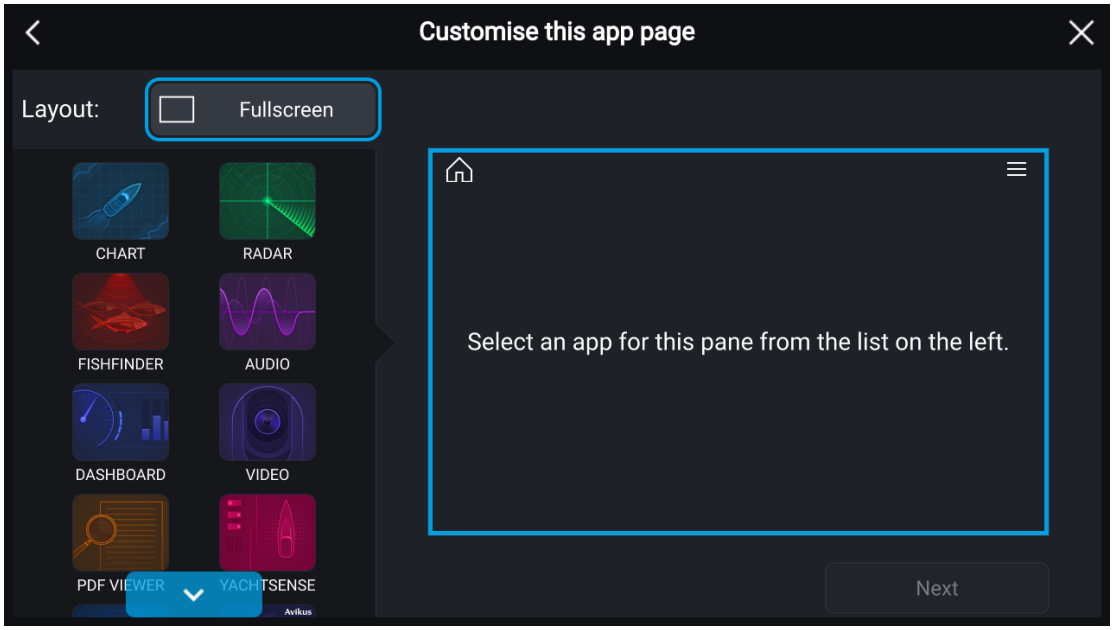
The Visual Processor is powered on by pressing the power button on the On/Off switch.

Once the visual processor and AXIOM display are turned on it will take approximately 1 minute before the EchoPilot App is visible under the app section on the AXIOM display. By pressing the EchoPilot App Icon you will enter the EchoPilot Forward Looking Sonar program.

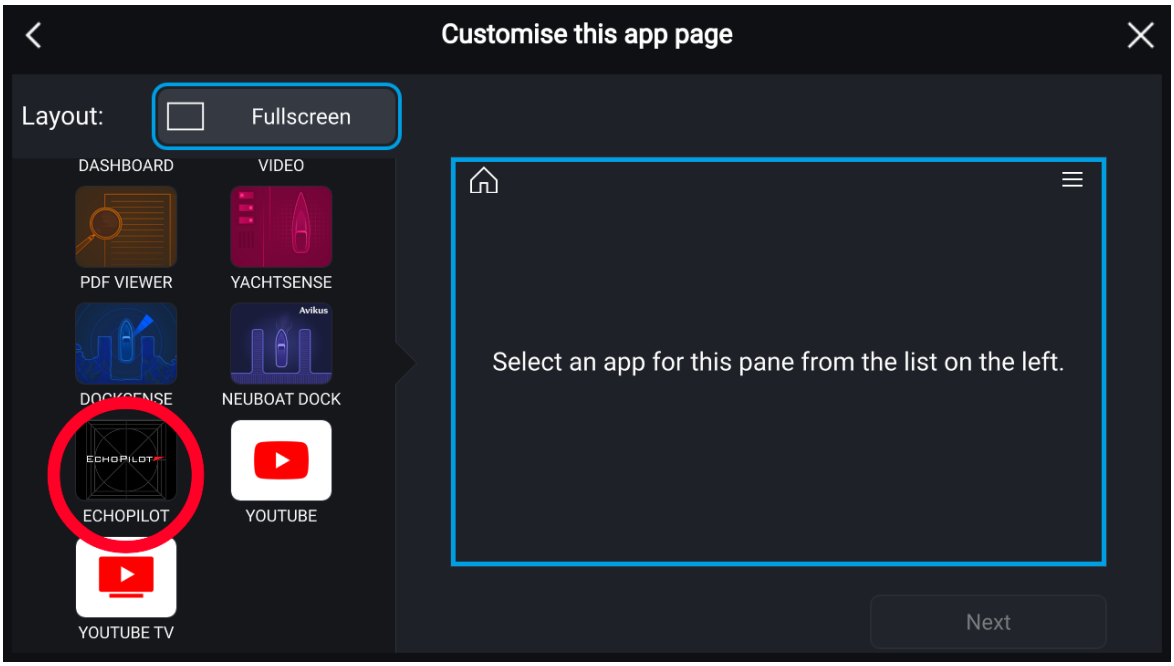


6.3 Adding the EchoPilot App to the main screen

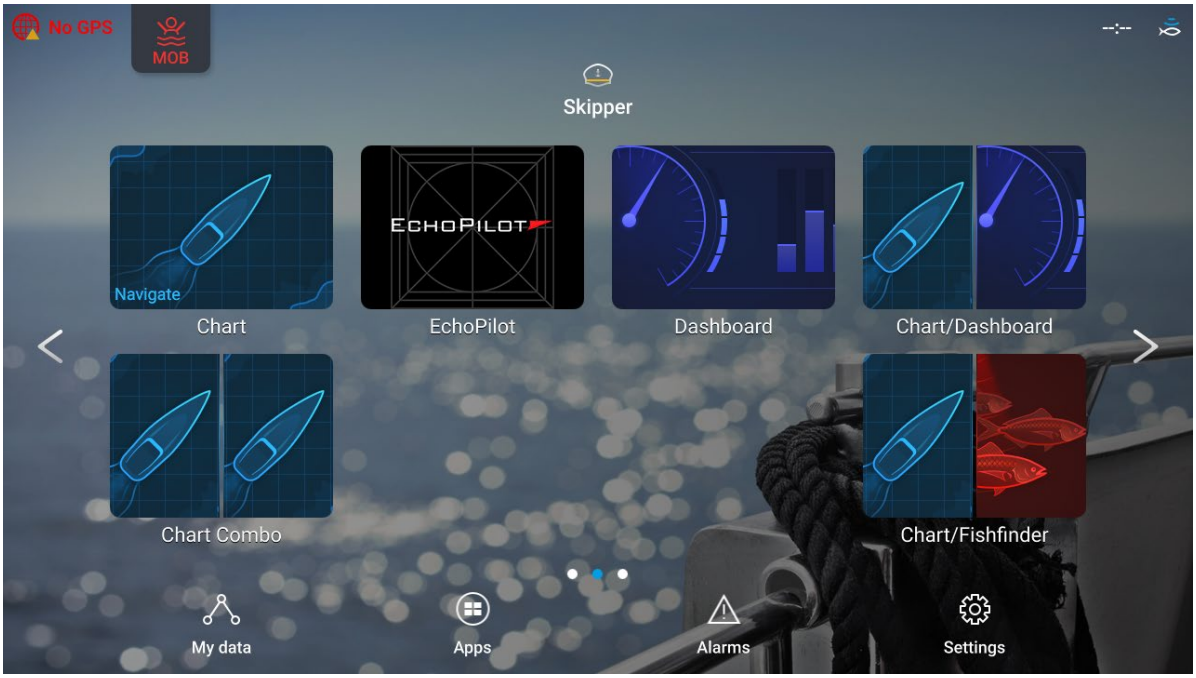
When on the main screen of the Axiom MFD press and hold on the main screen. This will access the “Customise this app page”.



