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PRODUCT DOCUMENTATION

Sonar 3D 15



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The online version is always the most up to date:

<https://docs.waterlinked.com/sonar-3d/sonar-3d-15-introduction/>

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Sonar 3D-15



The Water Linked Sonar 3D-15 is an advanced 3D multibeam imaging sonar designed to enhance underwater exploration and navigation.

With real-time 3D imaging capabilities, it provides a comprehensive view of submerged environments, even in low-visibility conditions.

Sonar 3D-15 Quickstart

This guide will help you connect and access the Sonar 3D-15 GUI so you can explore its features. You can follow the steps below or watch the accompanying video.

YouTube video player (video, watch online): <https://www.youtube.com/watch?v=IxMZxHuacdQ>

Requirements:

- Water Linked 3D sonar
- Power source (10-30V DC, 60W surge)
- Power connector
- Computer
- Ethernet cable



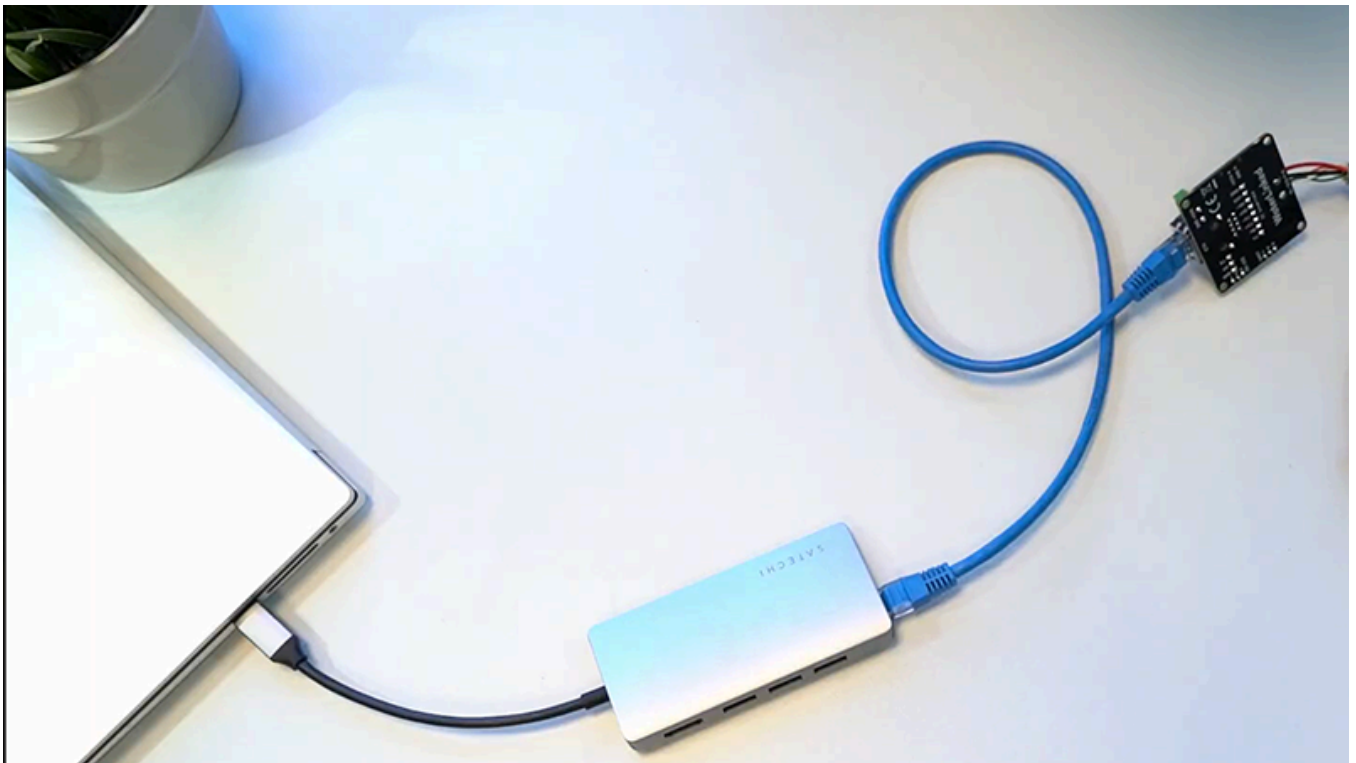
1. Unbox and place in water

Unbox the Sonar 3D-15 and place the Sonar 3D-15 in a water container (e.g., a bucket or tank). Avoid getting water on the I/O board.



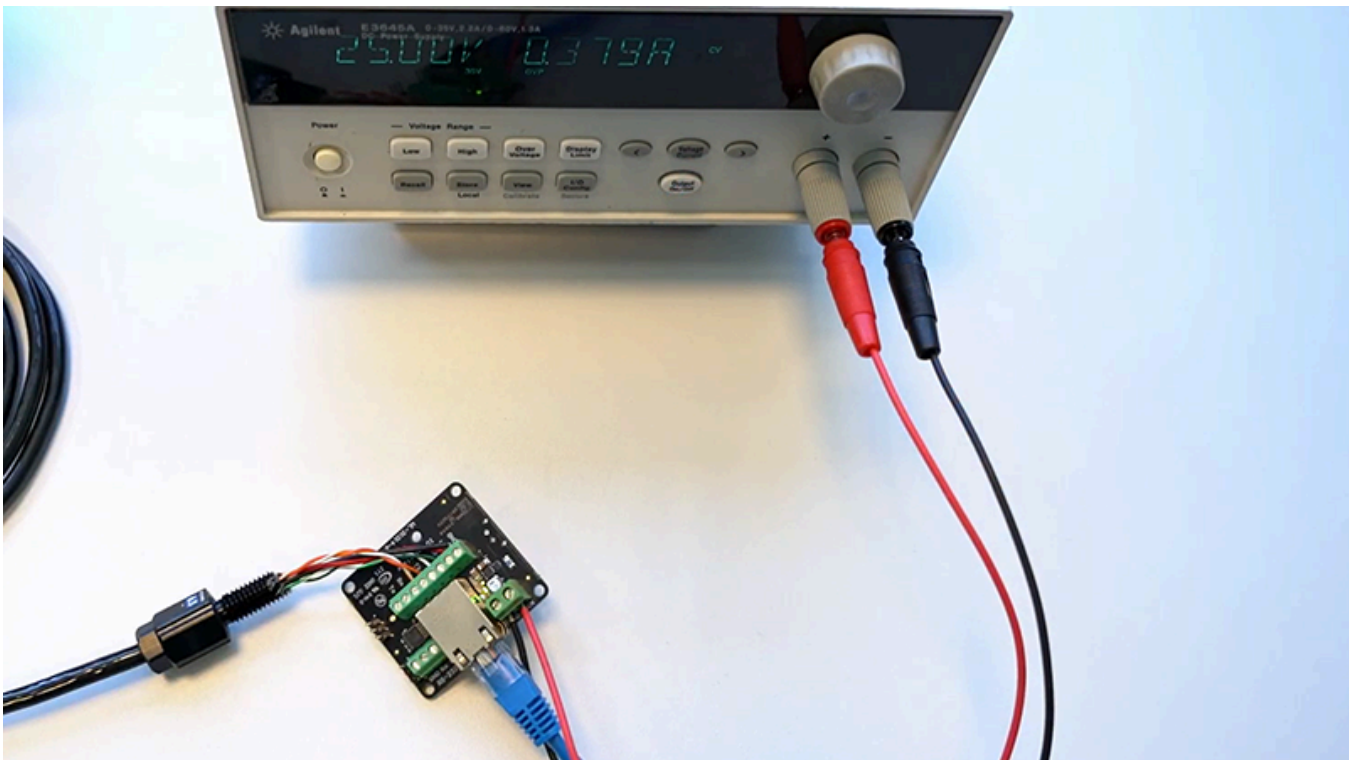
2. Connect the Ethernet cable

Plug one end of the Ethernet cable into your computer's Ethernet port, and connect the other end to the Sonar's I/O board.



3. Connect a power supply and boot the Sonar

- Connect your power supply to the I/O board. Use a power supply capable of delivering 60W (surge) at 10-30V (20+ V recommended).
- Turn on your power supply. Your Sonar 3D-15 takes about 30 seconds to boot.



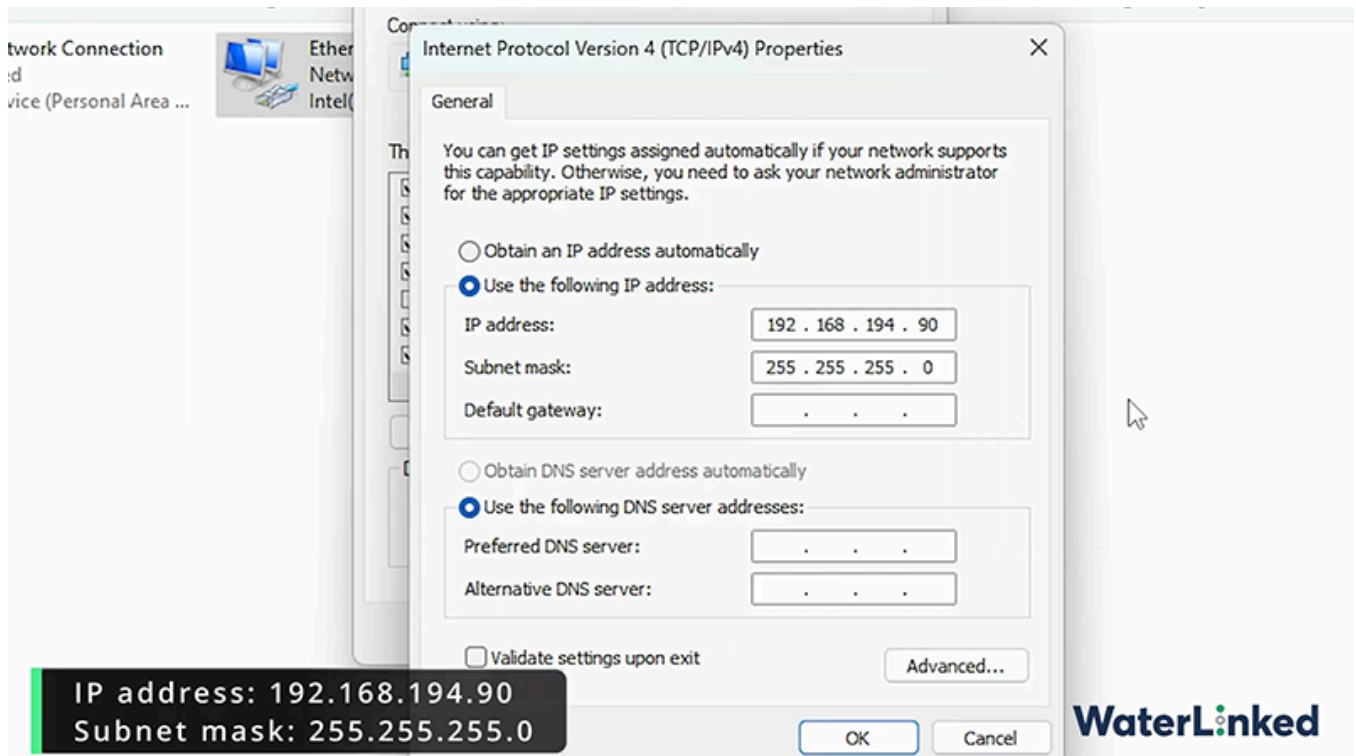
4. Configure your computer's IP

Assign your computer an IP address in the 192.168.194.x range (e.g.: 192.168.194.90 with netmask 255.255.255.0).

Note

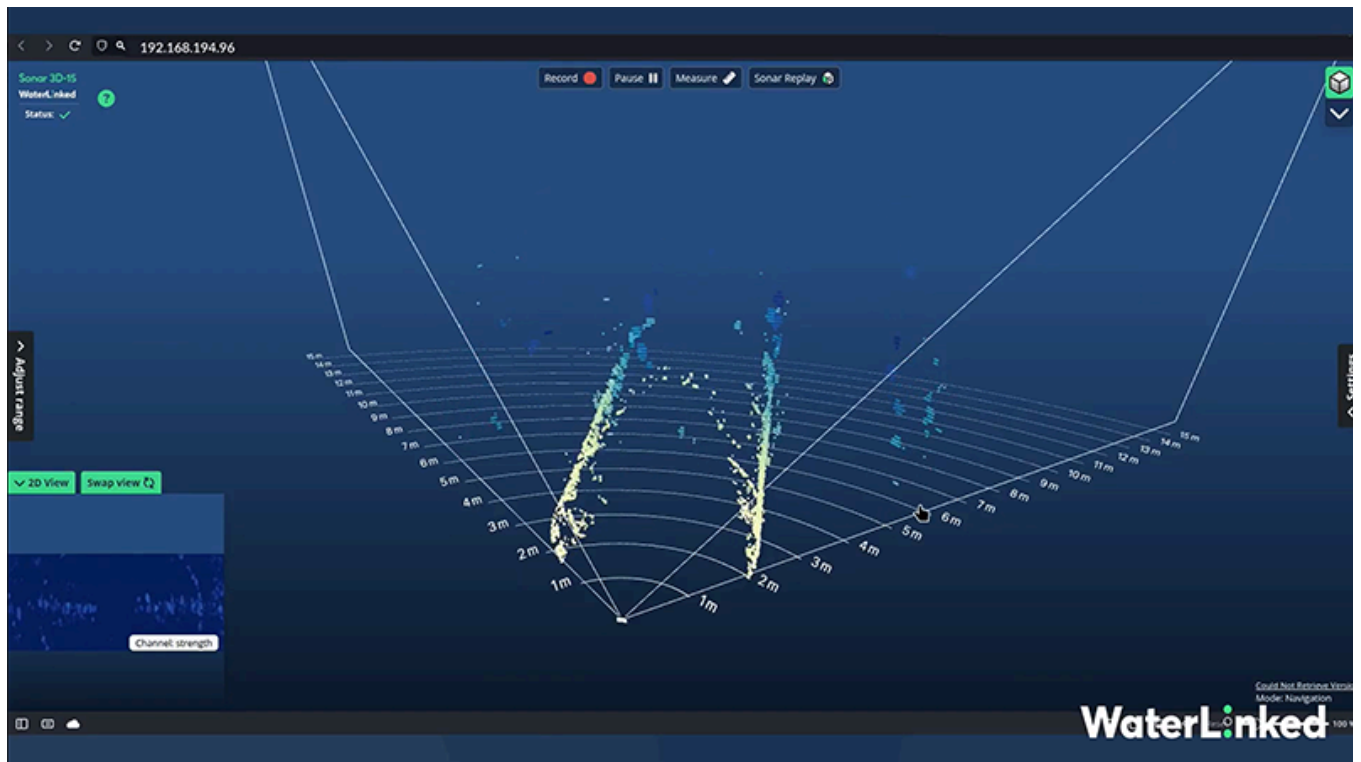
Configuring network varies between operating systems and versions. Please search the web on how to do this for your operating system. Feel free to contact us for support.

See more details in the [Networking section](#).



5. Access the Sonar GUI

Open up your web browser (e.g.: Chrome) and enter the fallback IP address 192.168.194.96. You should now be able to see and use the Sonar 3D-15 GUI.



Need help?

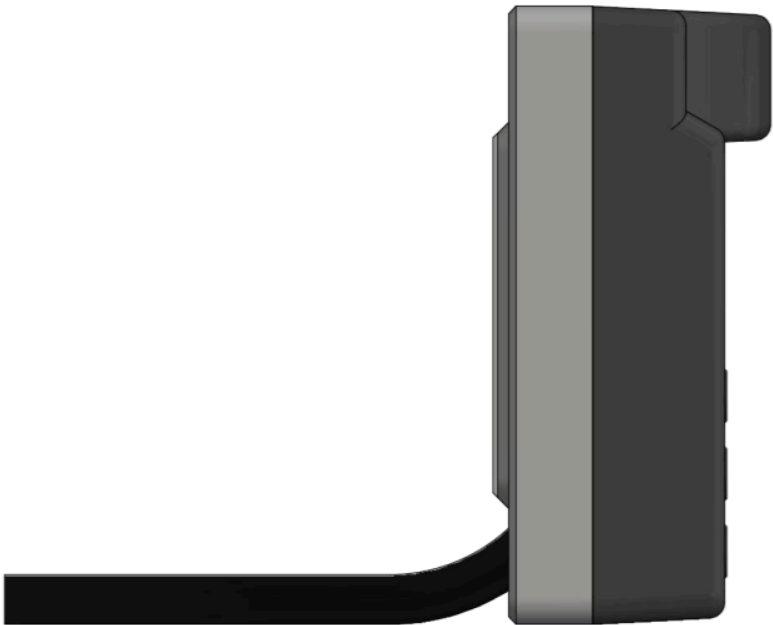
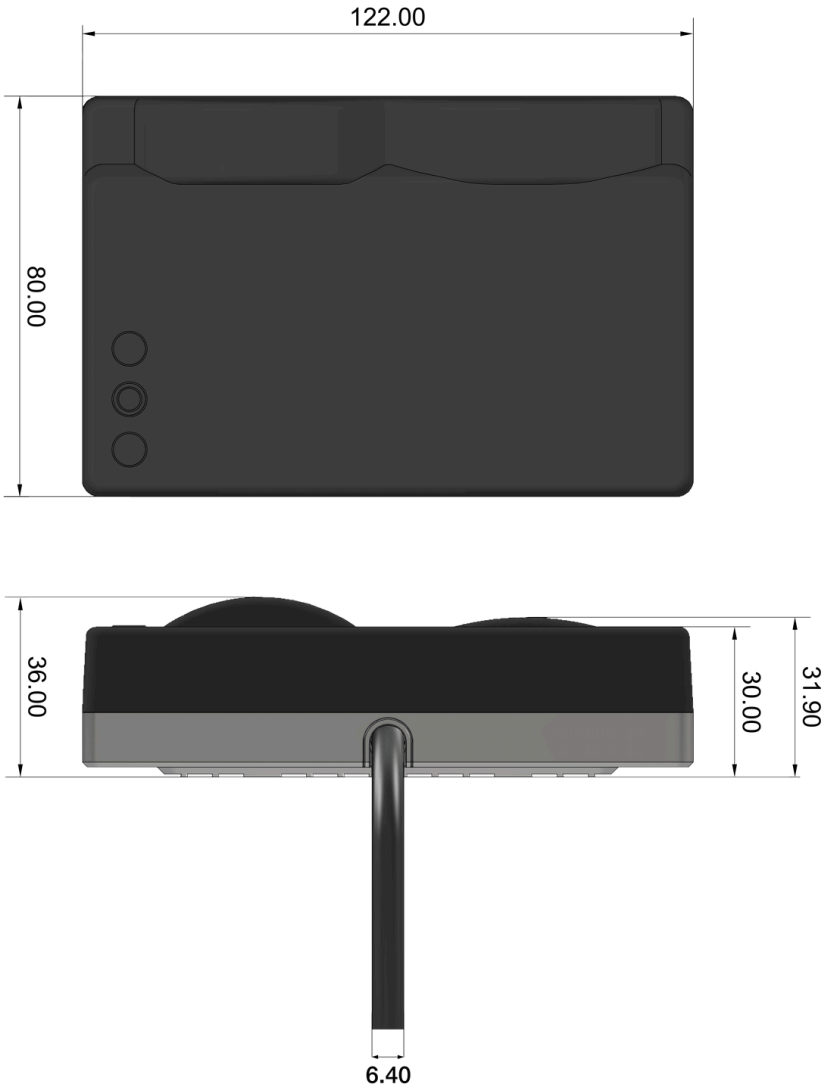
Check out the [FAQ!](#)

Mechanical Integration of the Sonar 3D-15

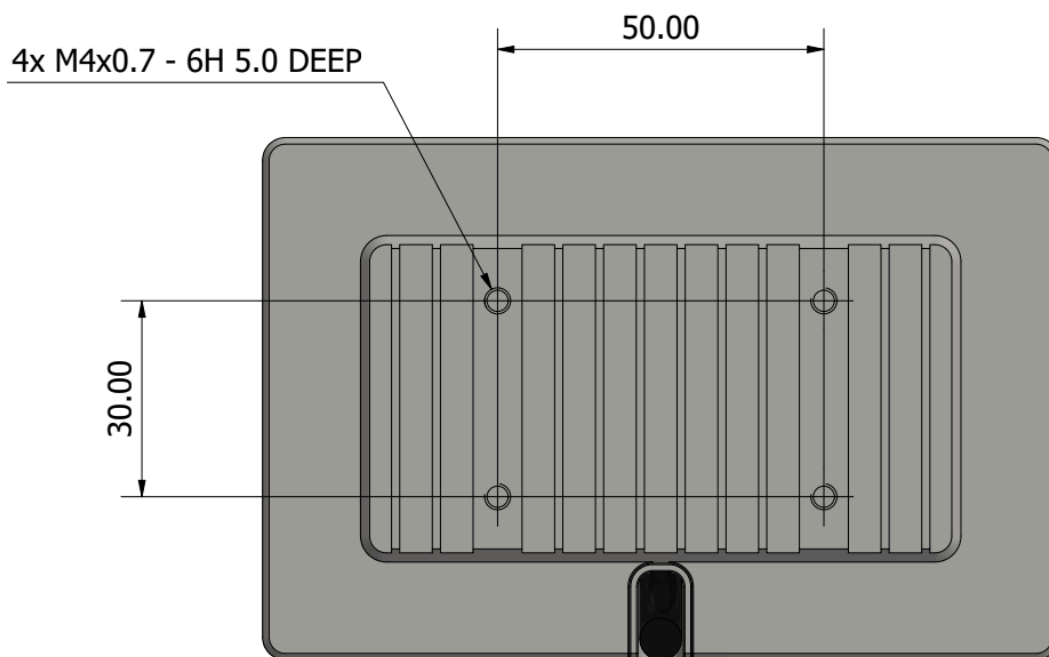
Here you should find all the information needed for a successful mechanical integration of the Sonar 3D-15 into your system.

Dimensions

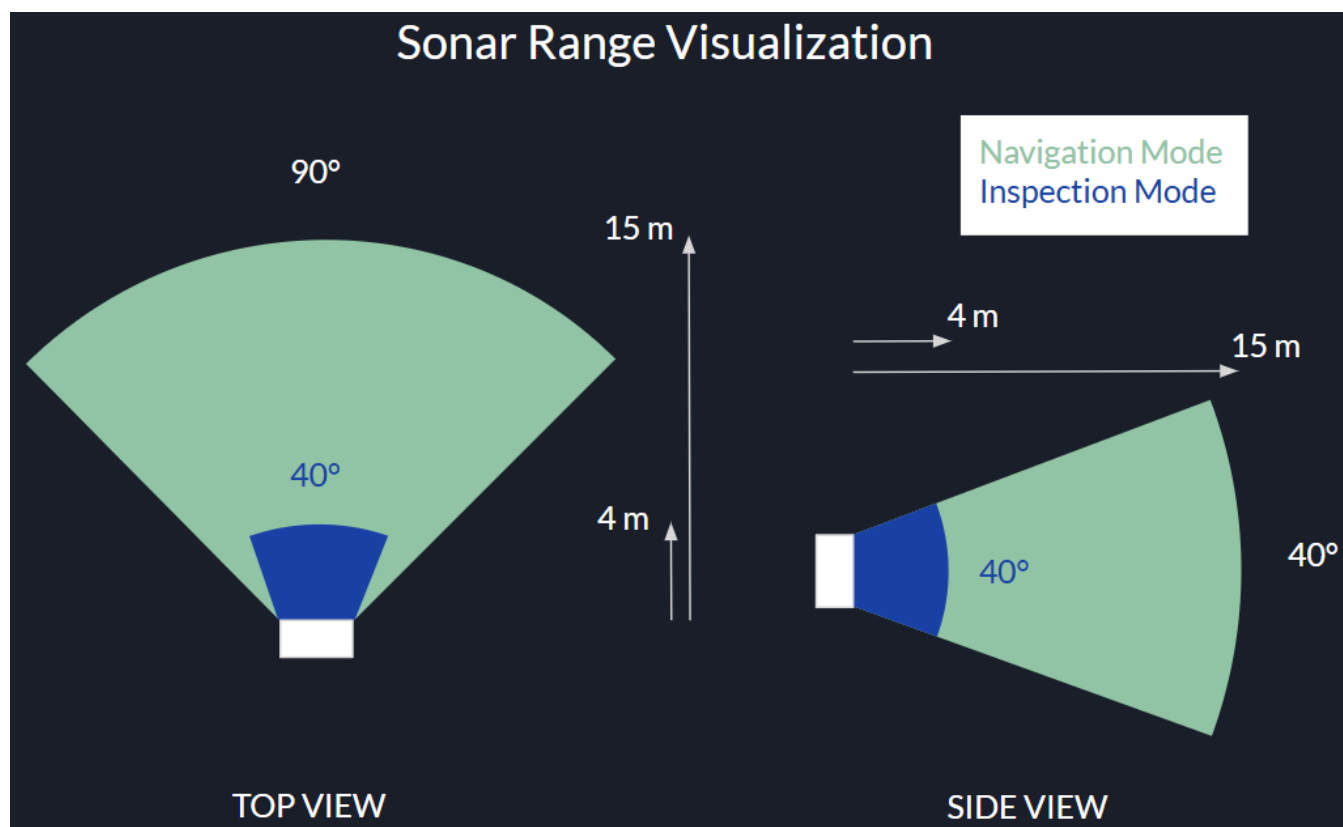
A detailed model (.step) of the Sonar, including the field of view, is available under [Resources](#)



The cable can be bent as shown in the image up to 90 degrees without causing any damage.



Field of view



The Sonar 3D-15 provides an opening angle as described in the tables below for the different modes.

Low Frequency (1.2 MHz)

Specification	Range
Pitch (opening)	-20° to +20°
Yaw (opening)	-45° to +45°
Vertical coverage	40° total
Horizontal coverage	90° total

High Frequency (2.4 MHz)

Specification	Range
Pitch (opening)	-20° to +20°
Yaw (opening)	-20° to +20°
Vertical coverage	40° total
Horizontal coverage	40° total

Wiring Sonar 3D-15

The tables below shows the pinning of the Sonar 3D-15 interface.

Interface	Color
Negative/Ground	Black
Positive (10-30V)	Red
ETH RX+	Green/White
ETH RX-	Green
ETH TX-	Orange
ETH TX+	Orange/White
Shielded wire	Naked (silver)

IO Boards

The Water Linked IO Board is the easiest solution for testing Water Linked Products like the Sonar 3D-15. They provide an interface for connecting Power and ethernet to the Sonar 3D-15. Read more about how to connect your IO Board to your Water Linked product under "IO-Interface Cards".

LED Sonar 3D-15

The table below shows the LED behavior of the Sonar 3D-15.

LED behavior	Description
No light	Power is off
Solid green	Powering on
Flashing green, mostly off (slow, about every second)	Power on, acoustics disabled
Flashing green, mostly on (slow, about every second)	Power on, acoustics enabled

LED behavior	Description
Flashing green for a few seconds	Diagnostics blink initiated from GUI or API
Flashing green (fast, many times a second)	Sonar is in thermal shutdown

Networking Sonar 3D-15

The Sonar 3D-15 has several services available over ethernet:

- [Multicast DNS](#) (mDNS) for easy discovery
- Web [GUI](#), providing a visualization of the data collected by the Sonar 3D-15, as well as configuration, [updating of software](#) and more.
- UDP Multicast [data stream](#)
- [Software updates](#)

Network configuration

Multicast DNS (mDNS)

The Sonar 3D-15 runs a DHCP client which will attempt to obtain an IP address from a DHCP server (e.g. in a router) on the same network, and supports mDNS: the mDNS name of the Sonar 3D-15 is `waterlinked-sonar`. On a computer which supports mDNS, one can then simply access the web [GUI](#) at <http://waterlinked-sonar>.

Note

If no DHCP server is available on the network, it is recommended to use the [fallback IP](#) or configure a [static IP address](#), as the Sonar 3D-15 can spend up to 5 minutes searching for a DHCP server.

Fallback IP

The Sonar 3D-15 will always be available with the static IP address: **192.168.194.96**. To be able to connect to the Sonar 3D-15 using it:

- Connect an ethernet cable directly from the Sonar 3D-15 to your computer.
- For an/the ethernet interface of your computer, configure it to have a static IP address in the same subnet as 192.168.194.96, (e.g. 192.168.194.90) or anything else of the form 192.168.194.xxx if using a subnet of the form 255.255.255.0 (aka 192.168.194.0/24).
- Activate the ethernet interface of your computer which you configured in the previous step.
- In a web browser, open <http://192.168.194.96> to access the web [GUI](#).

User set IP

The IP address of the Sonar 3D-15 can be configured in two ways via the web [GUI](#):

- DHCP client: An IP address is obtained from a DHCP server (e.g. in a router) on the same network, as mentioned above in [mDNS](#).
- Static: Configure the Sonar 3D-15 to use static IP address of your choice.

After the IP configuration of the Sonar 3D-15 is modified, the Sonar 3D-15 needs to be rebooted for the settings take effect.

 Note

The boot time, i.e. the time it takes from the Sonar 3D-15 receives power until it starts operating normally, will depend upon the IP configuration. Using the [fallback IP](#), the boot time can be as much as 1 min 30 sec, whilst it can be as low as 20 sec with a static IP.

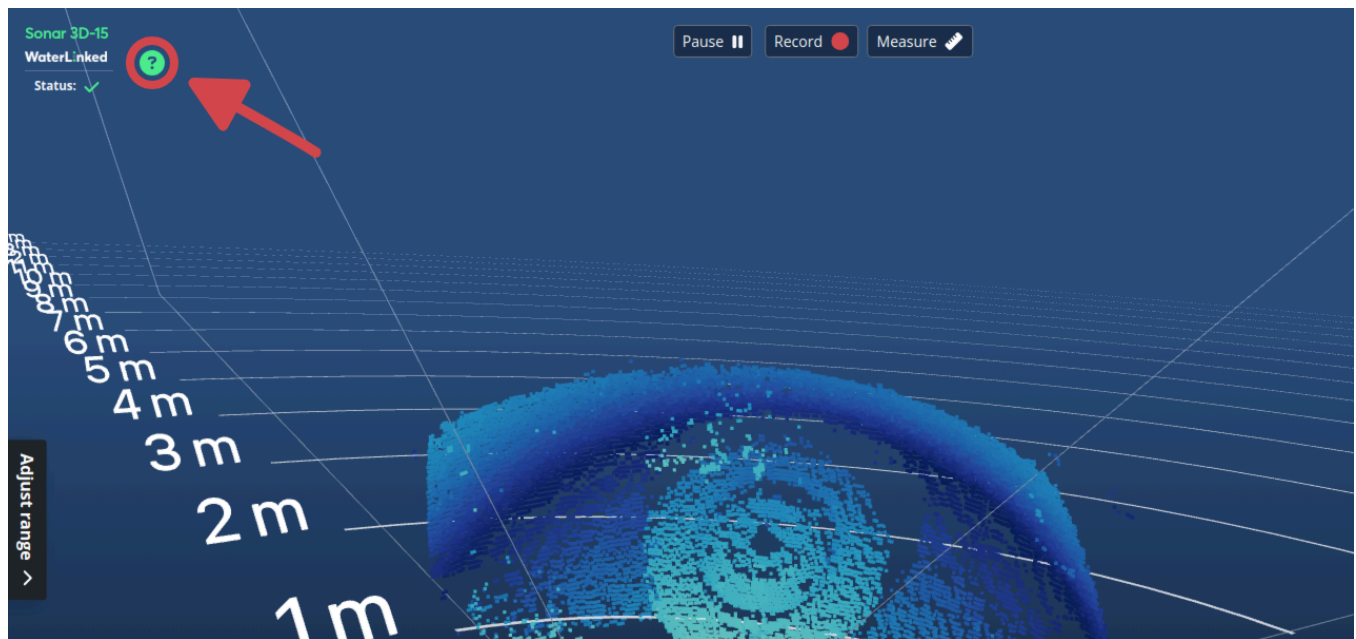
UDP multicast

By default, the Sonar 3D-15 uses **UDP Multicast** (224.0.0.96:4747), so any device on the local network can receive data without knowing the sonar's IP. Please see [API](#) for more information on the data on the UDP multicast.