On the left hand side, scroll and find the EchoPilot App.



Select the EchoPilot App and press Next. You can now Rename the page. Once you have given the app a name press save. The EchoPilot app is now on your main display.



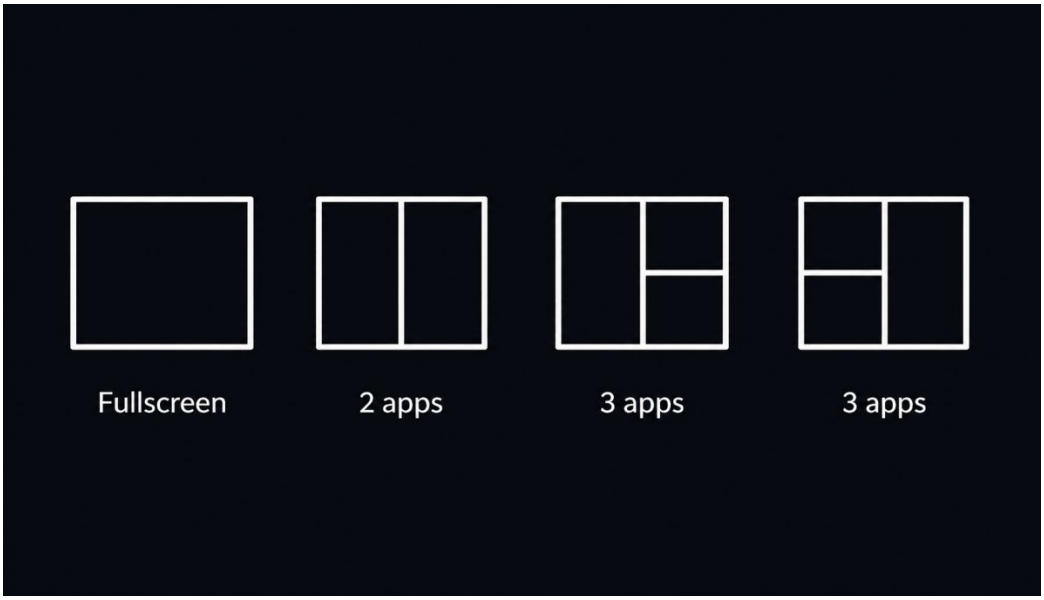
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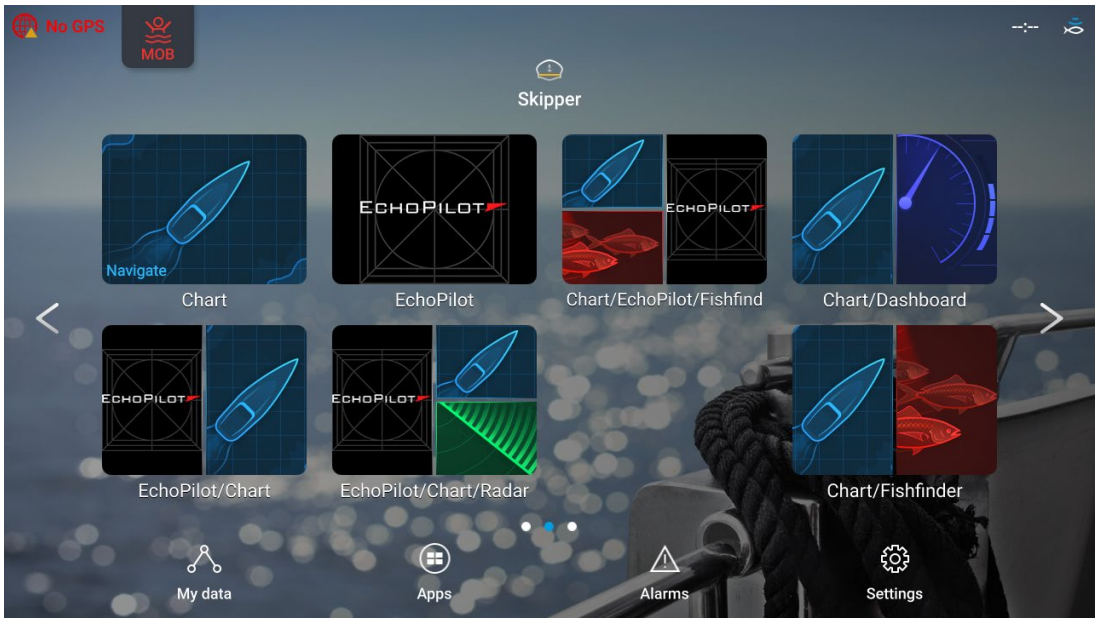
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6.4 Choosing Different Layouts For Your App

When on the main screen you can edit or add an app by pressing and holding you finger on the main display. This will let you enter the “Customise this app page”. Here you can choose different layout styles. The EchoPilot App can be utilized in the following layout styles:

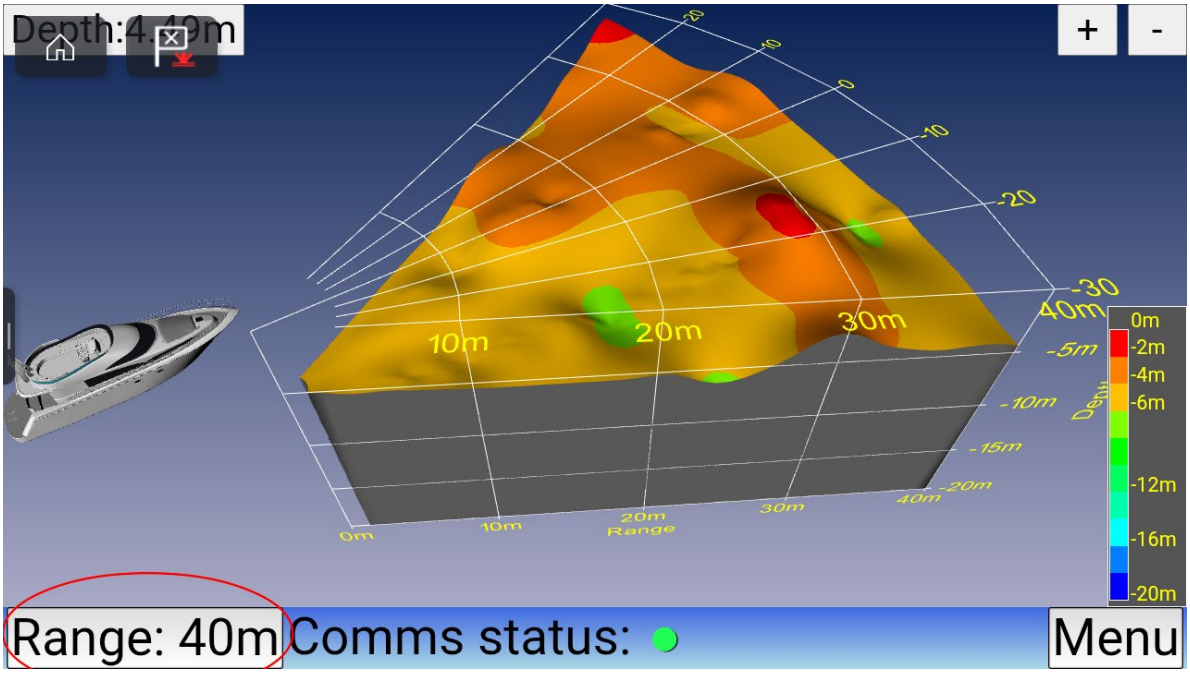


Once you have chosen your layout, choose the apps you want in your layout and press next. You will now be guided to the Rename page. Here you can give your application any name. After you have chosen your name press ‘Save’. Once you have pressed save you will see the new layout application on the Axiom home page.

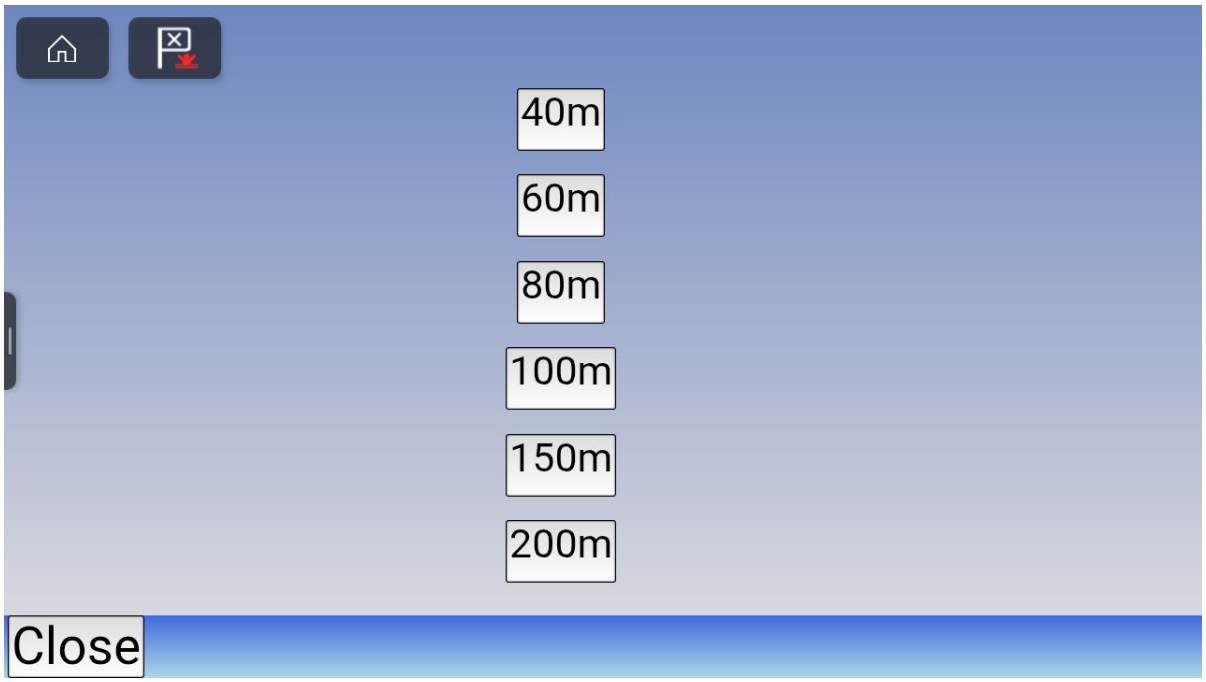


6.5 Changing Range Settings

While in the EchoPilot App you can change the range setting by pressing the range button.



Once you have pressed range a window will appear with different ranges to choose from: 40m, 60m, 80m, 100m, 150m, 200m. Simply choose your desired range and you will be brought back to the Sonar image and the range will update to the chosen range.



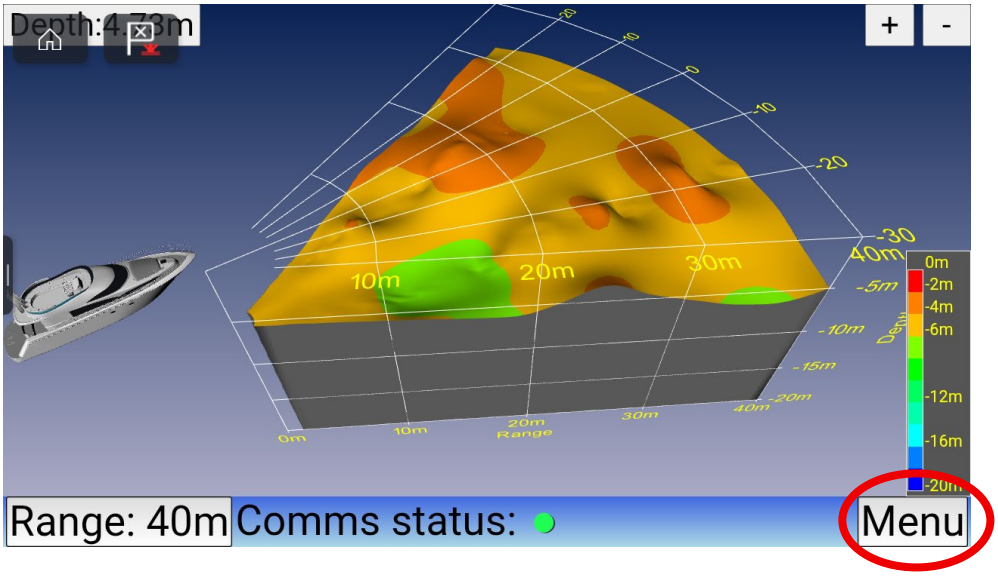
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6.6 Entering Menu Settings

Enter the menu by pressing the menu button

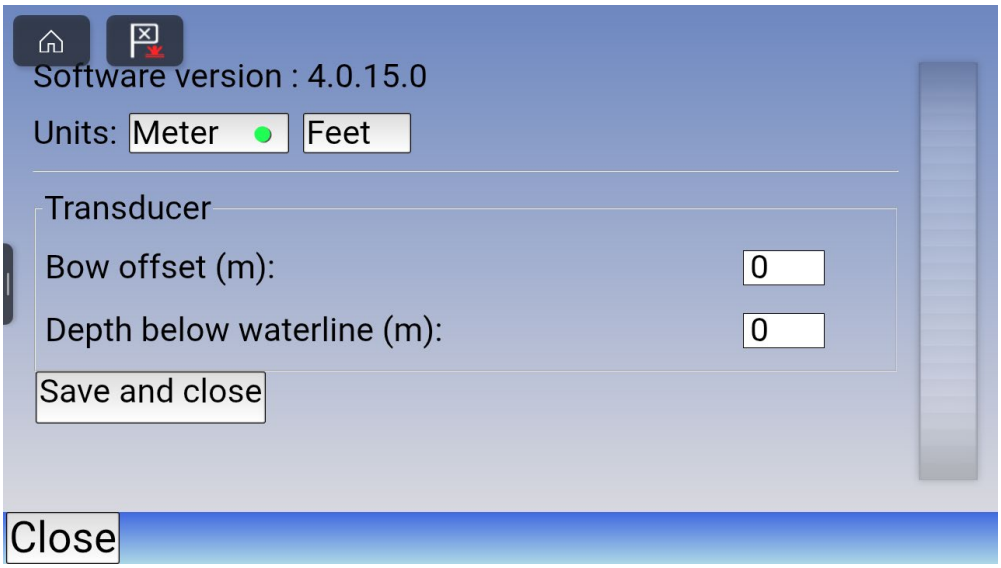


Inside the menu you can choose three different settings:

1. Units: Choose if you want to see the range in meters or feet
2. Bow offset (m): This value should be set to the distance that the transducer is set back from the bow. The setting can be set between 0 – 10 meters from the bow.
3. Depth below waterline (m): This value should be set to depth that the transducer is below the waterline. The setting can be set between 0 – 5 meters.