GUI

The GUI provides a simple no-setup solution to view the Sonar 3D-15 data and change its settings.

When you first start the Sonar 3D-15 GUI you will be greeted with a view showing the 3D point cloud and various settings. To get familiar with the interface, click the  icon (help overlay). The 3D view can be controlled via mouse and keyboard, or touch controls.



The help overlay walks you through common features of the Sonar 3D-15 GUI.

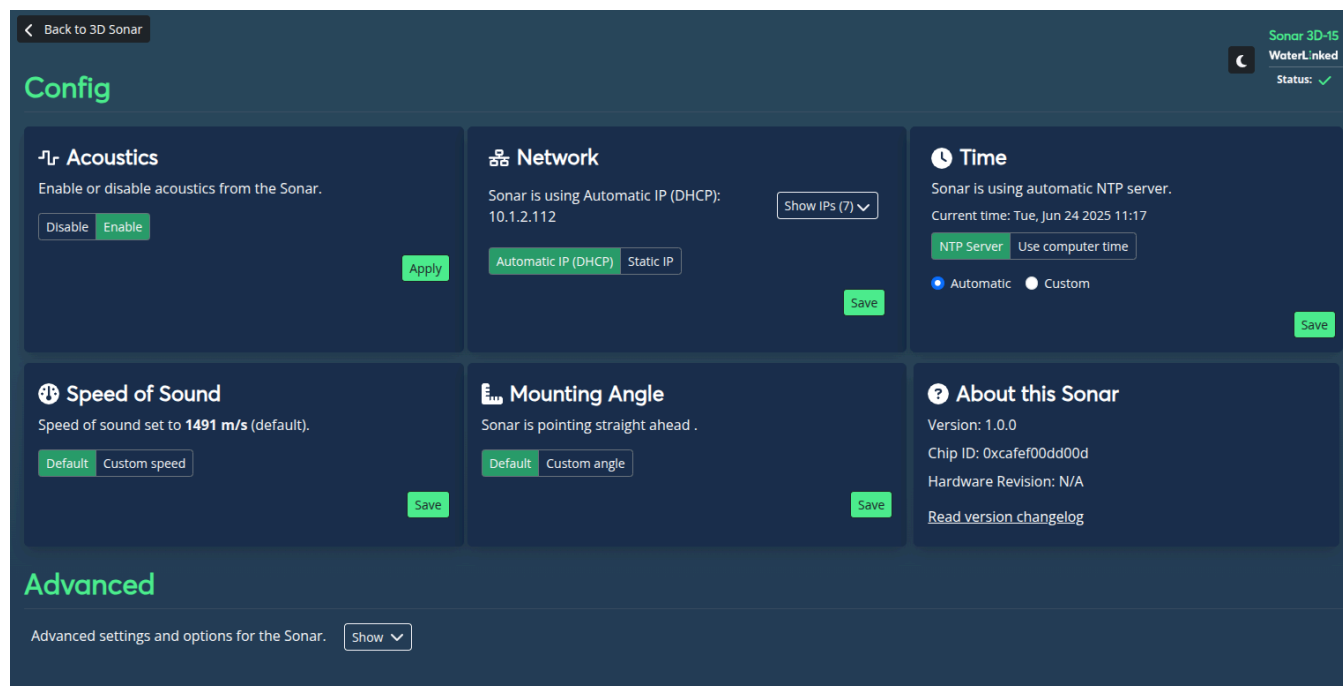
![[Help overlay 2]](../img/Sonar-3D-15-gui-help-overlay-1280-600-2.png) ## Config View ![[Config Access]](../img/Sonar-3D-15-gui-diagnostics-menu.png) You can access the config via the Settings sidebar and clicking "Config", like shown in the picture above. This allows you to configure common settings of the Sonar. Note that all configurations are reset to default on restart. ![[Config GUI]](../img/Sonar-3D-15-gui-config-3.png) ### Enable/disable acoustics Enable or disable acoustics from the sonar. Acoustics is disabled when first booting up the sonar. Make sure the sonar is submerged in water before enabling this. ### Network config Customize IP and network assignment for the sonar. ### Time config Change Time servers. ### Speed of sound config Change speed of sound according to your environment. ### Mounting angle offset Specify the sonar's mounting angle in pitch direction. This setting only affect the 3D point cloud view. ### About the Sonar Details what version and chip ID your sonar is running on along with the option to read the changelog. --- ## Advanced The advanced view opens from the Config when clicking "Show" under "Advanced". This view provides different options to help diagnose the sonar. Toggle the display of these settings with the 'Show/Hide' button next to the section. ![[Config GUI all]](../img/Sonar-3D-15-gui-advanced-menu.png) ### Blink LED Blinks the LED on the Sonar to verify connection and that it responds correctly. ### Restart Restart the sonar. Takes around 30 seconds to a minute. ### Update firmware Upgrade the Sonar's firmware. ### Download diagnostics Diagnostics allows for downloading a log containing information from the Sonar that can be used by Water Linked in troubleshooting issues. During diagnostics data collection the point cloud imagery will be paused. To ensure proper data collection, submerge the sonar in water and make sure that the front of the sonar is at least 40 cm away from any wall or solid object. Also provide a description for your setup and environment. Submit a [support ticket]

(<https://waterlinked.com/support>) with the diagnostic log file attached ### Update rate Show a data update graph as an overlay on 3D view. Useful to determine how fast data is being received from the Sonar. ### Factory reset Resets all sonar settings to factory defaults. The Sonar will also restart afterwards.

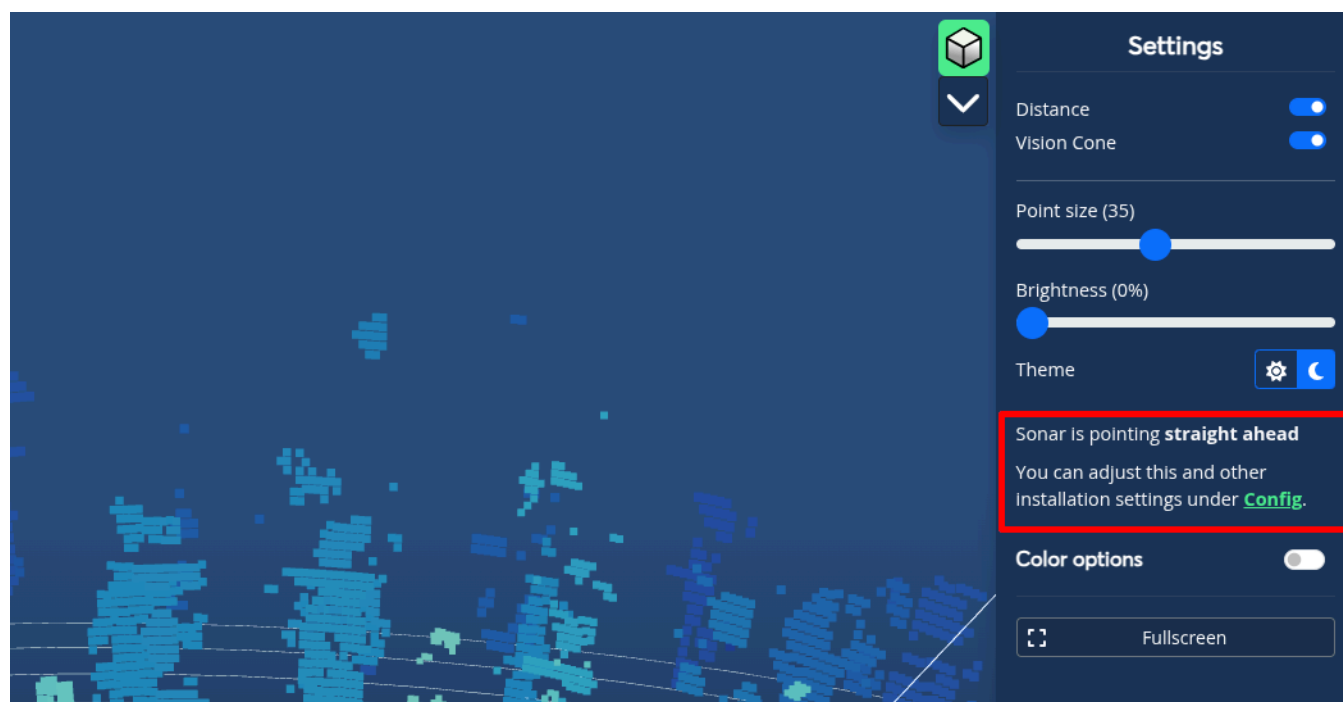
Settings - Sonar 3D-15

Introduction

A selection of different configurable settings to adjust and fine tune your experience with the Sonar 3D-15.

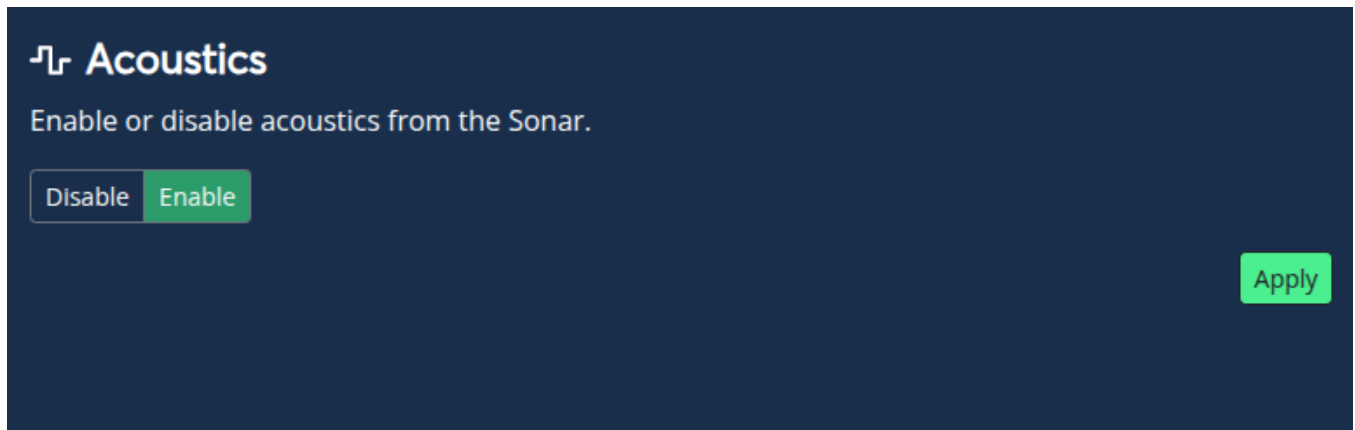


Access the configuration settings page from the "Settings" sidebar from the main page and following the "Config" link.



Acoustics

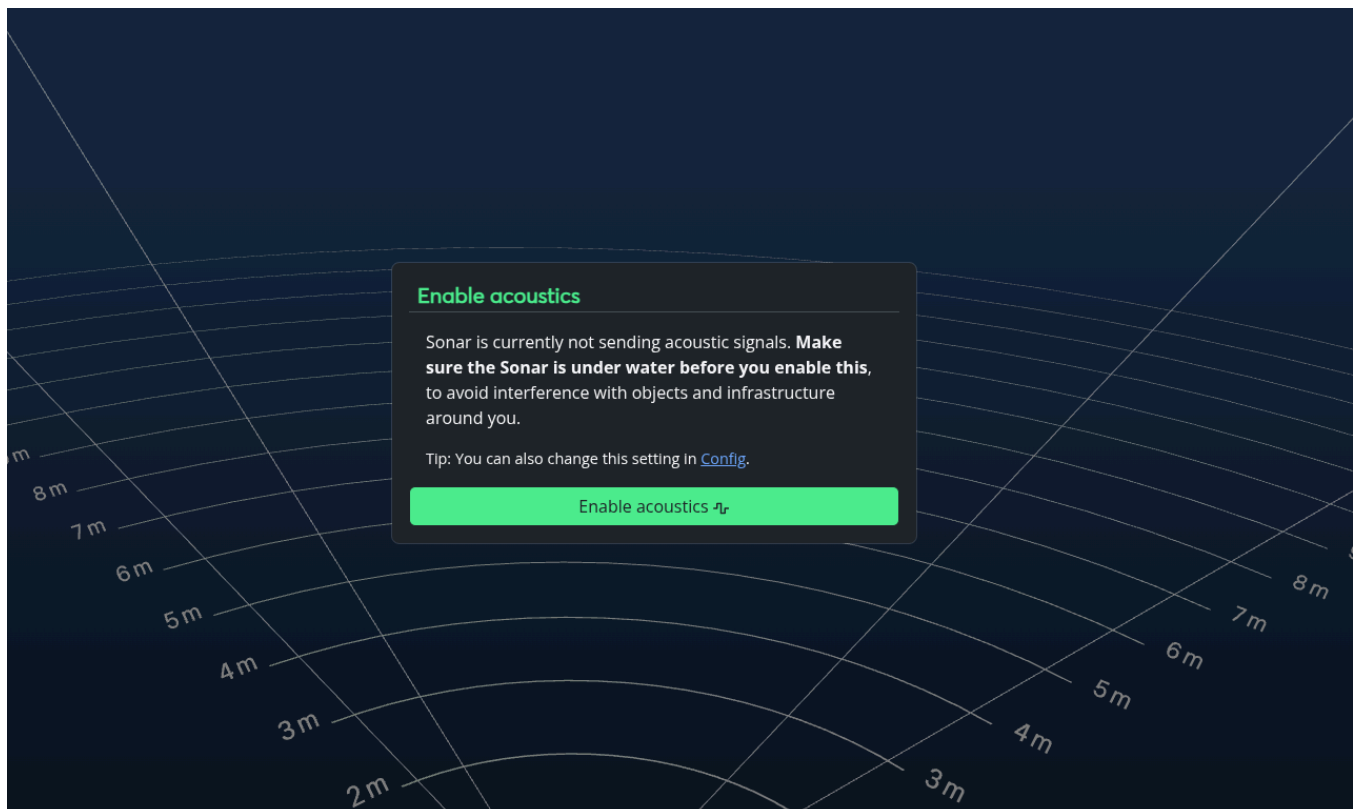
Toggle whether or not to enable the Sonar to send acoustic signals. The 3D point cloud can only be shown when this is enabled.



Important

Ensure that the Sonar is under water before enabling acoustics, to avoid interference with objects and infrastructure around you.

Acoustics are disabled when the Sonar first boot. You'll see a message in the 3D view about enabling this.



Network

Set how the Sonar 3D-15 is assigned an IP on your network: Automatic IP (DHCP) or Static IP. Default is Automatic IP. For further details regarding network setup, [see Networking](#).

 Note

Saved Network Settings are persistent, meaning it is kept on restart.

Time

Set how the Sonar acquires date and time, NTP Server or Use Computer Time. Default is NTP server (automatically get time sync from the Internet).

 Note

Using computer time is only valid until the next restart of the Sonar. Saved Time Settings are persistent, meaning it is kept on restart.

Speed of Sound

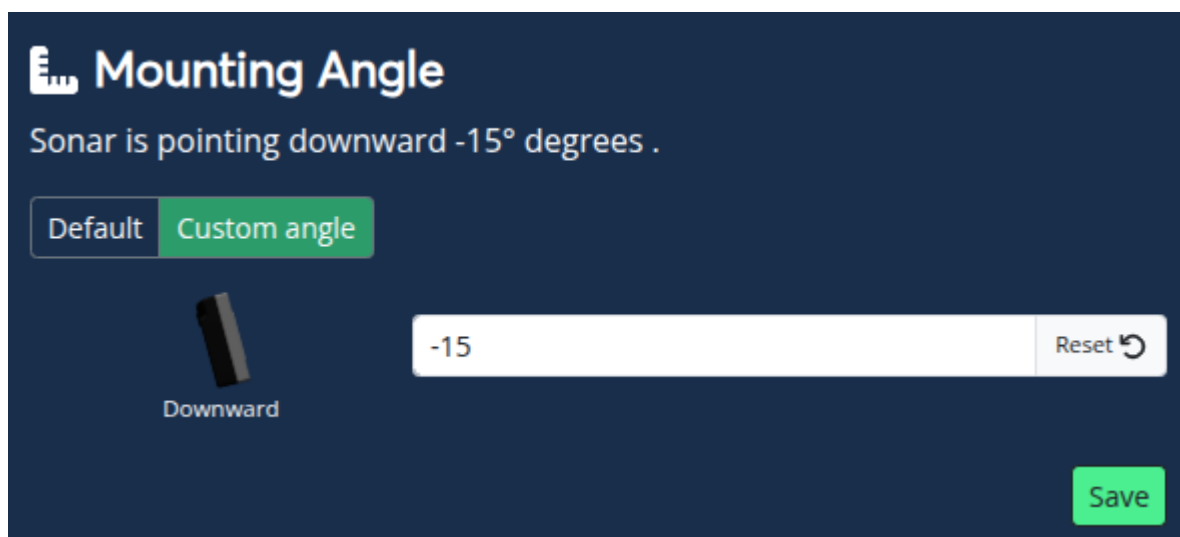
Change the speed of sound to reflect the surroundings of the Sonar. Default is **1491 m/s**, the approximate speed of sound in 5-10°C ocean water at 5 meters depth. When using custom speed, the speed must be between 1000 and 2000 m/s.

Mounting angle

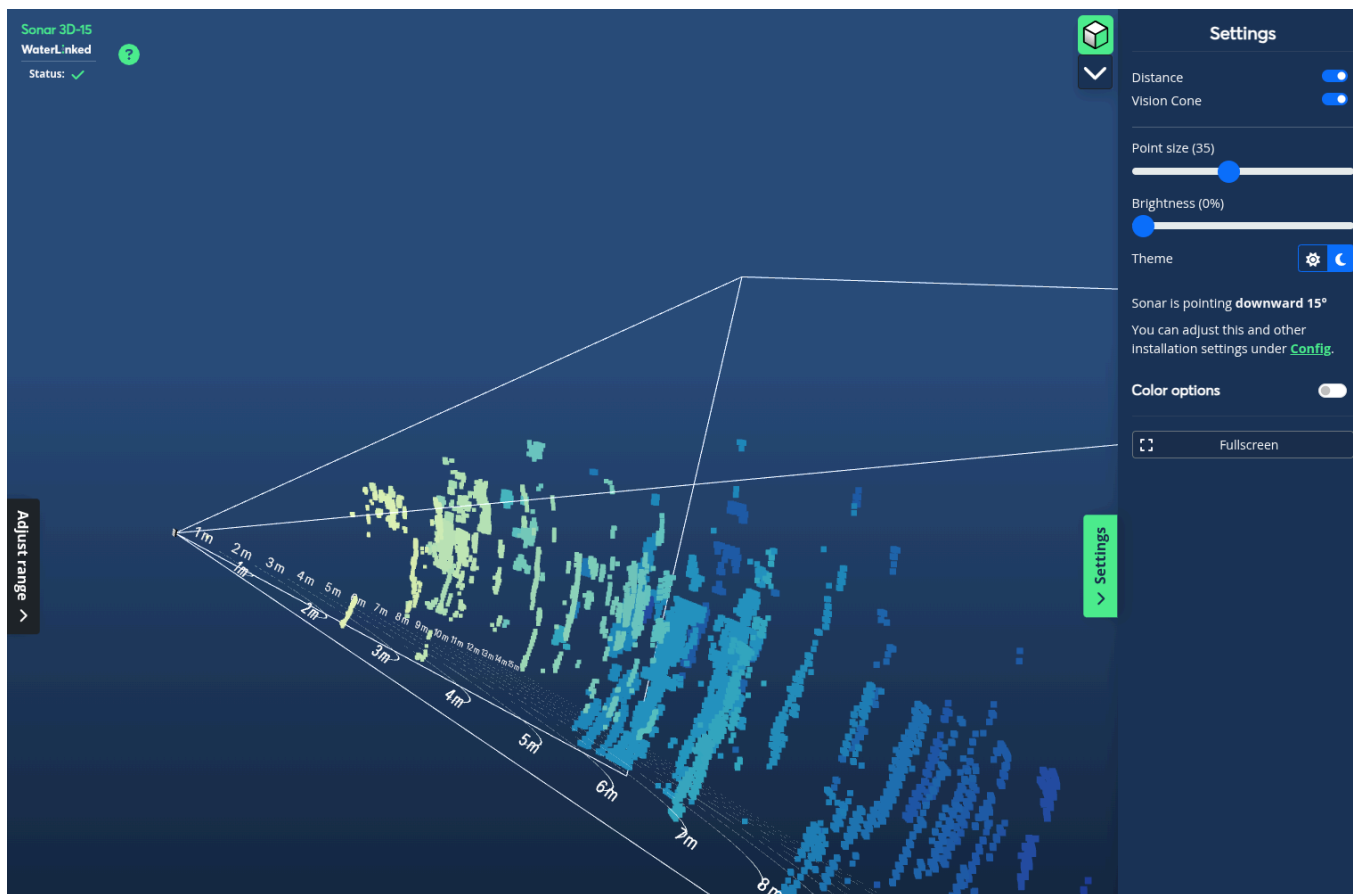
Adjust how the Sonar is mounted on your vehicle / ROV. Valid values are from -90° (downwards) to 90° (upwards). Default mounting angle is 0° (straight ahead).

 Note

Mounting angle is only stored locally in your browser and not persisted if you access the Sonar GUI from a different browser or device.



Changing this value will affect how the default rotation of the vision cone and Sonar model is shown in the 3D view.



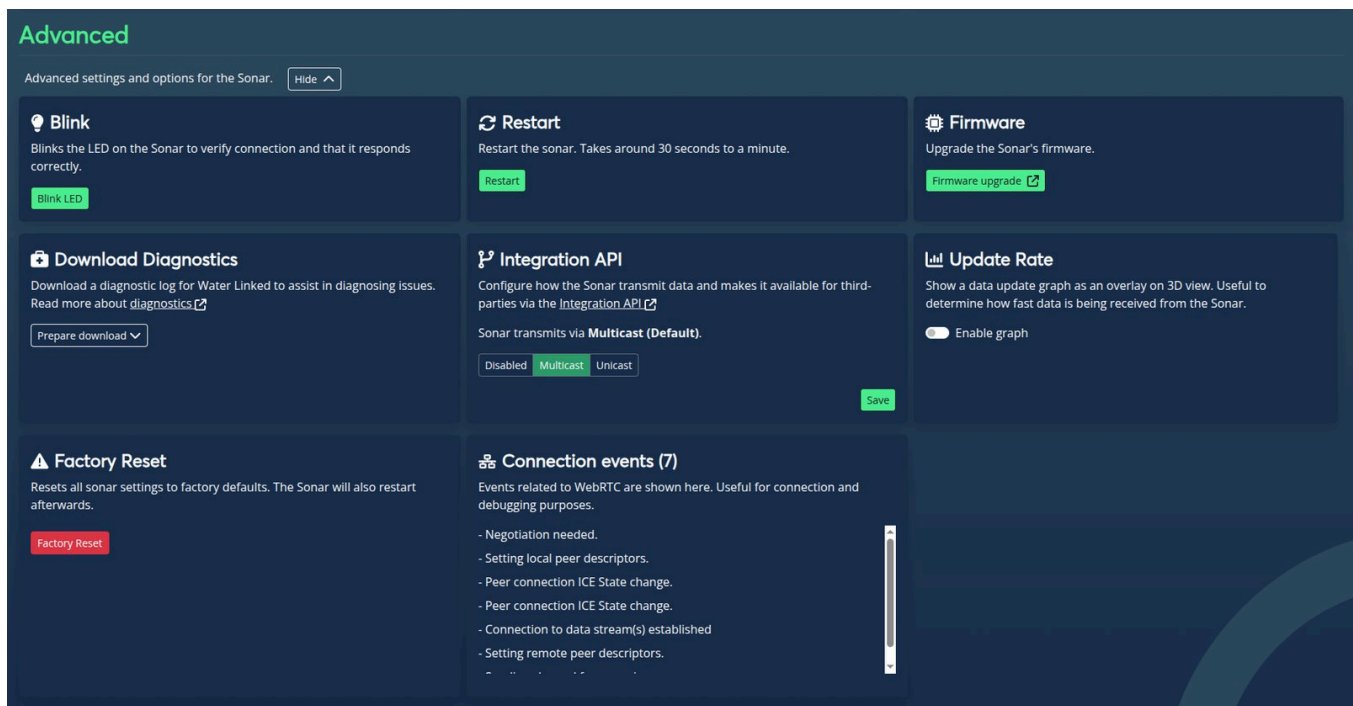
About this Sonar

Displays various version and hardware readouts from your Sonar. The changelog can also be accessed from here (or by clicking the version number in the footer of any other page).

The changelog only shows the latest changes for the firmware version currently installed. Use the [firmware upgrader](#) to see if there are newer versions available.

Advanced

Various advanced settings related to maintenance and troubleshooting the Sonar 3D-15. Toggle the display of these settings by clicking the "Show / Hide" button.



Blink

Toggle blinking of the Sonar's LED. The LED on the front of the Sonar blinks green for a set duration of time before turning off, confirming connection and operational status.

Restart

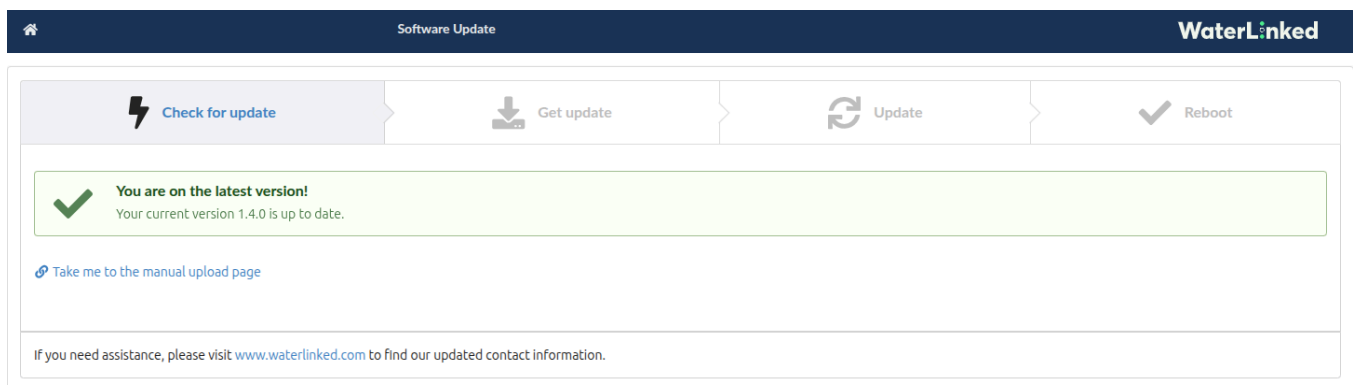
Restarts the Sonar. Restarts usually take between 30 seconds to a minute to complete.

Note

Some settings are preserved on restart. These are Network, Time and Integration API settings. Other settings may need to be set again after restart. See each respective section for further details.

Firmware

Allows for upgrading the Sonar's firmware. Click the button to open a new tab to the firmware updater.



The firmware upgrader allows for automatically checking and upgrading the Sonar firmware if necessary. This requires a working Internet connection to work. Alternatively, an offline (manual) upgrade can be used. [Read more about offline firmware upgrades.](#)

If needed, follow the steps to complete the upgrade. Upon completion, the Sonar will reset all settings back to factory default and restart. Firmware upgrade can take a couple of minutes.

Important

Keep the Sonar submerged in water to ensure a proper operational temperature during upgrade. Failure to do so may render your Sonar in an inoperable state.

Download Diagnostics

Generates a diagnostic log for Water Linked to assist in diagnosing issues.

 **Download Diagnostics**

Download a diagnostic log for Water Linked to assist in diagnosing issues. [Read more about diagnostics](#)

Prepare download ^

 *Submerge the Sonar in water and make sure the front of the Sonar is ideally 0.5m to 2m away from any wall or solid object.*

Provide a detailed description of the issue you are experiencing.

Minimum 10 characters.

Download 

Click the "Prepare download" button and ensure that the Sonar is submerged in water. Provide a detailed description of the issue in the text box and click "Download".

Important

The front of the Sonar should be 0.5m to 2m away from any wall or solid object to ensure ideal conditions before creating a diagnostic log.

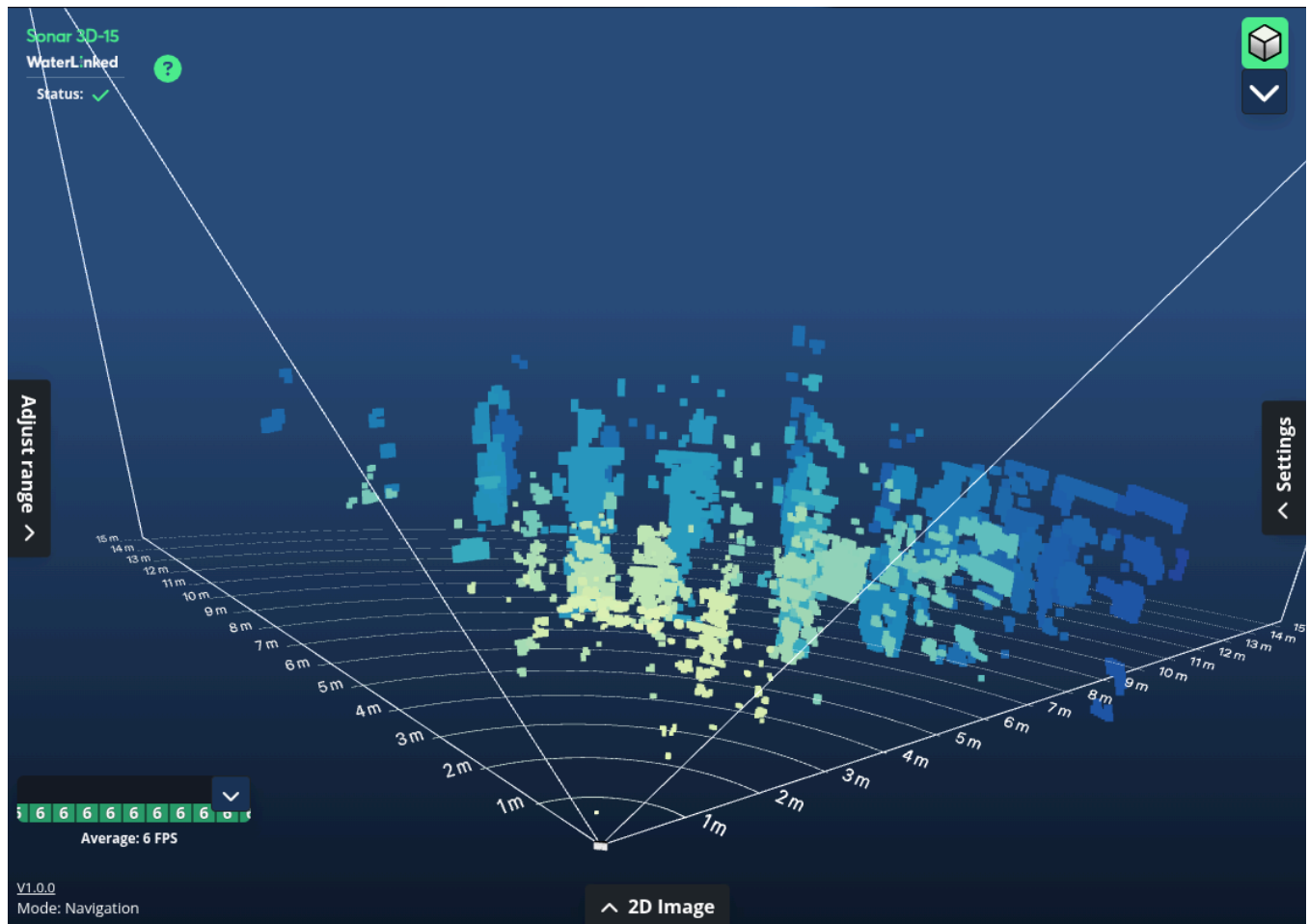
Submit a [support ticket](#) and attach the diagnostic log you just downloaded.