The settings are chosen by using the scroll wheel to the right on the menu page.

Once you are happy with the settings press ‘Save and close’ and you will be brought back to the main screen and your settings will be saved.



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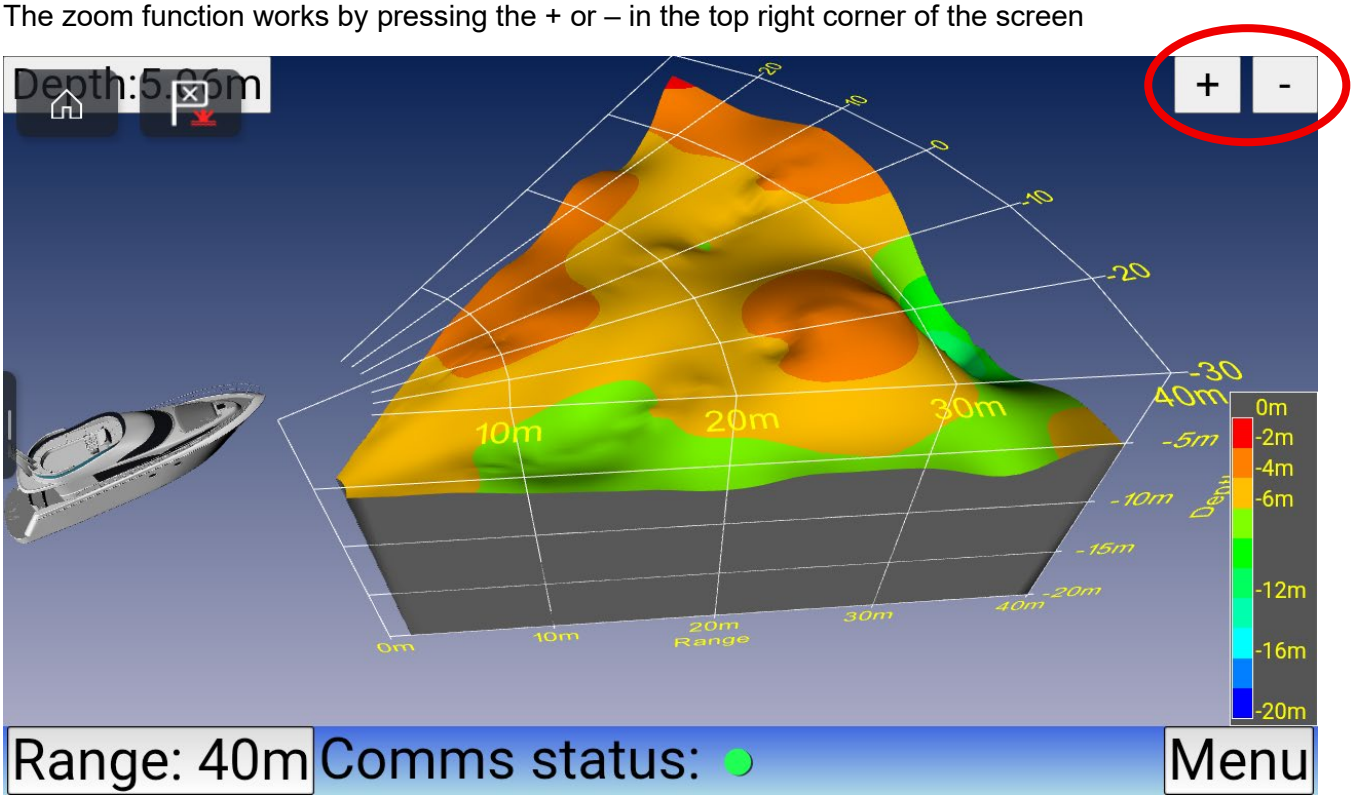
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6.7 Using zoom function and 360 rotation

360 Rotation of the image: You can rotate the FLS 3D image via touch directly on the display. Press and drag with your finger on the EchoPilot image to rotate the image via touch.

The zoom function works by pressing the + or – in the top right corner of the screen

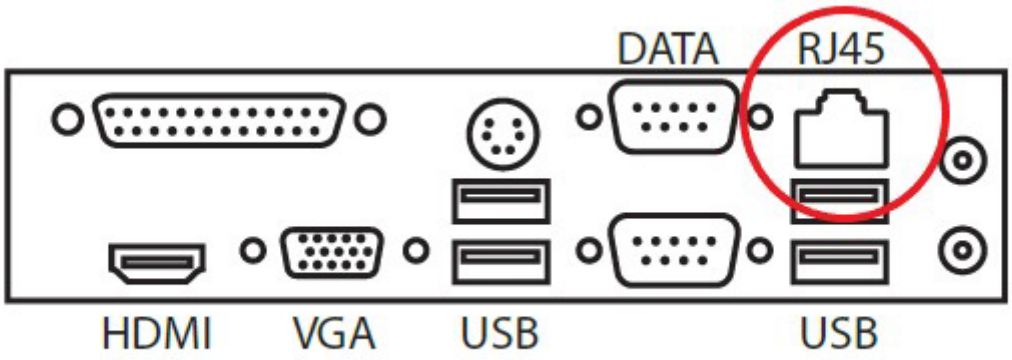


7. Simrad, B&G and Lowrance Integration

The FLS 3D is fully integrated with all Simrad, B&G and Lowrance MFD that has a network port. The integration is made by connecting an RJ45 directly to the Simrad, B&G or Lowrance network port or via a switch box. The RJ45 cable is not included in the FLS 3D kit and will need to be purchased separately.

7.1 Connecting The Visual Processor To The Simrad, B&G or Lowrance Network

The Visual Processor can only be connected to the network via the ethernet port on the back of the Visual Processor.



The Visual Processor can be connected several different ways to the Simrad, B&G or Lowrance MFD:

3. Connect directly to the Simrad, B&G or Lowrance MFD: You can connect the Visual Processor directly with a Simrad, B&G or Lowrance display by connecting a RJ45 ethernet cable from the visual processor to the network port in the Simrad, B&G or Lowrance display.
4. Connect to the network via a Switch Box: You can connect the Visual Processor to the network via a Switch Box. Connect the RJ45 ethernet cable from the visual processor to the switch box. It is important that the Simrad, B&G or Lowrance display is connected to the same switch box to connect.

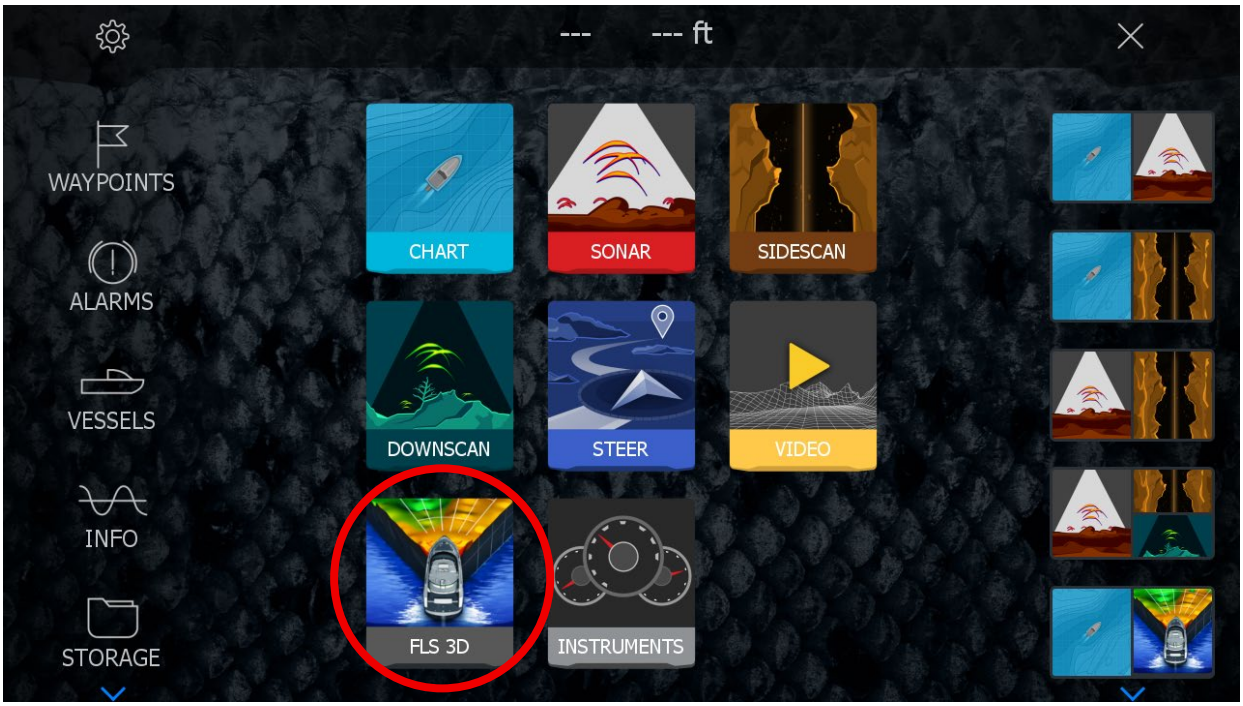
7.2 Powering on the FLS 3D

When the FLS 3D Visual Processor is connected to the Simrad, B&G or Lowrance display you need to power on the Visual Processor and the Simrad, B&G or Lowrance Display.

The Visual Processor is powered on by pressing the power button on the On/Off switch.

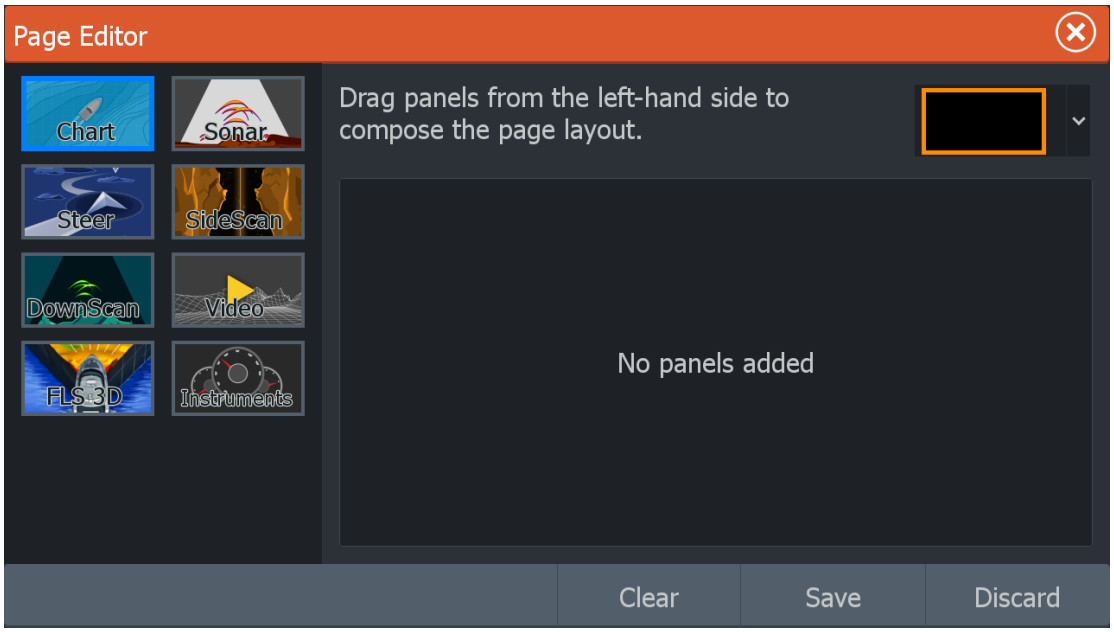
Once the visual processor and Simrad, B&G or Lowrance display are turned on it will take approximately 30 seconds before the FLS 3D App is visible on the main screen of the Simrad, B&G

or Lowrance display. By pressing the FLS 3D App Icon you will enter the EchoPilot Forward Looking Sonar program.



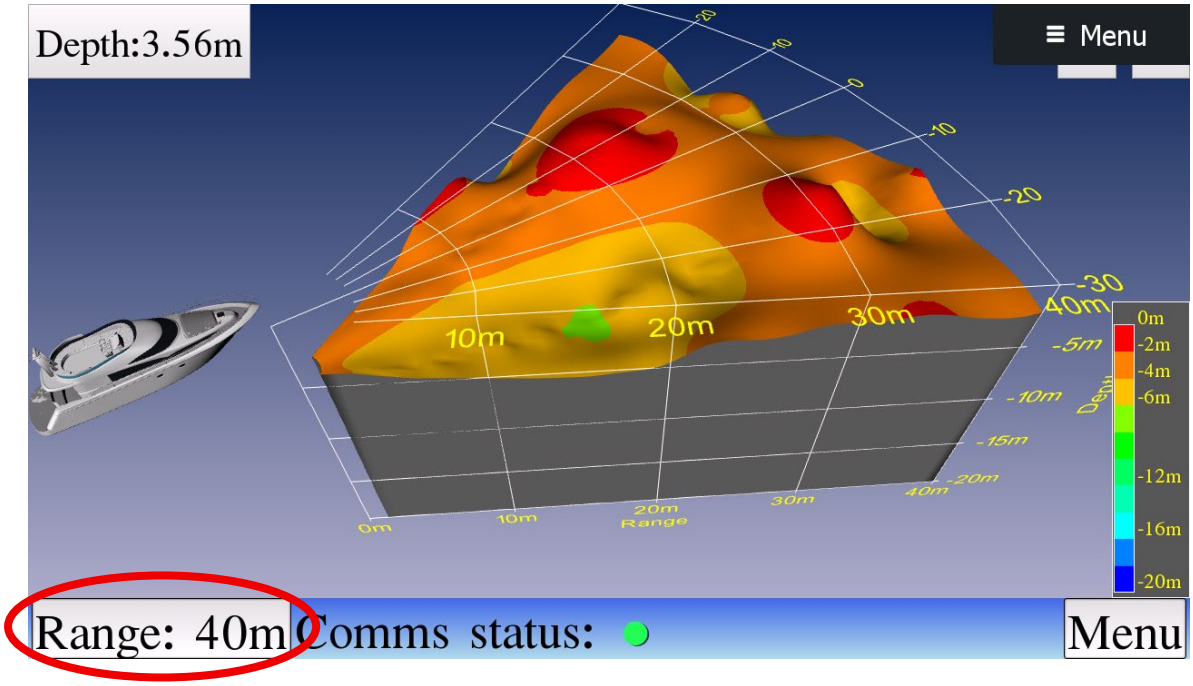
7.3 Choosing Different Layouts For Your App

On your Simrad, B&G or Lowrance display you can combine a maximum of 4 apps into your choice of layout in the page editor section. The FLS 3D will work in any layout you choose.