Integration API

Change how the Sonar transmits data and at what address the integration API is available from. Options are Disabled, Multicast (Default) and Unicast. [Read more about the Integration API.](#)

Update Rate

Toggle the display of an update graph overlay in 3D view which shows how fast data is being received from the Sonar. The graph displays the last 10 seconds of updates along with an average frame rate. The graph can be toggled in the 3D view.



Factory Reset

Reset all settings to factory defaults and restarts the Sonar. A confirmation is required before initiating a factory reset.

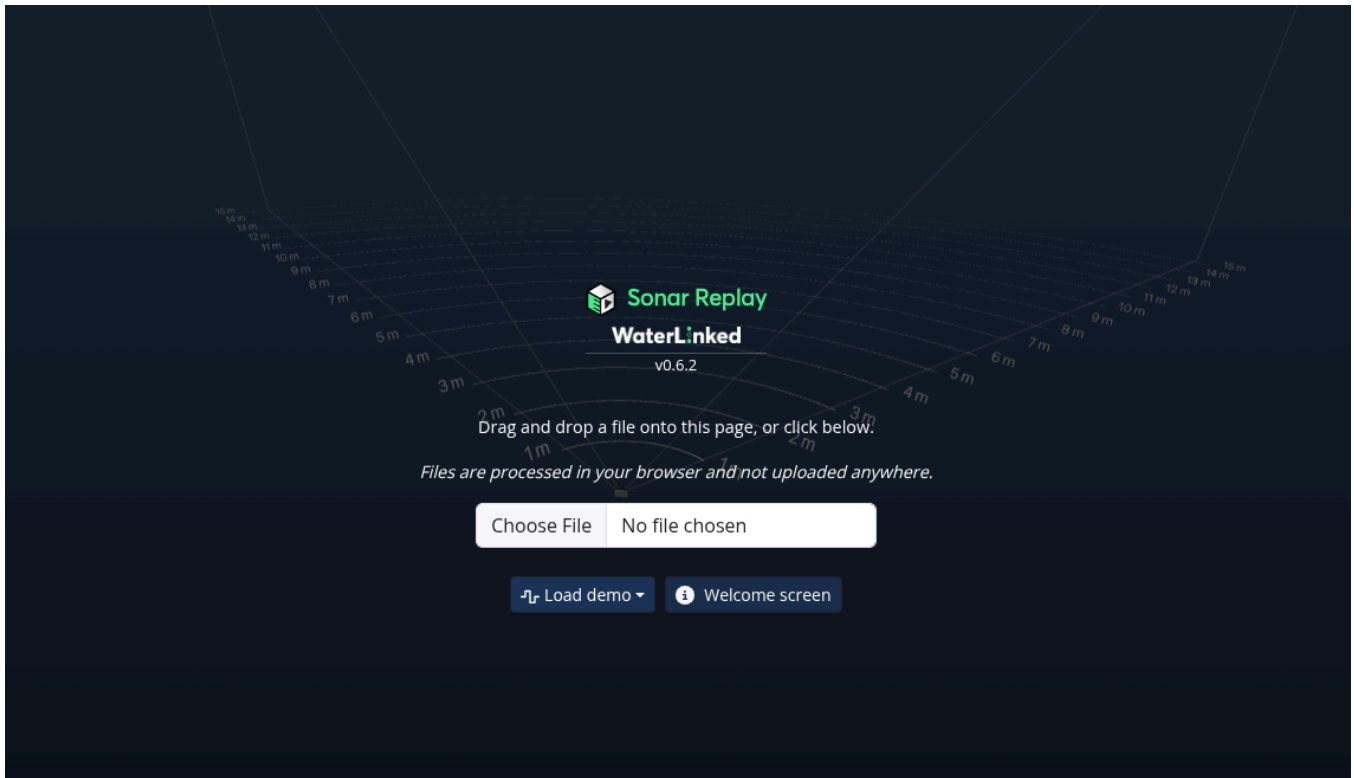
Connection events

Troubleshoot WebRTC connection issues between the GUI and the Sonar backend. These events relate to the UIs ability to communicate with the Sonar to establish the video streams, connection to the API, read system status and so on.

Sonar Replay

Sonar Replay allows play back of recordings taken with the [Sonar 3D-15](#) directly in your browser. You can access [Sonar Replay here](#). The interface is similar to that of the Sonar 3D-15, but with some changes.

All processing is done in your browser and not uploaded anywhere.

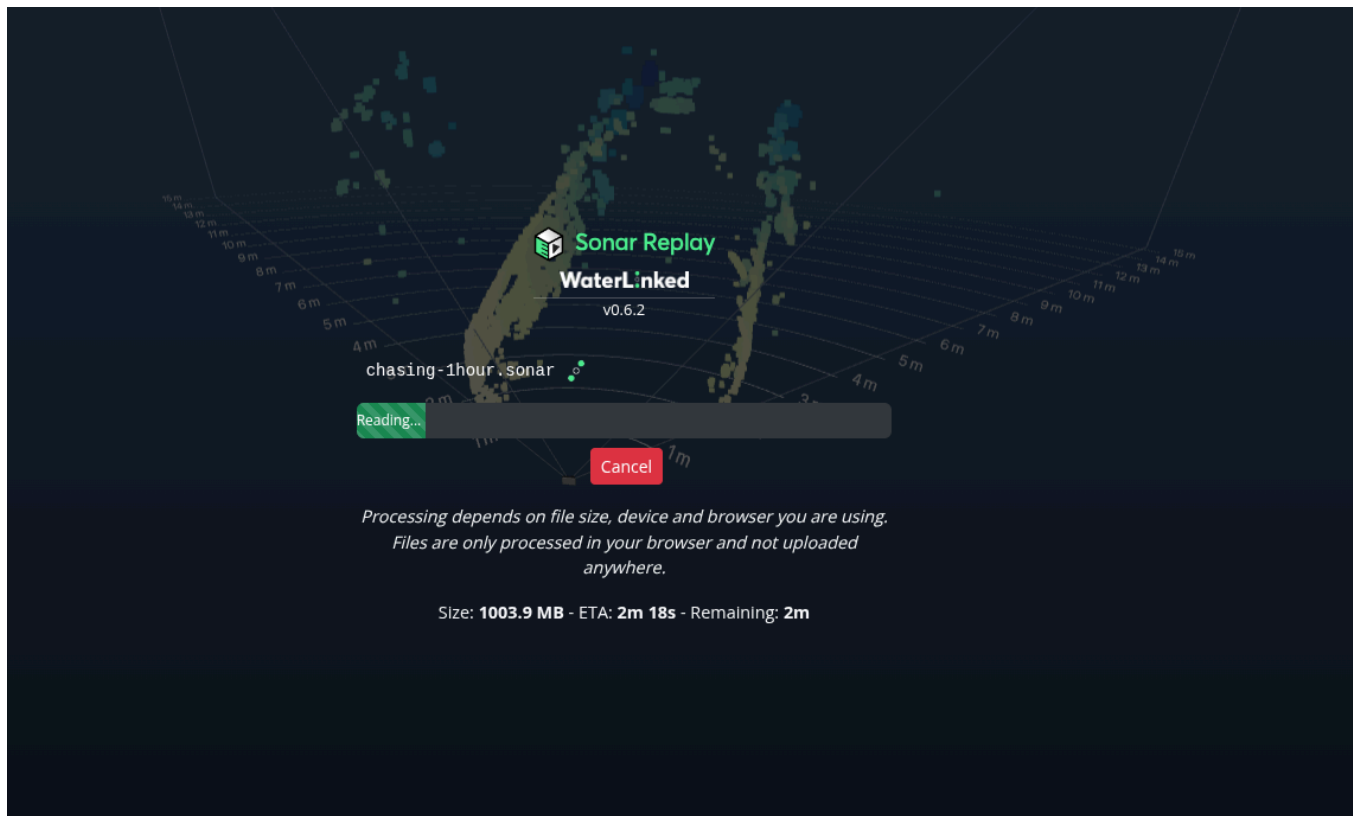


Note

Sonar Replay is still in development. Some features may not be fully functional or implemented yet.

Click the file input to select a file or drag and drop a file onto the browser window. Alternatively use one of the provided examples by clicking "Load demo".

Processing time depends on the file size, device and browser. While processing, an estimated remaining time is shown.

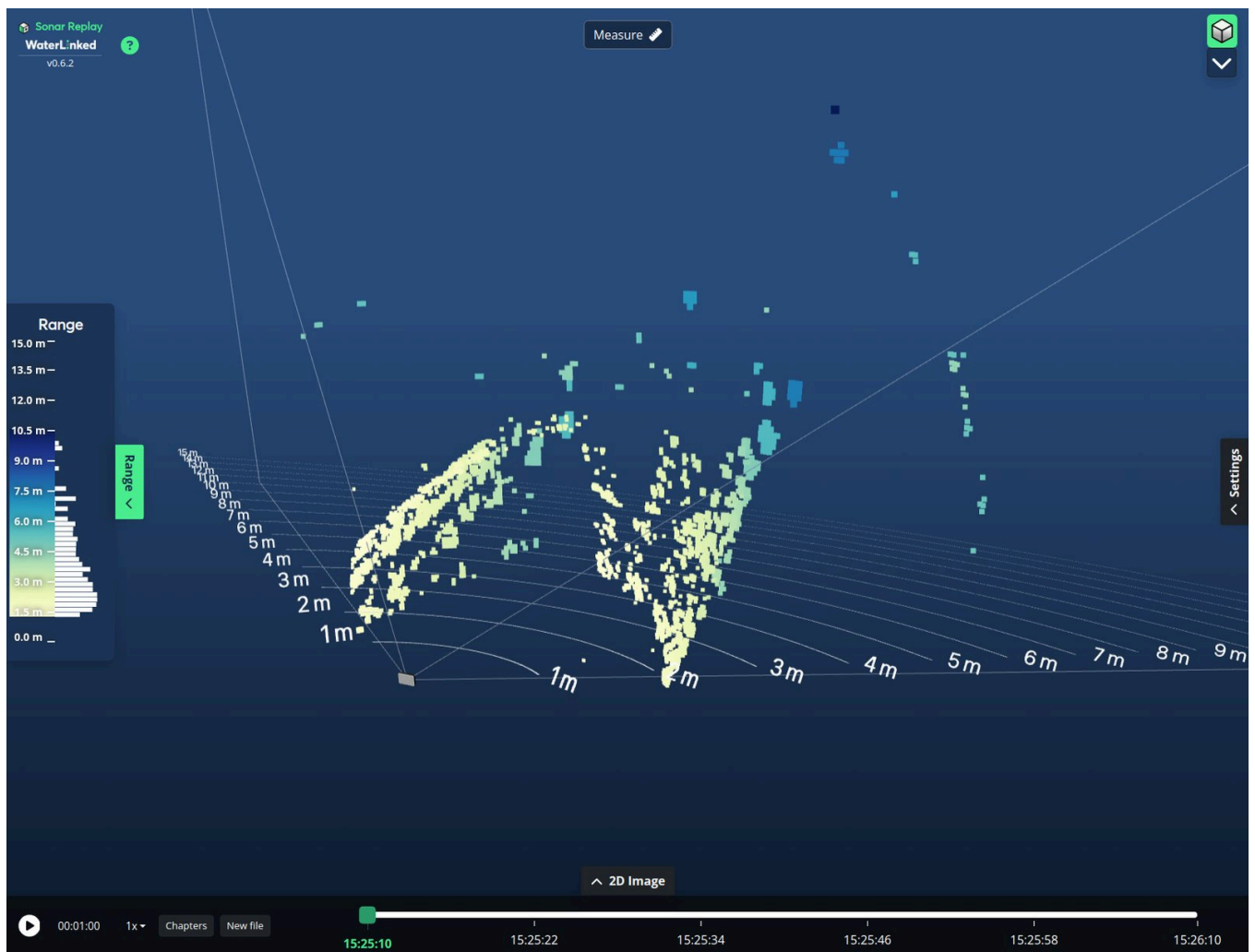


Note

We recommend recordings smaller than 300 MB for the best experience.

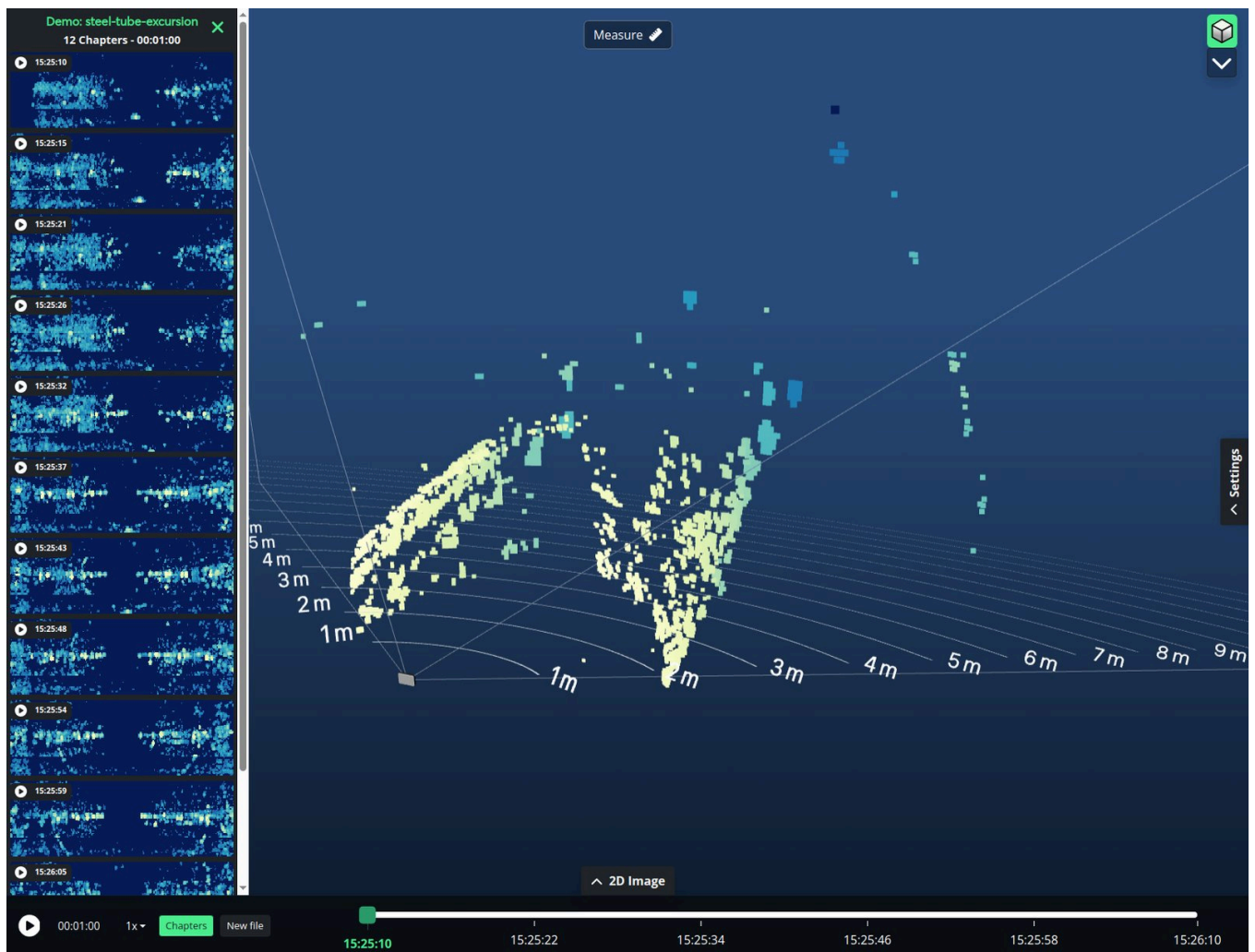
Play back

Once processing is complete, the 3D point cloud is shown and play back will start immediately. Scrub through the recording using the play back slider, pause, adjust play back speed and get an overview of the recording with "Chapters".



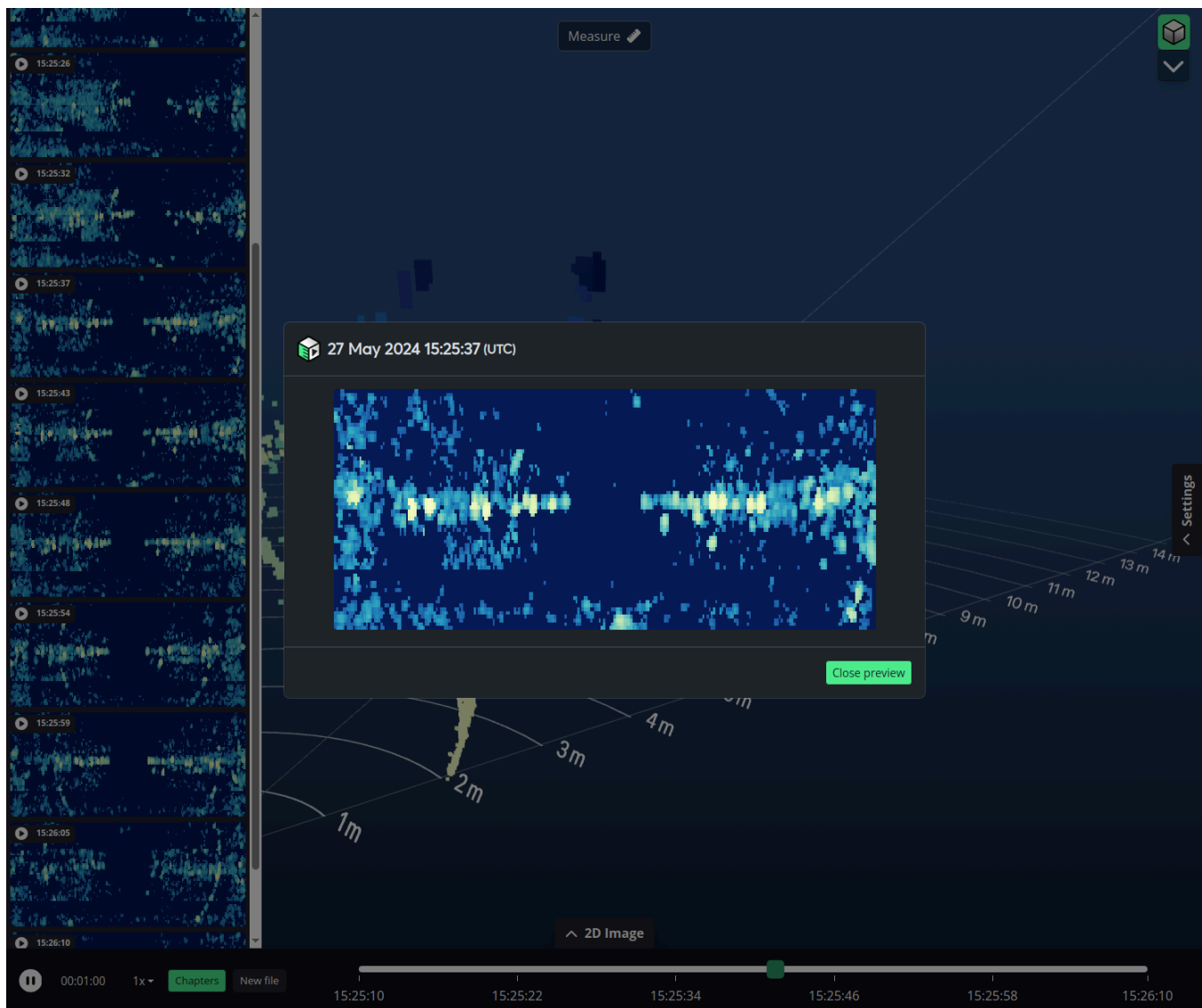
Chapters

Sonar Replay will automatically create chapter previews of the provided recording. Access this by clicking the "Chapters" button or by hitting **C** on your keyboard. Note that all recorded timestamps are in UTC (Coordinated Universal Time) and reflect the sonar's time settings at the time of recording.

**Tip**

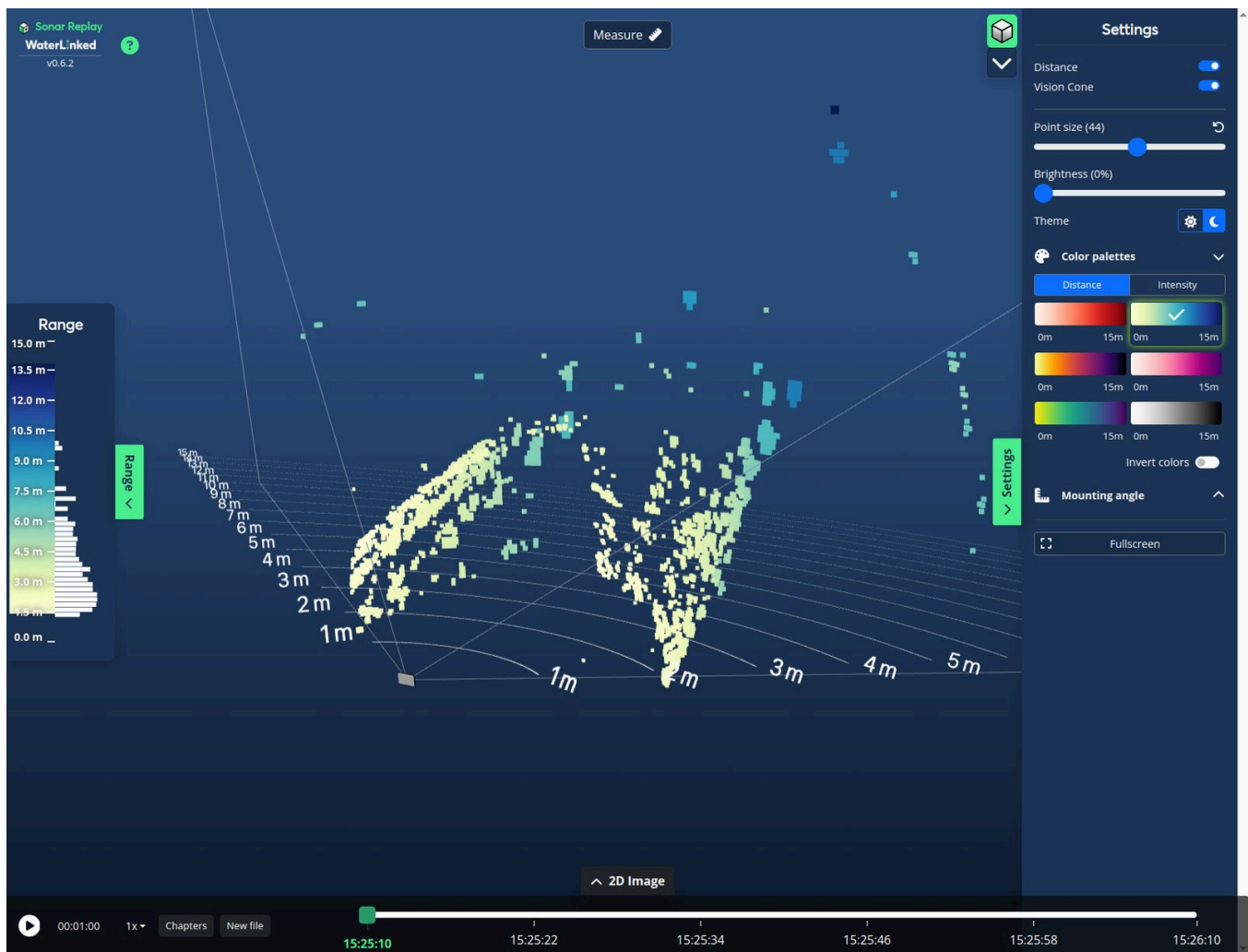
Quickly jump to a chapter by clicking the preview image.

Chapter preview can be expanded to a larger version by clicking the magnifying glass icon that appears when hovering the chapter preview.



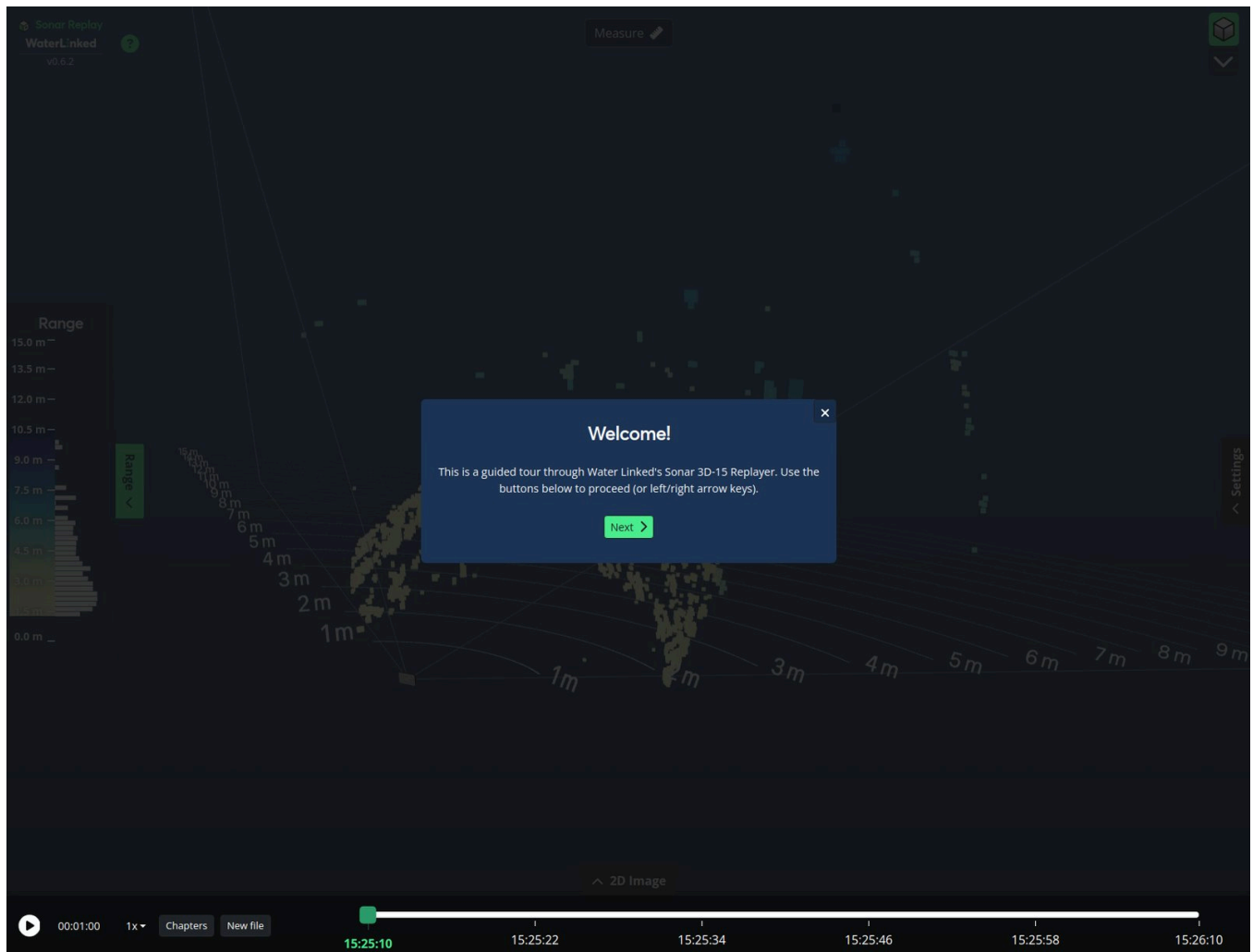
Adjust settings

Much like the real Sonar 3D-15, settings can be adjusted to better fit your use case and observe the recording. Toggle the settings tray by clicking the "Settings" button or hit **S** on your keyboard. From here many settings can be adjusted like point size, color palette and toggling elements in the 3D view.



Help

Get a quick overview of all main parts of the interface by clicking the ? (Question) icon top left or by hitting **H** on your keyboard.



Time

The sonar continuously attempts to synchronize time using the Network Time Protocol (NTP). When not synchronized with NTP, it is also possible to set time manually.

Supported versions

Supported on Sonar 3D-15 starting with release 1.7.1

See [Software Updates](#) for update instructions.

Importance of setting time

The sonar does know the current time when booting, and initial timestamps output from the sonar will be relative to some arbitrary time in the past. It is recommended to synchronize the sonar's time before using its output.

NTP server address configuration: auto or custom

The NTP server address can be configured as either "auto" or a specific server address. When NTP server address is configured as "auto", the sonar will attempt to reach a default pool of internet time servers. The configuration is persisted across reboots.

Setting manual time

When the sonar has not yet achieved NTP sync it is possible to set time manually. This is useful in deployment scenarios without a reachable NTP server, or as a fallback until an NTP server becomes available. A manually set time will be disregarded if the sonar later achieves NTP sync.

Time status

The sonar separates between NTP configuration and time status. Time status consists of the following fields:

Field	Description
<code>system_time</code>	system time
<code>ntp_synced</code>	true if synchronized to NTP source, false otherwise
<code>ntp_synced_to</code>	address the sonar is synchronized to if NTP is synchronized, "" otherwise
<code>ntp_seconds_since_last_sync</code>	seconds since last NTP sync if NTP is synchronized

NTP Force sync

A NTP force sync operation can be triggered which will attempt to achieve NTP sync within a specified timeout. Upon achieving sync, or when the timeout expires, the operation will respond with the following fields:

Field	Description
<code>success</code>	true if NTP sync was achieved within timeout, false otherwise
<code>message</code>	human-readable message
<code>status</code>	Time status as described here

Warning

`success` true means the sonar achieved NTP sync. To assert the sonar is synchronized to a specific NTP server, check the returned status.

Warning

The operation can cause abrupt jumps in system time, and is not recommended for use while reading sonar output.

Web GUI

On supported versions there is a "Time" section in the Config page.

HTTP API

The HTTP API allows configuration and inspection of time on the sonar. See [HTTP API](#).

Integration API Sonar 3D-15

Introduction

The **Water Linked Sonar 3D-15** provides real-time 3D views of underwater environments using a low-bandwidth **Range Image Protocol (RIP2)**. This protocol efficiently transmits data such as 3D points or grayscale bitmaps over UDP, enabling live visualization, analysis, or archival for later use.

The Sonar 3D-15 also exposes a HTTP API for configuration and inspection of system state.

A Python example implementation of the Sonar API is available on [github](#).

Range Image Protocol (RIP2)

RIP2 is a compact format for range and bitmap images, designed for <10 Mbit bandwidth.

NOTE: Some Sonar 3D-15 releases support sending RIP1 packets. RIP1 will be removed in a future release.

Packet structure

The packet format is designed to fit within a single UDP packet, introducing an upper limit of 65,507 bytes.

This is the structure of a RIP2 packet:

Number of bytes	Description
4	0x82 0x73 0x80 0x50, Identifier which reads "RIP2" in ASCII
4	Packet length (including identifier, packet length, payload and checksum)
payload length (packet length - 12)	Encoded protobuf message, compressed with Snappy .
4	IEEE 802.3 CRC-32 of the preceding bytes in the packet

Decoding Steps:

1. Verify the "RIP2" ID.
2. Read packet length.
3. Read compressed payload and CRC-32, and verify the CRC-32.
4. Decompress the payload into an encoded protobuf packet.
5. Decode into the `Packet` message type (see [.proto file](#))
6. Use `.msg.type_url` to identify the contained message.

7. Decode `.msg.value` into that message type (see `.proto` [file](#))

Transmission

RIP2 transmission is disabled by default. The HTTP API can be used to configure UDP multicast to `224.0.0.96:4747`, or UDP unicast to a given destination address and port. The configuration is persistent, meaning it is kept on restart.

UDP multicast allows transmitting RIP2 packets to devices on the local network without requiring the sonar to know the receiver's IP, and vice versa.

UDP unicast allows transmitting RIP2 packets to a given destination address and port, and can be routed across networks.

Because UDP does not guarantee delivery or ordering, packets may be lost, reordered, or duplicated. Use message sequence numbers to address this.

It is also possible to record RIP2 packets through the GUI.