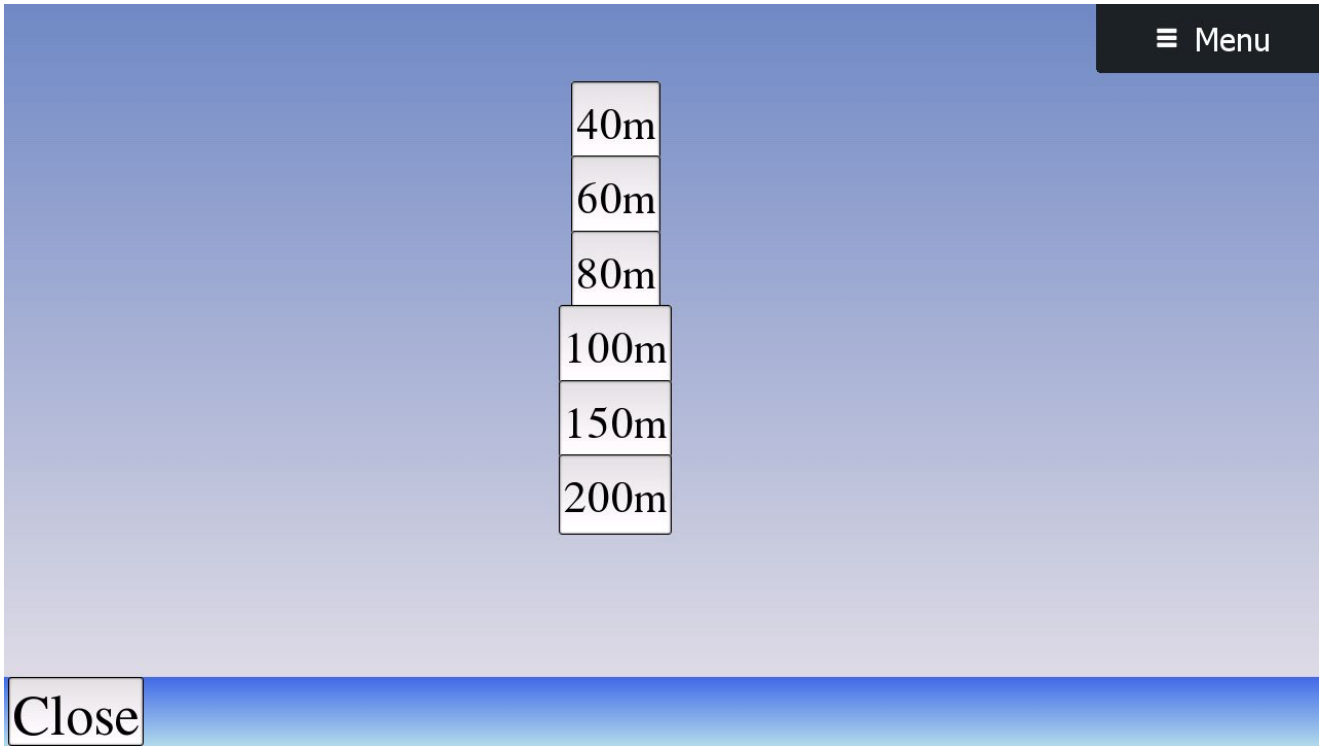


7.4 Changing Range Settings

While in the FLS 3D App you can change the range setting by pressing the range button.



Once you have pressed range a window will appear with different ranges to choose from: 40m, 60m, 80m, 100m, 150m, 200m. Simply choose your desired range and you will be brought back to the Sonar image and the range will update to the chosen range.

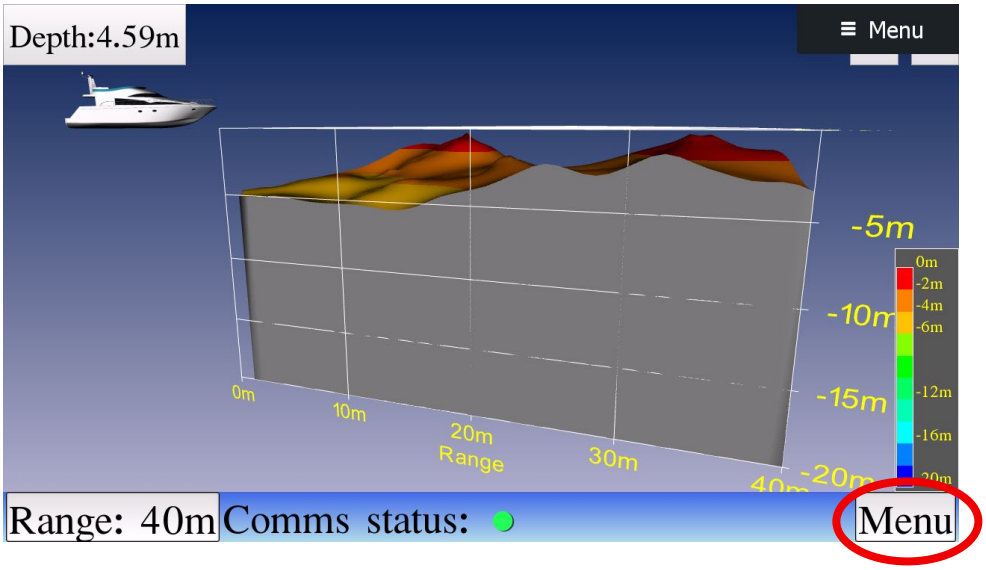


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7.5 Entering Menu Settings

Enter the menu by pressing the menu button

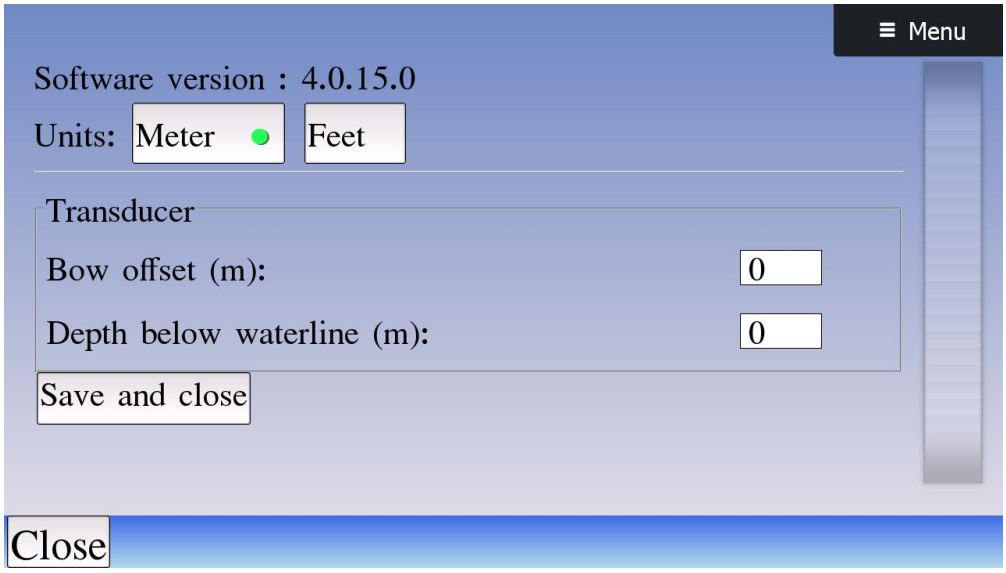


Inside the menu you can choose three different settings:

4. Units: Choose if you want to see the range in meters or feet
5. Bow offset (m): This value should be set to the distance that the transducer is set back from the bow. The setting can be set between 0 – 10 meters from the bow.
6. Depth below waterline (m): This value should be set to depth that the transducer is below the waterline. The setting can be set between 0 – 5 meters.

The settings are chosen by using the scroll wheel to the right on the menu page.

Once you are happy with the settings press ‘Save and close’ and you will be brought back to the main screen and your settings will be saved.