Image Sizes and Update Rates

Mode	Resolution (W×H)	FOV (H×V)	Rate
Low Frequency	256 × 64	90° × 40°	5 Hz
High Frequency	256 × 64	40° × 40°	20 Hz

Message Types

RIP2 supports several Protobuf-encoded messages, including:

`BitmapImageGreyscale8`

- 8-bit grayscale; each pixel = signal strength or shaded depth.
- `type` enum differentiates **signal strength** vs. **shaded**.

`RangeImage`

- Each pixel represents distance (radius) to the strongest reflection.
- `0` = no valid data.
- `radius = pixelValue * imagePixelScale`.

`ImuBatch`

- Raw measurements of specific force and rate of turn from an internal IMU at 100Hz.

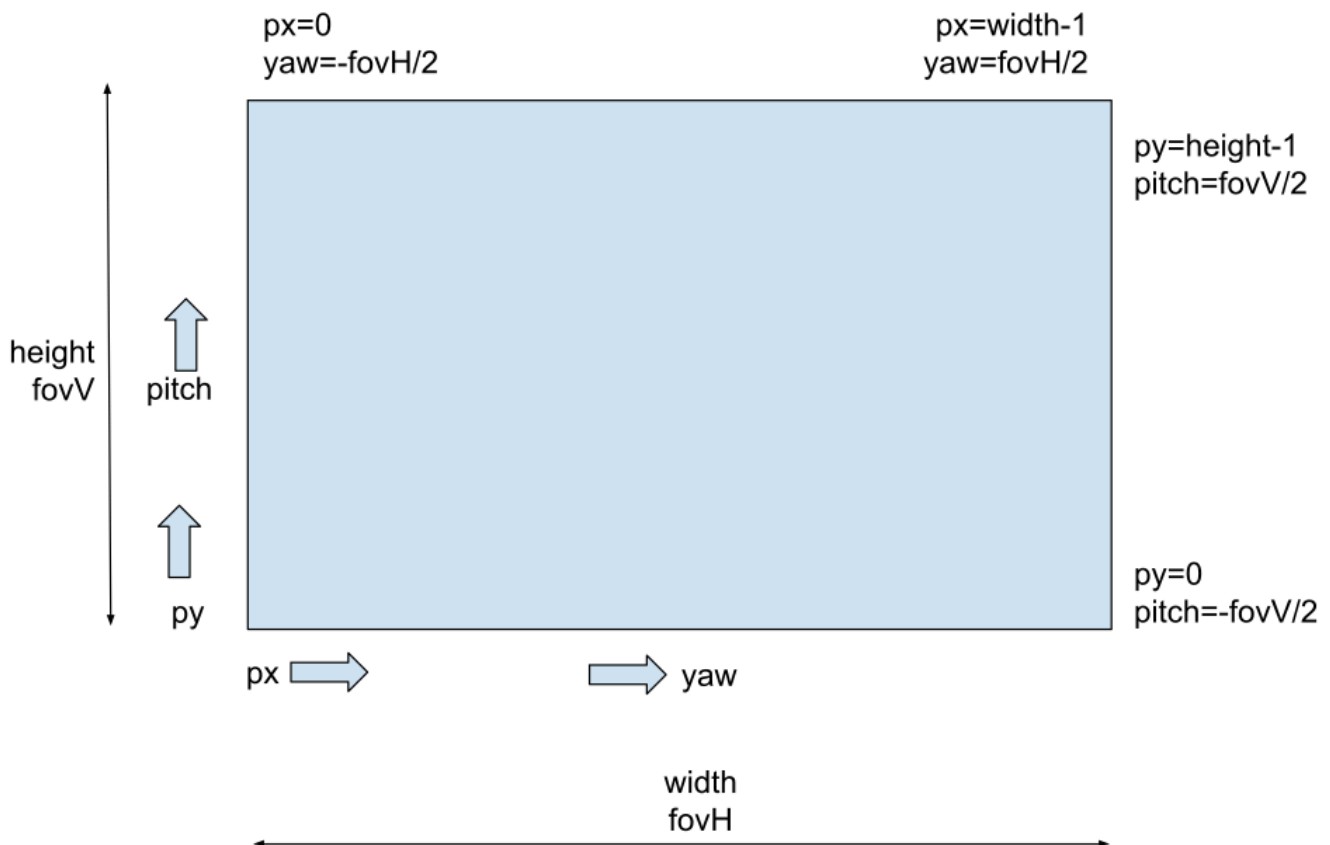
- Measurements are made at the position of the internal IMU within the sonar. The position offset relative to point cloud origin is -22 mm in x, -46 mm in y and -3 mm in z.
- Output in batches, with latency below 100ms during normal operation.
- Expect occasional spikes in latency.
- Expect spikes in latency during configuration.
- Output while acoustics are enabled.
- Disabled by default. Enable using the HTTP API.

Coordinate and Image Conventions

Axes (right-handed):

- **Origin:** The point cloud origin ($x = 0$, $y = 0$, $z = 0$) is located at the mechanical center of the front transducer/receiver surface. The front surface is the $x = 0$ plane; $y = 0$ is centered across the 122 mm width, and $z = 0$ is centered across the 80 mm height, with positive z pointing downward.
- **x:** forward
- **y:** right
- **z:** downward

Image:



- Horizontal FOV ($fovH$) spans width.

- Vertical FOV (`fovV`) spans height.
- (`px`, `py`) maps to (`yaw`, `pitch`):

```
yaw = (px / (width - 1)) * fovH - (fovH / 2)
pitch = (py / (height - 1)) * fovV - (fovV / 2)
```

Example: Converting Range Image to 3D:

```
// Convert pixelValue to radius in meters
if (pixelValue == 0) {
    return Undefined; // no valid data
}
radius = pixelValue * imagePixelScale;

// Convert (yaw, pitch) from degrees to radians
yaw    = deg2rad((px / (width - 1)) * fovH - (fovH / 2));
pitch  = deg2rad((py / (height - 1)) * fovV - (fovV / 2));

// Cartesian conversion (x forward, y right, z down)
x = radius * cos(pitch) * cos(yaw);
y = radius * cos(pitch) * sin(yaw);
z = -radius * sin(pitch); // z is downward
```

Protobuf packet description

The Sonar 3D-15 protobuf messages that are transmitted by the sonar is documented in a [.proto](#) file. The `.proto` file is used to generate code for decoding the messages in any of the [supported programming languages](#).

Refer to the full [protocol specification](#) and the [wlsonar](#) Python library for an example implementation.

Compatibility Notes

- Additional message types/fields may be introduced.
- Decoders should ignore unrecognized messages.
- Major breaking changes will involve a new protocol identifier.

HTTP API

The Sonar 3D-15 exposes a HTTP API for configuration and inspection of system state. The HTTP API is exposed on port 80 and uses paths rooted at `/api/v1/integration/`. JSON is used for request and response bodies. The HTTP API is documented with a [swagger.json](#) file. This file can be opened in a compatible viewer such as [this one](#). Example code using the HTTP API exists on [github](#).

Software Updates

Keeping your Sonar 3D-15 up to date is highly recommended. You can update the software [automatically](#) or [manually \(offline\)](#).

Warning

Thermal protection is disabled during software upgrades.

Make sure the Sonar 3D-15 is submerged in water (or otherwise cooled) throughout the update to prevent overheating.

Allowing the sonar to shut down during upgrade might permanently damage the Sonar.

Automatic Software Update

1. **Connect to the Internet**

Connect the Sonar 3D-15's Ethernet interface (via the I/O card) to a network with internet access.

Note

If you are using a personal computer, you may need to bridge your computer's network interfaces (e.g., Wi-Fi to Ethernet) so that the Sonar 3D-15 can reach the internet.

1. **Access the Sonar GUI**

In your web browser, go to: `http://[IP_ADDRESS_OF_THE_SONAR]:9000/#/` or navigate to "Advanced → config → Diagnostics (Show) → Firmware upgrade"

2. **Check and Install**

The GUI automatically checks for new software versions. If an update is found, follow the on-screen instructions to install it.

Offline Software Update

1. **Get Current Version and Chip ID**

In the Sonar GUI, select "Advanced → config → About this Sonar" to note the current software version and the **Chip ID**.

2. **Download the Update Package**

Visit the [update server](#) to locate the correct `.w1up` file for your Sonar's Chip ID. Confirm that the downloaded version is newer than your current version.

3. **Set System Time (If Needed)**

If you encounter an error (e.g., `Failed: Error upgrading: resize: non-zero exit code: exit status 1`), you must set the system time:

- Open the Sonar GUI and select **Advanced → Config**

- Under **Time** choose **use computer time** and click **save**.

4. Upload the Update File

Return to: `http://[IP_ADDRESS_OF_THE_SONAR]:9000/#/` Select **Software upgrade**, choose **Manual upload**, and then upload the `.w1up` file.

5. Complete the Upgrade

Wait for the Sonar to finish applying the update. Keep it submerged to avoid overheating.

After completion, the Sonar 3D-15 will reboot with the new software version.

If you have any questions or run into issues, please consult the release notes and check out the [Sonar 3D-15 FAQ](#) or contact our support team.

Integrating onto Deep Trekker PIVOT ROV

Introduction

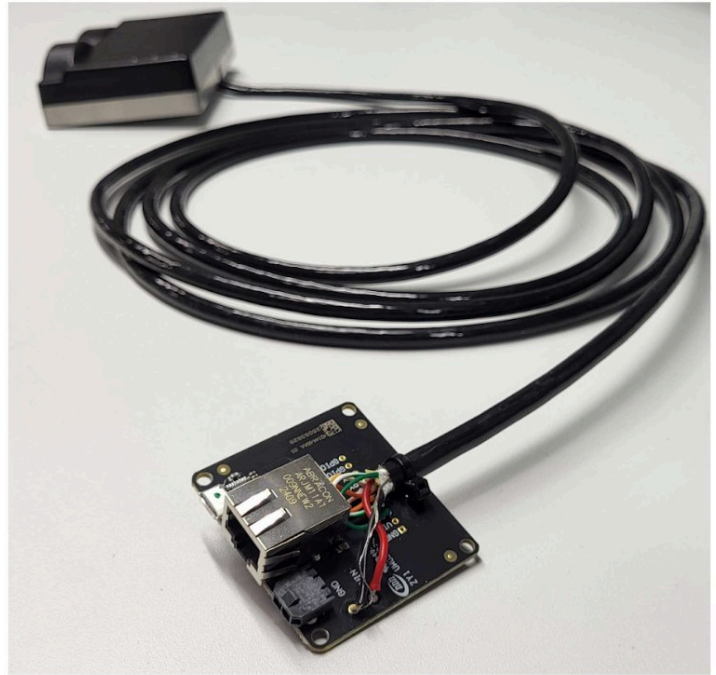
This is a manual on how to install the Water Linked Sonar 3D-15 for the Deep Trekker PIVOT ROV. We recommend that you contact Deep Trekker to purchase the Sonar 3D-15, along with all parts to allow for installation on your Deep Trekker vehicle. You can contact support@deeptrekker.com or sales@deeptrekker.com for this. Other documentation and information can be found at:

- [Deep Trekker PIVOT ROV Support](#)



What's in the box

The Sonar 3D-15 from Water Linked is normally shipped with an attached I/O Interface board. If you have bought the Sonar 3D-15 and Integration Kit from Deep Trekker, you will have a Deep Trekker (DT9636) connector instead of the I/O Interface. In that case, follow the integration instructions from Deep Trekker.



What You'll Need

To follow this guide, you will need the following:

- An Ethernet cable
 - *To connect the Deep Trekker Controller to your PC*
- Correct connector
 - *Deep Trekker DT9636*
- A mount (Sonar 3D-15 to ROV)
 - *An example can be downloaded from here: [3D step file](#)*
- Correct screws
 - *See the [Mounting](#) section*

Connector Setup

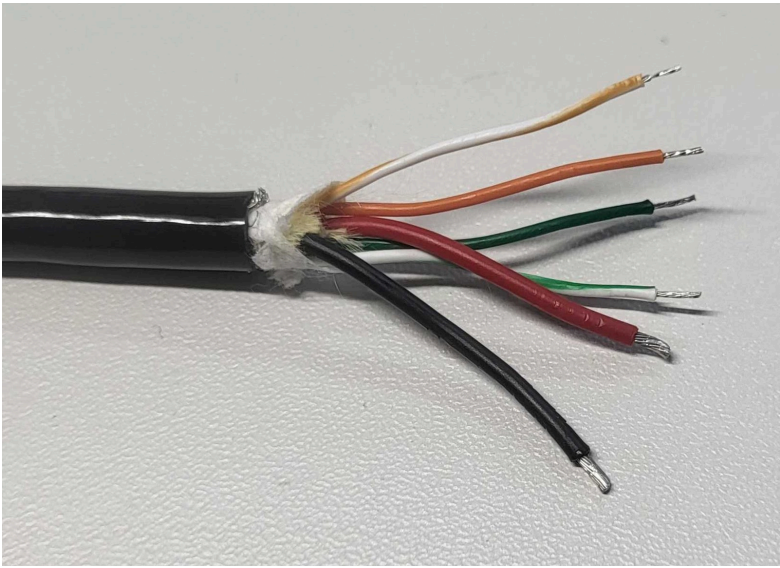
Testing the Sonar 3D-15 Separately

If the I/O Interface board is attached, the Sonar 3D-15 can be tested directly using an Ethernet cable and a power supply. If you wish to test the device on its own before integration, follow the general Quickstart tutorial, available here: [Quickstart](#).

Connecting to Deep Trekker ROV

The most common solution is to terminate a Deep Trekker connection port cable (DT9636) directly to the cable of the Sonar 3D-15. To do this, we recommend the following procedure:

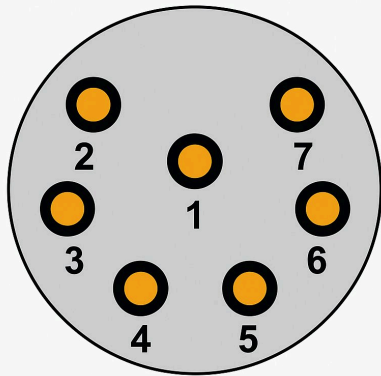
1. **Remove the I/O board.** After this step, the I/O board is no longer needed for normal operation. The cables from the Sonar 3D-15 are shown in the picture below.



2. **Terminate a Deep Trekker (DT9636) connection** to the Sonar 3D-15 cable using the table and pinmap below.

Sonar Cable Type	Sonar Cable Color	Pin Number 9636 Deep Trekker Connector 7-pole (Female) Rebuild Kit
DC-	Black	1
DC+	Red	2
RX+	Green/White	6
RX-	Green	5
TX+	Orange/White	4
TX-	Orange	3
NC	NC	7

DT 9636 Female connector front



3. **Add a waterproof seal** around the termination.



 Note

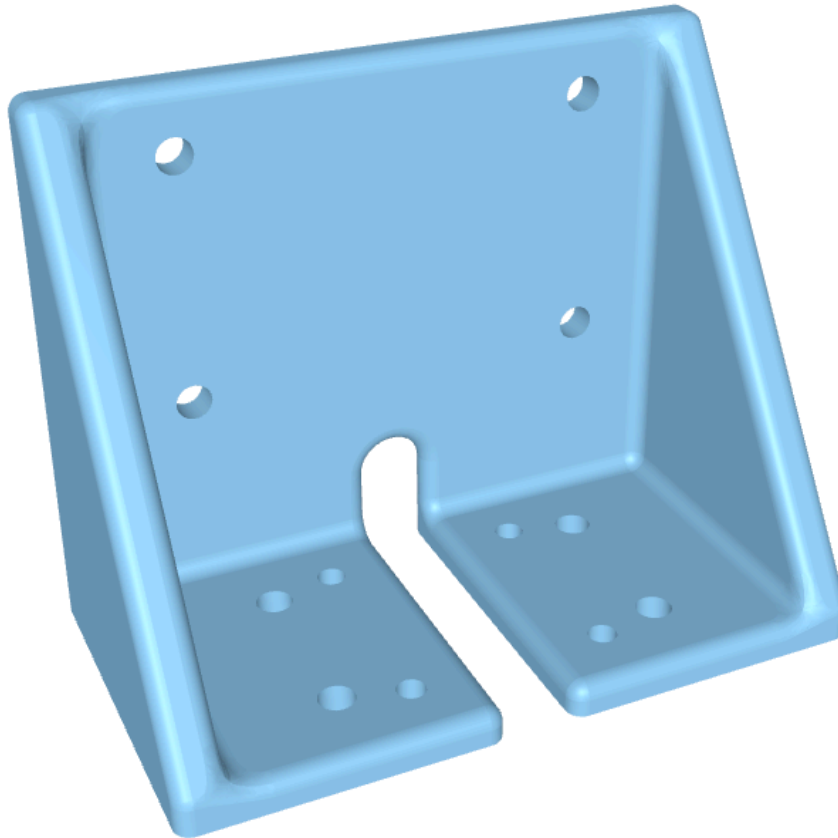
The termination has to be waterproof and needs to withstand the depths of which you will be running your ROV.

Mounting

The Sonar 3D-15 needs to be physically attached to the Deep Trekker ROV. A possible option on how to do this will be listed here. There are many different approaches to achieve this, and this approach is only listed to provide an idea.

1. **Create or find a suitable mount**

An example 3D step file of a mount is found here: [Download 3D step file](#)



 Note

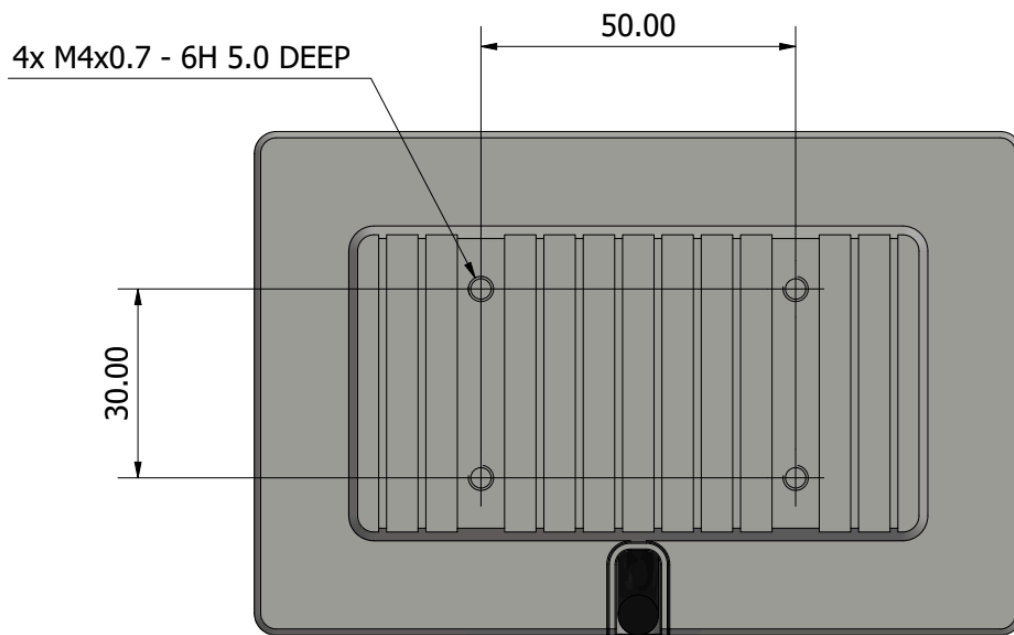
Choose a 3D print material that can withstand the expected operating conditions.

2. Identify the screws and mount to use

Use $[M4 \times (5.0 + X) \text{ mm}]$ screws to attach the Sonar 3D-15 to the mount, and use $[M4 \times (7.0 + X) \text{ mm}]$ screws with hex nuts and washers to attach the mount to the platform in front of the Deep Trekker. Exchange the X with the thickness of your mount.

For example, for a 3.0mm thick mount (*as the given 3D print*), the following is sufficient:

- 4x $M4 \times 8.0 \text{ mm}$ screws
- 4x $M4 \times 10.0 \text{ mm}$ screws
- 4x $M4$ Hex Nuts
- 4x $M4$ Washers



Warning

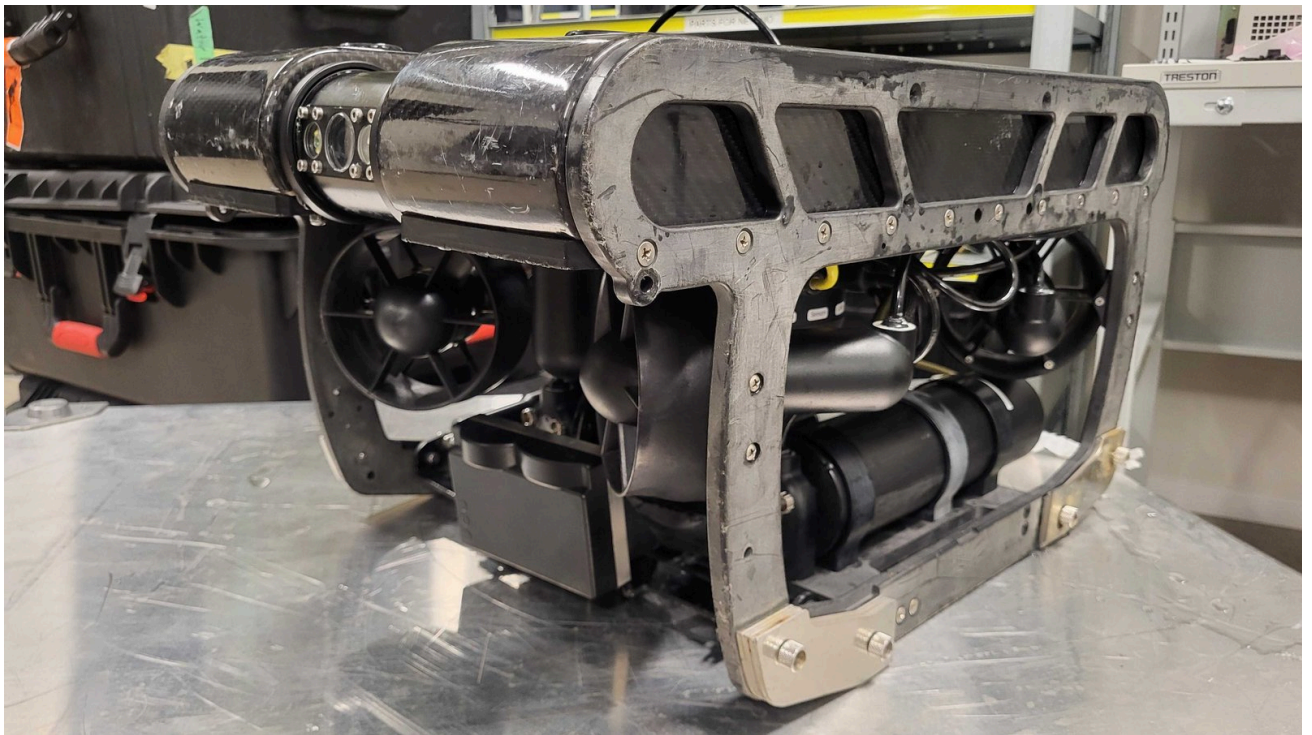
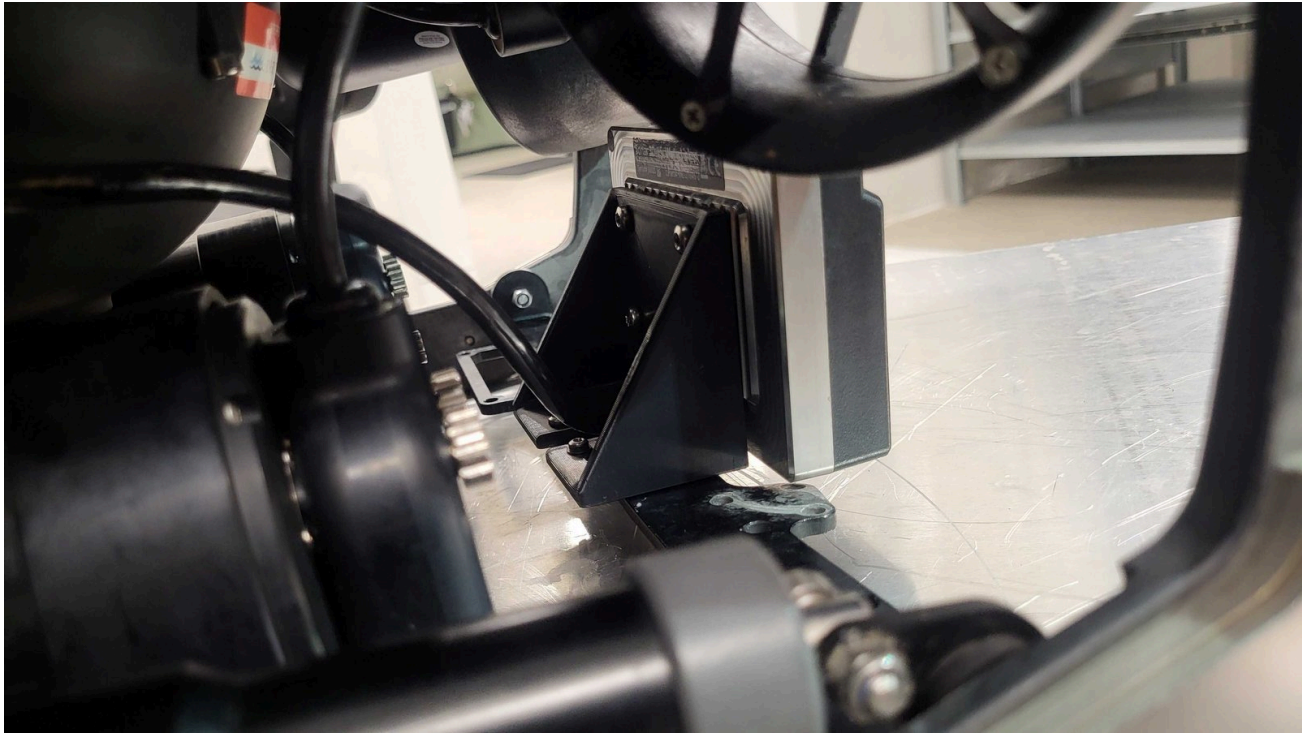
To avoid damaging the Sonar 3D-15, make sure the screws are not too long.

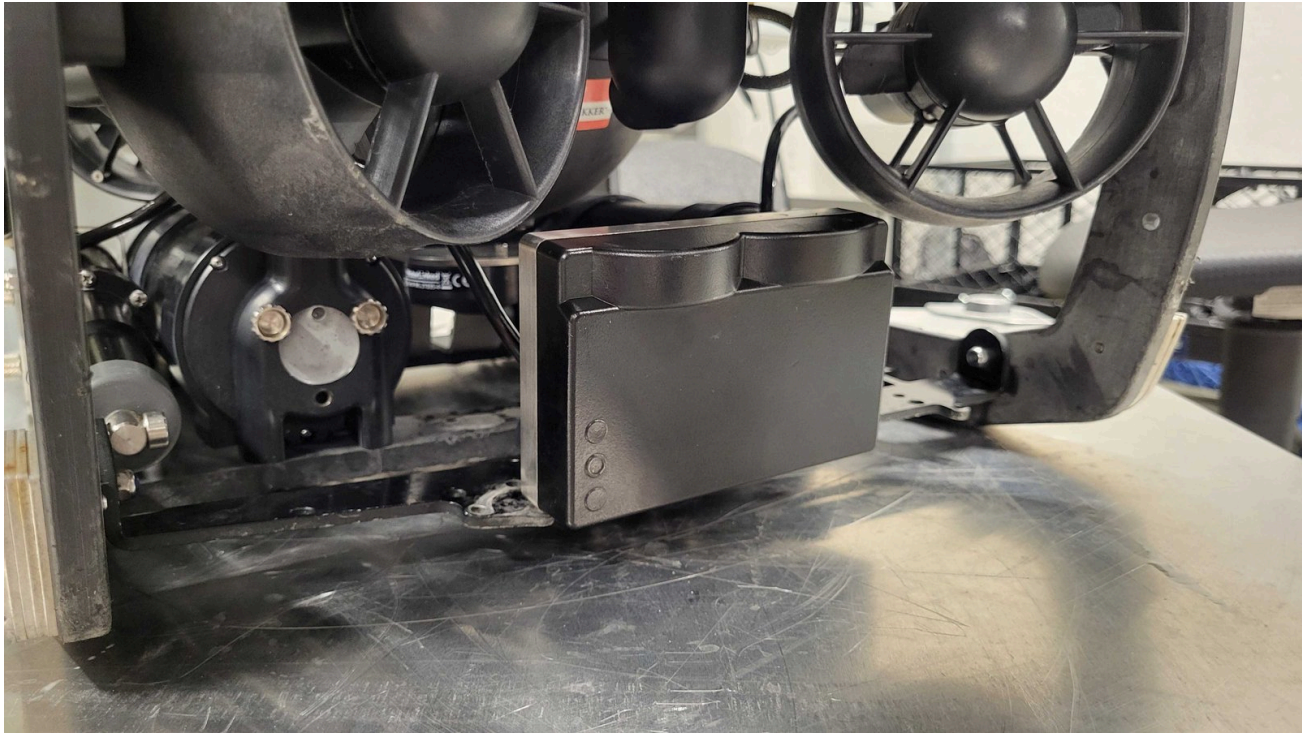
3. Attach the mount to the Sonar 3D-15



4. **Attach the mounted Sonar 3D-15 to the Deep Trekker ROV**

We recommend putting the Sonar 3D-15 on the platform in the front for the Deep Trekker. In that way, the Sonar 3D-15 can be tilted by using the controller of the ROV, without blocking the Sonar 3D-15's field of view.



**Note**

Make sure the Sonar 3D-15 and cable are neatly and securely attached before use.

Connection steps

1. **Connect to the bulkhead**

Connect the Sonar 3D-15 cable into one of your Deep Trekker ROV's free Ethernet ports on the Bulkhead of the DeepTrekker.



2. Connect the top side

Connect one end of an Ethernet cable to the Deep Trekker controller's Ethernet port, and the other end to your computer.





3. Turn on the drone

Click the power button on the Deep Trekker controller and let the drone boot up.

Warning

To avoid potential power hazard or errors, make sure all cables are securely connected before you turn on the controller. Do not connect sensors to the Deep Trekker while the power is on.



4. Access the Sonar 3D-15 GUI

The Sonar 3D-15 GUI is accessed by entering the Sonar 3D-15's IP-address into the browser running on the computer connected to the controller.

Both the PC and Deep Trekker need to have DHCP enabled. This is standard for most computers and is normally enabled. But, to check if your computer has DHCP enabled, do the following:

Checking DHCP for Windows:

Option 1:

1. Open **Settings > Network & Internet**.
2. Click on **Ethernet**
3. Select your active connection.
4. Scroll to IP-address settings:
 - If it says **Automatic (DHCP)** → it's enabled.
 - If it says **Manual** → DHCP is off.

Option 2:

1. Run the following command in the windows terminal

```
ipconfig /all
```

2. Look for the section **Ethernet adapter Ethernet** and the line **DHCP Enabled** (green arrow)
3. If **DHCP Enabled** is set to **Yes**, then DHCP is enabled.

```
PS C:\Users\[redacted] > ipconfig /all

Windows IP Configuration

Host Name . . . . . : [redacted]
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : localdomain

Ethernet adapter Ethernet:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . : localdomain
Description . . . . . : Intel(R) Ethernet Connection (16) I219-LM
Physical Address. . . . . : [redacted]
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```



Checking DHCP for Linux:

1. Run the following in the terminal:

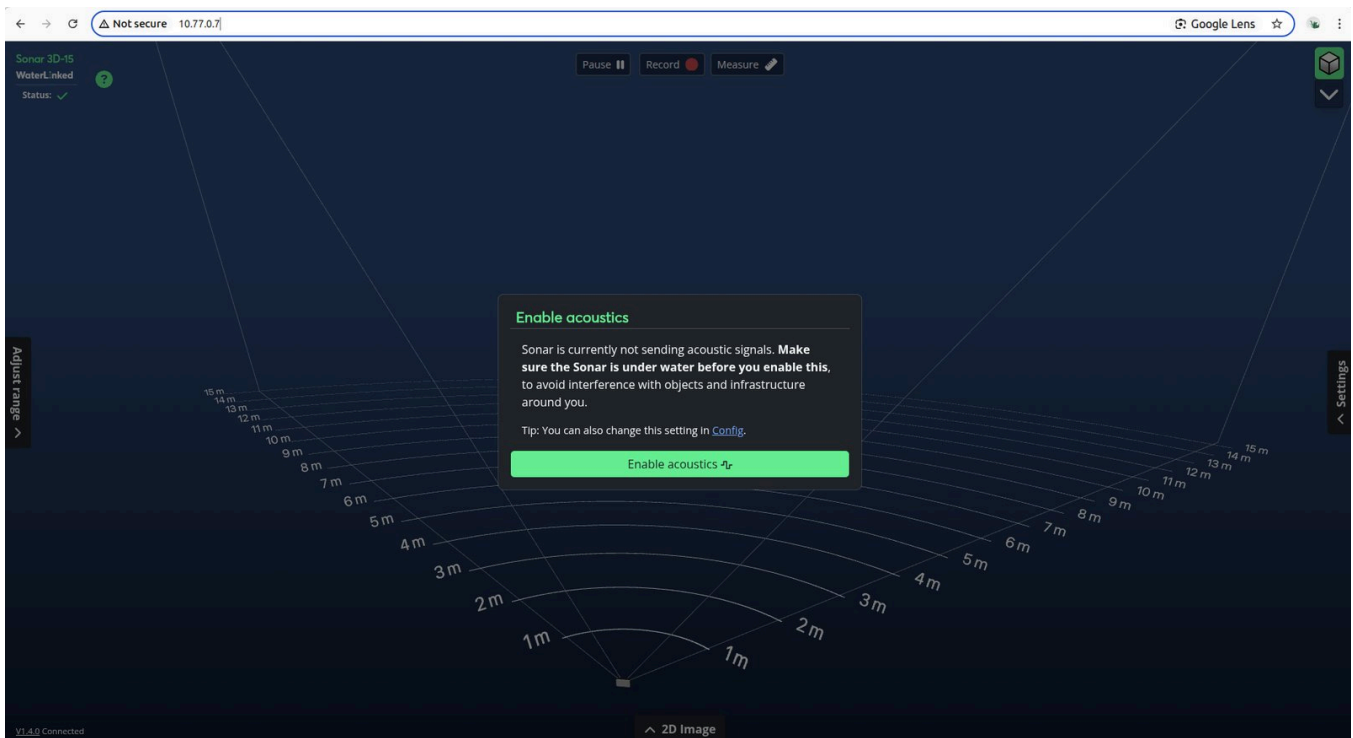
```
for iface in $(ip -o link show | awk -F': ' '{print $2}'); do
    echo "Interface: $iface"
    ip addr show "$iface" | grep -q dynamic && echo " --> DHCP detected" || echo " -->
Static or unknown"
done
```

If you see --> **DHCP detected**, your PC has DHCP enabled and you are ready to continue.

If DHCP is disabled, please enable this on your computer.

Finding and connecting to the IP-address of the Sonar 3D-15

You need to determine which IP-address has been automatically assigned to it by the Deep Trekker system. Once located, entering it into your browser will display a page like the one below — in this example, the Sonar 3D-15 is using 10.77.0.7.



Warning

Don't operate the Sonar 3D-15 out of water for any long periods. To avoid overheating of the Sonar 3D-15, **don't click the green button "Enable Acoustics"** until the ROV is submerged in water.

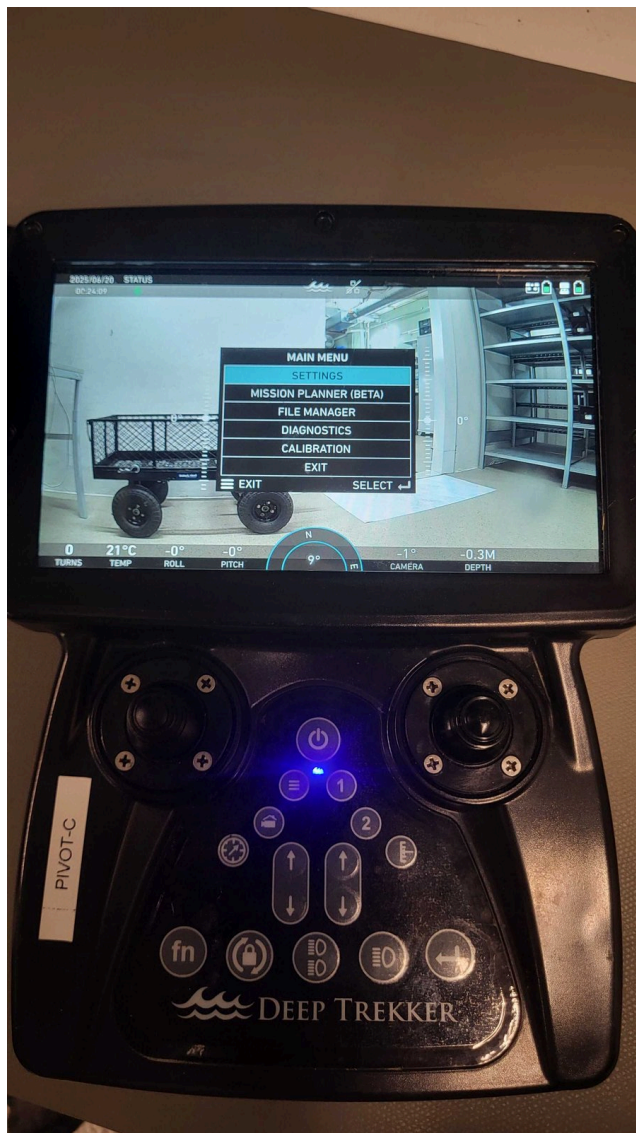
Acoustics is always disabled when first booting up the Sonar 3D-15, and will be turned on once clicking this button. The Sonar 3D-15 will automatically turn itself off if too hot, but will take some time to cool down, it's best to avoid this happening.

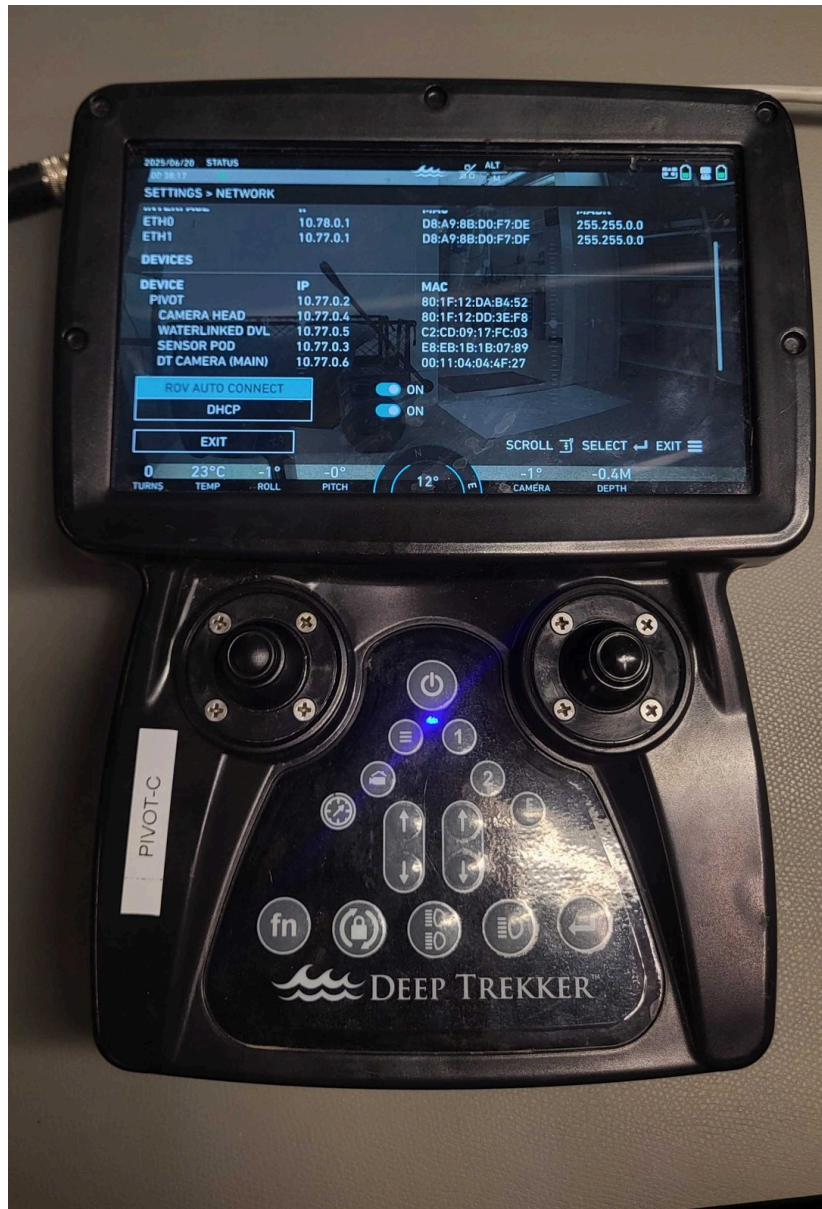
To figure out what the correct IP-address is, do the following:

1. Get an overview of the network

Click **Menu -> Settings -> Network**. This will show a list of the IP-addresses of the connected sensors on the DeepTrekker. At this time, the Sonar 3D-15 does not appear in the list, even when connected.







2. Test and find the IP-address

The ROV usually assigns connected devices using a base IP-address, in this example, `10.77.0.x`. It's possible your ROV has a different base, use the one shown on your Controller.

To locate the Sonar 3D-15's IP-address, test an address that doesn't appear in the network list — preferably one just above the highest one in the list.

- For example, if the highest IP-address on the list of the Deep Trekker Controller Network section is the DVL A50 with `10.77.0.6`, try accessing the Sonar 3D-15 with `10.77.0.7` or `10.77.0.8` in the browser
- Or, if all addresses between `10.77.0.1` - `10.77.0.7` are on the list, except for `10.77.0.4`, try the IP-address `10.77.0.4` for the Sonar 3D-15.

Tip

You can also access the GUI on the Sonar 3D-15's fallback address `192.168.194.96`, this is explained in more detail in the general Quickstart guide, which can be found at [Quickstart](#).

5. Put the ROV into the water

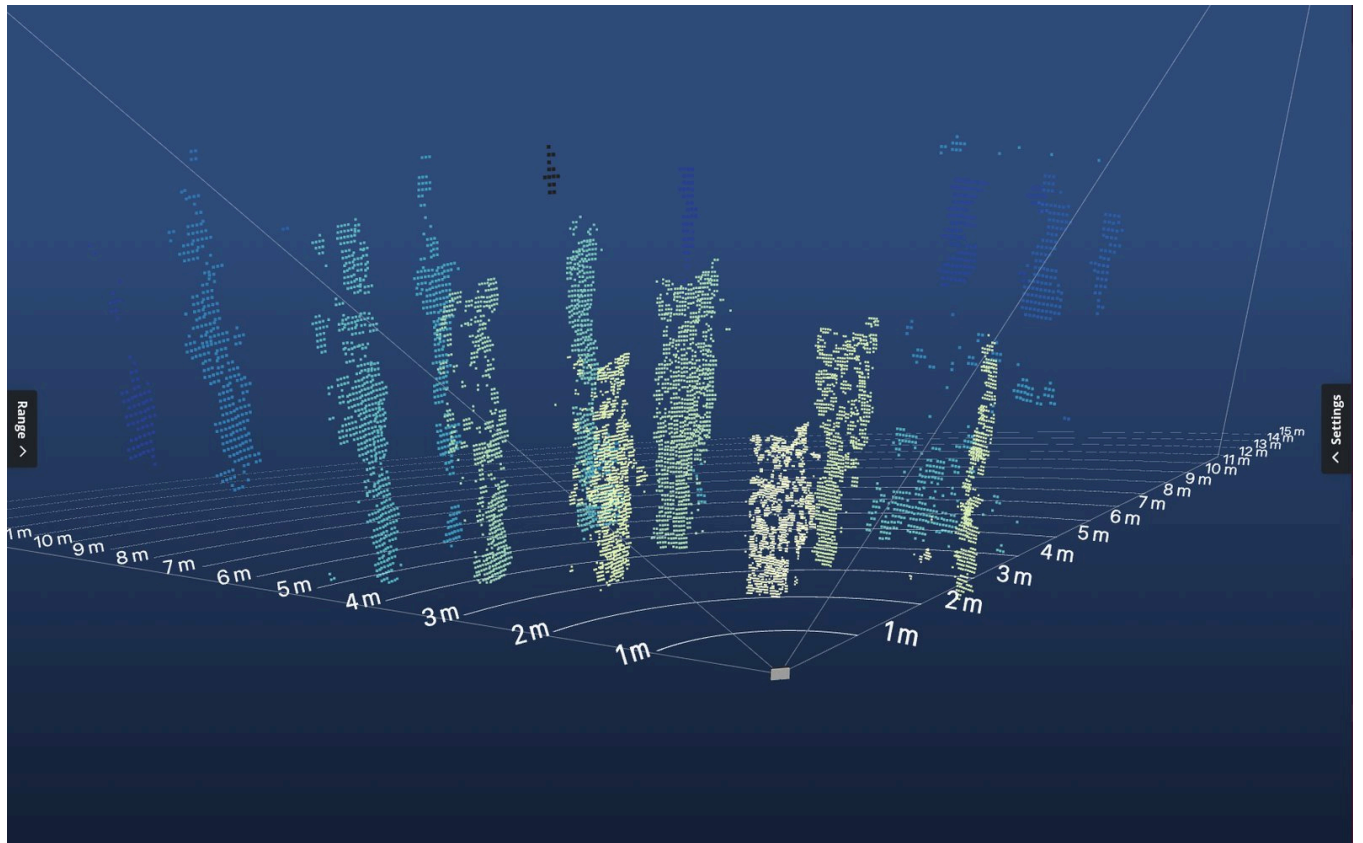
You are now ready to put the ROV into the water.



6. Enable acoustics

When ready, click the "Start acoustics" button to initiate the Sonar 3D-15. It will display a 3D point cloud in the GUI representing the area in front of the Sonar 3D-15.

You are now ready to use the Water Linked Sonar 3D-15 with the Deep Trekker ROV!



Integrating onto Blueye X3 ROV

Introduction

This is a manual on how to install the Water Linked Sonar 3D-15 for the Blueye X3 ROV. We recommend that you contact Blueye to purchase the Sonar 3D-15, along with all parts to allow for installation on your Blueye vehicle. You can contact Blueye at contact@blueye.no or blueyeroobotics.com/contact/sales for this. General documentation and information from Blueye can be found here:

- [Blueye General support](#)
- [Blueye X3 ROV User Manual](#)



What's in the box

The Sonar 3D-15 from Water Linked is normally shipped with an attached I/O Interface board. However, if you have purchased the Sonar 3D-15 along with the Integration Kit from Blueye, which we recommend, it will include a pre-terminated connector instead of the I/O Interface board. In that case, follow the integration instructions provided by Blueye.



Connector Setup

Testing the Sonar 3D-15 Separately

If the I/O Interface board is attached, the Sonar 3D-15 can be tested directly using an Ethernet cable and a power supply. If you wish to test the device on its own before integration, follow the general Quickstart tutorial, available here: [Quickstart](#).

Connecting to Blueye ROV

Please contact Blueye to obtain customized terminations and cables for connecting the Blueye ROV to the Sonar 3D-15. This guide will assume terminated cables provided from Blueye.

Mounting

The Sonar 3D-15 needs to be physically attached to the Blueye ROV. Blueye can provide a custom mount designed to fit the Sonar 3D-15. Please contact Blueye for further details.

1. Get a suitable mount

This is the mount from Blueye, with both space for the Sonar 3D-15 and a servo motor that can change the angle of the Sonar 3D-15 field-of-view.



2. Identify the screws to use

Use **M4 × 10 mm (ISO14583 A4)** screws with **M4 (ISO 7089 A4)** washers to attach the Sonar 3D-15 to the mount.



Warning

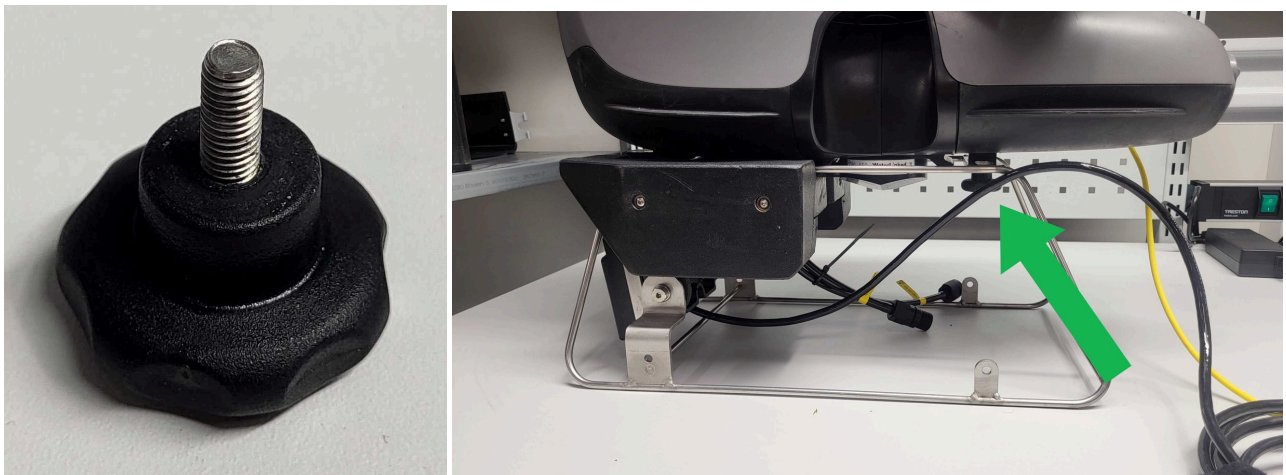
To avoid damaging the Sonar 3D-15, make sure the screws are not too long. In this example, 10 mm long screws with washers are suitable for the mounting setup.

3. Attach the mount to the Sonar 3D-15



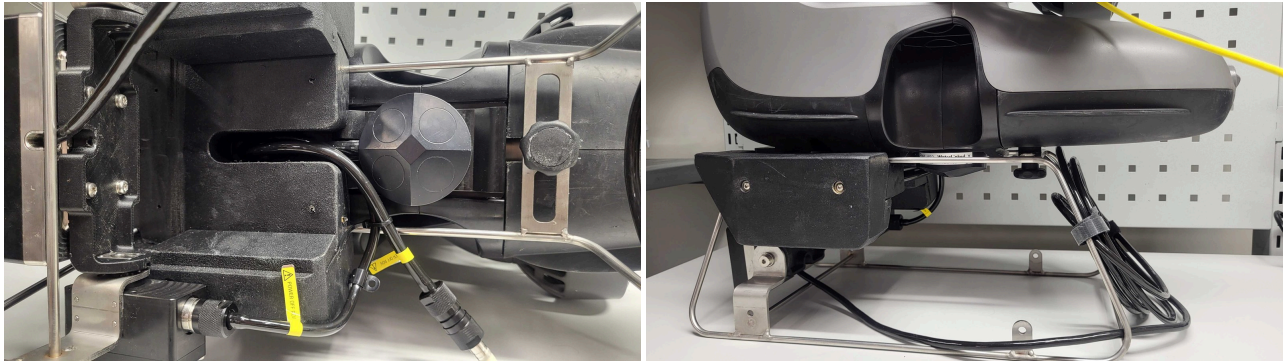
4. Attach the mount with the Sonar 3D-15 to the Blueye ROV

Use the star knob to attach and tighten the mount to the Blueye.



5. Connect the cables

Please make sure the cables are neatly attached, not blocking the view for either a Water Linked DVL or the Sonar 3D-15.



Warning

Make sure the Blueye ROV is turned off and without power before connecting the cables.

Note

Make sure the Sonar 3D-15 and cable are neatly and securely attached to the mount before use.

Connection steps

1. Turn on the Blueye ROV as normal

Please see Blueye's manual for standard startup procedure.

Warning

To avoid potential power hazard or errors, make sure every cable is well connected before you turn on the ROV. Do not connect sensors to the Blueye while the power is on.

2. Connect your PC/Mac/phone to the Blueye Wi-Fi

Most devices connected to the Blueye Wi-Fi—such as a PC, Mac, or smartphone—can display the Sonar 3D-15 GUI directly in their web browser.

To access the GUI, first go to the Wi-Fi settings of your selected device and connect to the Wi-Fi of the Blueye ROV with **SSID: "Blueye_XXXXXX"**. Use the default password **1234567890**.

Note

Accessing the sonar GUI in a browser on the same smartphone running the Blueye app will interrupt ROV control. To avoid this, use a separate device—preferably a computer—for a better user experience and larger screen view.

3. Identify the IP-address of the Sonar 3D-15

By standard, the local hostname of the Sonar 3D-15 is **waterlinked-sonar.lan** or **waterlinked-sonar.local**. Enter these in your web browser.

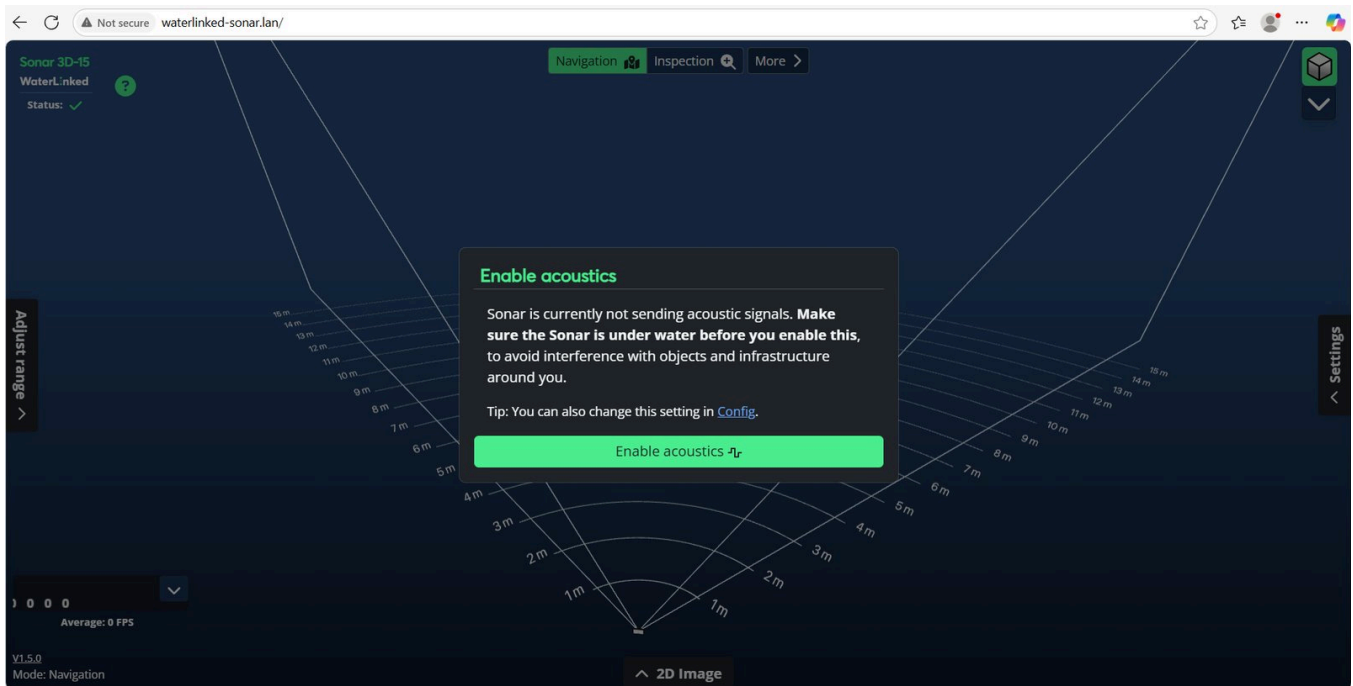
Warning

Don't operate the Sonar 3D-15 out of water for any long periods.

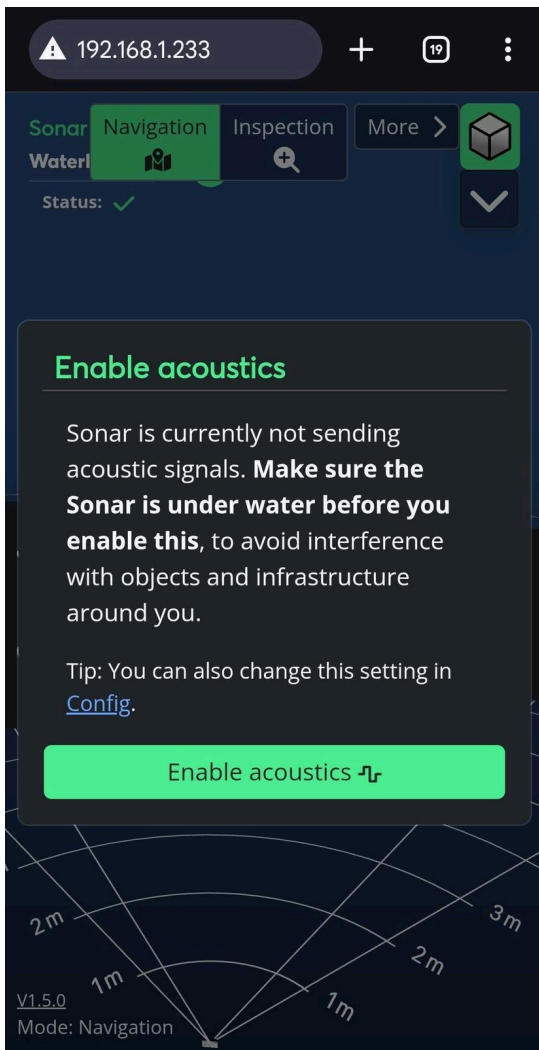
Don't click the green button "Enable Acoustics" until the ROV is submerged in water to avoid overheating of the Sonar 3D-15.

Acoustics are always disabled when first booting up the Sonar 3D-15, and will be turned on once clicking this button. The Sonar 3D-15 will automatically turn itself off if too hot, but will take some time to cool down, it's best to avoid this happening.

If working, the browser will display a page like the one below — in this example, the Sonar 3D-15 is using the local hostname `waterlinked-sonar.lan` on Google Chrome on a separate computer.