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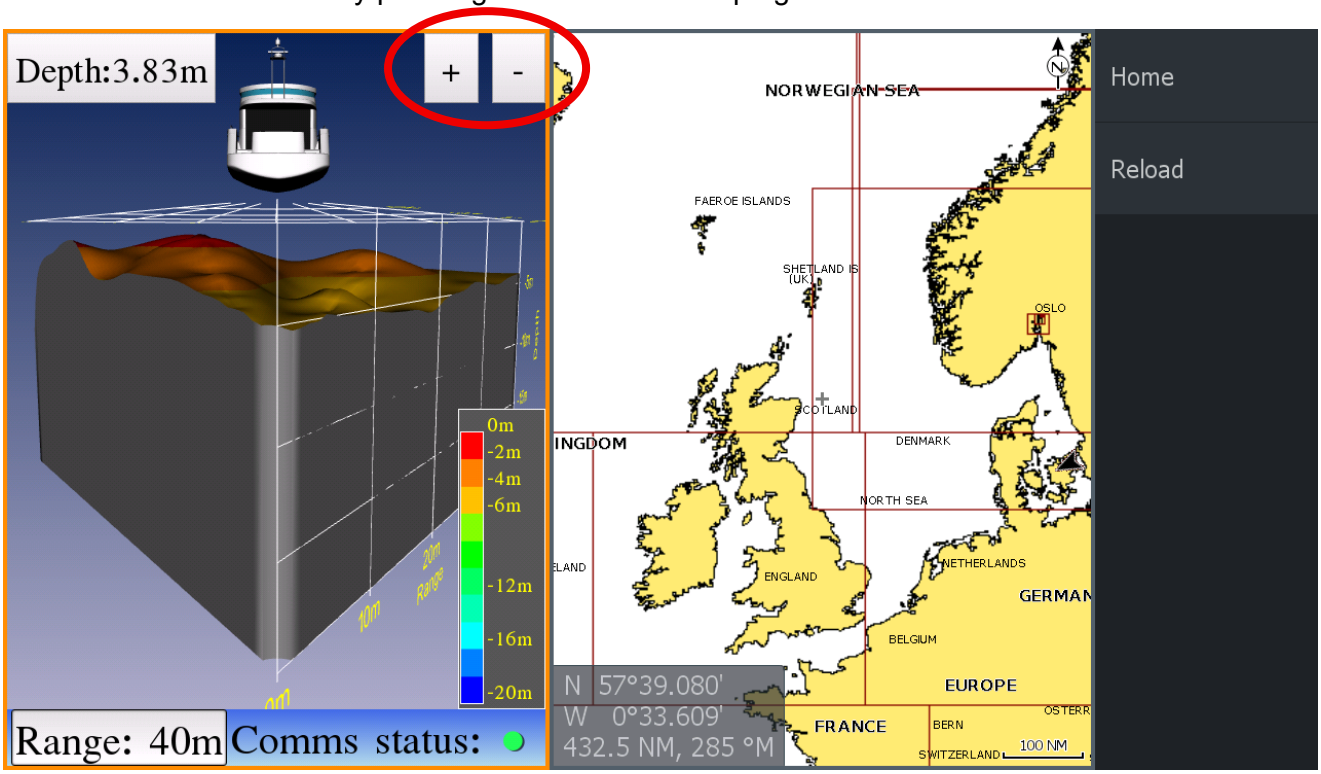
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7.6 Using zoom function and 360 rotation

360 Rotation of the image: You can rotate the FLS 3D image via touch directly on the display. Press and drag with your finger on the EchoPilot image to rotate the image via touch.

The zoom function works by pressing the + or – in the top right corner of the screen



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8. Technical Specifications

Specification	EchoPilot FLS 3D
Operational Speed	Up to 20 Knots
3D Forward Looking Image	Yes
Display	3rd part dependent
Bottom Mapping Range	20x water depth
Display Update Rate	1 second pr. update
Maximum Depth Detection	100m
Maximum Forward Range	200m
Operating Frequency	200 kHz
Power Requirements	12/24 V, ~20W
Maximum Output Power	28W
Angular Accuracy	~1.5 degree
Roll/Pitch Stabilization	N/A
Operating System	Windows
Update Rate	1 – 1½ second
Video Output	HDMI and VGA
Multi Display Option	Yes
Direct MFD Integration	Raymarine, Simrad, B&G and Lowrance

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9. FAQ & Troubleshooting

This section provides answers to the most frequently asked questions and guidance for diagnosing and resolving the most common issues with the FLS 3D system.

9.1 General Operation

Q: The image is not smooth and seems to have an update rate?

Answer:

This is normal behaviour.

The FLS 3D is a real-time sonar that updates approximately every 0.30 – 1 second. Each sonar ping is slightly different, so consecutive images will never be identical.

Recommendation:

Read our First Time User Guide to get a better understanding of how to navigate and train with the system: https://echopilot.com/wp-content/uploads/2025/12/FLS-First-Time-Usage.pdf

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Q: What range should I use?

Answer:
The correct range depends on depth and conditions.

- Shallow water → use shorter range (40–60m)
- Open water → use longer range (100–200m)

The system can typically see **10–20x the water depth ahead** depending on seabed conditions.

Q: How would you recommend that I practice using the system?

Answer:
With all new navigational tools it is important to practice using them. We recommend using our “First Time Usage Guide” to help practice and get familiar with the sonar: https://echopilot.com/wp-content/uploads/2025/12/FLS-First-Time-Usage.pdf

---

9.2 Power and Startup Issues

Q: My FLS 3D will not switch on

Check the following:

1. Does the **LED on the keypad or of/off button light up?**

- YES → system is powered → check display input

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- NO → continue below

2. Check:

- Power supply to visual processor – Is everything connected correctly in regards to the manual and is the Visual Processor receiving power?
- Correct voltage (12/24V) – Does the Visual Processor recieve correct?
- Check LED light inside the Visual Processor – You can look through the side of the Visual Processor. You should be able to see a constant red light inside the box. If you see the constant red light the Visual Processor has power. If not, the visual processor does not have power
- Connected to same power source and ground – It is very important that the Visual Processor and Transducer Interface box is connected to the same power source and ground, as stated in the manual.
- Connect the keypad or the on/off button to the second keypad port and try and powering on the unit.

If it's still not working → contact your local dealer or EchoPilot support
(Common cause: damaged PSU due to over-voltage or reverse polarity)

Q: The system powers on, but no image appears

Answer:
The reason an image does not appear can be due to connectivity issues. Please make the following checks:

- Check the connectivity – HDMI/VGA for Video Input, Network Cable for Integration.
- Check cables for damage or loose connections
- Verify correct video source is selected if connected via HDMI or VGA

9.3 Communication Errors

Q: I have a red dot in communications (no communication)

Answer:
Communications issues are typically due to power issues or cable issues. Please make the following checks:

- Power to **Transducer Interface** - Is everything connected correctly in regards to the manual and is the Transducer Interface receiving power?
- Correct voltage (12/24V) – Does the Transducer Interface receive the correct voltage?
- Connected to same power source and ground – It is very important that the Visual Processor and Transducer Interface box is connected to the same power source and ground, as stated in the manual.

- Data cable connection – Check that the data cable is connected to the correct port in the transducer interface box and the correct port in the Visual Processor.
- Check for any damages to the cable. Are there any cuts, deformations etc.