The following picture is an example of the Sonar 3D-15 GUI on a Android phone using the IP-address `192.168.1.233`.



Note

The Blueye might take a minute to boot up all the devices properly. If these local hostnames don't work immediately, it might be that the ROV just hasn't fully initialized them yet.

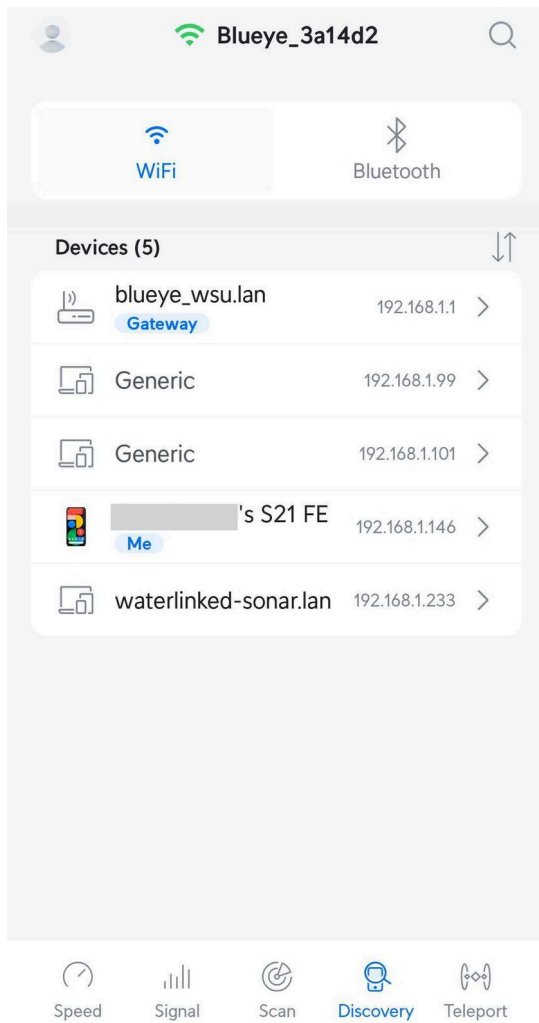
If these local hostnames don't show the GUI in your browser, the Blueye system has assigned the Sonar 3D-15 a different IP-address, and you need to determine which IP address has been assigned to the Sonar 3D-15.

To do this, we recommend downloading an app on your phone to find all IP-addresses on the Blueye Wi-Fi. WiFiman by Ubiquiti is a good and free option, it can be downloaded from [Google Play](#) or [App Store](#).

Note

There are many options of apps and programs that can find all IP-addresses on the network. Fing is another app that works, or you can also perform an IP scan on a computer.

Once installed and inside the WiFiman app, go to **Discovery** and scan the network. A list of all connected devices on the network will show, similar to the following:



Find the IP-address corresponding to the Water Linked Sonar 3D-15. In the picture, this is the **192.168.1.233**. Enter this IP-address into your browser to see the Sonar 3D-15 GUI.

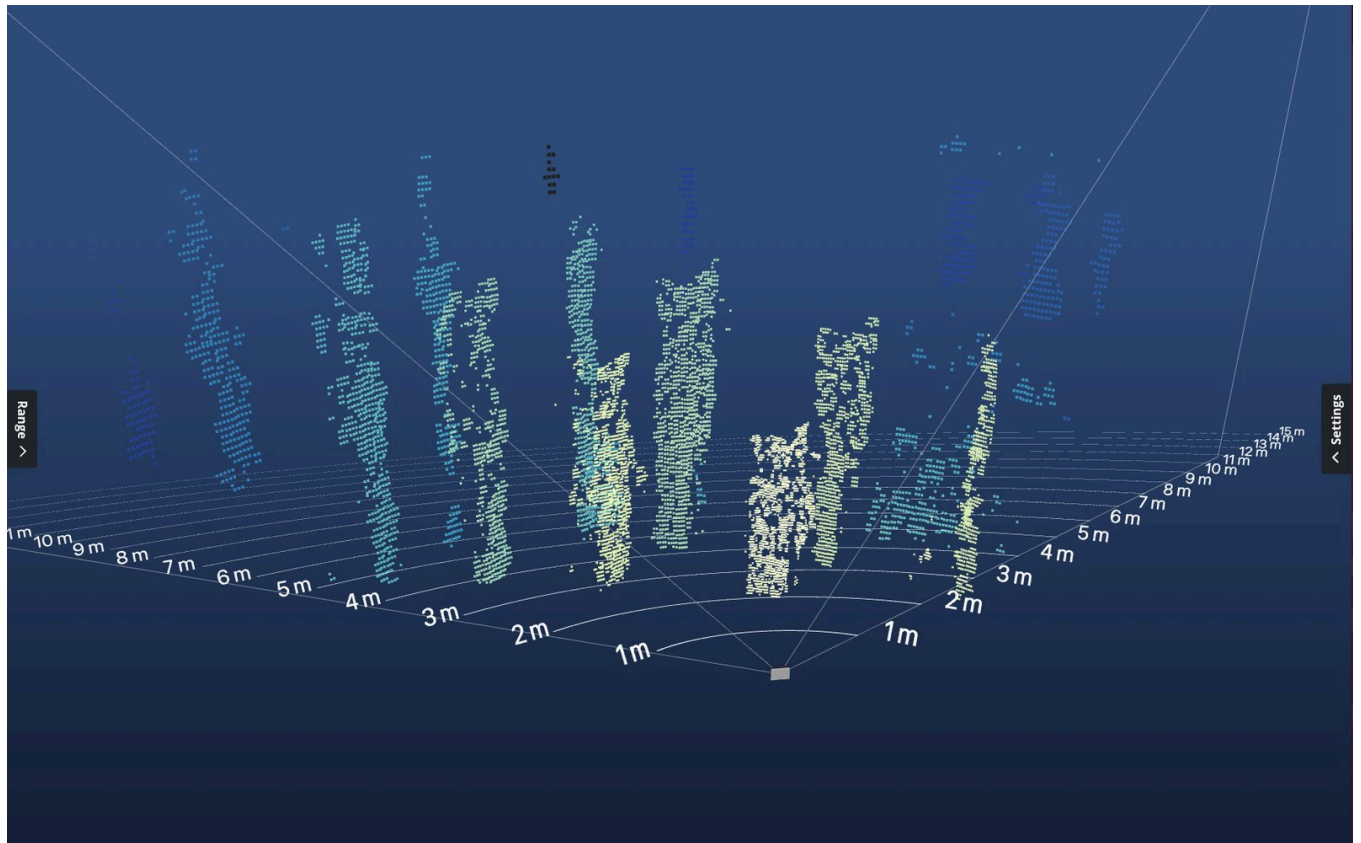
5. Put the drone in the water

You are now ready to put the ROV in the water.



6. Enable acoustics

When ready, click the "Start acoustics" button to initiate the Sonar 3D-15. It will display a point cloud in the GUI representing the 3D space in front of the Sonar 3D-15.



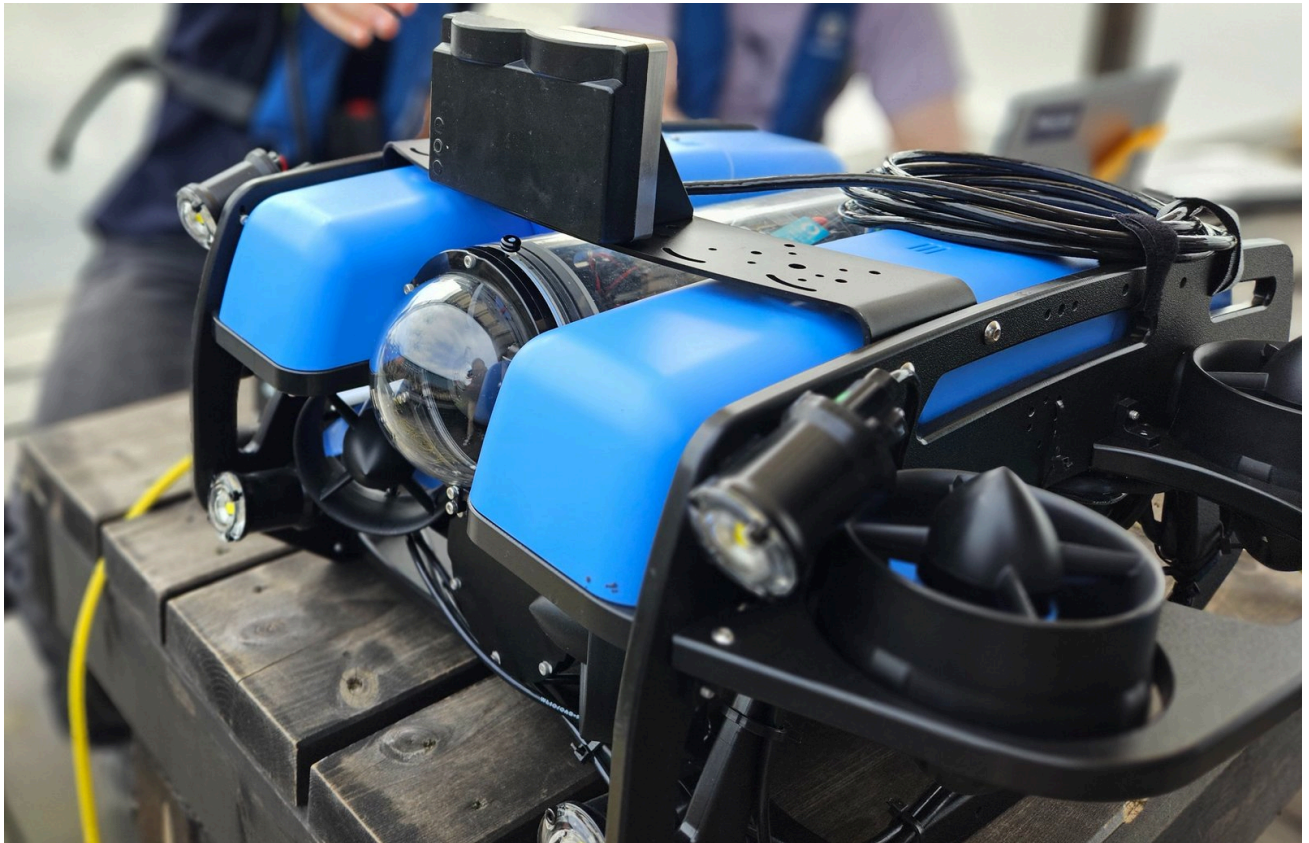
You are now ready to use the Water Linked Sonar 3D-15 with the Blueye ROV!

Integrating onto BlueROV2

Introduction

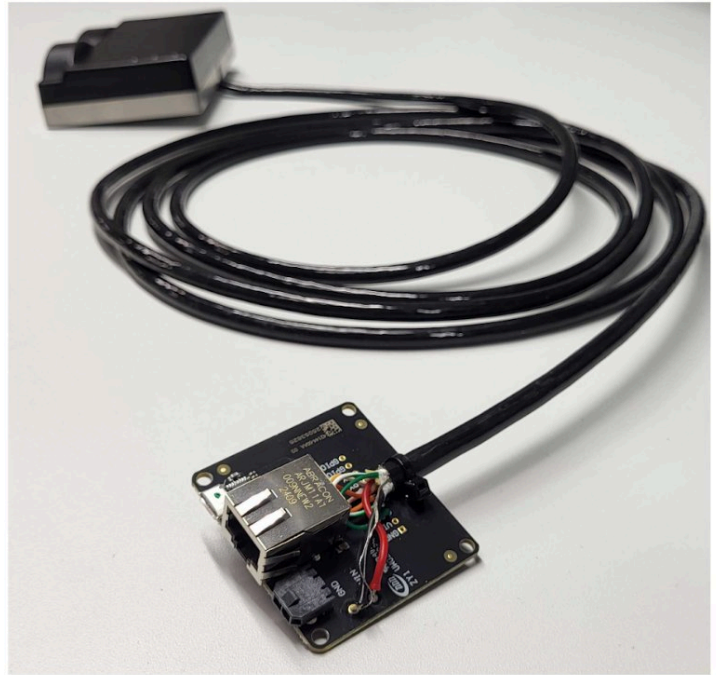
This is a manual on how to install the Water Linked Sonar 3D-15 for the BlueROV2. Documentation and information about the BlueROV2 can be found at:

- [BlueRobotics Help Center](#)
- [BlueRobotics Contact Us](#)
- [BlueRobotics Technical Reference](#)



What's in the box

The Sonar 3D-15 from Water Linked is normally shipped with an attached I/O Interface board.



Prerequisites

Before starting the integration, ensure you have all the necessary tools and parts ready.

Tools Required

- Soldering iron and solder
- Wire strippers / cutters
- Heat gun or lighter (for heat shrink)
- Small flathead screwdriver
- Hex key set (for opening ROV and mounting)

Parts Required

- **BlueROV2 Roof Rack:** To mount the sonar.
- **Sonar Mount:** Custom mount for Sonar 3D-15.
 - *Download the example [3D step file](#)*
- **Mounting Screws:**
 - 4x M4 screws (length depends on mount thickness) for Sonar-to-Mount.
 - 4x M4 screws + nuts + washers for Mount-to-ROV.
- **Connectors:**
 - 2x Spade connectors (or ring terminals) for power.
 - 1x JST 4-pin connector (GH type usually used with BlueROV2 devices, verify pitch).
- **WetLink Penetrator 6.5mm (Low Compression):** For passing cable into the enclosure.

- **Ethernet Switch:**
 - Must be installed in the BlueROV2. See [Ethernet Switch Installation Guide](#).
-

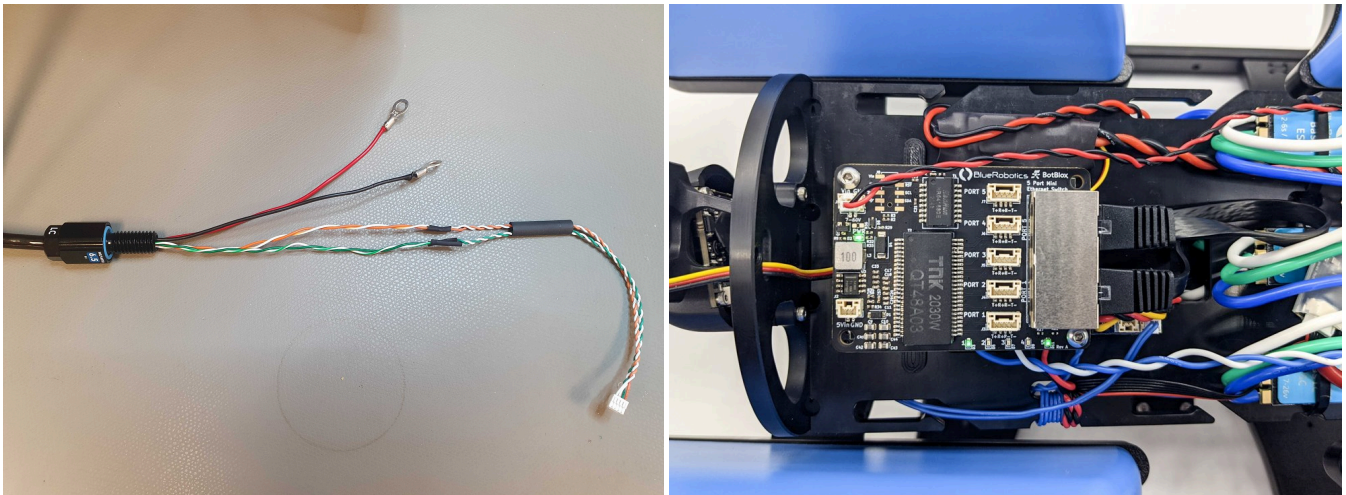
1. Prepare the Connectors

Testing the Sonar 3D-15 Separately

If the I/O Interface board is attached, the Sonar 3D-15 can be tested directly using an Ethernet cable and a power supply. If you wish to test the device on its own before integration, follow the general Quickstart tutorial, available here: [Quickstart](#).

Connecting to the BlueROV2

To connect the Sonar 3D-15 to the BlueROV2, you have to attach connectors to each of the wires from the Sonar 3D-15. You have to make the final cable assembly resemble the images below - with the cable towards the Sonar 3D-15 **on the left** and their JST connectors for the BlueROV2 **on the right**.



The installation procedure for the Sonar 3D-15 is very similar to the Water Linked DVL installation, which BlueRobotics has an excellent guide for. We recommend reviewing this guide before proceeding. It can be found here:

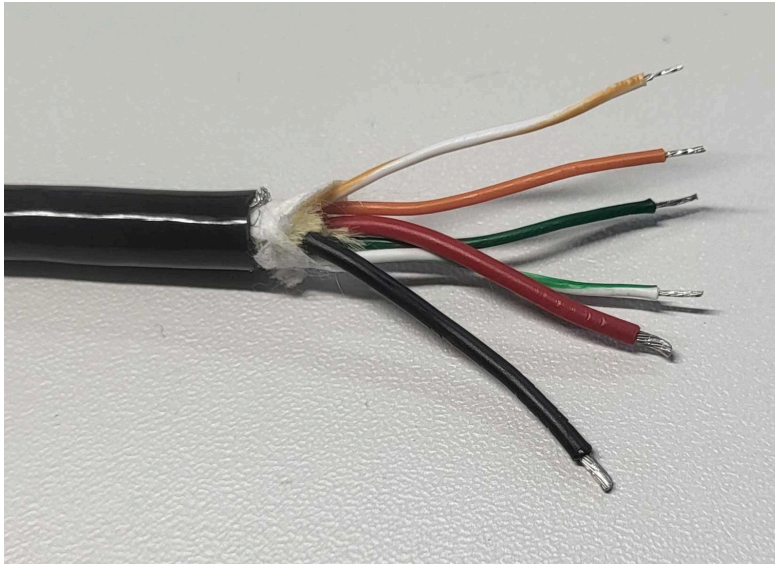
[DVL Installation Guide for BlueROV2](#)

For the remainder of this Sonar 3D-15 guide, we assume you are familiar with the BlueROV2 and its installation procedures.

To install the Sonar 3D-15 for the BlueROV2, perform the following procedure:

1. **Remove the I/O board.** Measure out the required length outside the ROV. Then cut the Sonar cable to that length plus approximately 30cm for inside the ROV.

After this step, the I/O board is no longer needed for normal operation. The cables from the Sonar 3D-15 are shown in the picture below.

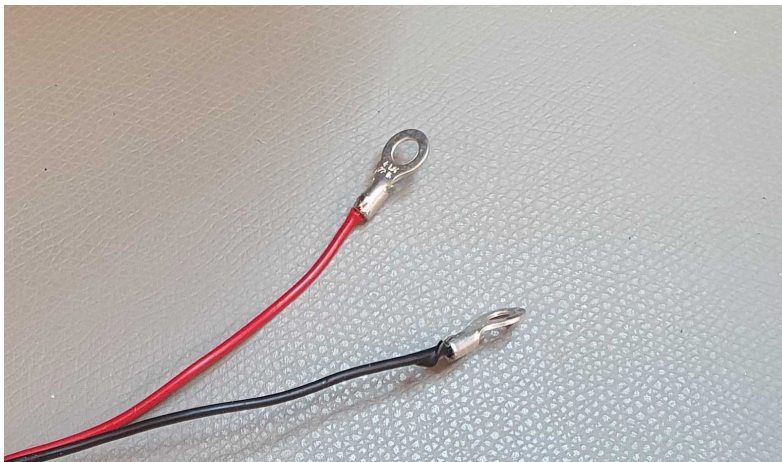
**Warning**

The Sonar 3D-15 cable is permanently attached and non-replaceable inside the Sonar 3D-15. If you cut the cable too short you will either have to splice the cable with another cable, or order a new Sonar 3D-15. **Measure twice, cut once!**

2. **Assemble a waterproof WetLink 6.5 LC Penetrator** according to the BlueRobotics guide. It can be found here: [WetLink Installation Guide from Blue Robotics](#)
3. **Identify the different cables** from the Sonar 3D-15. Make sure to correctly identify the different white signal cables. Differentiate between white/green (*RX+*) and white/orange (*TX+*).

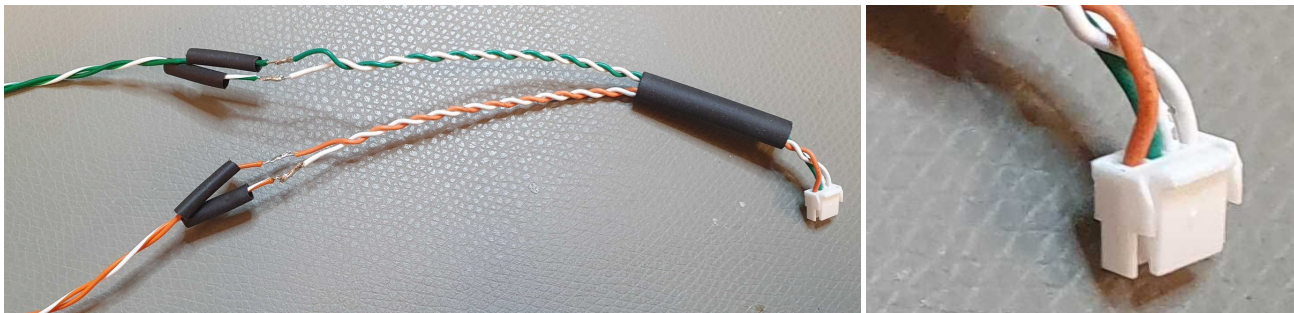
Sonar Cable Type	Sonar Cable Color
DC-	Black
DC+	Red
RX+	Green/White
RX-	Green
TX+	Orange/White
TX-	Orange

4. **Solder the spade connectors** onto the black and red power cables.

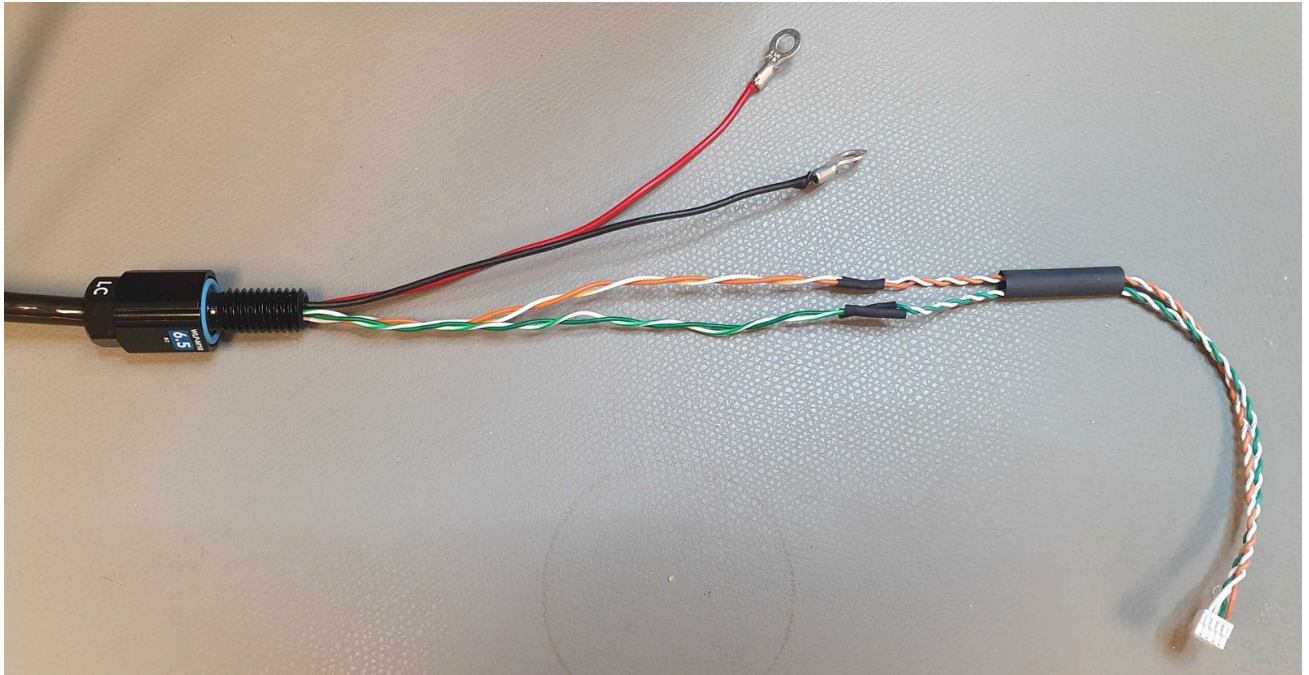


5. **Terminate a JST 4-pin connector** to the four remaining cables. The order is:

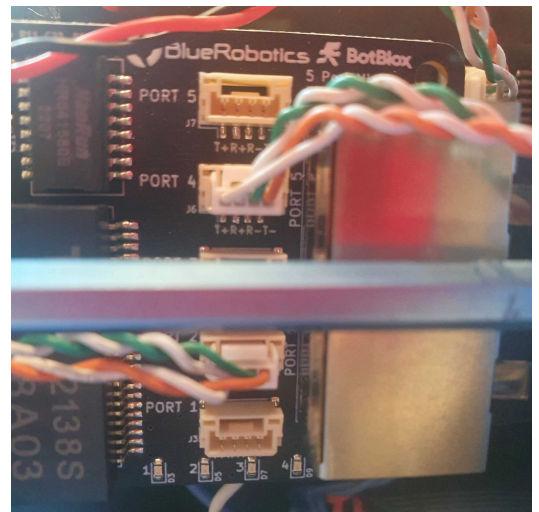
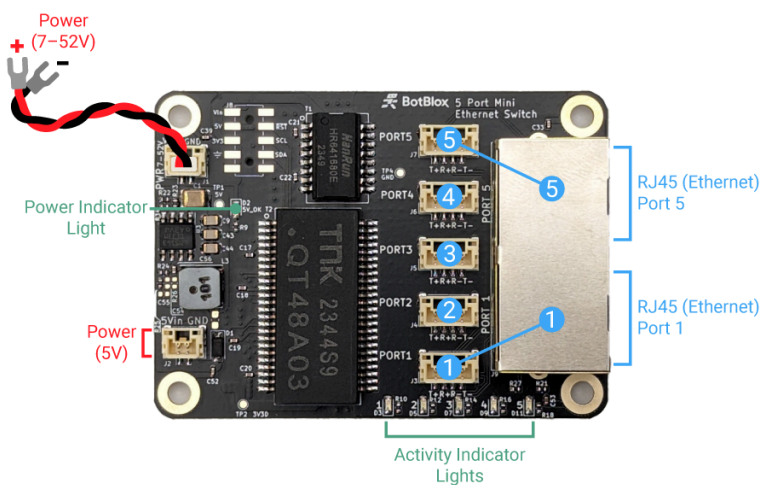
Pin Order	Wire Color	Sonar Cable Type
1	Green/White	RX+
2	Orange/White	TX+
3	Green	RX-
4	Orange	TX-



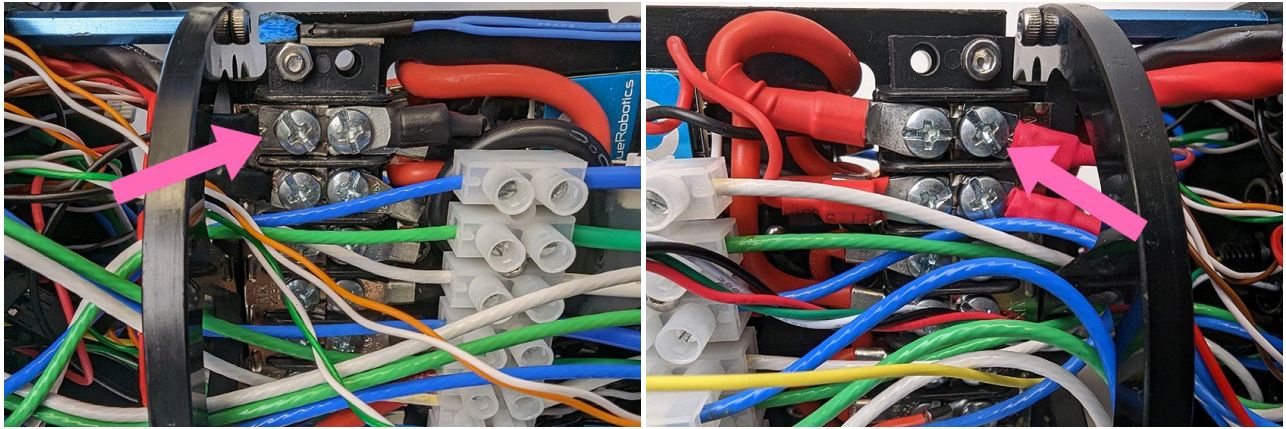
Make the cables from the Sonar 3D-15 look similar to the following:



6. **Install the WetLink Penetrator into the end cap** of the watertight enclosure. See the *Installing The Penetrator* chapter on Blue Robotics' DVL installation guide for proper penetrator installation: [DVL Installation Guide for BlueROV2](#).
7. **Connect the JST connector** to the Ethernet Switch board on the BlueROV2. Use port 2, 3, or 4 for the JST connector, as port 5 and 1 are occupied.



8. **Connect the power spade connectors** of the Sonar 3D-15 cables to the power terminal blocks on the BlueROV2. Connect the black power wire to an available space on the terminal block with the other black wires. Connect the red power wire to an available space on the terminal block with the other red wires.



9. **Seal and waterproof** the connection and BlueROV2 by closing end cap of the watertight enclosure properly.

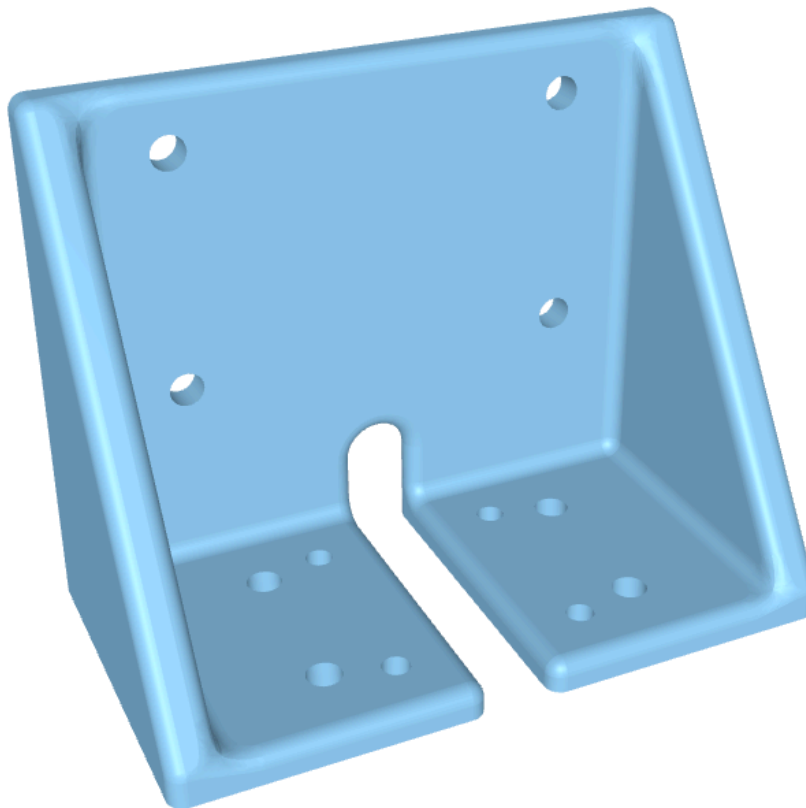
2. Mount the Sonar

Proper mounting is critical for accurate sonar performance.

Recommended Mounting Procedure

1. **Prepare the Mount** If you haven't already, print or machine the mount.

- [Download 3D step file](#)

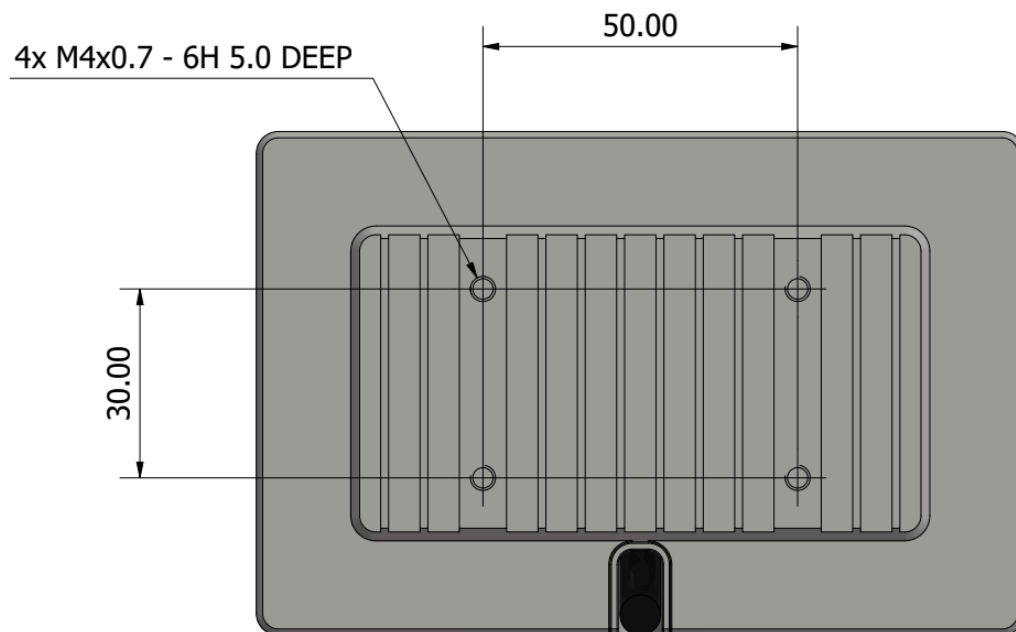


Note

Choose a material (like PETG or ABS) that can withstand the marine environment.

2. Attach Sonar to Mount Secure the Sonar 3D-15 to the mount using **4x M4 screws**.

- Length = 5.0mm + Mount Thickness (e.g., 8mm screws for a 3mm mount).



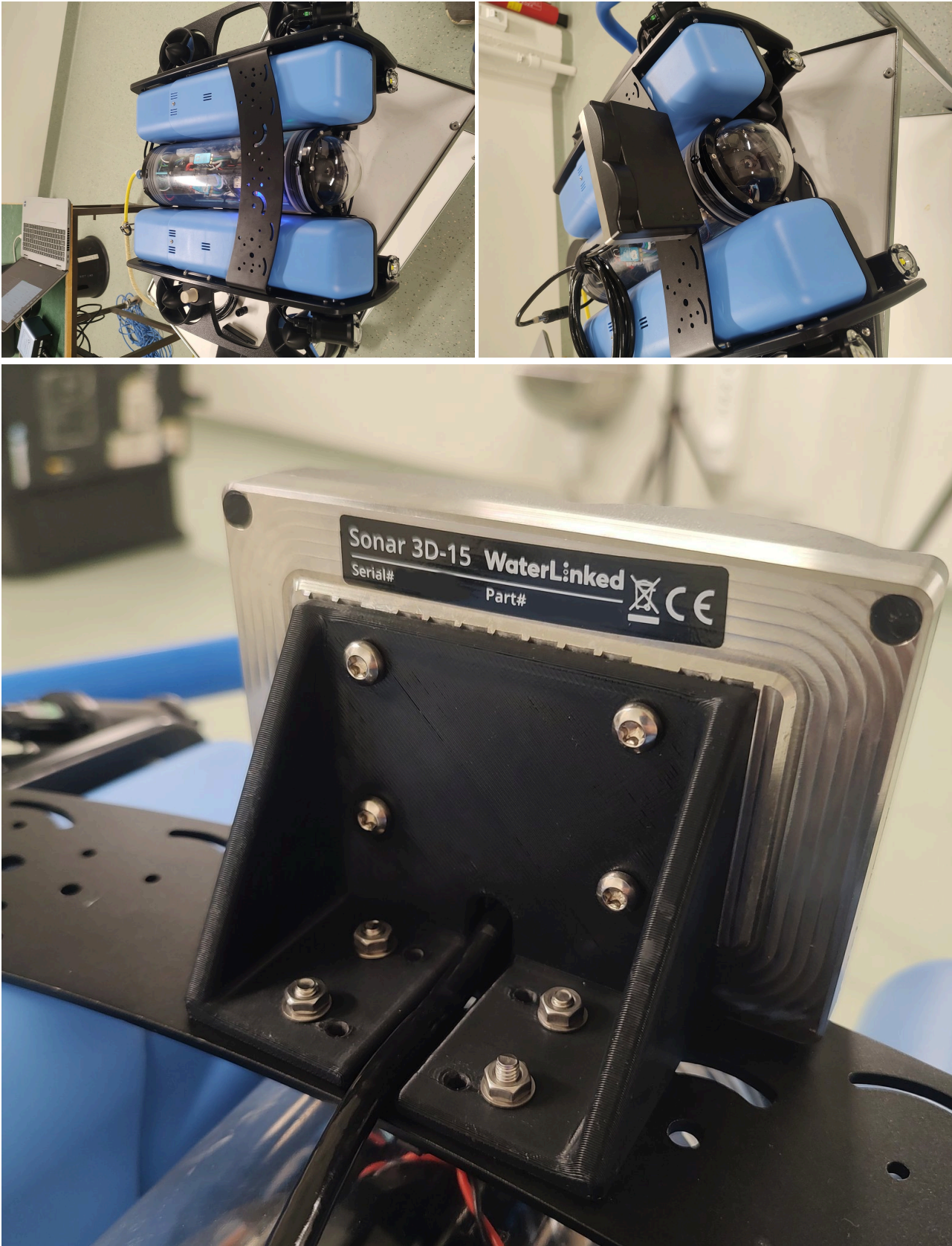
Warning

Do not use screws that are too long. They will penetrate the casing and permanently damage the sonar electronics.



3. **Attach Assembly to ROV** Mount the assembly to the **BlueROV2 Roof Rack**, preferably at the **front** to ensure a clear field of view.

- Use **4x M4 screws, nuts, and washers**.



3. Configure Software & Network

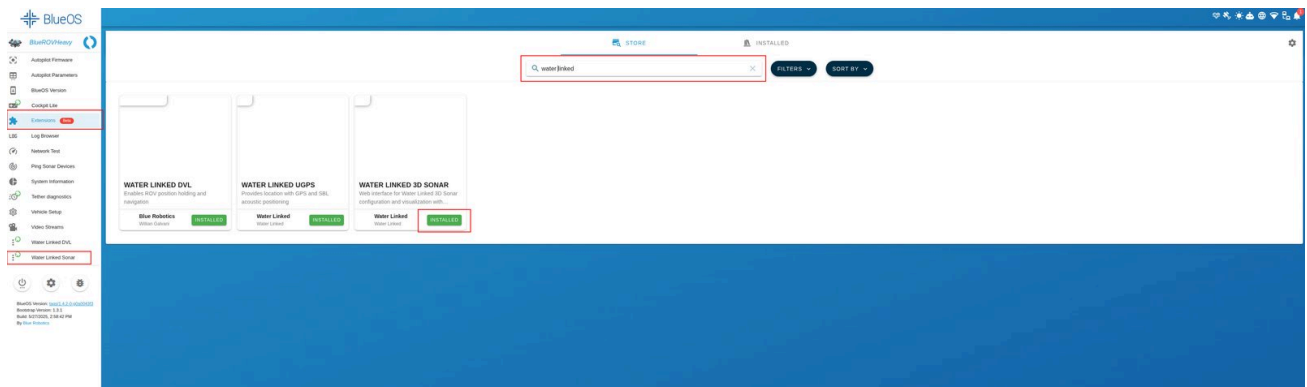
Step 1: Prepare the ROV

Power on the BlueROV2 and ensure it is connected to your computer. - Follow the [BlueROV2 Software Setup](#) if needed. - **Verify:** The Sonar 3D-15 should show a **green light**, indicating it is powered.

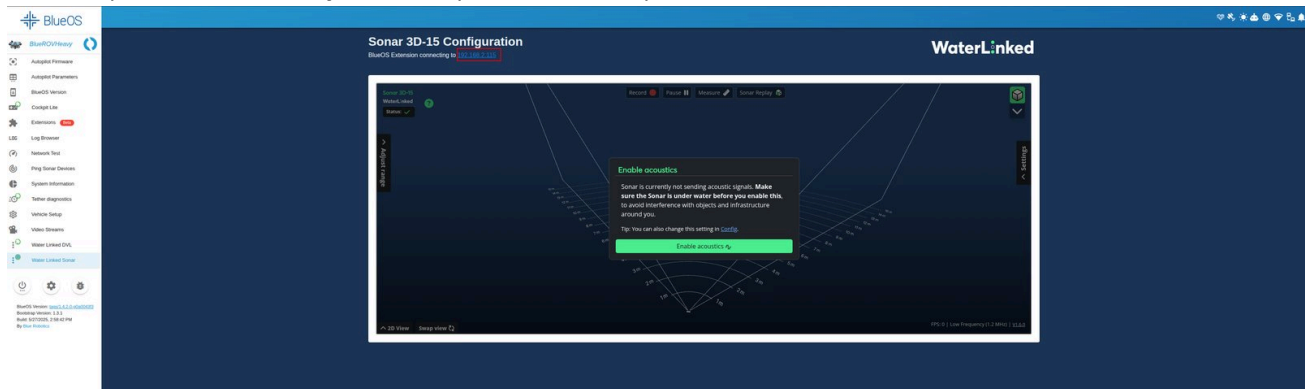
Step 2: Install BlueOS Extension (Recommended)

The easiest way to connect is using the **Sonar 3D-15 extension**.

1. Open the [BlueOS extension manager](#).
2. Search for and install **Sonar 3D-15 extension**.



3. Click the extension to open it. It will automatically detect the Sonar IP. Take note of the IP address displayed at the top of this screen as you will require this for Step 3 below



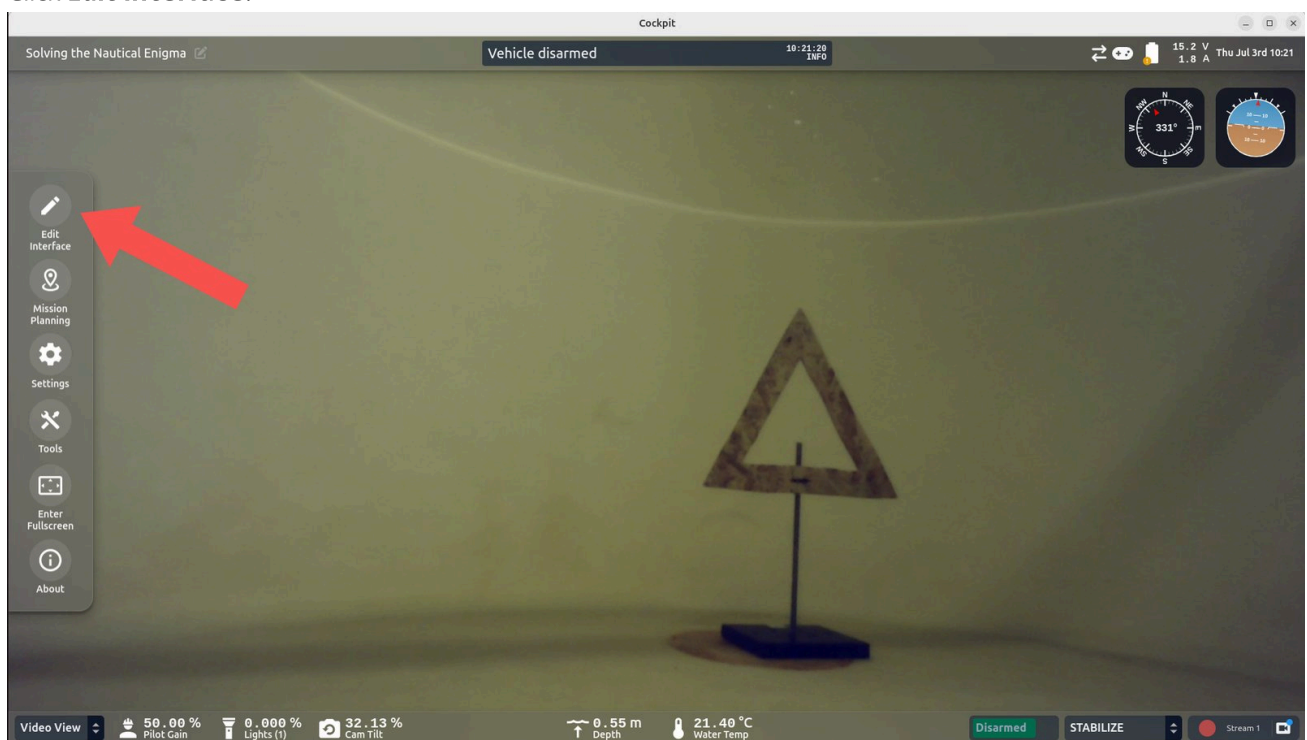
Step 3: Configure Cockpit

We recommend using **Cockpit** for the best experience.

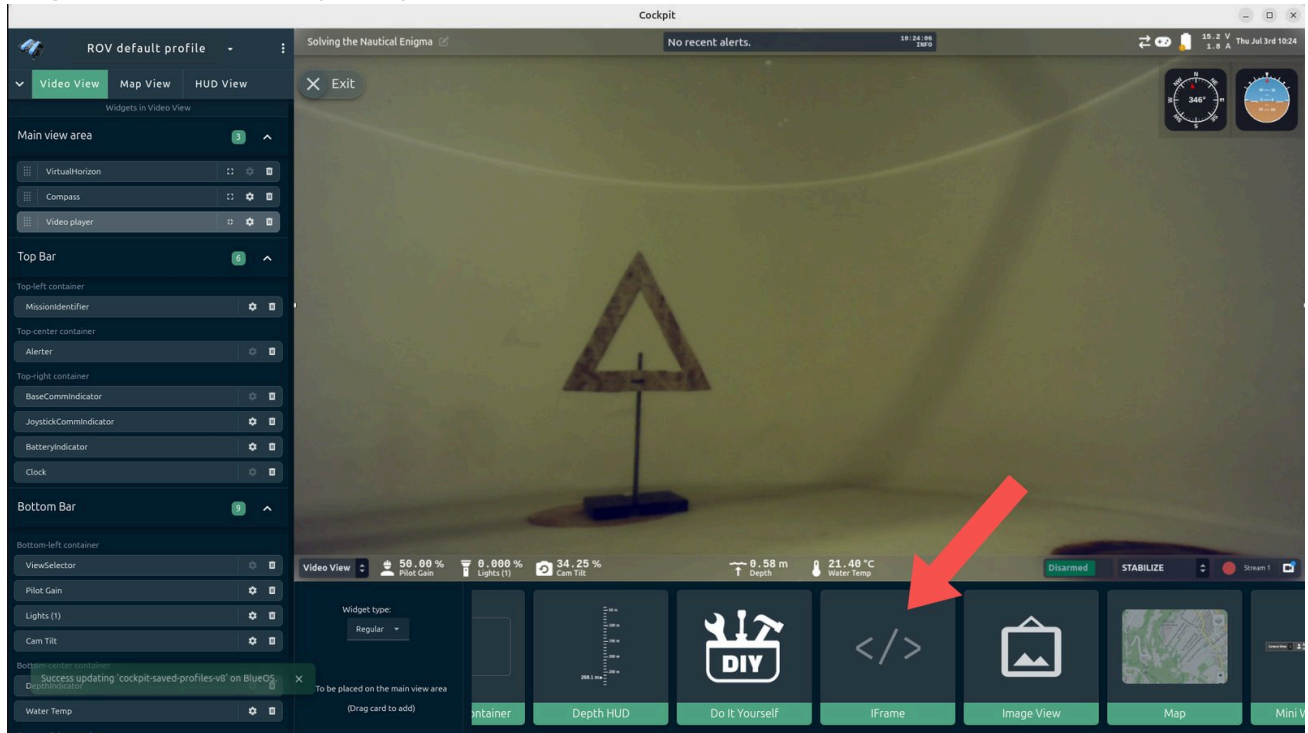
1. Open Cockpit and click the **collapse handle** on the left.



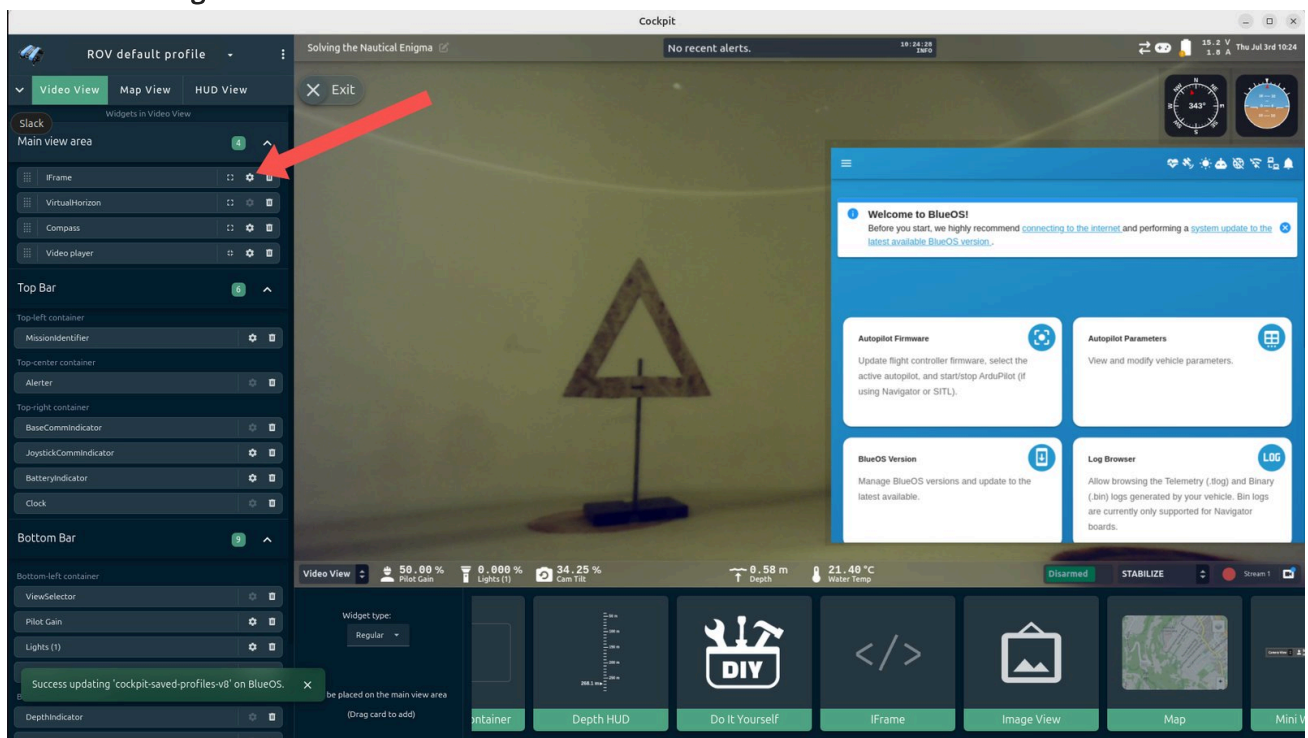
2. Click **Edit Interface**.



3. Drag an **IFrame** box onto your layout.



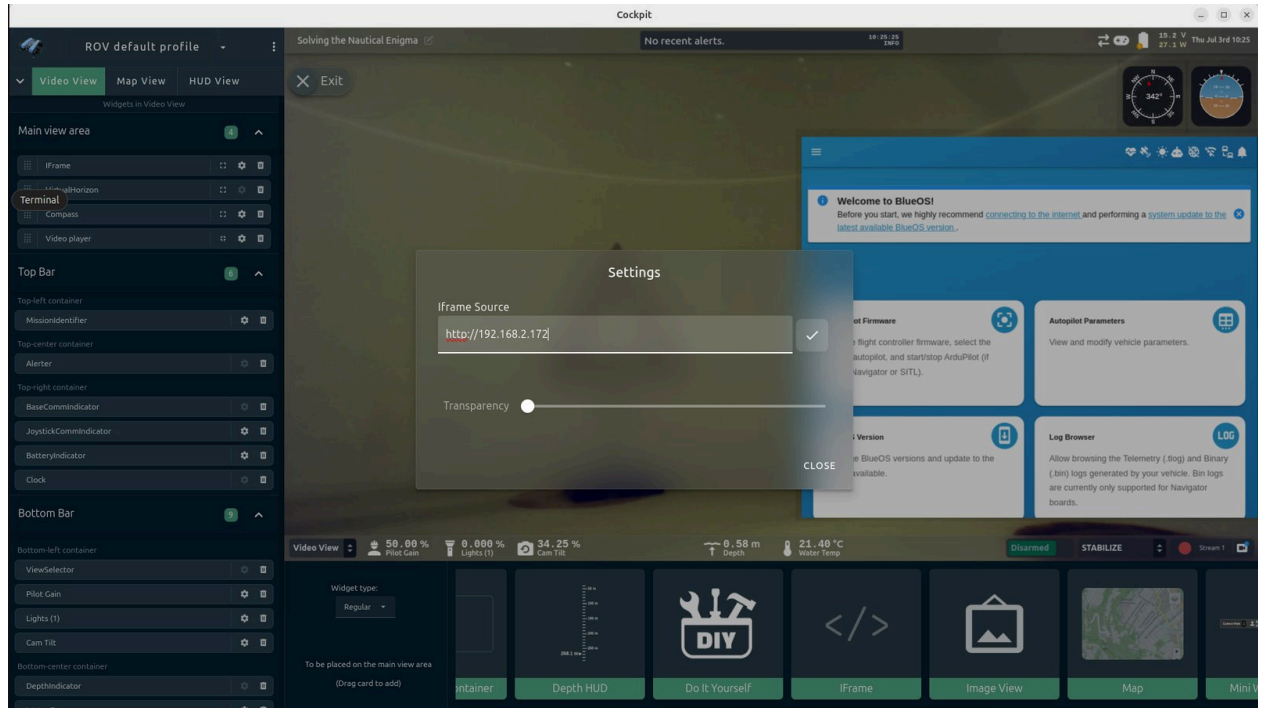
4. Click the **settings** icon for the IFrame.



5. Enter the Sonar IP Address:

- Use the IP address displayed in the Extension (Step 2), e.g., `http://192.168.2.172`.

- Press **Enter**.



Step 4: Deploy & Validate

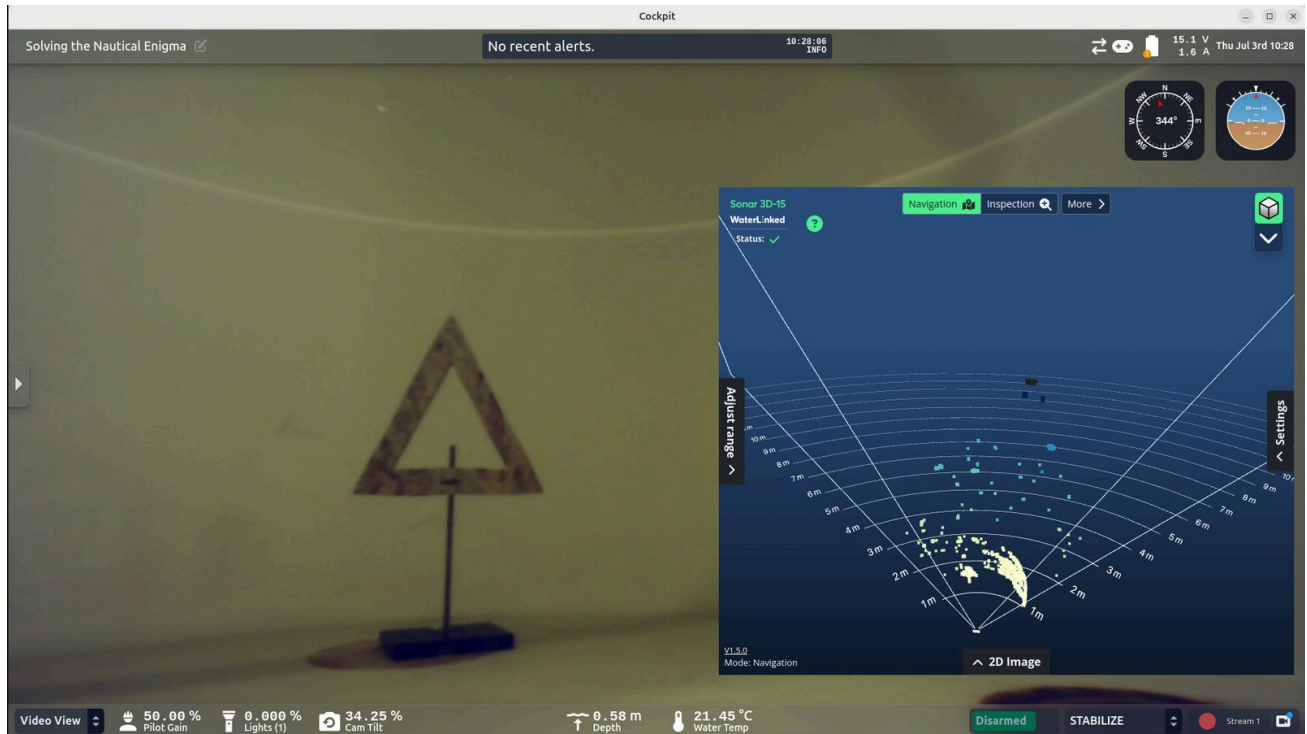
1. **Submerge:** Place the ROV in water.



2. **Enable Acoustics:** In the Sonar GUI (now visible in Cockpit), click the green "**Enable Acoustics**" button.

**Warning**

Never enable acoustics in air. Only enable when submerged to prevent overheating.



Success! You are now ready to use the Sonar 3D-15.

Troubleshooting & Advanced

**How to find the IP Address Manually**

If the extension does not work, you can find the IP manually.

1. **Identify your computer's IP** on the BlueROV network (`ip a` on Linux, `ipconfig` on Windows).
2. **Scan the network** using `nmap`: `sh`
`nmap -sn 192.168.2.*` (Adjust the subnet to match your BlueROV network)
3. **Try recognized IPs** in a browser until the Sonar GUI loads.
 - Common subnets: `192.168.2.x`
 - Fallback IP: `192.168.194.96` See [quickstart](#) for details.

Integrating onto Chasing M2 PRO MAX ROV

Introduction

This is a manual on how to install the Water Linked Sonar 3D-15 on the Chasing M2 PRO MAX. Other information from Chasing can be found at:

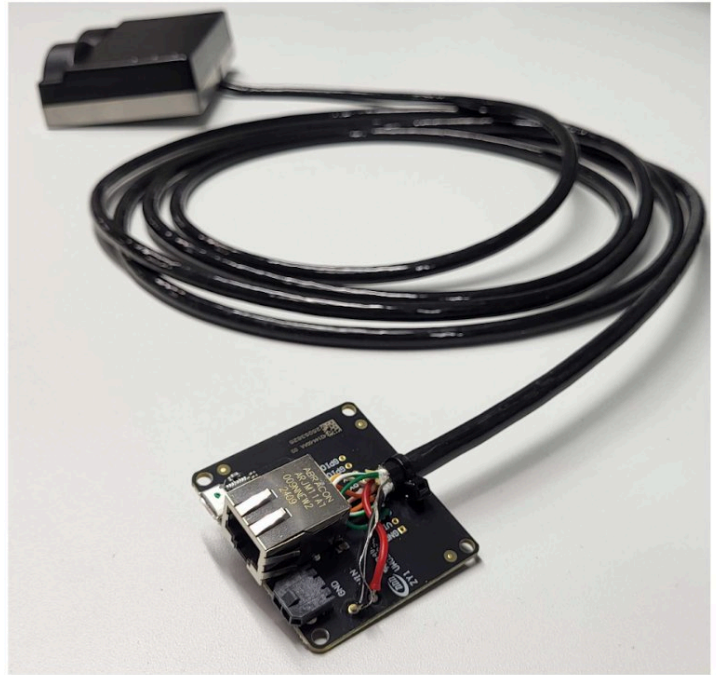
DO we need contact infor to chasing here?

- [Chasing M2 PRO MAX Manual](#)



What's in the box

The Sonar 3D-15 box from Water Linked comes normally with an attached I/O Interface board.



What You'll Need

To follow this guide, you will need the following:

- A phone or tablet with the CHASING GO1 app
 - Can be found at [Google Play](#) or [App Store](#)
- Chasing Connector
 - Contact Chasing - hi@chasing.com
- A mount (Sonar 3D-15 to ROV)
 - An example can be downloaded from here: [3D step file](#)
- Correct screws
 - See the [Mounting](#) section
- Buoyancy module
 - Contact Chasing - hi@chasing.com
- CHASING Quick Mounting Bracket
 - Contact Chasing - hi@chasing.com

Connector Setup

Testing the Sonar 3D-15 Separately

If the I/O Interface board is attached, the Sonar 3D-15 can be tested directly using an Ethernet cable and a power supply. If you wish to test the device on its own before integration, follow the general Quickstart tutorial, available here: [Quickstart](#).

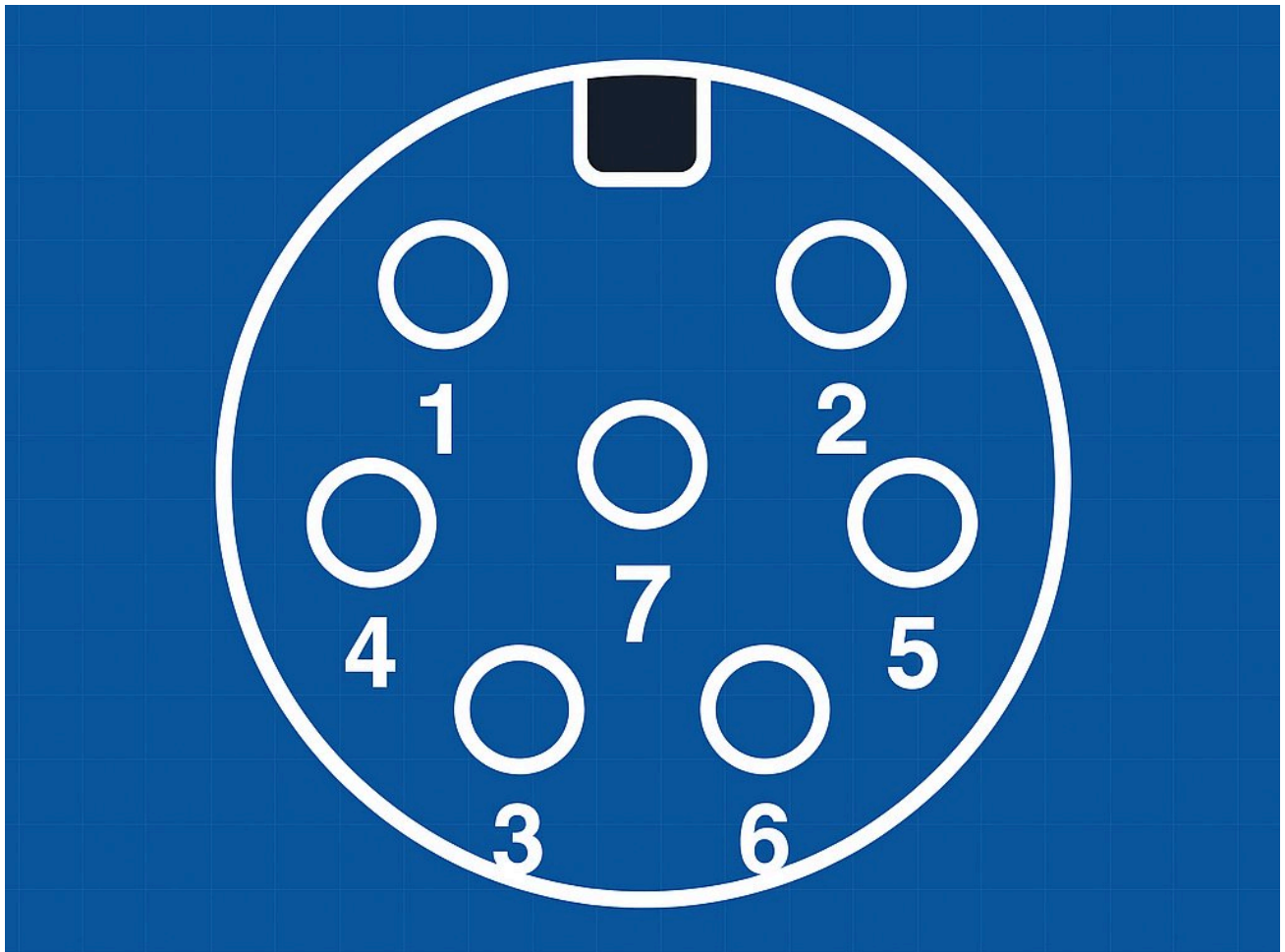
Connecting to Chasing ROV

The most common solution is to terminate a Chasing connector to the cable of the Sonar 3D-15. To do this, we recommend the following procedure:

1. **Remove the I/O board** After this step, the I/O board is no longer needed for normal operation.
2. **Terminate a Chasing connector** to the Sonar 3D-15 cable using the table below.

Sonar Cable Type	Sonar Cable Color	Chasing Cable Color	CHASING connector male
DC-	Black	Black	1
DC+	Red	Red	2
RX+	Green/White	White	6
RX-	Green	Brown	5
TX+	Orange/White	Green	4
TX-	Orange	Yellow	3
NC	NC	NC	7

The following is a picture of the pins for the male Chasing connector face:



3. **Add a waterproof seal** around the termination.

 Note

The termination has to be waterproof and needs to withstand the depths of which you will be running your ROV.

Mounting

The Sonar 3D-15 needs to be physically attached to the Chasing ROV. A possible option on how to do this will be listed here. There are many different approaches to achieve this, and this approach is only listed to provide an idea.

1. **Create or find a suitable mount**

An example 3D step file of a mount is found here: [Download 3D step file](#)



 Note

Choose a 3D print material that can withstand the expected operating conditions.

2. Identify the screws and mount to use

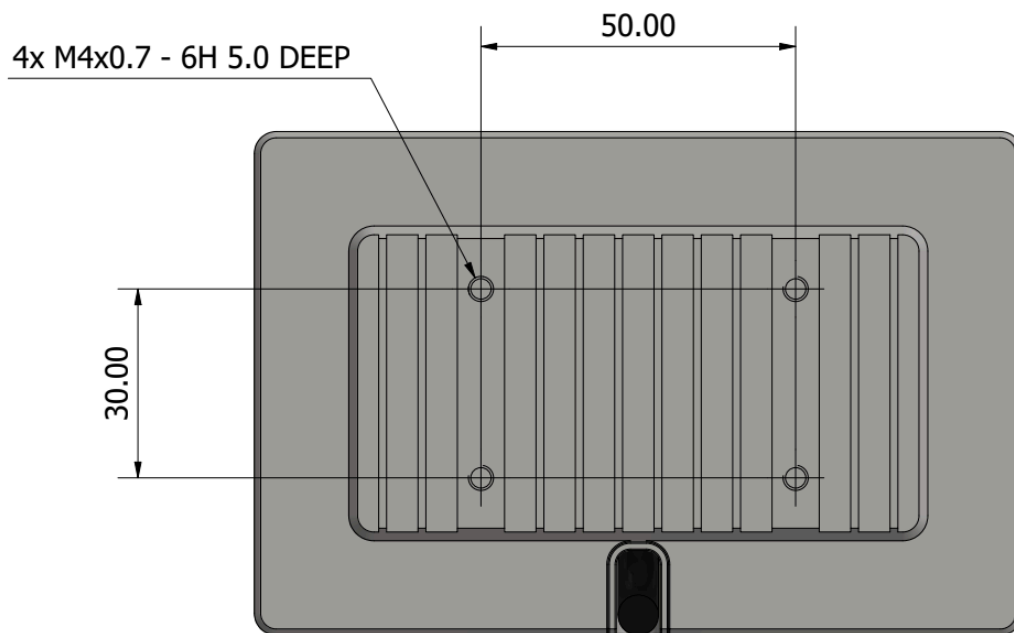
The four screw holes on the Sonar 3D-15 are sized [M4x0.7-6H 5.0 DEEP]. Choose a screw to fit this in addition to your chosen mount. Use a M4 Washer if necessary. For the Mounting Bracket plate, M3 screws is needed.

For the example mount (*as the given 3D print file*), the following screws and washers are sufficient:

- 4x M3x6.0mm ISO 14583 A4 screws
- 4x M4x12mm ISO 14583 A4 screws
- 4x M4 ISO 7089 A4 Washers

 Warning

To avoid damaging the Sonar 3D-15, make sure the screws are not too long.



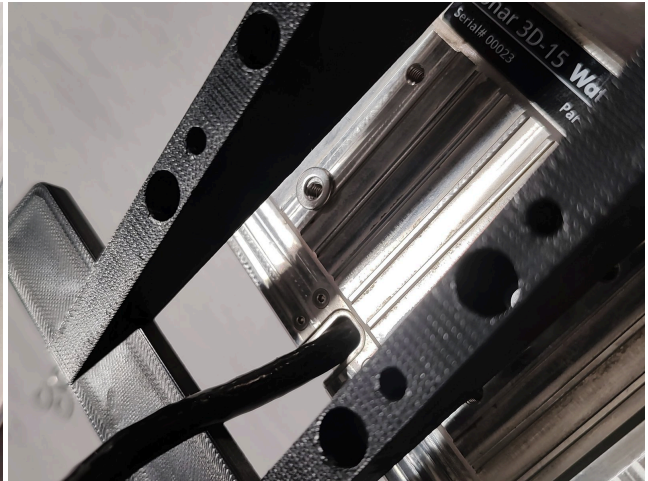
3. Attach the CHASING Quick Mounting Bracket plate to the Mount

Attach the CHASING Quick Mounting Bracket plate to the Mount like in the images below, using the M3 screws that was provided when purchased from Chasing.



4. Attach the mount to the Sonar 3D-15

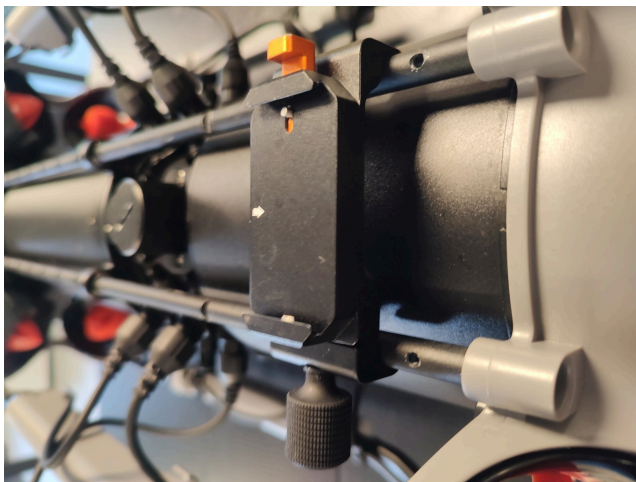
We recommend attaching the Sonar 3D-15 to the attachment rail underneath at the front of the Chasing, so that the Sonar 3D-15's field of view is not obstructed.

 **Tip**

Attach buoyancy module to the top attachment rail on the front to counteract the additional downward force caused by the Sonar 3D-15.

5. Attach the mounted Sonar 3D-15 to the Chasing ROV

Use the CHASING Mounting Bracket to attach the mounted Sonar 3D-15 to the ROV.

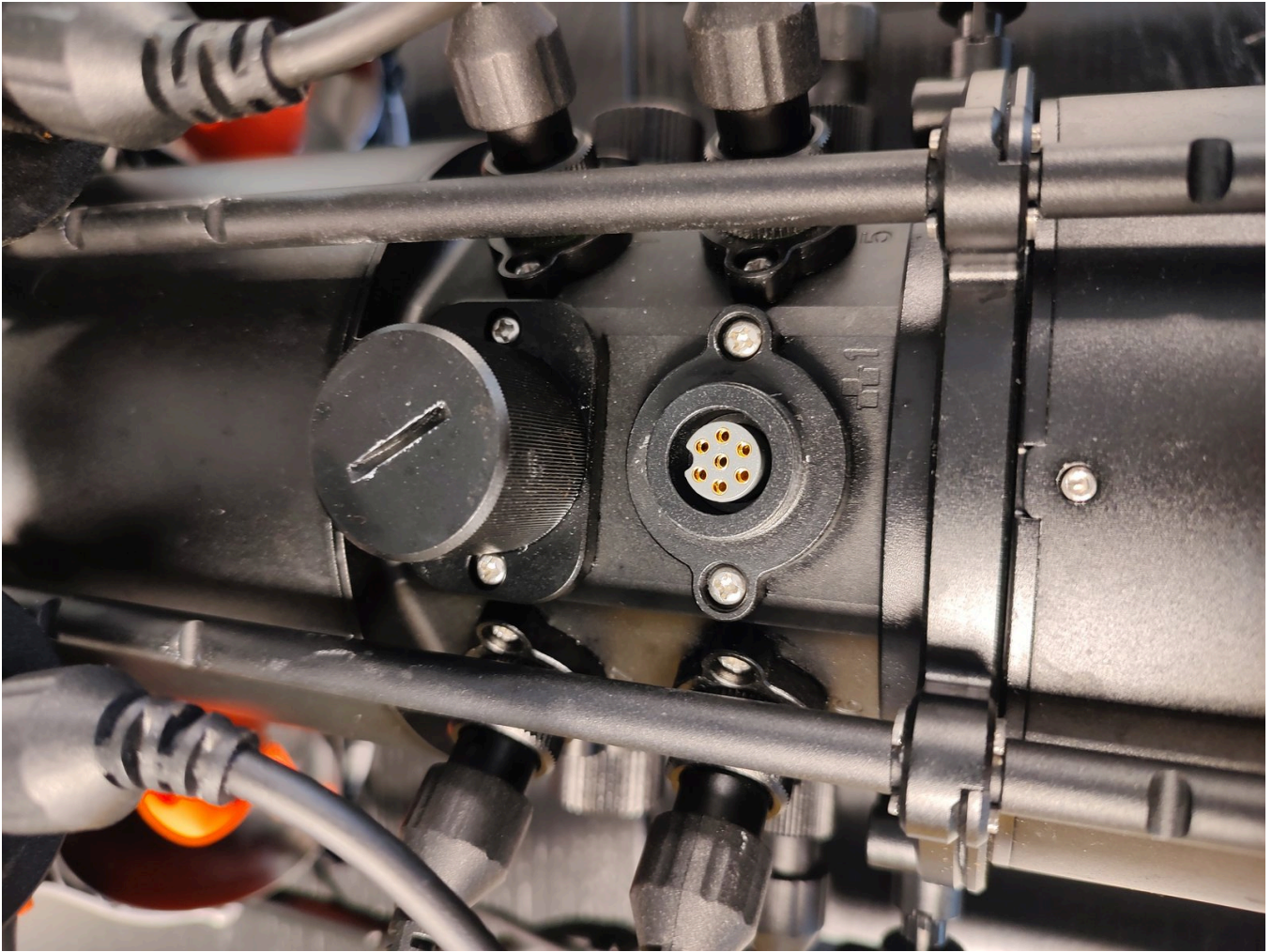
 **Note**

Make sure the Sonar 3D-15 and cable is neatly and securely attached before use.

Connection steps

1. Connect the cable

Connect the Sonar 3D-15 cable into one of the free ethernet ports on the Chasing.



2. Turn on the ROV

Use the power switch on the Chasing controller and let the ROV boot up. This activates the Chasing Wi-Fi network.

Warning

To avoid potential power hazard or errors, make sure every cable is well connected before you turn on the controller. Do not connect sensors to the Chasing while the power is on.



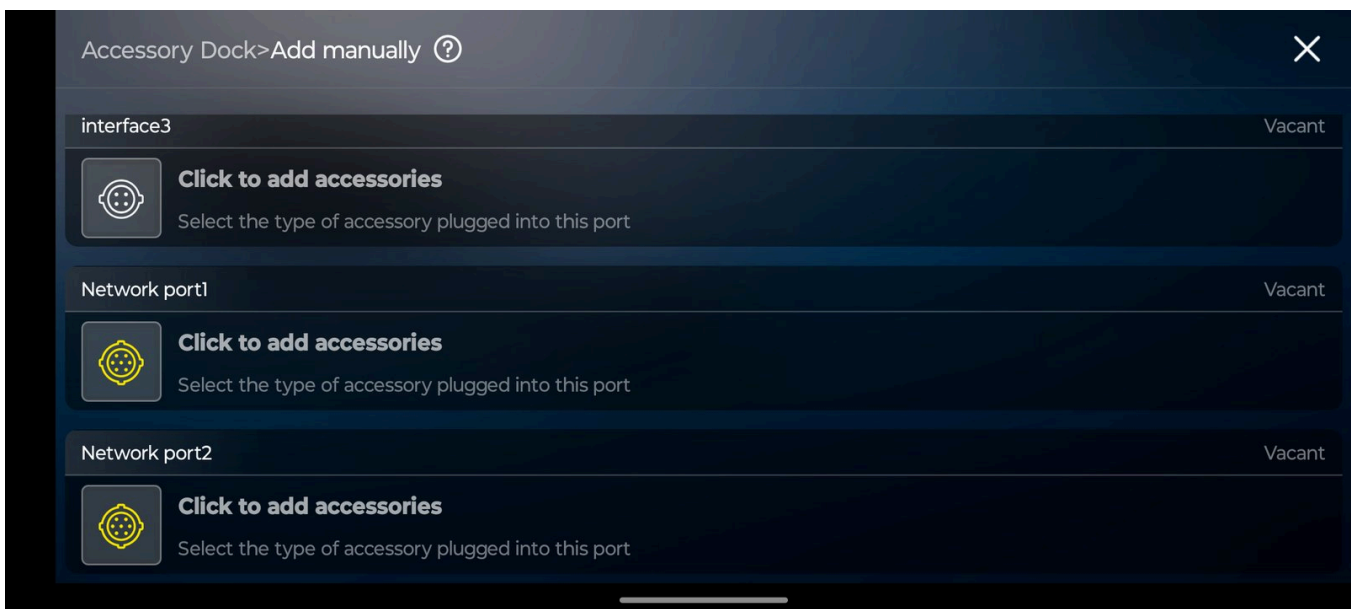
3. Add the Sonar 3D-15 device

Connect your phone to the Chasing Wi-Fi network from the Wi-Fi settings on your phone. Go into the CHASING GO1 app to activate the ROV. Your device will likely prompt you to confirm the connection since the Wi-Fi has no internet access. You must accept this to proceed.

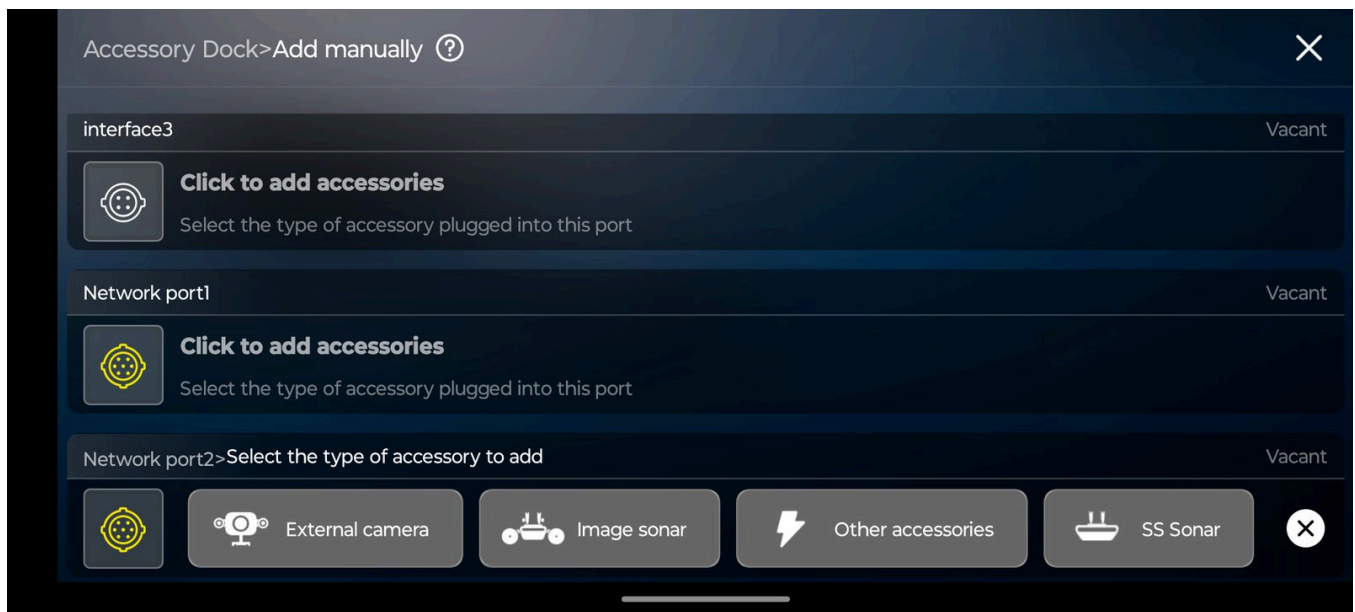
Enter CHASING GO1 and click on the puzzle piece in the bottom right. Here we will add the Sonar 3D-15 as an external device.



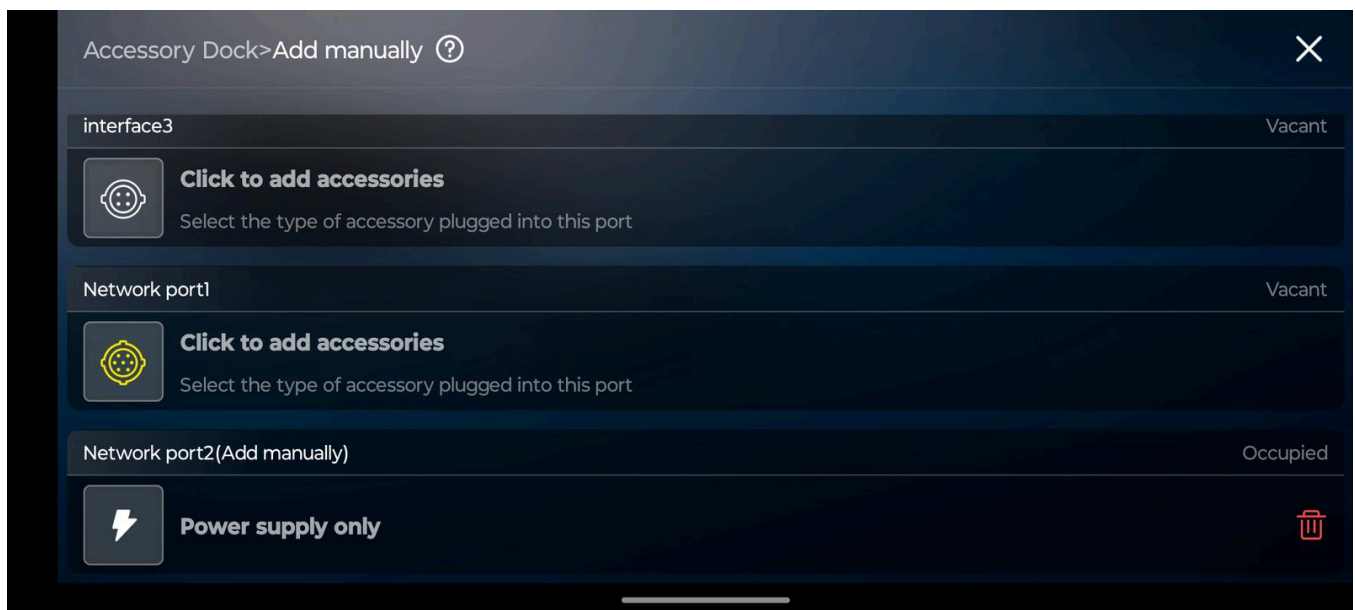
Select "**Click to Add Accessories**" on the Network port the Sonar 3D-15 is connected to.



Click "**Other accessories**".



Now the Sonar 3D-15 will be powered and assigned an IP-address by the Chasing ROV.



Note

If the green light at the front of the Sonar 3D-15 is on, the Sonar 3D-15 is receiving power.

4. Access the Sonar 3D-15 GUI

The Sonar 3D-15 GUI is accessed by entering the Sonar 3D-15's IP-address into the browser running on any device connected to the Chasing Wi-Fi.

Note

We recommend operating the Sonar 3D-15 GUI on a separate device so that you can view the sonar while continuing to operate the ROV as usual on the main ROV controller display; typically your smartphone.

Both the device and Chasing need to have DHCP enabled. This is standard for most computers and phones and is normally enabled. To check if your computer has DHCP enabled, do the following:

Checking DHCP

--> Windows - Option 1:

1. Open **Settings > Network & Internet**.
2. Click on **Ethernet**
3. Select your active connection.
4. Scroll to IP settings:
 - If it says **Automatic (DHCP)** → it's enabled.
 - If it says **Manual** → DHCP is off.

--> Windows - Option 2:

1. Run the following command in the Windows terminal