If unresolved → return Visual Processor + Interface for service

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Q: Everything is powered on but the EchoPilot App does not show on my Raymarine, Simrad, B&G or Lowrance MFD:

Answer:
If the app does not appear on your MFD it is typically due to a connectivity issue. Please make the following checks:

- Does you Visual Processor have power? Does the LED on the On/Off button light up? If there is no power on the visual processor then the app will not appear on the MFD.
- Wait ~1 minutes after startup – Be patient when starting up the Visual Processor. It can take 1-2 minutes from when you power on the Visual Processor for the connection to be established and the app shows up.
- Try with a different network cable – Issue can be caused by a defect network cable. Try with a second network cable

If unresolved → Contact local dealer or EchoPilot Support

9.4 Image & Performance Issues

Q: Poor Seabed image or excessive noise

Answer:

If your seabed image looks distorted and acts extremely irrational, there can be several reasons as to why this is happening:

Incorrect Range Setting:
If the selected range is longer than the actual usable sonar range for the current depth and seabed conditions, the image may appear weak, noisy, or unstable.

In shallow water the sonar may only realistically see 40–60 meters ahead. Selecting 150–200 meters may result in weak or scattered echoes.

Turbulence or Air Bubbles:

Ultrasonic sonar signals travel poorly through air. Turbulence, cavitation, or aerated water passing across the transducer will scatter the sonar signal and reduce performance.

This is one of the most common causes of poor sonar images at speed.

Typical causes of turbulence:

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- Bow thrusters
- Hull steps
- Strakes
- Intakes or through hull fittings
- Propeller wash
- Transducer mounted too close to keel or chines

Recommendation:

- Install transducer in clean, non-aerated water flow
- Avoid mounting downstream of hull fittings or intakes
- Test performance at different vessel speeds

Dirty Transducer:

Marine growths, such as barnacles, algae, slime, or heavy antifouling buildup can significantly reduce sonar sensitivity and image quality.

Even a thin layer of fouling can weaken sonar returns.

Recommendation:

- Inspect transducer regularly
- Clean carefully using a soft cloth or plastic scraper
- Never use abrasives or metal tools
- Apply only a very thin layer of antifouling if required

Interference from Other Sonar Systems:

The FLS 3D operates at 200 kHz. Other sonar equipment operating at or near the same frequency may interfere with the sonar signal.

This includes:

- Fish finders
- Depth sounders
- Other forward looking sonars

Recommendation:

- Turn off other sonar systems during testing of FLS 3D system
- Separate transducers as far as possible from other sounders
- Never mount FLS 3D Transducers directly behind another transducer

Cable Connection, Damage or Interference:

Loose connectors, damaged cables, corroded pins, modified cables or interference from other high powered cables can reduce signal quality or cause intermittent communication problems.

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Important:
The transducer cable is factory tuned to the transducer and must never be cut or modified. Please also make sure to route the transducer cables away from other transducer or power cables.

Recommendation:

- Inspect all connectors carefully
- Check for bent or corroded pins
- Ensure locking rings are properly tightened
- Inspect cables for crushing, stretching, cuts, or abrasion damage
- Check the cable routings. Are they routed with other cables?

Incorrect Transducer Installation:

The transducer must be installed completely vertical in the hull. Even small installation angles can distort the sonar image and reduce performance.

If the transducer:

Leans forward → the seabed may appear to slope upwards

Leans aft → surface clutter and distorted returns may appear

Leans sideways → the image may appear uneven or tilted

Important:

The FLS 3D transducer must be installed 100% vertical for correct performance.
Fairing blocks, tapered spacers, or angled mounting solutions may be required depending on hull shape.

Environmental Conditions:
Certain environmental conditions can naturally affect sonar performance:

- Heavy plankton
- Algae blooms
- Muddy water
- Strong current
- Wake from nearby vessels
- Harbour reflections

In confined areas such as marinas or near quay walls, reflected sonar signals can create additional noise and unstable images. You can read more about this type of environmental conditions in our First Time User Guide: https://echopilot.com/wp-content/uploads/2025/12/FLS-First-Time-Usage.pdf

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Q: Half of the image is missing:

Answer:

When half of the image is missing this is typically due to the transducer interface box malfunctioning or a faulty transducer. Please make the following checks:

1. First try and swap the transducer connectors in the transducer interface box. Swap the starboard transducer to the portside connector and the port side transducer to the starboard side connector on the transducer interface box. Once switched, please check if the missing image has changed from one side to the other.

2. If the missing image has changed from one side to the other, the issue is due to a faulty transducer. Please contact your local dealer or EchoPilot.

3. If the missing image has not changed from one side to the other, the issue is due to a faulty transducer interface box. Please contact your local dealer or EchoPilot.

Q: My image only shows a flat blue seabed:

Answer:

If your image only shows a flat blue seabed, this usually indicates that there is a potential issue with the transducer interface box or the data cable. Please make the following checks:

1. Check the data cable:

- Is there any damage to the data cable?
- Has the data cable been cut?
- Is the data cable connected to the correct data port on the Visual Processor?

If all is okay please proceed to next check:

2. Check transducer interface box and comms status:

- What is shown in the comms status? Is there a green circle or a red circle in the comms status?
- Check that your transducer interface box has power and is connected to power correctly as instructed in the manual.

If none of the above checks fixes the issue, please contact your local dealer or EchoPilot.

Q: My FLS 3D with 60 degree forward view is only showing a 30 degree image:

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When your FLS 3D system with 60 degree forward view only shows a 30 degree image usually indicates a faulty transducer. Please make the following checks:

1. Check your transducer cables. Are they damaged? Are they connected properly to your transducer interface box?

2. Check your transducers. Is there any visible damage to the transducers?

If the issue is not resolved in the previous steps, please contact your local dealer or EchoPilot

---

9.5 Installation Issues

Q: Where should the transducer be installed

Answer:

- The transducer must be 100% vertically installed.
- The transducer should be placed as far forward from other sounders as possible to avoid interference.
- The transducers must have a clear line of sight. Each Transducer has a 30 degree forward view. The transducer should have a clear line of sight in a 30 degree forward angel.
- The transducers must be placed where they will always be submerged in water, and should not come out of water when planning.
- The transducers should be placed in an area with calm water where air bubbles or turbulence are not generated. Bow thrusters and ports can make disturbed water.
- Do not route transducer cables together with other cables.
- There is no minimum distance between transducers but transducers cannot be placed more than 5 meters apart from each other.

The choice of transducer position will have a major effect on final performance so please carefully consider all factors and if you have any doubts, please contact the factory on +45 4737 3800.

Q: Can I cut the transducer cable?

Answer:

No — under no circumstances.

Cutting the cable will reduce performance and sensitivity and may damage the system.

Q: Can I extend cables?

Answer:

The cables can only be extended via approved EchoPilot extension cables or custom factory made cables made by EchoPilot.

Transducer Cables can be extended up to 22 meters using the approved transducer extension cables made by EchoPilot. The transducer cables must never be cut or amended!

The Data Cable can be custom made by Echopilot up to 100 meters. The data cable must never be cut or amended!

Q: Can I install the transducers near another sonar?

Answer:
No. We recommend that you have as much separation from other sounders as possible. We recommend that there is a distance between 3-5 meters apart. If in doubt, please contact your local dealer or EchoPilot for guidance.

Q: Can the FLS 3D see floating objects in the water (e.g. containers)?

Answer:
No — the system is designed to map the **seabed only**.

Q: Why can I sometimes "see behind" objects?

Answer:
This is caused by **echo reflections and multipath signals**, not actual objects behind the target.

You can read more about this in our First Time Usage Guide: https://echopilot.com/wp-content/uploads/2025/12/FLS-First-Time-Usage.pdf

Q: What is Average Forward Depth (AFD)?

Answer:
AFD is the **average depth of all sonar returns ahead of the vessel**, giving a quick overview of seabed conditions.

You can read more about this in our First Time Usage Guide: https://echopilot.com/wp-content/uploads/2025/12/FLS-First-Time-Usage.pdf

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