```
ipconfig /all
```

2. Look for the section **Ethernet adapter Ethernet** and the line **DHCP Enabled** (green arrow)
3. If **DHCP Enabled** is set to **Yes**, then DHCP is enabled.

```
PS C:\Users\[redacted] > ipconfig /all

Windows IP Configuration

Host Name . . . . . : [redacted]
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : localdomain


Ethernet adapter Ethernet:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . : localdomain
Description . . . . . : Intel(R) Ethernet Connection (16) I219-LM
Physical Address. . . . . : [redacted]
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
```

--> Linux:

1. Run the following in the terminal:

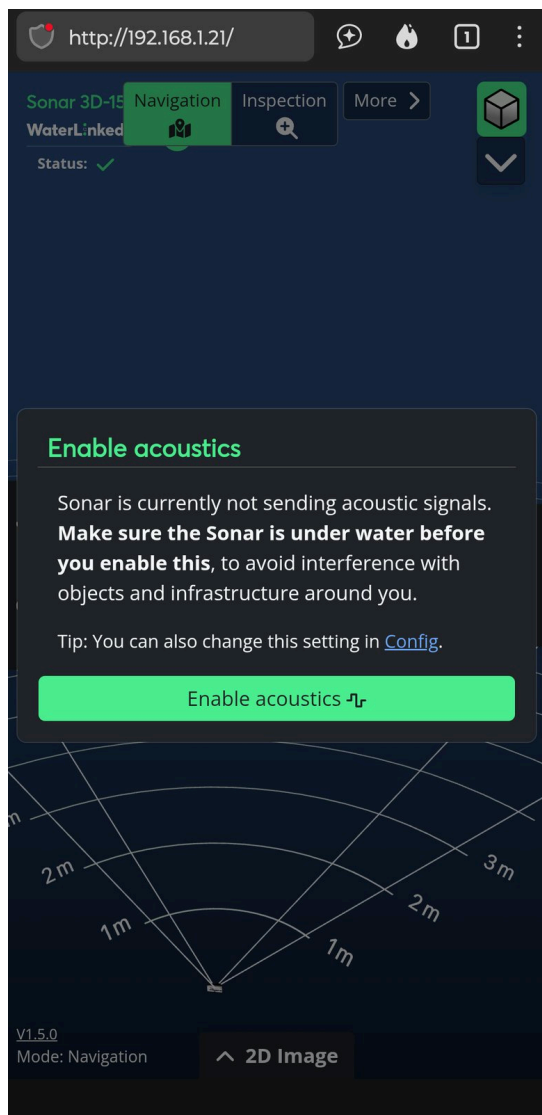
```
for iface in $(ip -o link show | awk -F': ' '{print $2}'); do
    echo "Interface: $iface"
    ip addr show "$iface" | grep -q dynamic && echo " --> DHCP detected" || echo " -->
Static or unknown"
done
```

If you see --> **DHCP detected**, your PC has DHCP enabled and you are ready to continue.

If DHCP is disabled, please enable this on your computer.

Determining the IP-address

Once you have assured that your device is using DHCP, you need to determine which IP-address has been automatically assigned to the Sonar 3D-15 by the Chasing system. Once located, entering it in your browser displays a page like the one below — in this example, the Sonar 3D-15 is assigned the IP-address `192.168.1.21`.



Warning

To avoid overheating, **do not click the green button “Enable Acoustics”** until the ROV is submerged in water.

Acoustics is always disabled when first booting up the Sonar 3D-15, and will be turned on once this button is clicked. The Sonar 3D-15 will automatically turn itself off if too hot, but will take some time to cool down, it's best to avoid this happening.

Find the IP-address corresponding to the Sonar 3D-15 on a computer by doing the following:

1. Get an overview of the network

--> On a computer

You need the network IP-address of your computer on the Chasing network. On **Linux** you find it by typing in:

```
ip a
```

in the terminal.

On **Windows** you find it by typing in:

```
ipconfig
```

Tip

It's easier to find your IP-address if your computer is connected only to the Chasing network.

A quick easy way to see the IP-addresses of the devices on your local network is to use [nmap](#). Install it for your operating system and go to the terminal and write

```
nmap -sn <YOUR_IP>
```

This will scan the Chasing Wi-Fi and show all accessible connected devices and their IPs.

```
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-06-23 15:30 CEST
Nmap scan report for 192.168.1.1
Host is up (0.012s latency).
Nmap scan report for 192.168.1.20
Host is up (0.013s latency).
Nmap scan report for 192.168.1.21
Host is up (0.016s latency).
Nmap scan report for WL7YLCLL3 (192.168.1.22)
Host is up (0.00027s latency).
Nmap scan report for 192.168.1.88
Host is up (0.030s latency).
Nmap scan report for 192.168.1.101
Host is up (0.022s latency).
Nmap done: 256 IP addresses (6 hosts up) scanned in 2.21 seconds
```

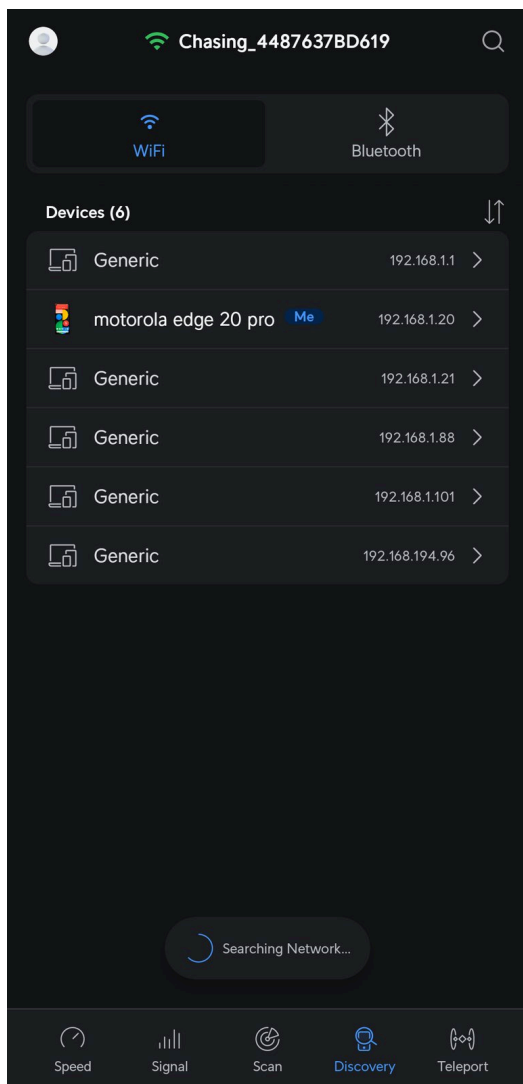
--> On a smartphone

WiFiman by Ubiquiti is a good and free option to perform an IP-scan and find all accessible IP-addresses on the network. It can be downloaded from [Google Play](#) or [Apple Store](#).

Note

There are many options of apps and programs that can perform a IP-scan of the network. Fing is another app that works well.

Once installed and inside the WiFiman app, go to **Discovery** and scan the network. A list of all connected devices on the network will show, similar to the following:



2. Test and find the IP-address

To find the IP-address of the Sonar 3D-15, try the IP-addresses on the list by typing them into the search bar of your browser.

- For example, if you have the list above, try `192.168.1.1` , `192.168.1.20` , `192.168.1.21` and so on. You may try them all safely.

If the Sonar 3D-15 GUI appears, you have found the correct IP-address.

Tip

It is possible to access the GUI on the Sonar 3D-15's fallback address `192.168.194.96` . This method is explained in more detail on the general quickstart guide, which can be found at [Quickstart](#) .

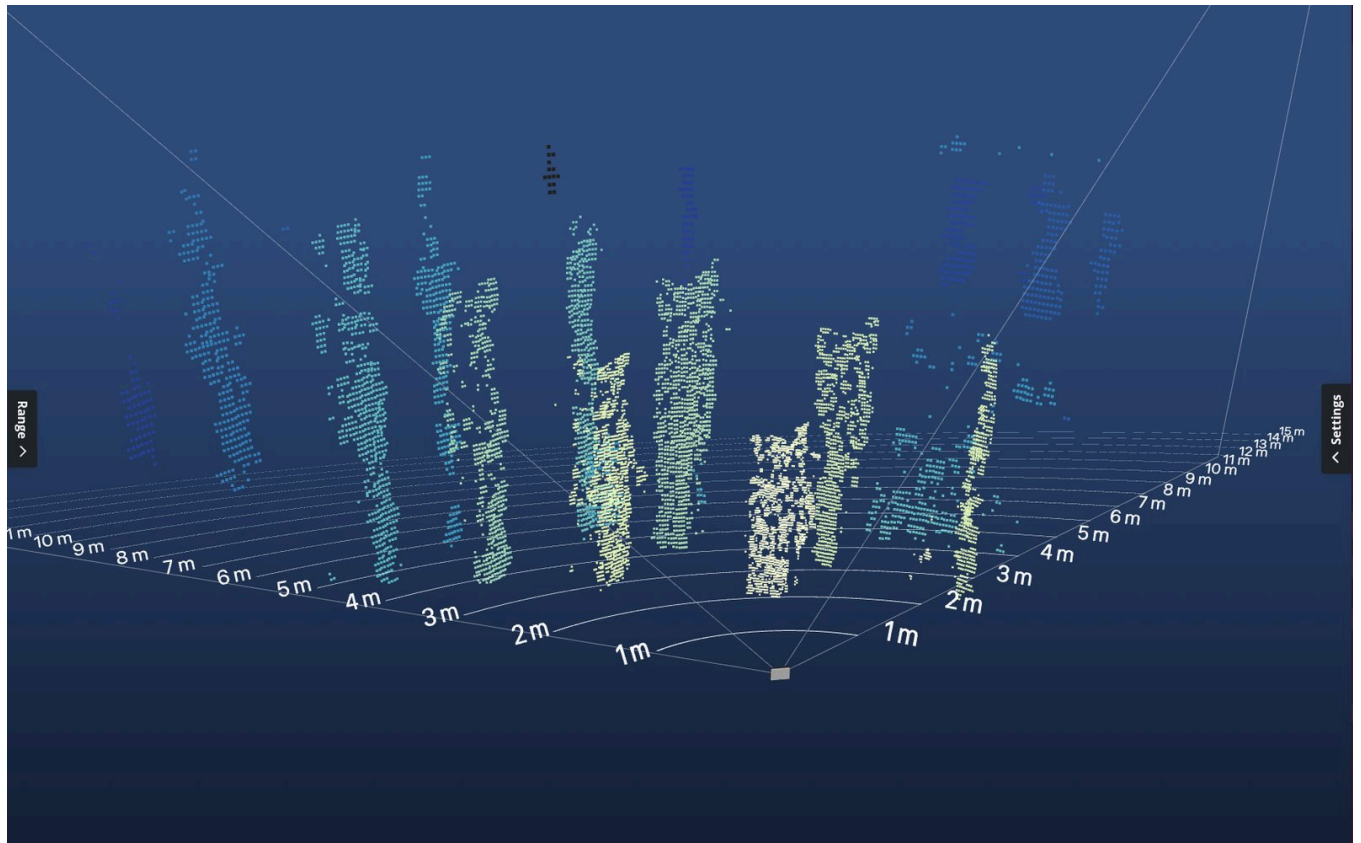
5. Put the ROV in water

You are now ready to put the ROV in water.



6. Enable acoustics

When ready, click the **"Enable Acoustics"** button to initiate the Sonar 3D-15. It will display a point cloud in the GUI representing the 3D space in front of the Sonar 3D-15.



You are now ready to operate the Water Linked Sonar 3D-15 with the Chasing ROV!

Sonar 3D-15 FAQ

Below are some frequently asked questions about the Sonar 3D-15. Click on a question in the table of content to the right or simply scroll down to read the FAQ's.

1. What is the maximum depth rating of the Sonar 3D-15?

The Sonar 3D-15 is rated for depths up to 300m, ensuring reliable performance in a wide range of underwater environments.

2. What kind of power supply is recommended?

We recommend using a power supply capable of delivering 60W peak (surge) at 10–30V. For optimal performance, a 20V or higher supply is preferred.

3. Does the Sonar 3D-15 have a thermal shutdown mechanism?

Yes. The Sonar 3D-15 includes an internal thermal shutdown to prevent damage to its electronics. You will receive a warning in both the GUI and the API if the internal temperature reaches 55 °C, indicating that the unit will shut down the acoustic at 60 °C if it continues to heat up. This will cause you to lose the sonar image.

Recommended action:

- Once you see the overheat warning (55 °C), check that the Sonar is in water or cooled in any other way.
 - If the temperature reaches 70 °C, the Sonar 3D-15 will shut down to prevent permanent damage and not restart before it reaches 65 °C again, and it must reach 55 °C before you will get the sonar image back.
-

4. What are the default network settings of the Sonar 3D-15?

By default, the Sonar 3D-15 uses **DHCP** to request an address. If no DHCP server answers, it is always accessible on the fallback IP `192.168.194.96`. For a step-by-step guide to using the fallback IP, mDNS, or setting a static IP in the GUI, see [Sonar 3D-15 Networking](#).

5. Is any software installation required to operate the Sonar 3D-15?

No, there is no software installation needed. Once connected and powered on, you can access the Sonar 3D-15's built-in GUI through a standard web browser. This allows you to operate and configure the sonar without installing any additional software.

6. The performance is not as expected?

If the performance is not as expected and you can not find a solution in this documentation, please create a [diagnostic log](#) with your Sonar 3D-15 and submit a [support ticket](#) with the Sonar 3D diagnostic log file attached.

7. How should I maintain the Sonar 3D-15?

After operating in seawater, brackish water, chlorinated pools, or any medium other than freshwater, rinse the unit thoroughly with fresh water to remove residues and salt deposits. Once dry, wipe the exterior with a clean, dry cloth. Avoid solvents or abrasive cleaners.

8. What if I need a custom integration?

For advanced integrations, you can use the Sonar 3D-15's API to develop custom solutions. This requires some programming knowledge but enables control and automation of the Sonar 3D-15's functionality from your custom system.

How to take a Diagnostic Log

A diagnostic log is one of the most important tools we have for helping you. It allows us to:

- Check the health and performance of the sonar.
- Analyse the acoustic environment the sonar is operating in.
- Identify issues related to noise, reflections, and installation.

Submerge the Sonar 3D-15 in water and make sure the front of the Sonar 3D-15 is ideally 0.5m - 2m away from any wall or solid object.

You can acquire this in the **UI > Settings > "Go to sonar config" Button > "Diagnostics" Tab > Diagnostic Log**.

Resources for the Sonar 3D-15

Sonar 3D-15 Shop Page Resources

Here you can find the Datasheet, 3D Model (.step) and Certificate of Origin

[Shop Page](#)

Software Versions

v1.8.1 (2026-09)

- Internal improvements

v1.8.0 (2026-06)

- Add option to enable raw IMU output

v1.7.1 (2026-05)

- Added an integration API for NTP configuration and status to provide tighter time synchronisation
 - Users with a NTP configuration from prior versions must apply this configuration again
- Improve NTP status feedback in GUI
- Fix LED not blinking in thermal shutdown
- Fix source IP of UDP multicast packets in integration API
- Improve Ethernet stability

v1.7.0 (2026-02)

- Introduce high-frequency 2.4 MHz mode
- Add estimation of speed of sound based on temperature and salinity
- Improve accuracy of image timestamp
- Rework of status API:
 - Add "systems_check" status
 - Remove "calibration" status
 - Replace "severity" with "status": "ok", "warning" or "error"
- Move changelog to docs.waterlinked.com

v1.6.0 (2025-11)

- Improve imaging performance
- Add dedicated diagnostic page with improved functionality
- Add compression of image packets (RIP2 protocol)
- Change time to automatically be set from user's time
- Change protocol from WebRTC to websocket for Web GUI

v1.5.1 (2025-07)

- Improve Sonar imaging
- Add activity LED
- Reduce boot time by several seconds

v1.5.0 (2025-06)

- Add support for UDP unicast
- Add support for UDP disable

v1.4.0 (2025-05)

- Add recording functionality
- Add range adjustment
- Add diagnostic functionality
- Improve strength image
- Fix integration API not working with the fallback IP address
- Fix time setting fails when no NTP server is available
- Fix issue that causes Ethernet connectivity problems with certain switches

v1.3.0 (2025-04)

- Replace gain slider with automatic gain control
- Improve user feedback when saving speed of sound

v1.2.2 (2025-04)

- Improve Sonar imaging stability
- Improve 2D image view
- Add light theme to GUI

v1.2.1 (2025-03)

- Improve Sonar imaging
- Add slider to adjust gain in GUI
- Fix LED not working
- Reduce boot time by several seconds

v1.2.0 (2025-03)

- Improve Sonar imaging
- Improve performance in GUI
- Add option to restart the Sonar
- Improve feedback on integration API status
- Fix bug causing wrong timestamps in integration API

v1.1.0 (2025-02)

- Improve visual performance and update rate
- Add display of warnings and errors
- Add customer API output (multicast)
- Add temperature shutdown
- Add speed of sound configuration
- Add change log

v1.0.0 (2025-01)

- Initial release